Technical Report No. 4B

Lake Champlain Economic Database Project

Lake Champlain Basin Program

Socio-Economic Profile, Database, and Description of the Tourism Economy for the Lake Champlain Basin

Prepared by
Holmes & Associates

for
Lake Champlain Management Conference

March 1993

PUBLICATION SERIES

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SOCIO-ECONOMIC PROFILE, DATABASE, AND DESCRIPTION OF THE TOURISM ECONOMY FOR THE LAKE CHAMPLAIN BASIN

Prepared For

Lake Champlain Management Conference

Prepared By

Holmes & Associates
Saranac Lake, New York

Principal Authors:

Timothy P. Holmes, Holmes & Associates
Dr. Bryan R. Higgins, SUNY-Plattsburgh
Gordon G. DeVries, SUNY-Plattsburgh
Dr. Richard S. Kujawa, Saint Michael's College
Anthony Artuso

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This technical report is the fourth in a series of reports prepared under the Lake Champlain Basin Program. Those in print are listed below.

Lake Champlain Basin Program Technical Reports

1. *A Research and Monitoring Agenda for Lake Champlain.* Proceedings of a Workshop, December 17-19, 1991, Burlington, VT. Lake Champlain Research Consortium. May, 1992.

2. *Design and Initial Implementation of a Comprehensive Agricultural Monitoring and Evaluation Network for the Lake Champlain Basin.* NY-VT Strategic Core Group. February, 1993.

3. (A) *GIS Management Plan for the Lake Champlain Basin Program.* Vermont Center for Geographic Information, Inc., and Associates in Rural Development. March, 1993.

   (B) *Handbook of GIS Standards and Procedures for the Lake Champlain Basin Program.* Vermont Center for Geographic Information, Inc. March, 1993.

   (C) *GIS Data Inventory for the Lake Champlain Basin Program.* Vermont Center for Geographic Information, Inc. March, 1993.

4. (A) *Lake Champlain Economic Database Project. Executive Summary.* Holmes & Associates. March 1993.

   (B) *Socio-Economic Profile, Database, and Description of the Tourism Economy for the Lake Champlain Basin.* Holmes & Associates. March 1993

   (C) *Potential Applications of Economic Instruments for Environmental Protection in the Lake Champlain Basin.* Anthony Artuso. March 1993.

   (D) *Conceptual Framework for Evaluation of Pollution Control Strategies and Water Quality Standards for Lake Champlain.* Anthony Artuso. March 1993.

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The Economic Database Study is a survey of existing data and national literature intended to provide an overview of economic and demographic characteristics, and market-based approaches to facilitate water pollution control and prevention. Specific calculation of economic impacts of proposed actions will usually require additional information and data to apply principles from this compilation of existing data and literature to the Champlain Basin. In particular, current Lake Champlain Basin Program research in the areas of agriculture, recreation and fisheries will provide underlying data needed for refined estimates of costs and economic impacts of potential management actions.

March 1993

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PROJECT SUMMARY

A primary objective of the Comprehensive Pollution Prevention, Control, and Restoration Plan being developed by the Lake Champlain Management Conference is to restore and maintain recreational and economic activities in and on the lake. However, the economic interrelationships between and among Lake Champlain, its residents, and its visitors are complex. The purpose of this project was to identify and interpret socio-economic data necessary for defining the Lake's role in the economy of the Lake Champlain Basin area within Vermont and New York. This timely report and database provide socio-economic data necessary for evaluating the public and private implications of restoring and maintaining the chemical, physical, and biological integrity of Lake Champlain's waters.

The study team has compiled the most complete and detailed socio-economic database for the Lake Champlain Basin that has yet been available. The report contains summary statistics gleaned from the socio-economic database, accompanied by an outline of the over 50 socio-economic variables that comprise the database. Two over-arching goals for the database and report have been accomplished. First and foremost, we have compiled and organized data in a manner to maximize accessibility for all interested parties. The database is clearly and consistently organized so that other researchers can perform statistical and GIS-based analysis. The report's TABLE OF CONTENTS provides the file names, table numbers, and variable descriptions necessary to access the database. Database disks are available from the Lake Champlain Basin Program office in Grand Isle, Vermont.

Second, researchers can now begin a more rigorous analysis of the relationship between key socio-economic variables and the various water quality parameters currently being monitored. The database is comprised primarily of U.S. census data listed at the town level, with summary data computed for the Lake Champlain Basin and Shoreland areas in Vermont and New York. The town-level data for the 144 Vermont towns and the 54 New York towns within the Basin provide a much finer level of detail than was previously available. For example, the interested researcher can now extract type of sewage disposal system or per capita income for a specific sub-basin of the watershed by compiling the data for those towns lying within the particular sub-basin. In summary, the socio-economic database contains information necessary for linking human activities and characteristics with environmental processes and conditions, thereby providing the first opportunity to systematically integrate the needs of people and the environment within the Lake Champlain Basin.

An important component of this report is the detailed consideration of the tourism industry within the Basin. The study team documented the lack of Lake Champlain Basin tourism studies and compiled a wide variety of New York and Vermont economic data on tourism within the Basin. This research, for the first time, estimates the significant economic expenditures by internal tourists (i.e., local residents within the region). The overall economic impact of tourism in the Basin and the contributions from distinct sectors are also assessed. A major recommendation is for systematic evaluation of the advantages and disadvantages of tourism development as a step towards sustainable tourism in the Lake Champlain Basin.

SOMMAIRE DE PROJET

Un objective principal du Projet Compréhensif de la Prévention de la Pollution, du Contrôle, et de la Restauration du Lac Champlain en train d'être développer par la Conference de l'Administration du Lac Champlain est de restaurer et de maintenir les activities de récréation et d'économie qui sont associés avec le Lac. Cependant les interrelations économiques entre le Lac Champlain, ses résidants et ses visiteurs sont complexes. L'intention de ce rapport est de identifier et d'interprèter l'information socio-économique nécessaire pour définir le rôle du lac dans l'économie du bassin du Lac Champlain dans les états de New York et du Vermont. Ce rapport et base d'information opportun offre l'information socio-économique nécessaire pour évaluer les implications publiques et privées dans les actions de restauration et de maintien de l'intégrité biologique, chimique et physique des eaux du Lac Champlain.

L'équipe d'étude a compilé l'information socio-économique la plus complète et détaillée jusqu'a maintenant du Bassin. Le rapport contient un sommaire de statistiques glanée de la base d'information accompagne par une description de plus de 50 variables socio-économique qui formé actuellement la base d'information. Deux buts principaux pour cette base d'information et ce rapport ont était accompli. En premier, nous avons compilé et organisé cette information d'une telle maniéré que l'accès est au maximum pour tout groupes intéressés. La Table des Matières du rapport liste les noms des dossiers, des tables et des variables de la base d'information. Cette base d'information est disponsible sur disquettes au Bureau du Programme du Bassin du Lac Champlain sur l'île Grande du Vermont.

En deuxième, les cherchers pourront maintenant faire une analyse plus rigoureuse de la relation entre les caractéristiques clé de l'information socio-économique et les paramètres diverses de qualité d'eau couramment surveillé. La base d'information est organisé d'une maniere claire et consistante ainsi que d'autres cherchers puisse facilement executer des analyses statistiques et de GIS (Systemes d'Information Géographique) avec les variables. La base est comprimé d'information prise du recensement 1990 des États-Unis au niveau des municipalités avec sommaires inclu pour le bassin et les rivages du Lac Champlain. L'information des 144 municipalités du Vermont et des 54 de New York offre un niveau beaucoup plus detaillé qu'avant. Par example, les cherchers intéressés pourront maintenant extraire des variables comme type de systeme d'égout ou revenu par capital pour un sous-bassin en compilant tout l'information des municipalités du sous-bassin particulier. En somme, l'information socio-économique contenu dans cette base est nécessaire pour lier les activités et caracteristiques humaines avec les procés et conditions environmental, et alors offre, pour la premiere fois, l'occasion de intégrer systématiquement les besoins du peuple et l'environment du Bassin.

Une partie importante de ce rapport est la considération detaillée de l'industrie du tourisme dans le Bassin. L'équipe a documenté le manque d'études sur le tourisme de cette region et a aussi compilé une grande variété d'information économique sur le tourisme du bassin dés deux états. Cette recherche, pour la premiere fois, estime les dépenses économique significatif des touristes de l'interieur (résidants locaux de la région). L'impact économique du tourisme dans le Bassin et les contributions des secteurs distincts ont aussi était évalué. Une recommandation majeure est de faire des évaluations systématique des avantages et désavantages du développement touristique dans le Bassin pour aider a atteindre un tourisme soutenu.

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A separate document, available on computer disk from the Lake Champlain Basin Program: Gordon-Center House, 54 West Shore Road, Grand Isle VT 05458. Phone: 1-802-372-3213

APPENDIX A: 1990 FEDERAL CENSUS DATA, SELECTED VARIABLES; RECENT STATE AGENCY DATA ON EMPLOYMENT, WAGES, VALUE ADDED, AND RECEIPTS; and, 1987 CENSUS OF BUSINESSES compiled by Gordon G. DeVries

1990 Census of Population and Housing, Census Summary File 1A
1990 Census of Population and Housing, Census Summary File 3A
New York Department of Labor and Vermont Department of Employment and Training, Time Series Data: 1985-1991, 1986-1991, 1986, 1991
1987 Census of Manufacturers
1991 Sales and Marketing Management, Survey of Buying Power
1987 Census of Service Industries
1987 Census of Wholesale Trade
New York Department of Labor and Vermont Department of Employment and Training, Government Employment and Wages: 1990

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LCIND	Table 34:	Average Annual Employment by Industry (1986)
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INTRODUCTION

This report is one of a series of four economic reports developed between June 1992 and March 1993, under the Lake Champlain Management Conference (LCMC) project: *Economic Database for the Lake Champlain Basin*. The goal of the project was to provide the following information: an accurate, accessible economic database for the entire Basin; a description and discussion of Lake Champlain-related economic sectors; and, an analysis of the economic implications of possible Lake Champlain pollution control programs. The four reports and the computerized database help to define the role of Lake Champlain in the economic well being of the lake Basin.

The reports are published in four separate volumes:

Volume I: Economic Database for the Lake Champlain Basin: Executive Summary (30 pages);

Volume II: Socio-Economic Profile, Database, and Description of the Tourism Economy for the Lake Champlain Basin (140 pages);

Volume III: Potential Applications of Economic Instruments for Environmental Protection in the Lake Champlain Basin (75 pages); and,

Volume IV: Conceptual Framework for Evaluation of Pollution Control Strategies and Water Quality Standards for Lake Champlain (25 pages).

The purpose of this report, Volume II, is to characterize the Lake Champlain Basin in demographic and economic dimensions. In addition, this report provides a series of tables and file names necessary to access the computerized database compiled for this study. The specific goals of this report are:

- to compile available economic and demographic data;
- to provide a detailed discussion of lake related economic sectors; and,
- to describe the computerized database so that it can be easily accessed by Lake Champlain researchers and other interested parties.

To reach these goals, the study team has synthesized data and information obtained from a variety of sources, including federal and state databases, previous Lake Champlain-related reports and studies, the professional literature and journals, and personal interviews with a wide range of experts and practitioners. It should be noted that the economic data base project was conducted with a major emphasis on collecting a comprehensive and in-depth set of available economic information for the Basin. Since no particular economic models or analytic techniques (e.g., input/output analysis) are presently being developed for use in the Lake Champlain Basin, the study team concentrated its efforts on compiling socio-economic data, discussing Lake-related economic sectors, and presenting examples of socio-economic analyses that might assist in factoring human activities into environmental planning for the Lake Champlain Basin.

DATA COLLECTION AND REPORTING

The states of New York and Vermont use town-level governments that serve as sub-county local governmental units. The U.S. Bureau of the Census recognizes the New York and Vermont towns as unique geographic areas and census data is available at the town level. Town level data is the basic building block for the data summaries presented in this report and they provide a finer level of analysis than has been previously available. Previous Basin-wide economic studies have relied almost exclusively on county-level data (see for example: Bigalow, Sargent, & Bevins 1970; Humstone 1978).

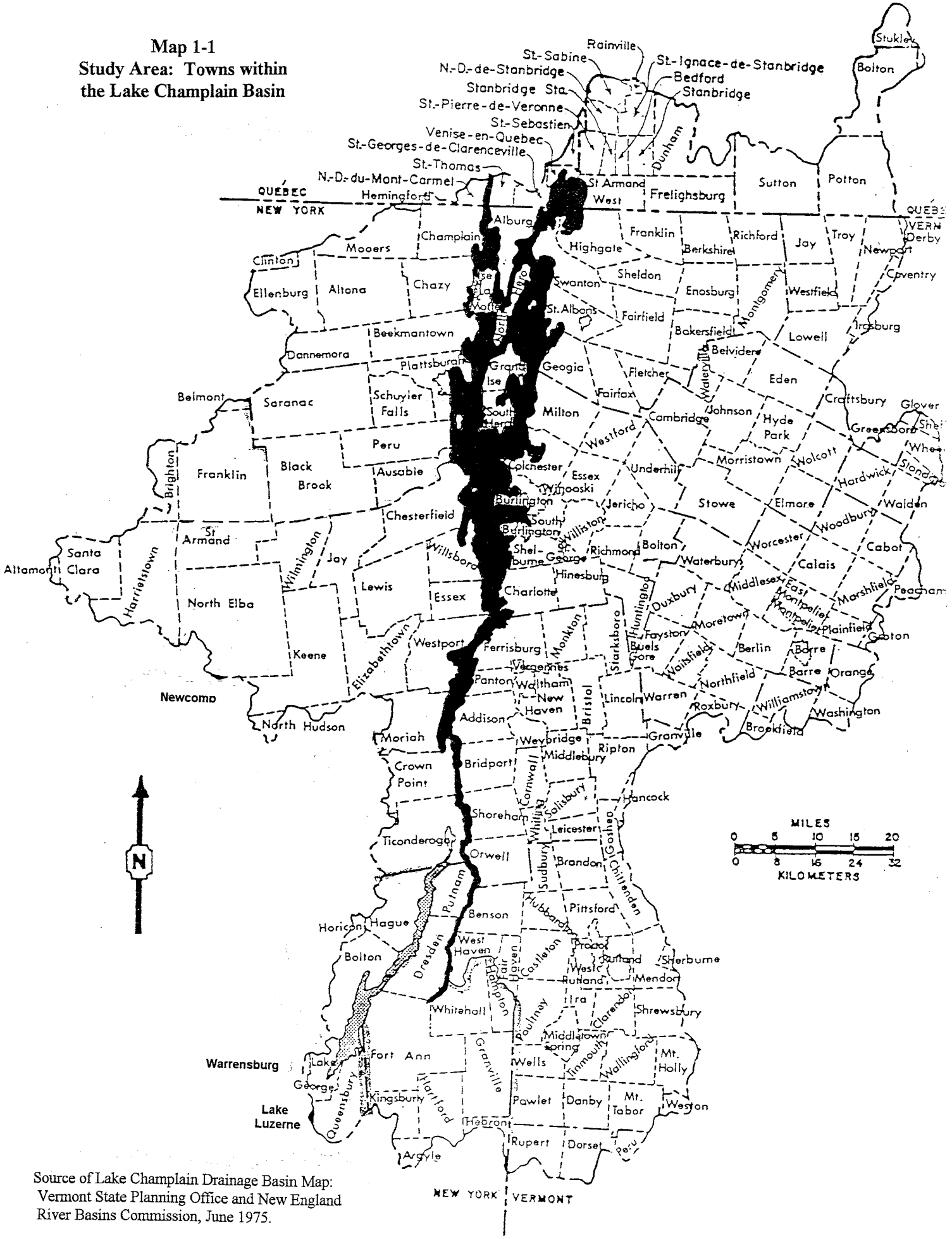
There are a total of 198 towns within the U.S. Lake Champlain Basin, 54 in New York and 144 in Vermont. The database includes all towns that contain land draining into Lake Champlain. Map 1-1 illustrates the towns comprising the Lake Champlain Basin. Table 1-1 provides alphabetized list of Basin towns and associated counties, including the 34 Quebec municipalities. The study team grappled with various possibilities for the inclusion or exclusion of towns lying only partially within the Basin, for example based on percentage of area or population within the Basin. We decided to compile the most comprehensive socio-economic database possible within the scope of the project, and include all Basin towns, even those with only a sliver of their land base in the Basin, and let individuals focus on those Basin towns of particular interest. The inclusion of all towns serves an educational function by offering all Basin residents the opportunity to see the characteristics of their town included in a socio-economic profile of the Basin.

The socio-economic characteristics of those town areas that are outside the actual Basin boundary influence the findings to some degree, however the effect is minimal. A significant portion of the Basin boundary falls in some of the most mountainous terrain in the region. The towns along that part of the boundary also tend to be sparsely populated. Queensbury town in Warren County New York is one exception, with approximately one-half of its population of 22,630 people living outside the Basin. Although this has some impact on the summary data for the Basin (constituting approximately 2% of the Basin population), the researchers consider it to be insignificant. Queensbury, as well as the other boundary towns, was dropped from the ecologic-economic zone analysis, as discussed in detail in Chapter II.

The inclusion of all towns also increases the geographic extent of the Basin, from approximately 8,000 square miles in area to over 9,000 square miles. The majority of the increase occurs in New York, where the bordering towns are 4 to 5 times the area of bordering Vermont towns. Where the analysis includes consideration of Basin's area in square miles or acres, the study team has made adjustments, or noted the difference, to reflect the actual situation by subtracting the area of the large New York towns along the border of the Basin.

The US Bureau of the Census is the primary source for the Basin-wide demographic and economic data. The Bureau released the 1990 census data on CD-ROM to the regional census data centers during the period of this study. Mr. Gordon DeVries, currently Information Services Manager with the Office of Analysis and Assessment at SUNY-Plattsburgh, is the manager of the regional affiliate data center in Plattsburgh. Mr. DeVries extracted and compiled the selected 1990 Census variables for both New York and Vermont. The study team compiled comparable data for a sub-set of those variables from published 1980 and 1970 census reports. We also compiled economic data from other federal agencies, and from New York and Vermont State agencies.

Map 1-1
Study Area: Towns within the Lake Champlain Basin



Source of Lake Champlain Drainage Basin Map: Vermont State Planning Office and New England River Basins Commission, June 1975.

Table 1-1
Lake Champlain Basin Towns:
Alphabetical Listing by State and Province, with Associated Counties

New York

	Town	County
1	Altamont town	Franklin
2	Altona town	Clinton
3	Argyle town	Washington
4	AuSable town *	Clinton
5	Beekmantown town *	Clinton
6	Belmont town	Franklin
7	Black Brook town	Clinton
8	Bolton town	Warren
9	Brighton town	Franklin
10	Champlain town *	Clinton
11	Chazy town *	Clinton
12	Chesterfield town *	Essex
13	Clinton town	Clinton
14	Crown Point town *	Essex
15	Dannemora town	Clinton
16	Dresden town *	Washington
17	Elizabethtown town	Essex
18	Ellenburg town	Clinton
19	Essex town *	Essex
20	Fort Ann town *	Washington
21	Franklin town	Franklin
22	Granville town	Washington
23	Hague town	Warren
24	Hampton town	Washington
25	Harrietstown town	Franklin
26	Hartford town	Washington
27	Hebron town	Washington
28	Horicon town	Warren
29	Jay town	Essex
30	Keene town	Essex
31	Kingsbury town	Washington
32	Lake George town	Warren
33	Lake Luzerne town	Warren
34	Lewis town	Essex
35	Mooers town	Clinton
36	Moriah town *	Essex
37	Newcomb town	Essex
38	North Elba town	Essex
39	North Hudson town	Essex
40	Peru town *	Clinton
41	Plattsburgh city *	Clinton
42	Plattsburgh town *	Clinton
43	Putnam town *	Washington
44	Queensbury town	Warren
45	Santa Clara town	Franklin
46	Saranac town	Clinton
47	Schuyler Falls town	Clinton
48	St. Armand town	Essex
49	Ticonderoga town *	Essex
50	Warrensburg town	Warren
51	Westport town *	Essex
52	Whitehall town *	Washington
53	Willsboro town *	Essex
54	Wilmington town	Essex

Quebec

	Town	County
1	Abercorn, VL	Brome
2	Austin, SD	Brome
3	Bedford, CT	Missisquoi
4	Bedford, V	Missisquoi
5	Bolton-East, SD	Brome
6	Bolton-West, SD	Brome
7	Clarenceville, VL	Missisquoi
8	Dunham, V	Missisquoi
9	Frelighsburg, SD	Missisquoi
10	Frelighsburg, V	Missisquoi
11	Lacolle, VL *	St. Jean
12	N-D-de-Stanbridge, P	Missisquoi
13	ND-du-Mont-Carmel, P *	St. Jean
14	Noyan, SD *	Missisquoi
15	Phillipsburg, V *	Missisquoi
16	Potton, CT	Brome
17	Rainville, SD	Missisquoi
18	St. Alexander, VL	Iberville
19	St. Alexandre, P	Iberville
20	St. Armand (West), P *	Missisquoi
21	St. Bernard-de-Lacolle, P	St. Jean
22	St. Etienne de-Bolton. SD	Brome
23	St. Georges-de-Clarenceville, SD *	Missisquoi
24	St. Ignance-de-Stanbridge, P	Missisquoi
25	St. Pierre-de-Veronne-A-Pike-River, SD *	Missisquoi
26	St. Sabine, P	Missisquoi
27	St. Sebastien, P	Iberville
28	Stanbridge Station, SD	Missisquoi
29	Stanbridge, CT	Missisquoi
30	Stukely-South, SD	Shefford
31	Stukely-South, VL	Shefford
32	Sutton, CT	Brome
33	Sutton, V	Brome
34	Venise-En-Quebec, SD *	Missisquoi

* Lake Champlain Shoreland towns.

Source: Holmes & Associates, 1993.

Table 1-1 (Cont'd)
Vermont

	Town	County
1	Addison town *	Addison
2	Alburg town *	Grand Isle
3	Bakersfield town	Franklin
4	Barre city	Washington
5	Barre town	Washington
6	Belvidere town	Lamoille
7	Benson town *	Rutland
8	Berkshire town	Franklin
9	Berlin town	Washington
10	Bolton town	Chittenden
11	Brandon town	Rutland
12	Bridport town *	Addison
13	Bristol town	Addison
14	Brookfield town	Orange
15	Buels Gore	Chittenden
16	Burlington city *	Chittenden
17	Cabot town	Washington
18	Calais town	Washington
19	Cambridge town	Lamoille
20	Castleton town	Rutland
21	Charlotte town *	Chittenden
22	Chittenden town	Rutland
23	Claredon town	Rutland
24	Colchester town *	Chittenden
25	Cornwall town	Addison
26	Craftsbury town	Orleans
27	Danby town	Rutland
28	Dorset town	Bennington
29	Duxbury town	Washington
30	East Montpelier town	Washington
31	Eden town	Lamoille
32	Elmore town	Lamoille
33	Enosburg town	Franklin
34	Essex town	Chittenden
35	Fair Haven town	Rutland
36	Fairfax town	Franklin
37	Fairfield town	Franklin
38	Fayston town	Washington
39	Ferrisburg town *	Addison
40	Fletcher town	Franklin
41	Franklin town	Franklin
42	Georgia town *	Franklin
43	Glover town	Orleans
44	Goshen town	Addison
45	Grand Isle town *	Grand Isle
46	Granville town	Addison
47	Greensboro town	Orleans
48	Groton town	Caledonia
49	Hancock town	Addison
50	Hardwick town	Caledonia
51	Highgate town *	Franklin
52	Hinesburg town	Chittenden
53	Hubbardton town	Rutland
54	Huntington town	Chittenden
55	Hyde Park town	Lamoille
56	Ira town	Rutland
57	Irasburg town	Orleans
58	Isle La Motte town *	Grand Isle
59	Jay town	Orleans
60	Jericho town	Chittenden
61	Johnson town	Lamoille
62	Leicester town	Addison
63	Lincoln town	Addison
64	Lowell town	Orleans
65	Marshfield town	Washington
66	Mendon town	Rutland
67	Middlebury town	Addison
68	Middlesex town	Washington
69	Middletown Springs town	Rutland
70	Milton town *	Chittenden
71	Monkton town	Addison
72	Montgomery town	Franklin
73	Montpelier city	Washington
74	Moretown town	Washington
75	Morristown town	Lamoille
76	Mount Holly town	Rutland
77	Mount Tabor town	Rutland
78	New Haven town	Addison
79	Newport town	Orleans
80	North Hero town *	Grand Isle
81	Northfield town	Washington
82	Orange town	Orange
83	Orwell town *	Addison
84	Panton town *	Addison
85	Pawlet town	Rutland
86	Peacham town	Caledonia
87	Peru town	Bennington
88	Pittsford town	Rutland
89	Plainfield town	Washington
90	Plymouth town	Windsor
91	Poultney town	Rutland
92	Proctor town	Rutland
93	Richford town	Franklin
94	Richmond town	Chittenden
95	Ripton town	Addison
96	Rochester town	Windsor
97	Roxbury town	Washington
98	Rupert town	Bennington
99	Rutland city	Rutland
100	Rutland town	Rutland
101	Salisbury town	Addison
102	Sheffield town	Caledonia
103	Shelburne town *	Chittenden
104	Sheldon town	Franklin
105	Sherburne town	Rutland
106	Shoreham town *	Addison
107	Shrewsbury town	Rutland
108	South Burlington city *	Chittenden
109	South Hero town *	Grand Isle
110	St. Albans city *	Franklin
111	St. Albans town *	Franklin
112	St. George town	Chittenden
113	Stannard town	Caledonia
114	Starksboro town	Addison
115	Stowe town	Lamoille
116	Sudbury town	Rutland
117	Swanton town *	Franklin
118	Tinmouth town	Rutland
119	Troy town	Orleans
120	Underhill town	Chittenden
121	Vergennes town *	Addison
122	Waitsfield town	Washington
123	Walden town	Caledonia
124	Wallingford town	Rutland
125	Waltham town	Addison
126	Warren town	Washington
127	Washington town	Orange
128	Waterbury town	Washington
129	Waterville town	Lamoille
130	Wells town	Rutland
131	West Haven *	Rutland
132	West Rutland town	Rutland
133	Westfield town	Orleans
134	Westford town	Chittenden
135	Weston town	Windsor
136	Weybridge town	Addison
137	Wheelock town	Caledonia
138	Whiting town	Addison
139	Williamstown town	Orange
140	Williston town	Chittenden
141	Winooski town	Chittenden
142	Wolcott town	Lamoille
143	Woodbury town	Washington
144	Worcester town	Washington

* Lake Champlain Shoreland towns.

A database as large as the one compiled for this study requires a clear, easy to follow approach for summarizing and displaying its major features. The data are aggregated and displayed at five distinct levels:

1. **The Lake Champlain Basin**
   The focus is on the U.S. portion of the Basin, supplemented with population change data for the Canadian portion of the Basin.

2. **The Vermont and New York Portions of the Basin**
   These are aggregate summaries for the respective portions of the Basin.

3. **Lake Champlain Shoreland Towns**
   Available data is aggregated at the town-level political jurisdiction. Data for those towns lying adjacent to Lake Champlain are aggregated for a comparative analysis with the Basin towns as a whole.

4. **New York and Vermont Shoreland Towns**
   Shoreland data is aggregated by State for comparison with the other Basin areas.

5. **Ecologic-Economic Zones**
   The study team, in consultation with knowledgeable individuals, has divided the Basin into nine major ecologic-economic zones. The zones allow for comparisons of social and economic characteristics between the major ecologic regions within the Basin.

The majority of the charts and graphs display comparative data at the first four levels of analysis listed above (i.e., Basin, NY & VT Basin, Shoreland, NY & VT Shoreland). The ecologic-economic zone analysis focuses on two major variables under study: population change and employment.

The study team has compiled the most complete and detailed socio-economic database for the Lake Champlain Basin that has yet been available. The socio-economic database is clearly and consistently organized so that other researchers can easily perform statistical and GIS-based analysis with the data. For example, the interested researcher can now extract type of sewage disposal system or per capita income for a specific sub-basin of the watershed by compiling the data for those towns lying within the particular sub-basin. The Lake Champlain Basin GIS mapping system was not yet in operation at the time of this reporting, however, two maps are included here that illustrate the type of map analysis that can be performed on the data.

ORGANIZATION OF THE REPORT

In addition to the INTRODUCTION, this report consists of five chapters. Chapter II offers a description and map of the Lake Champlain Ecologic-Economic Zones. Chapter III is an overview and summary of the main socio-economic characteristics of the Basin. Chapter IV focuses on the tourism and recreation sector of the Basin economy, providing a detailed discussion of economic impact of tourism in the Basin. Chapter V contains the summary, listing of main findings, policy recommendations, and suggestions for further research. The BIBLIOGRAPHY is divided into two sections, the first containing cited references, the second listing pertinent socio-economic literature on the Basin that was not referenced in this report.

The APPENDIX to this document is comprised of the socio-economic database. The printed database is considered to be unwieldy at over 300 pages and we recommend that interested parties use the database in its computerized format. Under APPENDIX in the TABLE OF CONTENTS is a list of the title of each table in the database, with associated file name. The socio-economic database will be available on computer disk from the Lake Champlain Basin Program. They can be contacted at:

Lake Champlain Basin Program
Gordon-Center House
54 West Shore Road
Grand Isle VT 05458

Phone: 1-802-372-3213

TOWNS, COUNTIES AND REGIONAL GOVERNMENT BODIES

Most of the data presented in this report are for the town or county political jurisdiction. Although the U. S. Census treats all local geographic units within the Basin similarly, some important functional differences between Vermont and New York local governments should be noted. First, county government within the State of New York has legal authority and provides services which are unheard of at the county level in Vermont. Also, only five of New York's 63 counties lie within the Basin. In contrast, 12 of the 14 counties in the State of Vermont lie, at least in part, within the Basin.

The differences between towns in New York and Vermont also has implications for the pollution prevention, control, and restoration of Lake Champlain. First, the 54 New York towns within the Basin occupy a total of 4,381 square miles for an average town size of 81 square miles. In Vermont, the 144 towns occupy a total of 5,144 square miles for an average town size of 36 square miles. Consequently, New York towns are over twice as large as towns in Vermont. Among Shoreland towns the ratio is slightly lower, although New York towns are still 1.7 times larger than Vermont Shoreland towns. Since there are more towns in the Vermont Shoreland area, 22 as compared to 17 in New York, and since the Shoreland areas constitute a relatively larger physical area and voting constituency in the smaller Vermont towns, the Shoreland areas receive more detailed attention from Vermont town governments. In other words, concerns of town residents living along the Shoreland likely carry more weight in Vermont than in New York because in Vermont those persons comprise a relatively greater proportion of Shoreland town residents. Another major difference is Vermont towns have a long tradition of grassroots democracy which is not found among New York towns. Finally, towns within the Vermont portion of the Basin have a slightly longer and more extensive tradition of land use planning and zoning than their New York counterparts.

A number of regional planning bodies are found within the Basin. In the New York portion of the Basin the Lake Champlain-Lake George Regional Planning Commission has performed various tasks during the past two decades. Although its jurisdiction includes most of the New York portion of the Basin, the scope of its studies and administration is relatively limited. The major planning and development regulation body within the New York portion of the Basin is the Adirondack Park Agency. It is especially significant that approximately 86% of the New York Basin's surface area lies within the Adirondack Park. The Park area within the Basin also includes 43% of the New York Basin's population (see Table 3-37). In summary, a major portion of the New York portion of the Basin falls under the substantial planning and development regulations of the Adirondack Park Agency.

A number of regional bodies have jurisdiction within the Vermont portion of the Basin. Regional planning commissions prepare regional plans, provide planning assistance for town governments, and perform certain statewide coordination functions. In addition, a separate network of regional economic development commissions also operate within Basin. They initiate economic studies, provide technical assistance to businesses, and administer industrial parks throughout the Basin. Finally, the Vermont Agency of Natural Resources administers the District Environmental Commissions involved with Act 250 development review within Vermont.

TERMINOLOGY AND ACRONYMS

The words "Basin" and "Shoreland" are used frequently throughout the report. When capitalized, Basin and Shoreland refer to the respective Lake Champlain Basin areas. When left in lower case, they refer to shorelands and basins in general.

Acronyms used in this report include:

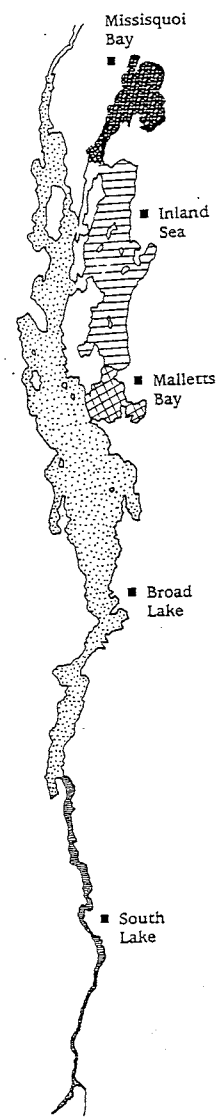
LCMC	Lake Champlain Management Conference
LCBP	Lake Champlain Basin Program
NY	New York State
NYDEC	New Department of Environmental Conservation
SUNY	State University of New York
VBMA	Vermont Boat and Marine Association
VT	Vermont

LAKE CHAMPLAIN ECOLOGIC-ECONOMIC ZONES

The nine ecologic-economic zones that comprise one level of analysis in this study are based on five distinct areas of Lake Champlain: Missisquoi Bay, Inland Sea, Malletts Bay, Broad Lake, and South Lake (Lowenstein & Lechner 1990). The study team developed the ecologic-economic zone analysis in an attempt to illuminate the socio-economic characteristics of the Basin areas that drain into each of those five zones. The five lake regions are shown in Map 2-1, while Map 2-2 illustrates the ecologic-economic zones.

Zones 1 through 3 correspond to the three areas in the northeast section of the lake along the Vermont shoreline: Missisquoi Bay, the Inland Sea, and Malletts Bay. Zones 4, 8, and 9 comprise all those Basin lands that drain into the "Broad Lake" area. The Vermont portion of the Broad Lake ecologic-economic zone is identified as Zone 4. Given the relatively large size of the Broad Lake zone portion in New York State, the analysis further distinguishes the northern portion from the southern (i.e., Zones 8 and 9), roughly along the divide between the Saranac and Ausable River watersheds. The "South Lake" ecologic-economic zone is divided between the Vermont and New York portions, identified as Zones 5 and 6. Zone 9 is comprised of those towns within the Basin that border on Lake George, but that do not border Lake Champlain. Although ecologically connected to the South Lake portion of the Basin, the economic impact of Lake George-related tourism on its shoreland towns sets that area apart economically from the remainder of the South Lake Zone.

Map 2-1
Lake Champlain Areas

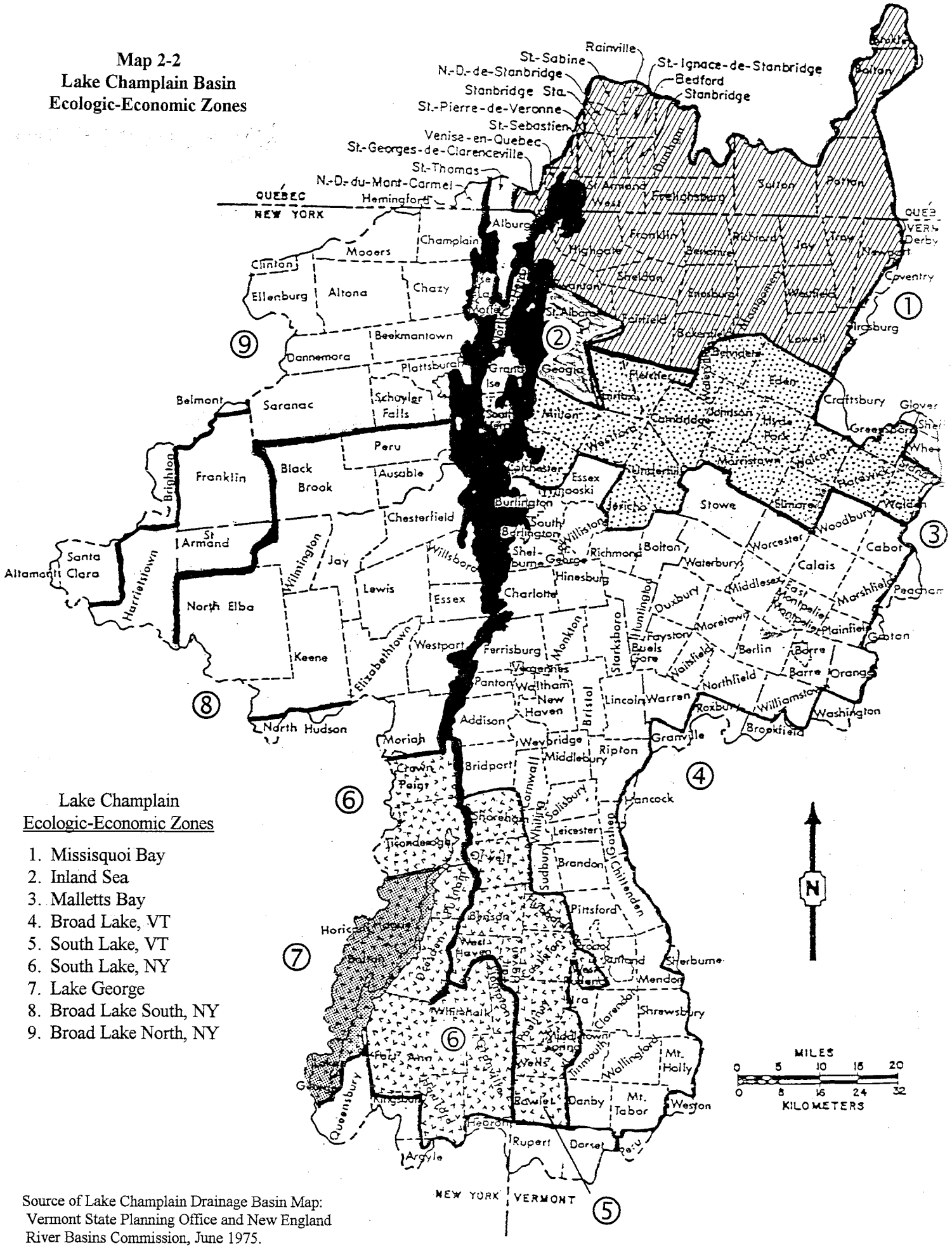


The ecologic-economic zones serve at least three purposes:

- First, the zones provide a framework for describing the social and economic characteristics of those areas of the Basin that are ecologically linked to each of the five lake areas. The zone level analysis provides a more direct link of environmental characteristics with socio-economic characteristics than is possible at the Basin, state, or county level of analysis.

- Second, by analyzing and presenting data for nine distinct ecologic-economic zones comprising the Lake Champlain Basin, the study team has provided the LCMC with a valid basis for comparing and contrasting different areas in the Basin. This type of information can be used to tailor programs to specific zones and to more accurately assess the potential social and economic impacts of management schemes directed at specific lake regions.

Map 2-2
Lake Champlain Basin
Ecologic-Economic Zones



Lake Champlain
Ecologic-Economic Zones

1. Missisquoi Bay
2. Inland Sea
3. Malletts Bay
4. Broad Lake, VT
5. South Lake, VT
6. South Lake, NY
7. Lake George
8. Broad Lake South, NY
9. Broad Lake North, NY

Source of Lake Champlain Drainage Basin Map:
Vermont State Planning Office and New England
River Basins Commission, June 1975.

- Third, since the rationale for the Lake Champlain Basin planning process is one of bioregionalism, a logical extension is the pursuit of sub-basin planning and policy along bioregional lines. As the LCMC begins to incorporate research findings into the planning process, one powerful motivation must be to link the physical and environmental aspects of the Basin with socioeconomic characteristics and economic well-being. Research and policy development on a bioregional basis, such as the ecologic-economic zones discussed in the report, is a definite step in this direction.

The procedure for determining the geographic extent of each ecologic-economic zone was developed by the study team, with review of the zone boundaries by Tony Esser, Water Quality Coordinator, USDA: Syracuse, and by members of the LCMC Technical Advisory Committee, Economic Subcommittee. Dr. Higgins used the boundaries of the Lake areas in conjunction with topographic maps to determine the portion of the Basin that drains into each Lake area. He then adjusted the boundaries of the Basin areas according to town and state boundary lines, forming the nine zones used to aggregate the town-level census data. In cases where a town was partially located in two or more zones, he allocated the town to the zone containing a majority of the town's population. Towns straddling the Basin boundary and having a majority of their population living outside the Basin were withdrawn from the ecologic-economic zone analysis. Table 2-1 is a listing of each town's zone number, organized by state and county. Due to time and budget constraints, the study team was able to perform only a limited number of ecologic-economic zone analyses (see for example, pages 3-6 to 3-8, 3-32 to 3-34, and 3-37). The socio-economic database compiled for this study provides the baseline data necessary for subsequent sub-basin analyses.

The ecologic-economic zone analysis extends traditional socio-economic analysis by providing valuable insights into the characteristics of sub-Basin areas distinguished by their ecological, rather than jurisdictional, attributes. Political jurisdiction-based analyses are necessary for comparing the Lake Champlain Basin counties and towns to political jurisdictions lying outside the Basin, as well as for comparing previous findings to the current situation. The ecologic-economic zone analysis, on the other hand, is the type of analysis critical to the development of management plans that are responsive to environmental concerns as well as to contemporary social and economic conditions in the Basin. One premise of such plans would be that environmental protection must be linked to economic vitality. The LCMC should take special note of examples within the Basin where the link between the environment and economic development policy has been recognized and explore the possibility of extending proven approaches to broader ecologic-economic areas. Efforts by the Town of Colchester in this vein should be reviewed and discussed by LCMC representatives involved in the planning and policy process.

In other areas of the U.S., vanguard approaches to resource management and environmental conservation have focused on helping the economy and ecology to flourish together. The emphasis of these approaches is on addressing the entire inhabited landscape, not just individual species or habitats, and recognizing that humans, too, must be treated as part of the ecosystem (Stevens 1992). One basis for the new management strategies is social science research that has shown that environmental issues and problems are essentially social problems, and that enduring solutions can only be attained by factoring in their human dimensions (Holmes et al. 1985). The zone-level analyses included in this report demonstrate the socio-economic diversity that exists among major Lake Champlain Basin areas, and illustrate the type of analysis necessary for incorporating human dimensions into the Lake Champlain Basin planning and management process. An additional benefit of using a bioregional approach to management of the Lake Champlain Basin is that it would pull planning and implementation closer to the local level, closer to the grassroots, and therefore improve the opportunity for effective public input and the prospects for plan implementation.

Table 2-1: Towns Comprising the Ecologic-Economic Zones, by State and County

	Ecologic Zone
New York State	
Clinton County	
Altona town	9
AuSable town *	8
Beekmantown town *	9
Black Brook town	8
Champlain town *	9
Chazy town *	9
Clinton town	99
Dannemora town	9
Ellenburg town	9
Mooers town	9
Peru town *	8
Plattsburgh city *	9
Plattsburgh town *	9
Saranac town	9
Schuyler Falls town	9
Essex County	
Chesterfield town *	8
Crown Point town *	6
Elizabethtown town	8
Essex town *	8
Jay town	8
Keene town	8
Lewis town	8
Newcomb town	99
Moriah town *	8
North Elba town	8
North Hudson town	99
St. Armand town	9
Ticonderoga town *	6
Westport town *	8
Willsboro town *	8
Wilmington town	8

	Ecologic Zone
New York State (cont'd)	
Franklin County	
Altamont town	99
Belmont town	99
Brighton town	99
Franklin town	9
Harrietstown town	9
Santa Clara town	99
Warren County	
Bolton town	7
Hague town	7
Horicon town	99
Lake George town	7
Lake Luzerne town	99
Queensbury town	99
Warrensburg town	99
Washington County	
Argyle town	99
Dresden town *	6
Fort Ann town *	6
Granville town	6
Hampton town	6
Hartford town	6
Hebron town	99
Kingsbury town	99
Putnam town *	6
Whitehall town *	6

* Shoreland Town

Lake Champlain Ecologic-Economic Zones:

1: Missisquoi Bay, 2: Inland Sea, 3: Malletts Bay, 4: Broad Lake VT, 5: South Lake VT,
6: South Lake NY, 7: Lake George, 8: Broad Lake South NY, 9: Broad Lake North NY,
99: Not included in Ecologic-Economic Zone analysis.

Table 2-1 (Cont'd)

	Ecologic Zone
Vermont	
Addison County	
Addison town *	4
Bridport town *	4
Bristol town	4
Cornwall town	5
Ferrisburg town *	4
Goshen town	4
Granville town	99
Hancock town	99
Leicester town	4
Lincoln town	4
Middlebury town	4
Monkton town	4
New Haven town	4
Orwell town *	4
Panton town *	4
Ripton town	4
Salisbury town	4
Shoreham town *	5
Starksboro town	4
Vergennes town *	4
Waltham town	4
Weybridge town	4
Whiting town	4
Bennington County	
Dorset town	99
Peru town	99
Rupert town	99
Caledonia County	
Groton town	99
Hardwick town	3
Peacham town	99
Sheffield town	99
Stannard town	3
Walden town	3
Wheelock town	99

	Ecologic Zone
Vermont (cont'd)	
Chittenden County	
Bolton town	4
Buels Gore	4
Burlington city *	4
Charlotte town *	4
Colchester town *	3
Essex town	4
Hinesburg town	4
Huntington town	4
Jericho town	3
Milton town *	3
Richmond town	4
St. George town	4
Shelburne town *	4
South Burlington city *	4
Underhill town	3
Westford town	3
Williston town	4
Winooski town	4
Franklin County	
Bakersfield town	1
Berkshire town	1
Enosburg town	1
Fairfax town	3
Fairfield town	1
Fletcher town	3
Franklin town	1
Georgia town *	2
Highgate town *	1
Montgomery town	1
Richford town	1
St. Albans city *	2
St. Albans town *	2
Sheldon town	1
Swanton town *	1

* Shoreland Town

Lake Champlain Ecologic-Economic Zones:

1: Missisquoi Bay, 2: Inland Sea, 3: Malletts Bay, 4: Broad Lake VT, 5: South Lake VT,
6: South Lake NY, 7: Lake George, 8: Broad Lake South NY, 9: Broad Lake North NY,
99: Not included in Ecologic-Economic Zone analysis.

Table 2-1 (Cont'd)

	Ecologic Zone
Vermont (cont'd)	
Grand Isle County	
Alburg town *	9
Grand Isle town *	9
Isle La Motte town *	9
North Hero town *	2
South Hero town *	4
Lamoille County	
Belvidere town	3
Cambridge town	3
Eden town	3
Elmore town	3
Hyde Park town	3
Johnson town	3
Morristown town	3
Stowe town	4
Waterville town	3
Wolcott town	3
Orange County	
Brookfield town	99
Orange town	4
Washington town	99
Williamstown town	4
Orleans County	
Craftsbury town	99
Glover town	99
Greensboro town	3
Irasburg town	99
Jay town	1
Lowell town	1
Newport town	1
Troy town	1
Westfield town	1

	Ecologic Zone
Vermont (cont'd)	
Rutland County	
Benson town *	5
Brandon town	4
Castleton town	5
Chittenden town	4
Claredon town	4
Danby town	4
Fair Haven town	5
Hubbardton town	5
Ira town	4
Mendon town	4
Middletown Springs town	5
Mount Holly town	4
Mount Tabor town	4
Pawlet town	5
Pittsford town	4
Poultney town	5
Proctor town	4
Rutland city	4
Rutland town	4
Sherburne town	99
Shrewsbury town	4
Sudbury town	4
Tinmouth town	4
Wallingford town	4
Wells town	5
West Haven *	5
West Rutland town	5

* Shoreland Town

Lake Champlain Ecologic-Economic Zones:

1: Missisquoi Bay, 2: Inland Sea, 3: Malletts Bay, 4: Broad Lake VT, 5: South Lake VT,
6: South Lake NY, 7: Lake George, 8: Broad Lake South NY, 9: Broad Lake North NY,
99: Not included in Ecologic-Economic Zone analysis.

Table 2-1 (Cont'd)

	Ecologic Zone
Vermont (cont'd)	
Washington County	
Barre city	4
Barre town	4
Berlin town	4
Cabot town	4
Calais town	4
Duxbury town	4
East Montpelier town	4
Fayston town	4
Marshfield town	4
Middlesex town	4
Montpelier city	4
Moretown town	4
Northfield town	4
Plainfield town	4
Roxbury town	99
Waitsfield town	4
Warren town	4
Waterbury town	4
Woodbury town	4
Worcester town	4
Windsor County	
Plymouth town	99
Rochester town	99
Weston town	99

* Shoreland Town

Lake Champlain Ecologic-Economic Zones:

1: Missisquoi Bay, 2: Inland Sea, 3: Malletts Bay, 4: Broad Lake VT, 5: South Lake VT,
6: South Lake NY, 7: Lake George, 8: Broad Lake South NY, 9: Broad Lake North NY,
99: Not included in Ecologic-Economic Zone analysis.

Source: Holmes & Associates, 1993

SOCIO-ECONOMIC PROFILE OF THE LAKE CHAMPLAIN BASIN

The purpose of this chapter is threefold: to provide contemporary summary statistics about the Lake Champlain Basin's human community, to highlight significant findings from the analysis of Shoreland, Basin, and ecologic-economic characteristics; and to provide an outline and brief description of the data sets incorporated in the Lake Champlain Basin socio-economic computer database. Chapter IV of this report explores the tourism economy of the Basin in more detail.

GENERAL CHARACTERISTICS OF THE POPULATION

Table 3-1 lists each of the population variables included in the Lake Champlain Basin socio-economic database. Each listed variable is a unique data set, and most are individual computer files. The computer file names are listed in the TABLE OF CONTENTS: LIST OF TABLES, at the beginning of this report.

Table 3-1
Population Variables in the Lake Champlain Basin Socio-Economic Database

1990 Census of Population and Housing: New York and Vermont

Population of Lake Champlain Basin Towns (1950-1990)
Population by Gender, Population Density, Number of Families and Households (1990)
Group Quarters Population (1990)
Population By Age (1990)
Population By Race/Ethnic Category (1990)
Non-Hispanic Population By Race (1990)

1980 Census of Population and Housing: New York *

Urban and Rural Population (1980)
Median Age, Age 18 and Over, Age 65 and Over (1980)
Population per Household (1980)
Populations in Group Quarters, Inmates of Institutions (1980)

1980 Census of Population and Housing: Vermont

Percent of Population Under 18 (1980)
Percent of Population Over 65 (1980)
Median Age (1980)

1970 Census of Population and Housing: New York

Urban and Rural Population (1970)
Median Age, Age 18 and Over, Age 65 and Over (1970)
Population per Household (1970)
Populations in Group Quarters, Inmates of Institutions (1970)

1970 Census of Population and Housing: Vermont

Percent of Population Under 18 (1970)
Percent of Population Over 65 (1970)
Median Age (1970)

Quebec Census Data

Population of Basin Municipalities (1951-1986)

* 1980 New York Census data in the database does not include Franklin county.

As shown in Table 3-1, the description of the general population characteristics relies exclusively on Census data. The researchers compiled data from a variety of sources to describe other characteristics of the Basin community (e.g., employment, occupation).

Population Change

The 1990 population of the Lake Champlain Basin was 607,788, an increase of approximately 9.2% over 1980. As shown near the bottom of Table 3-2, that was the smallest increase for any decade since 1960.

Table 3-2
Population Change by Decade: New York, Vermont, Quebec, and Lake Champlain Basin Areas (1950 to 1990)

	Population				
Area Name	1950	1960	1970	1980	1990
State of New York	14,830,192	16,782,304	18,241,391	17,558,072	17,990,455
State of Vermont	377,747	389,881	444,732	511,456	562,758
Province of Quebec	4,055,681	5,259,211	6,027,764	6,438,403	6,811,800
New York Shoreland Towns	63,461	80,708	82,305	88,320	92,351
New York BasinTowns	146,315	172,674	179,461	196,441	210,117
Vermont Shoreland Towns	72,409	80,297	99,184	111,016	124,772
Vermont Basin Towns	234,533	247,065	289,991	333,604	371,350
Quebec Shoreland Towns	3,593	4,120	4,635	5,601	5,586
Quebec Basin Towns	25,017	22,440	22,634	26,643	26,321
Lake Champlain Shoreland	139,463	165,125	186,124	204,937	222,709
Lake Champlain Basin	405,865	442,179	492,086	556,688	607,788

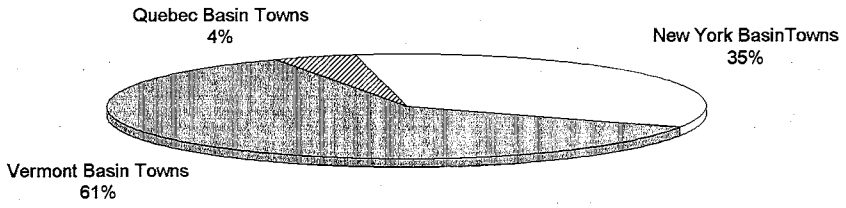
	Percent of Total Basin Population				
Area Name	1950	1960	1970	1980	1990
New York Shoreland Towns	15.6%	18.3%	16.7%	15.9%	15.2%
New York BasinTowns	36.1%	39.1%	36.5%	35.3%	34.6%
Vermont Shoreland Towns	17.8%	18.2%	20.2%	19.9%	20.5%
Vermont Basin Towns	57.8%	55.9%	58.9%	59.9%	61.1%
Quebec Shoreland Towns	0.9%	0.9%	0.9%	1.0%	0.9%
Quebec Basin Towns	6.2%	5.1%	4.6%	4.8%	4.3%
Lake Champlain Shoreland	34.4%	37.3%	37.8%	36.8%	36.6%
Lake Champlain Basin	100.0%	100.0%	100.0%	100.0%	100.0%

	Percent Population Change					
Area Name	1950-60	1960-70	1970-80	1980-90	1970-90	1950-90
State of New York	13.2%	8.7%	-3.7%	2.5%	-1.4%	21.3%
State of Vermont	3.2%	14.1%	15.0%	10.0%	26.5%	49.0%
Province of Quebec	29.7%	14.6%	6.8%	5.8%	13.0%	68.0%
New York Shoreland Towns	27.2%	2.0%	7.3%	4.6%	12.2%	45.5%
New York BasinTowns	18.0%	3.9%	9.5%	7.0%	17.1%	43.6%
Vermont Shoreland Towns	10.9%	23.5%	11.9%	12.4%	25.8%	72.3%
Vermont Basin Towns	5.3%	17.4%	15.0%	11.3%	28.1%	58.3%
Quebec Shoreland Towns	14.7%	12.5%	20.8%	-0.3%	20.5%	55.5%
Quebec Basin Towns	-10.3%	0.9%	17.7%	-1.2%	16.3%	5.2%
Lake Champlain Shoreland	18.4%	12.7%	10.1%	8.7%	19.7%	59.7%
Lake Champlain Basin	8.9%	11.3%	13.1%	9.2%	23.5%	49.8%

Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing. Statistics Canada, 1951, 1961, 1971, 1981, and 1986 Census of Population.

Vermont's portion of the Basin comprised 61.1% of the total population or 371,350 people. As illustrated in Figure 3-1 New York's portion of the Basin contained 35% of the Basin's population, and Quebec's 4% . Quebec's population reside either in the Missisquoi Bay area or along the north end of the Lake where it flows into the Richelieu River. As was shown in Table 3-2, over the past 40 years there is a general trend towards an increase in the percentage of the Basin's population residing in Vermont, and a decrease in the percentage residing in New York and Quebec.

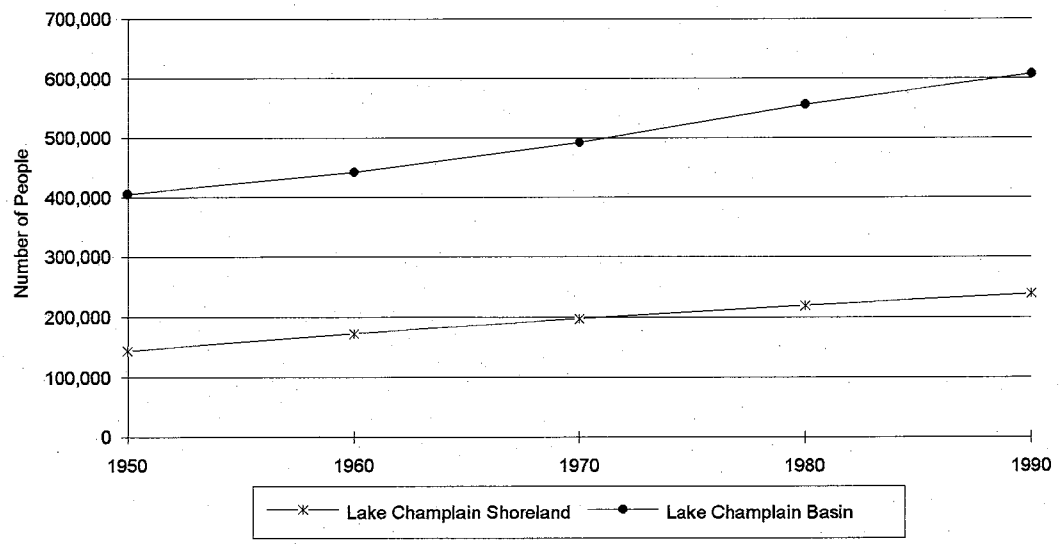
Figure 3-1
Percentage of Total Basin Population Residing in New York, Vermont, and Quebec (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A. Statistics Canada, 1986 Census of Population.

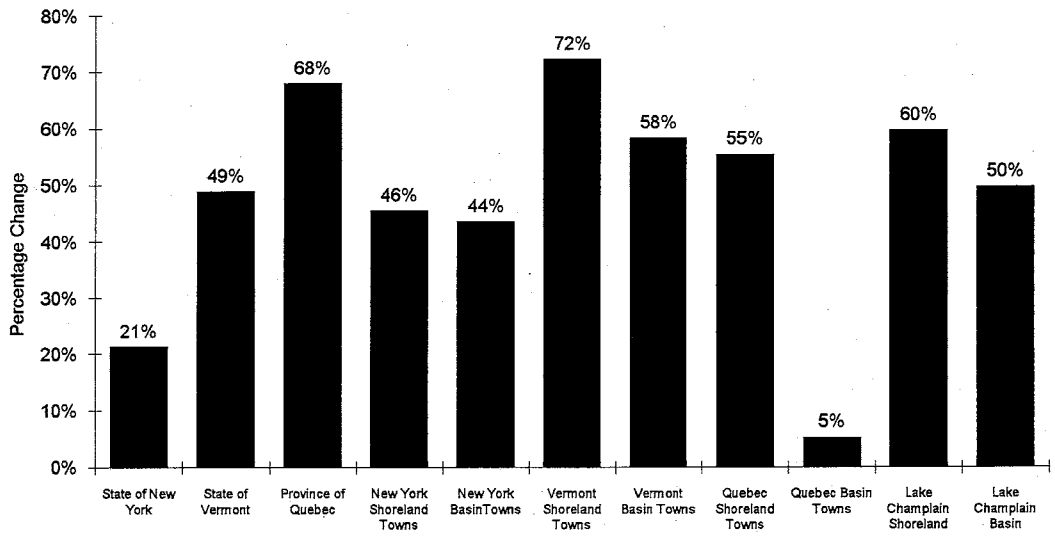
The Basin population was projected to grow by 30% between 1975 and 1990 (Humstone 1978). The actual rate of increase has been somewhat less, however. Referring to the "Percent Change" in population for the period 1970-90 in Table 3-1, while the Vermont portion of the Basin grew by 28.1%, the total population increase in the Basin was closer to 24%. The average increase in Basin population, by decade, has been approximately 12% over the past 40 years, or, 1.2% per year. In a ranking of the 50 states according to population growth between 1970 and 1990, Vermont was 31st in the country, as ranked from lowest to highest, placing it among the 25 fastest growing states in the country (Hall & Kerr 1992:111). If the Basin were to be ranked with the states, it would be ranked 29th, sharing that position with the State of Maine. Figures 3-2 and 3-3 further illustrate the population changes that have taken place in the Basin and Shoreland areas over the past 40 years.

Figure 3-2
Lake Champlain Shoreland and Basin Population by Decade (1950 - 1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing. Statistics Canada, 1951, 1961, 1971, 1981, and 1986 Census of Population.

Figure 3-3
Population Change between 1950 and 1990: NY, VT, Quebec, and Lake Champlain Basin Areas

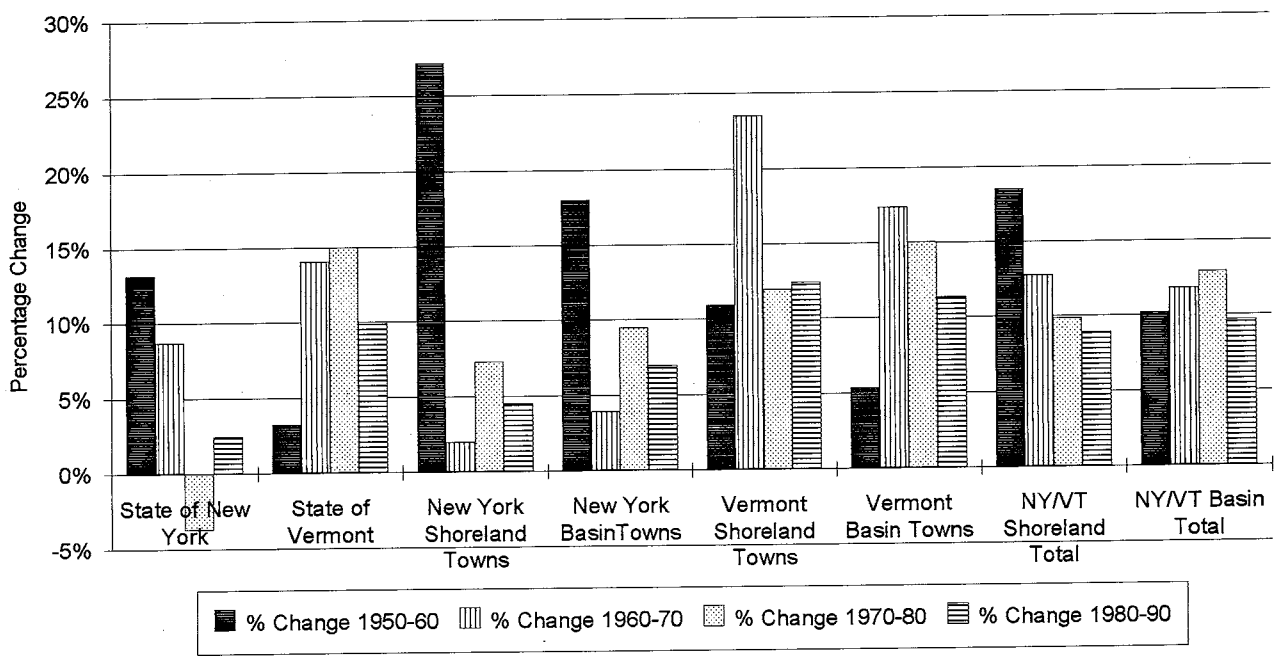


Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing. Statistics Canada, 1951, 1961, 1971, 1981, and 1986 Census of Population.

Data collection for this project on the Canadian portion of the Basin was limited to the population change data discussed above. The remainder of this report focuses exclusively on the United States (U.S.) portion of the Basin: those Basin areas encompassed by the States of New York and Vermont.

Figure 3-4 highlights the decade by decade population change for Basin and Shoreland areas within the U.S. Lake Champlain Basin. As discussed by Humstone (1978), the 1950s were high growth years for the New York portion of the Basin, and especially for New York Shoreland areas, reflecting the direct impact of the establishment of the Plattsburgh Air Force Base in 1952. On the Vermont side, the 1960-70 decade was the high growth period, attributable "to the introduction of the interstate highway system and the concurrent expansion of the economic base of the Burlington area" (Humstone 1978:1). The 1970s showed an increase in population growth over the 1960's in New York's portion of the Basin, due in part to construction of the Northway highway system between Albany and Montreal in the early 1970s. Looking at the past 40 years, the Basin population grew at a smaller rate during the 1980s (i.e., 9.2%) than for any other decade. The Vermont Shoreland population experienced the highest growth rate of any major Basin area (i.e., 12.4%) and was the only area to show an increased growth rate as compared to the 1970s.

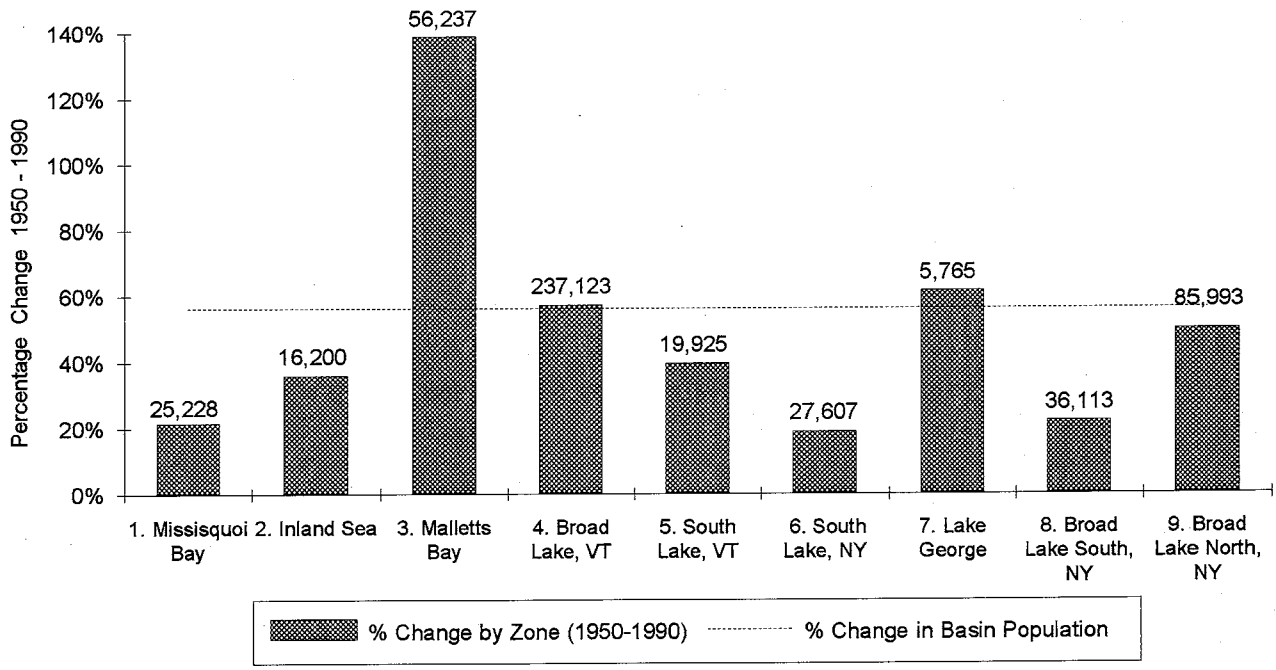
Figure 3-4
Population Change by Decade:
NY, VT, Quebec, and Lake Champlain Basin Areas (1950-1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing. Statistics Canada, 1951, 1961, 1971, 1981, and 1986 Census of Population.

The ecologic-economic zone analysis provides further insights into population change dynamics in the Lake Champlain Basin. Figure 3-5 shows the percentage change in population in each ecologic-economic zone for the entire 40 year period, 1950 to 1990. The Malletts Bay zone is conspicuous in its level of population growth over the past 40 years, at nearly 2.5 times the Basin average. The Vermont portion of Broad Lake and the Lake George area experienced population growth during the period at a level similar to that of the Basin as a whole. Growth rates were lowest in Missisquoi Bay and in the New York zones of South Lake and Broad Lake South. Close to one-half of the Basin's population (i.e., 46%) resides in the Broad Lake, VT ecologic-economic zone.

Figure 3-5
Population Change between 1950 and 1990:
Lake Champlain Ecologic-Economic Zones

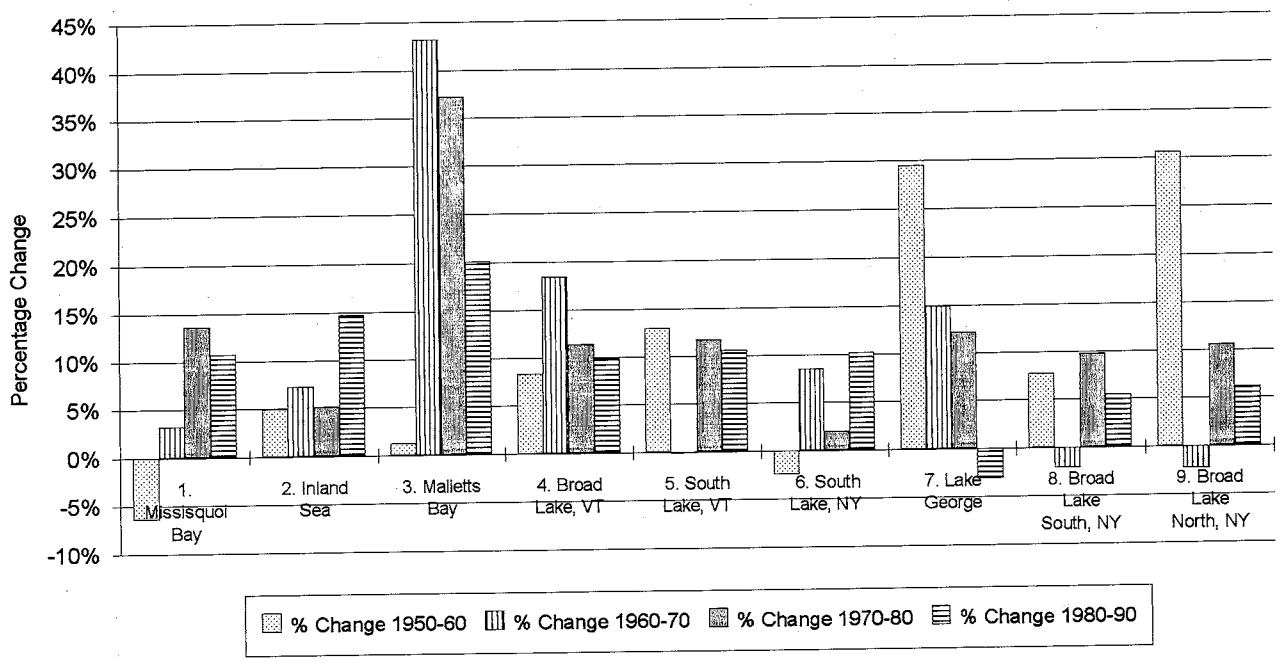


Note: The numbers indicate the 1990 population of the ecologic-economic zones.

Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing, Census Summary File 1A.

As illustrated in Figure 3-6, the Malletts Bay zone experienced a 20% increase in population in the 1980-90 decade, nearly twice the rate of increase in the Basin as a whole. The findings demonstrate the continued economic vitality of the greater Burlington area. The majority of lake zones, including Malletts Bay, experienced a decline in growth rate in the last decade as compared to the 1970-80 period. Two exceptions are the Inland Sea and South Lake, NY. The Inland Sea experienced a 15% growth rate in the recent decade compared to a 5% growth rate in the previous one, indicating the widening influence of Burlington-related employment opportunities. South Lake, NY experienced a 10% growth rate in the recent decade as compared to a 2% growth rate in the 1970-80 period, attributable largely to growth in the Glens Falls area. In contrast to the general upward trend in population throughout the Basin, the three towns comprising the Lake George zone experienced a net population decrease approximately 2%.

Figure 3-6
Population Change by Decade:
Lake Champlain Ecologic-Economic Zones (1950 to 1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1950, 1960, 1970, 1980, and 1990 Census of Population and Housing.

A preliminary look at population change by town, as shown in Table 3-3 and on Map 3-1, confirms the relatively high growth in the Inland Sea and Malletts Bay and areas, and along the Vermont Shoreland in the northern part of the lake. Surprising is the large number of New York Shoreland towns that appear among the towns with the largest decrease in population. They provide a strong testament to the significant differences among Shoreland towns, and to the social impact of job loss on a town's population base. To some extent, the large number of NY Shoreland towns losing population indicates an inability to capitalize on the economic opportunity offered by the close proximity of Lake Champlain. On the other hand, the migration of people out of Shoreland towns could indicate that the Lake itself is not sufficient to sustain local economies.

Table 3-3
Population Change by Town:
Lake Champlain Towns with Largest Increase and the Largest Decrease (1980-1990)

Largest Decrease

	Town Name	County	State	1990 Population	Change 1980-90 (percent)
1	Buels Gore	Chittenden	VT	2	-77.8
2	Weston town	Windsor	VT	488	-22.2
3	Essex town*	Essex	NY	687	-21.9
4	Newcomb town	Essex	NY	544	-20.1
5	Sherburne town	Rutland	VT	738	-17.2
6	Hague town	Warren	NY	699	-8.7
7	Brighton town	Franklin	NY	1,511	-7.0
8	Putnam town *	Washington	NY	477	-5.7
9	Chesterfield town *	Essex	NY	2,267	-5.5
10	Lake George town	Warren	NY	3,211	-5.4
11	Ticonderoga town *	Essex	NY	5,149	-5.3
12	Moriah town *	Essex	NY	4,884	-5.0
13	Clinton town	Clinton	NY	663	-3.2
14	Wilmington town	Essex	NY	1,020	-2.9
15	Glover town	Orleans	VT	820	-2.7
16	Altamont town	Franklin	NY	6,199	-1.9
17	Champlain town *	Clinton	NY	5,796	-1.6
18	Willsboro town *	Essex	NY	1,736	-1.3
19	Richford town	Franklin	VT	2,178	-1.3
20	Keene town	Essex	NY	908	-1.2

Largest Increase

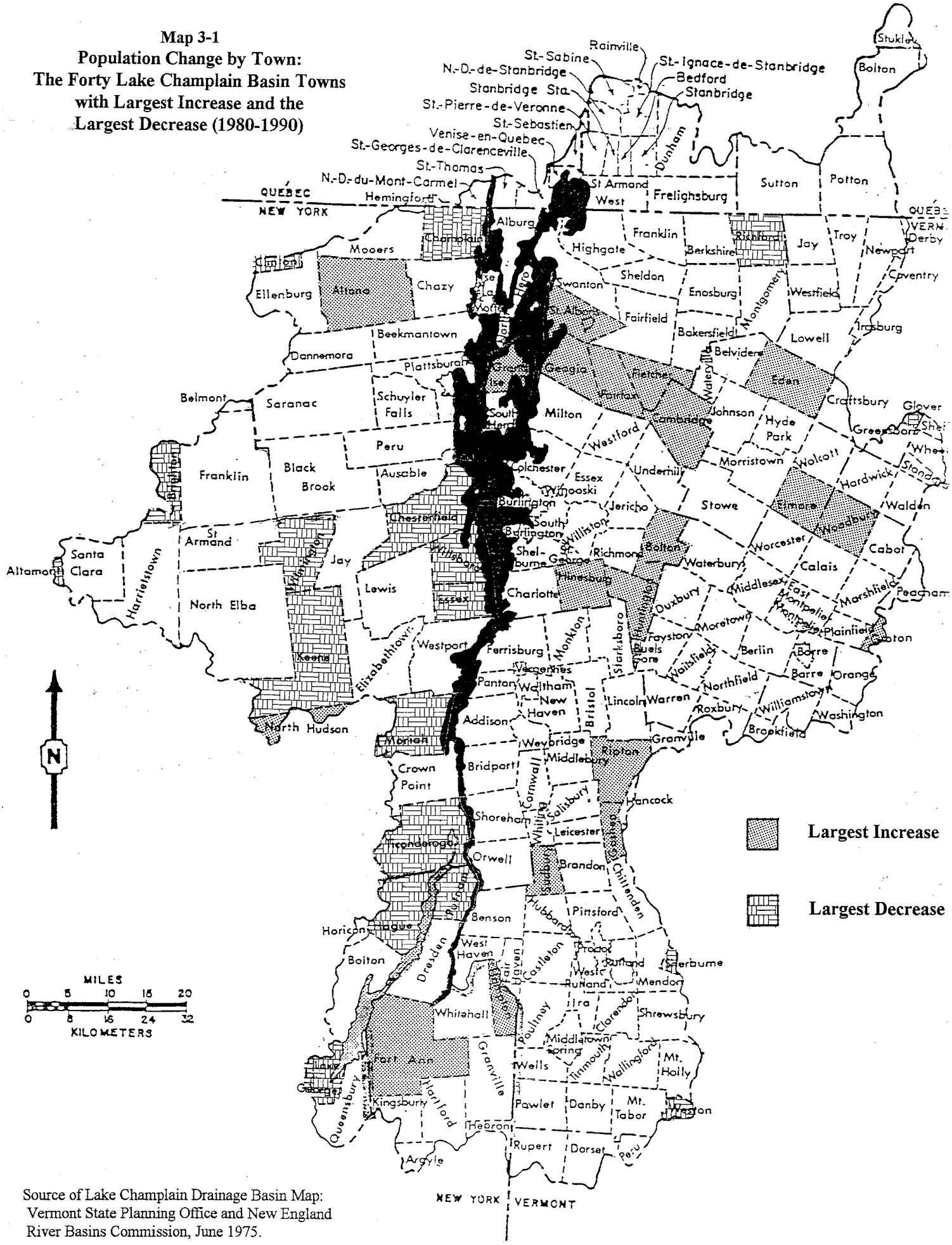
	Town Name	County	State	1990 Population	Change 1980-90 (percent)
1	Fletcher town	Franklin	VT	941	50.3
2	North Hudson town	Essex	NY	266	48.6
3	Fort Ann town *	Washington	NY	6,368	43.9
4	Hinesburg town	Chittenden	VT	3,780	40.5
5	Goshen town	Addison	VT	226	38.7
6	Huntington town	Chittenden	VT	1,609	38.6
7	Fairfax town	Franklin	VT	2,486	37.7
8	Eden town	Lamoille	VT	840	37.3
9	Elmore town	Lamoille	VT	573	36.1
10	Bolton town	Chittenden	VT	971	35.8
11	Sudbury town	Rutland	VT	516	35.8
12	Ripton town	Addison	VT	444	35.8
13	Hampton town	Washington	NY	756	35.2
14	Woodbury town	Washington	VT	766	33.7
15	Altona town	Clinton	NY	2,775	33.6
16	Georgia town *	Franklin	VT	3,753	33.2
17	Grand Isle town *	Grand Isle	VT	1,642	32.6
18	Cambridge town	Lamoille	VT	2,667	32.1
19	St. Albans town *	Franklin	VT	4,606	29.6
20	Groton town	Caledonia	VT	862	29.2

* Shoreland Towns
Source: U.S. Department of Commerce, Bureau of the Census, 1980 and 1990 Census of Population and Housing.

In summary, overall population growth in the U.S. Lake Champlain Basin between 1980 and 1990 was similar to that for Vermont as a whole. Recognizing that Vermont was among the 25 fastest growing states in the country, the Basin population growth rate is deserving of monitoring and further study. The current growth rate is more moderate than in the past, being lower in the past decade than in the three prior decades. Although Shoreland towns grew at a faster rate than the rest of the Basin between 1950 and 1970, that trend has reversed over the past twenty years, primarily due to high growth in the Vermont Basin towns inland from Burlington, and a loss of population in 7 of the 17 New York Shoreland towns.

In comparing the differences between the two states, since 1980, the growth in Vermont Basin towns is nearly twice that of New York Basin towns, and Vermont Shoreland towns are growing at almost three times the rate of their New York counterparts. Vermont Shoreland towns comprise the fastest growing

Map 3-1
Population Change by Town:
The Forty Lake Champlain Basin Towns with Largest Increase and the Largest Decrease (1980-1990)



Source of Lake Champlain Drainage Basin Map: Vermont State Planning Office and New England River Basins Commission, June 1975.

area among the major Basin areas. Among the nine ecologic-economic zones, the Malletts Bay area has consistently experienced the highest growth rate over the past 40 years. It is important to note that study of growth and development in the Malletts Bay area has been progressing for a number of years. There is a Malletts Bay Advisory Committee and a Harbor Management Plan is in progress. The LCMC should stay informed of on-going Malletts Bay planning activities.

The Vermont part of the Basin currently holds 61% of the population, while its share of the total Basin population is growing at about one percent per decade. Canadian citizens comprise a relatively small amount of the Basin's population (i.e., 5%). Finally, about 43% of the Basin population resides in Shoreland towns.

Population Density

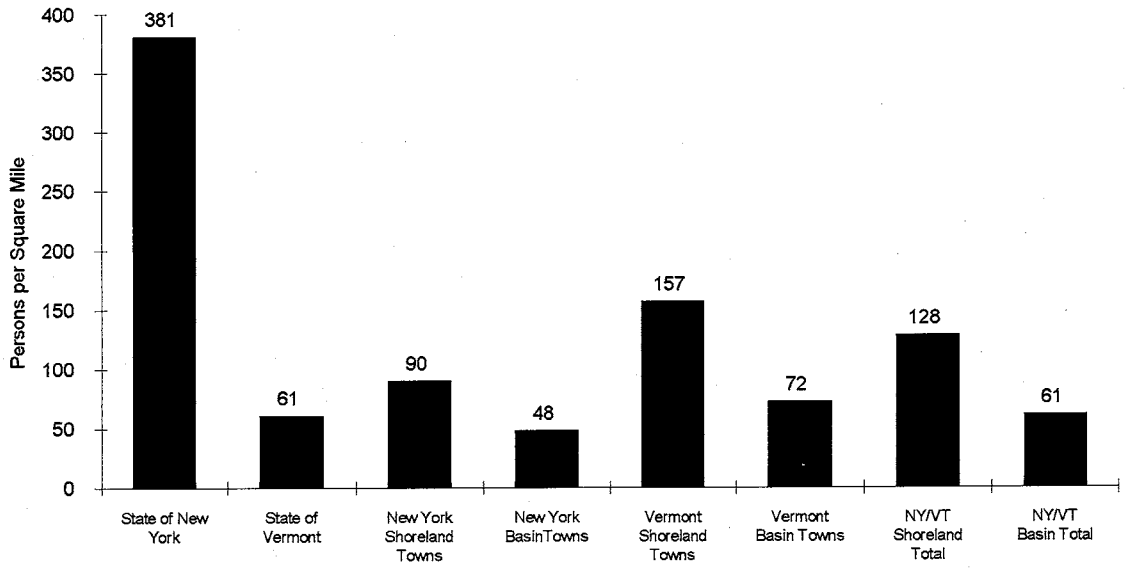
The population density data in Table 3-4 and Figure 3-7 reveal a high degree of population concentration in the vicinity of Lake Champlain. The population density of the Lake Champlain Basin as a whole is 61 persons per square mile, almost identical to that of the State of Vermont. New York Shoreland towns have a population density that is 1.5 times that of the Basin, while in Vermont, Shoreland density is over 2.5 times that of the Basin. While by including all Basin towns results in a U.S. Basin area of 9,525 square miles, a more accurate figure is obtained by subtracting the area of large NY bordering towns: 8,662 square miles. The Shoreland town area of 1,820 square miles comprises about 21% of the Basin land area. The same area contains about 40% of the population. The forthcoming Lake Champlain Basin GIS program will produce a more accurate Basin area figure with which more accurate density data can be determined; however, given that the corrections will occur only along the Basin boundary, the density estimates presented here will change only slightly.

Table 3-4
Population Density:
NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Population	Percent of Basin Population	Square Miles	Percent of Basin Area	Population Density per Square Mile	Square Miles (less Large NY Border Towns) *	Percent of Basin Area (less Large NY Border Towns) *
State of New York	17,990,455		47,224		381.0		
State of Vermont	562,758		9,249		60.8		
New York Shoreland Towns	92,351	15.9%	1,024	10.8%	90.2	1,024	11.8%
New York Basin Towns	210,117	36.1%	4,381	46.0%	48.0	3,518	40.6%
Vermont Shoreland Towns	124,772	21.5%	796	8.4%	156.8	796	9.2%
Vermont Basin Towns	371,350	63.9%	5,144	54.0%	72.2	5,144	59.4%
NY/VT Shoreland Total	233,621	40.2%	1,820	19.1%	128.4	1,820	21.0%
NY/VT Basin Total	581,467	100.0%	9,525	100.0%	61.0	8,662	100.0%

* The towns removed were Belmont, Santa Clara, Altamont, Newcomb, and North Hudson.
Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Figure 3-7
Population Density Per Square Mile:
NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Age And Gender Characteristics

Table 3-5 illustrates the age and gender characteristics of the Lake Champlain Basin, while in Figure 3-8 are displayed the percentage of the population under 18 and over 65 years of age. The Basin characteristics are very similar to those of the general population in New York and Vermont.

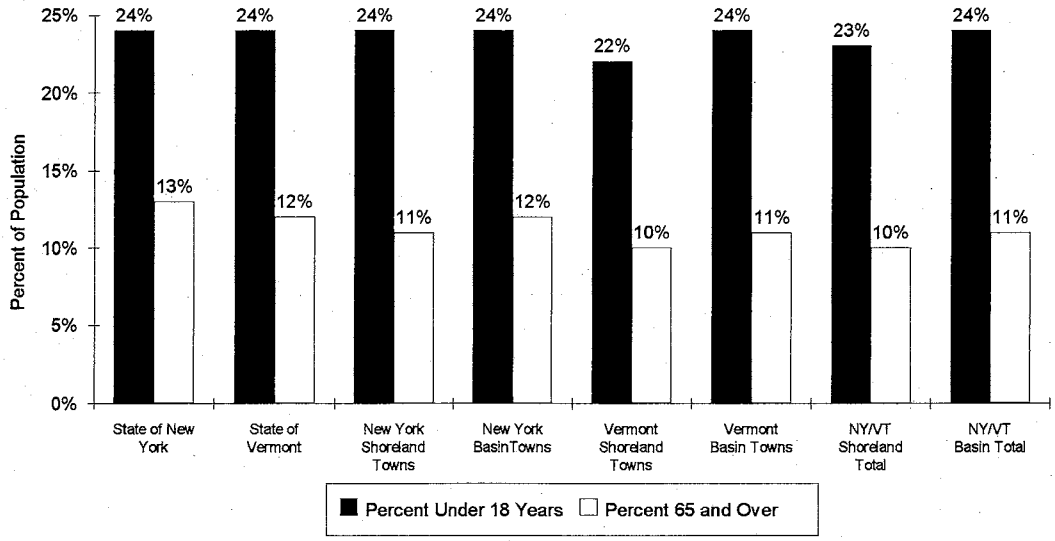
Table 3-5
Gender and Age Characteristics:
NY, VT, and Lake Champlain Basin Areas (1990)

		Gender:			Age Categories:						
Area Name	Population	Males	Females	Percent Female	0 to 4 Years	5 to 17 Years	18 to 21 Years	22 to 64 Years	65 + Years	Percent Under 18 Years	Percent 65 Years and Over
State of New York	17,990,455	8,625,673	9,364,782	52.1%	1,255,764	3,003,785	1,118,755	10,248,429	2,363,722	23.7	13.1
State of Vermont	562,758	275,492	287,266	51.0%	41,261	94,184	39,387	314,125	66,163	24.4	11.9
New York Shoreland Towns	92,351	46,908	45,443	49.2%	6,839	14,823	8,231	51,033	10,177	23.8	11.2
New York Basin Towns	210,117	107,250	102,867	49.0%	14,911	34,430	14,636	117,983	25,327	23.8	12.2
Vermont Shoreland Towns	124,772	60,419	64,353	51.6%	8,770	18,898	13,963	69,554	12,000	22.5	9.7
Vermont Basin Towns	371,350	181,891	189,459	51.0%	27,433	61,099	29,559	208,712	39,592	24.2	10.8
NY/VT Shoreland Total	217,123	107,327	109,796	50.6%	15,609	33,721	22,194	120,587	22,177	23.0	10.3
NY/VT Basin Total	581,467	289,141	292,326	50.3%	31,795	71,199	37,653	248,577	48,559	23.5	11.1

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Figure 3-8 demonstrates very similar age characteristics throughout the Shoreland and Basin areas.

Figure 3-8
Percent of Population Under 18 and 65 or Over:
NY, VT and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Racial Characteristics

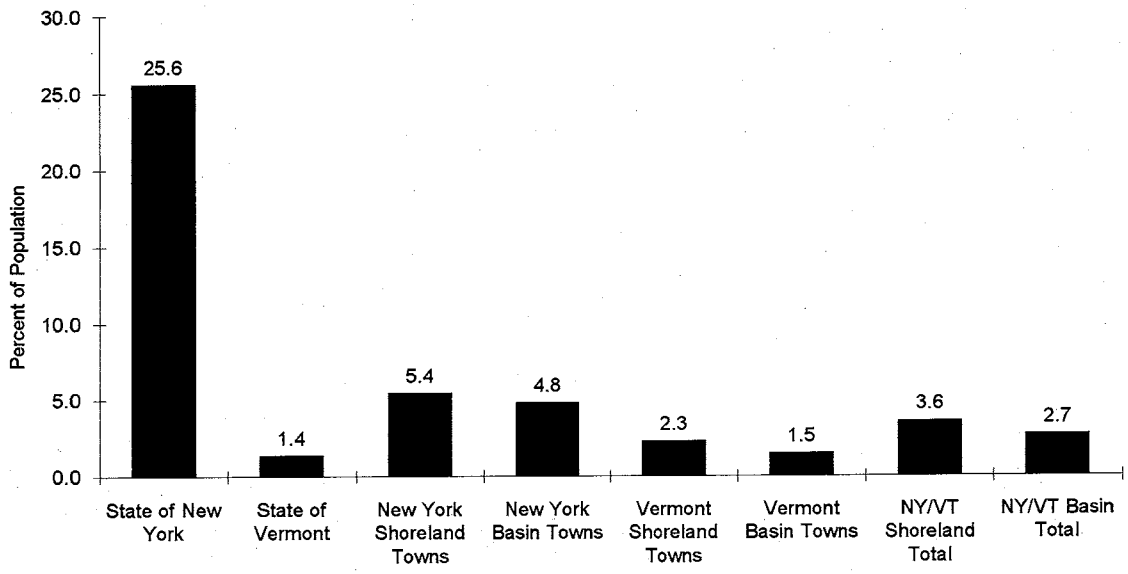
As shown in Table 3-6, approximately 97% of the Basin population is classified as white, 2% as black, 1% as Asian or Pacific Islander, and less than 1% as other races. The Native American population numbers 1,770 according the 1990 Census, with the majority (1,272) residing in the Vermont portion of the Basin. Figure 3-9 shows the relatively high minority population in the New York portion of the Basin as compared with the Vermont side of the Basin. That characteristic of the New York Basin population is likely related to the relatively high percent of the population living in group quarters, discussed below.

Table 3-6
Racial Characteristics of the Population:
NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Total	White	Black	Am. Indian, Eskimo, or Aleut	Asian or Pacific Islander	Other Race	Percent Minority	Hispanic Origin
State of New York	17,990,455	13,385,255	2,859,055	62,651	693,760	989,734	25.6	2,214,026
State of Vermont	562,758	555,088	1,951	1,696	3,215	808	1.4	3,661
New York Shoreland Towns	92,351	87,321	3,576	178	651	625	5.4	2,057
New York Basin Towns	210,117	199,950	7,130	498	1,154	1,385	4.8	4,495
Vermont Shoreland Towns	124,772	121,938	665	741	1,179	249	2.3	980
Vermont Basin Towns	371,350	363,692	1,403	1,272	2,319	555	1.5	2,649
NY/VT Shoreland Total	217,123	209,259	4,241	919	1,830	874	3.6	3,037
NY/VT Basin Total	581,467	563,642	8,533	1,770	3,473	1,940	2.7	7,144

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Figure 3-9
Minority Population as a Percentage of Total Population: NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Families, Households, And Group Quarters

The Bureau of the Census defines families, households, and group quarters as follows:

> A family consists of a householder and one or more other persons living in the same household who are related to the householder by birth, marriage, or adoption. All persons in a household who are related to the householder are regarded as members of his or her family. A household can contain only one family for purposes of census tabulations. Not all households contain families since a household may comprise a group of unrelated persons or one person living alone (1991a:B-15).
>
> A household includes all persons who occupy a housing unit. A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live and eat separately from any other persons in the building and which have direct access from the outside of the building or through a common hall. In 100-percent tabulations, the count of households or householders always equals the count of occupied housing units (1991a:B-14).
>
> All persons not living in households are classified by the Census Bureau as living in group quarters. Two general categories of persons in group quarters are recognized: (1) institutionalized persons and (2) other persons in group quarters (also referred to as "non institutional group quarters") (1991a:B-7).

Institutionalized persons include those residing in: correctional institutions (e.g., prisons, local jails, halfway houses); nursing homes; mental hospitals; hospitals for the chronically ill, mentally retarded,

physically handicapped, and for drug/alcohol abuse; juvenile institutions; and, detention centers. Non institutionalized group quarters include: rooming houses, group homes, religious quarters, college dormitories, military quarters, agricultural workers' dormitories, shelters, and staff residents of institutions (Bureau of the Census 1991a).

As shown in Table 3-7, in 1990 the average family size in the Lake Champlain Basin was 3.1 persons, while the average household size was 2.58 persons. Both families and households were slightly larger on the New York side of the lake.

Table 3-7
Households and Families: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Total Population	Number of Families	Persons Per Family	Number of Households	Persons Per Household
State of New York	17,990,455	4,489,312	3.22	6,639,322	2.63
State of Vermont	562,758	144,895	3.06	210,650	2.57
New York Shoreland Towns	92,351	22,647	3.12	32,045	2.64
New York Basin Towns	210,117	52,649	3.13	73,785	2.64
Vermont Shoreland Towns	124,772	29,485	3.06	45,620	2.58
Vermont Basin Towns	371,350	93,940	3.08	137,237	2.55
NY/VT Shoreland Total	217,123	52,132	3.09	77,665	2.60
NY/VT Basin Total	581,467	146,589	3.10	211,022	2.58

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

The influence of the group quarters population on the demographic statistics of the Lake Champlain Basin is indicated by the data shown in Table 3-8 and Figure 3-10. Looking first at the New York and

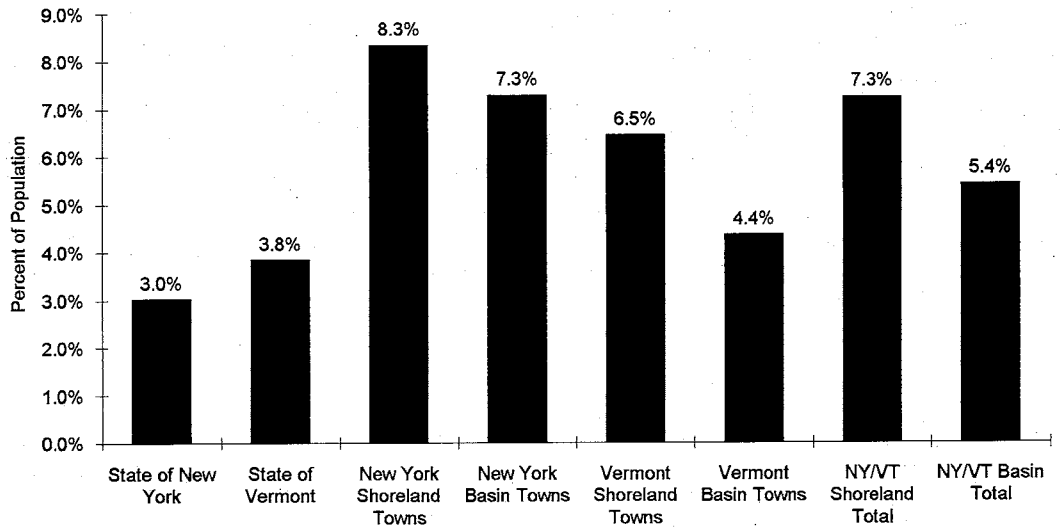
Table 3-8
Population in Group Quarters: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Total Population	Total in Group Quarters	Institu-tionalized Persons	Non-Institu-tionalized Persons	Percent in Group Quarters
State of New York	17,990,455	545,265	267,122	278,143	3.03%
State of Vermont	562,758	21,642	6,161	15,481	3.85%
New York Shoreland Towns	92,351	7,700	3,926	3,774	8.34%
New York Basin Towns	210,117	15,326	10,456	4,870	7.29%
Vermont Shoreland Towns	124,772	8,053	1,446	6,607	6.45%
Vermont Basin Towns	371,350	16,249	3,513	12,736	4.38%
NY/VT Shoreland Total	217,123	15,753	5,372	10,381	7.26%
NY/VT Basin Total	581,467	31,575	13,969	17,606	5.43%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Vermont State populations as a whole, the group quarters population comprise 3% and 3.9% of the total state population, respectively. In the Lake Champlain Basin in contrast, the group quarters population totals approximately 5.4% of the Basin population, and is as high as 8.3% in the NY Shoreland area.

Figure 3-10
Percent of Population in Group Quarters:
NY, VT, and Lake Champlain Shoreland & Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 1A.

Table 3-9 provides some indication of the increase in group quarters population over the past 20 years by illustrating the growth in the New York portion of the Basin. There was a 52% growth in group quarters population over-all, and a 113% growth between 1970 and 1990 in the population of institutionalized persons. The increase in New York group quarters population appears to be primarily due to the expansion of the prison system in northern New York.

Table 3-9
Change in Group Quarters Population - 1970 to 1990:
New York Portion of the Lake Champlain Basin

Area Name	Total Group Quarters Population	Institu-tionalized Persons	Non-Institu-tionalized Persons
New York Basin Towns - 1970	10,066	4,903	5,163
New York Basin Towns - 1990	15,326	10,456	4,870
Percent Change: 1970- 1990	52.3%	113.3%	-5.7%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 & 1970 Census of Population and Housing, Census Summary File 1A.

Housing Characteristics

A number of housing characteristics from the 1990 Census of Population and Housing are included in the Lake Champlain Basin socio-economic database. Also included are variables for the New York side of the Basin from the 1970 and 1980 census, and for Vermont from the University of Vermont, Center for Rural Studies database. The housing variables included in the database are listed in Table 3-10.

Table 3-10
Housing Variables in the Lake Champlain Basin Socio-Economic Database

1990 Census of Population and Housing: New York and Vermont

Housing Units by Tenure (1990)
Housing Units by Vacancy (1990)
Persons In Unit As A Percent of Total Occupied Units (1990)
Persons Per Room-Occupied Housing Units (1990)
Value of Specified Owner-Occupied Housing Units (1990)
Contract Rent of Specified Renter-Occupied Housing Units (1990)
Number of Housing Units By Year Structure Built (1990)
Vacant Housing Units By Condominium Status (1990)
Housing Units By Type of Sewage Disposal (1990)
Occupied Housing Units By House Heating Fuel Used (1990)
Housing Units By Source of Water (1990)
Housing Units By Plumbing Facilities (1990)

1980 Census of Population and Housing: New York *

Housing Units Occupied Year-Round (1980)
Housing Units Renter Occupied (1980)
Percent Occupied Housing Units Owner Occupied (1980)
Median Persons per Occupied Housing Unit (1980)
Owner-Occupied Non-Condominium Housing Units Median Value (1980)
Housing Units Year-Round (1980)

1970 Census of Population and Housing: New York

Housing Units Occupied Year-Round (1970)
Percent Occupied Housing Units Owner Occupied (1970)
Seasonally Vacant Housing Units (1970)

Vermont Data Sets

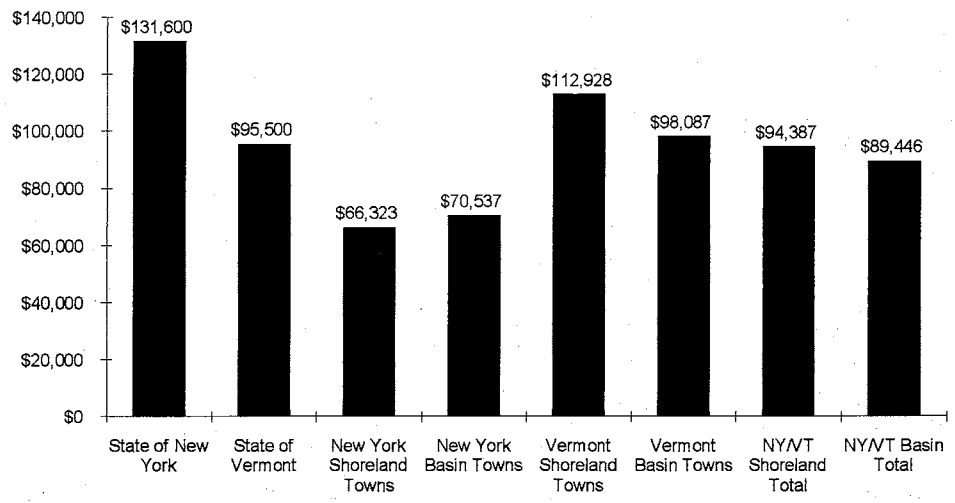
Average Residential Sale Price (1980)
Average Residential Sale Price (1985)
Number of Residential Sales (1980)
Number of Residential Sales (1985)
Fair Market Value: Residential Less Than 6 Acres (1989)
Fair Market Value: Residential Greater Than 6 Acres (1989)
Fair Market Value: Total (1989)

* 1980 New York Census data in the database does not include Franklin county.

The median value of owner occupied housing units data shown in Figure 3-11 reveal that housing units in the New York portion of the Basin are valued significantly lower, on average, than their Vermont counterparts. The median value of a New York Basin home is $70,537, while that of a Vermont Basin home is $98,087. Surprisingly, the New York Shoreland homes have a lower median value than the New York Basin homes. One explanation is that relatively high home values in resort areas of the New York

Basin (e.g., Lake Placid, Lake George) are influencing the median value of Basin housing units. The town and county data in the database show that values in Warren County towns, which includes the Lake George area, are nearly 1.5 times that of the New York Shoreland towns. That the average Vermont Shoreland home is valued at 1.7 times that of an average New York Shoreland home is likely due in large part to the value of housing in the Burlington area.

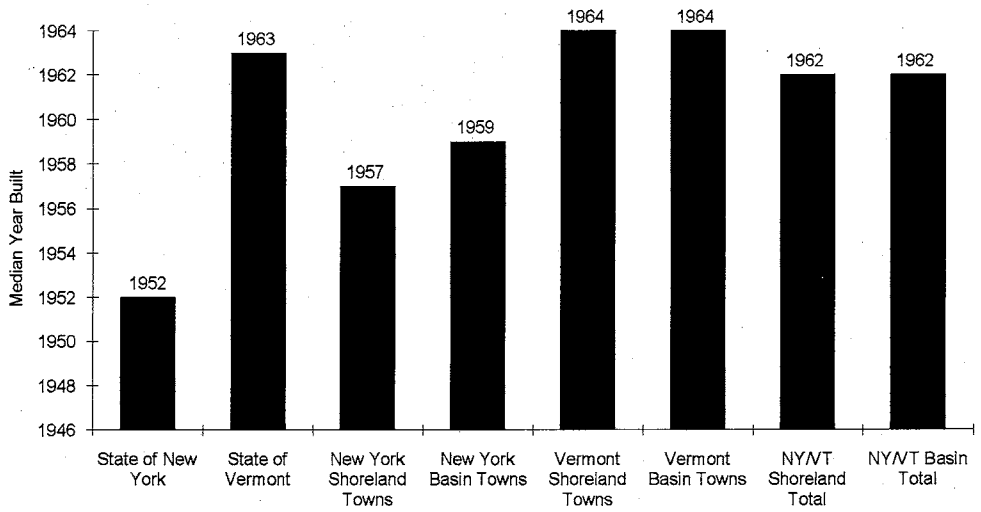
Figure 3-11
Median Value of Owner Occupied Housing Units:
NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

One indicator of the overall quality of the housing stock is the average age of all housing units. Figure 3-12 illustrates a distinct difference between the New York and Vermont Basin areas in that regard.

Figure 3-12
Age of Owner Occupied Housing Units:
NY, VT, and Lake Champlain Basin Areas (1990)

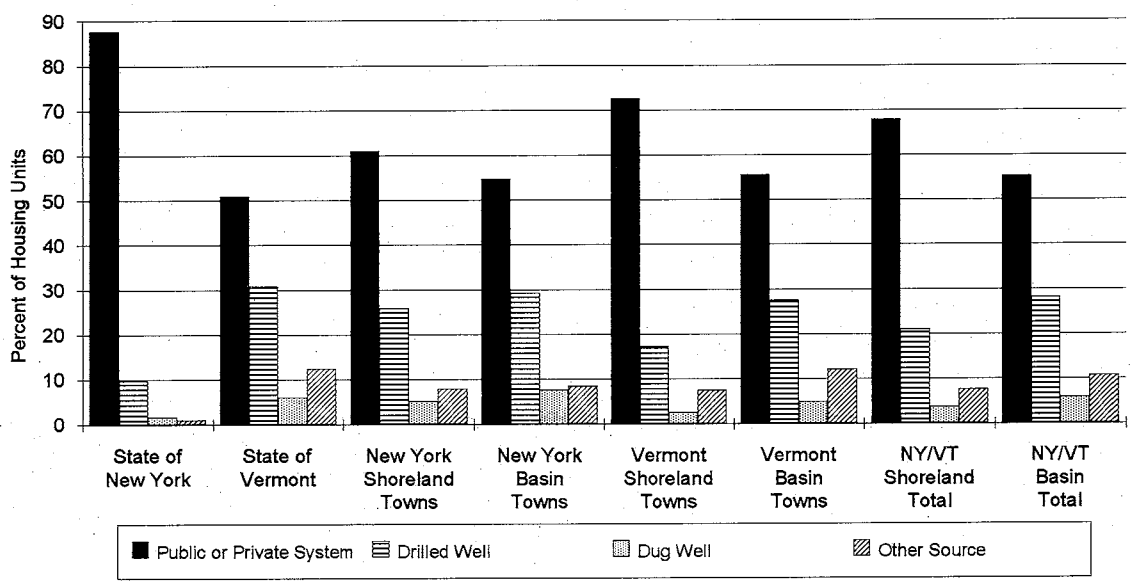


Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

The median construction date of New York Basin housing is 1959 (i.e., about 34 years old), as compared to 1964 for Vermont Basin housing (i.e., about 29 years old). The average for the Basin overall is 1962 or about 31 years old.

Two housing related characteristics of particular interest to the LCMC are source of drinking water and sewage disposal. In terms of water source, a slight majority of the Basin residents (i.e., 55 %) are tied into community systems, either public or private, represented by "public/private systems" in Figure 3-13. Slightly under 30% are served by drilled wells, approximately 5% by dug wells, and 11% by "other" sources of water, including lakes, springs, and creeks.

Figure 3-13
Source of Water by Source Type as a Percentage of All Housing Units: NY, VT, and Lake Champlain Basin Areas (1990)



Other Source: water obtained from springs, creeks, rivers, lakes, cisterns, etc.
Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

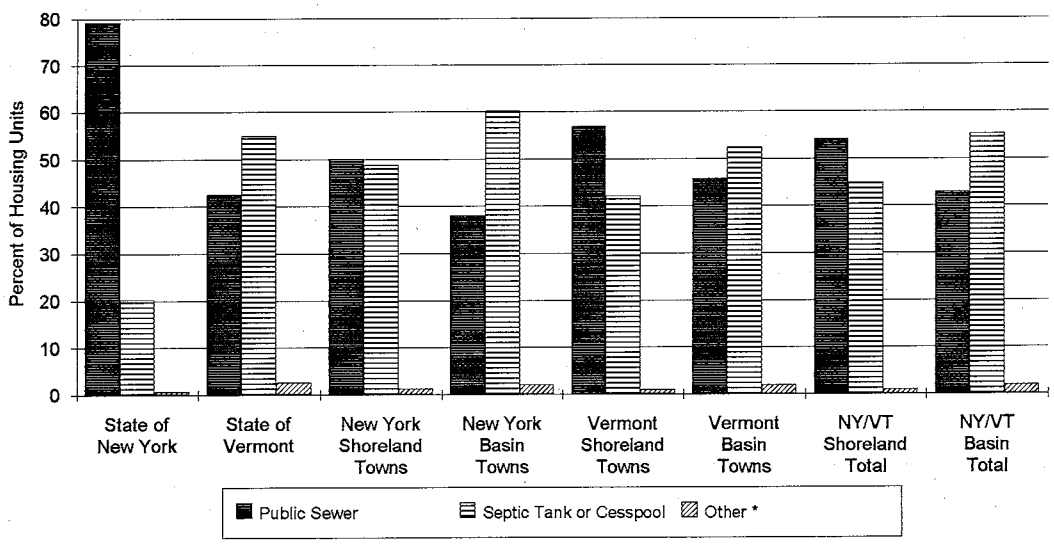
The census data does not differentiate the source of water for the public and private systems, so it is insufficient for estimating the population relying on Lake Champlain for their water. A preliminary investigation into the use of Lake Champlain as a drinking water source indicates that approximately 188,000 people, or 32% of the Basin population, obtain their drinking water from Lake Champlain. According to New York Public Health and Vermont Water Supply Division personnel about 5,000 New York residents and 179,000 Vermont residents are served by public water systems that draw water from Lake Champlain (personal communications: Bill Amberman, New York Health Department, Saranac Lake District Office 8/26/92; Rita Mitchell, Clinton County Health Department 9/3/92; Susan Mitchell, Vermont Water Supply Division 8/28/92). Census data show that 7.6% of Shoreland residents (i.e., 15,346 people or 5,902 households) obtain their water from "other" sources. Relying on previous water source research on Lake Placid camps (Holmes 1992), the study team estimates that 25% of those households, or 1,476 households (3,836 people), are drawing water directly out of Lake Champlain. The majority of people drinking Lake Champlain water (98%) receive their water through public or private water systems (i.e., supplying 5 or more housing units). For example the Champlain Water District serves 50,000 people, the Burlington Water District serves 50,000 people, and the South Burlington

Water District serves 12,670 people. In addition, most of the people obtaining Lake Champlain water through public or private systems reside in Vermont (95%).

In terms of sewage disposal, more households in the Basin rely on septic tanks and cesspools (55%) than are connected to public sewer systems (43%). As can be seen in Figure 3-14, a lower percentage of Shoreland households (44%) rely on private septic systems or cesspools than is the case for the Basin as a whole. Comparing Vermont and New York, the data show that private septic systems are more predominant in the New York Basin towns, being used by 60% of all New York Basin households. However, the percentages are fairly consistent throughout the Lake Champlain Basin area.

One influencing factor on the relatively high percentage of private septic system use in the Basin is the number of seasonal vacation homes in the area. The majority of seasonal homes are located in rural areas not currently served by public systems. Seasonal homes are discussed in more detail in the next section.

Figure 3-14
Sewage Disposal by Type as a Percentage of All Housing Units: NY, VT, and Lake Champlain Basin Areas (1990)



* Other is defined as disposing of sewage in some other way.
Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Seasonal Households

One of the major components of the Lake Champlain Basin economy is the seasonal resident. Whether their seasonal homes are referred to as camps, cabins, second homes, vacation homes, or seasonal homes, the seasonal home owner makes a significant contribution to local, rural economies in the Basin. As discussed by Dr. Higgins in the next chapter of this report, the economic impact of seasonal residents in the Basin, including those who also maintain a year-round home in the Basin, is substantial.

Table 3-11 and Figure 3-15 provide the basic data necessary to any discussion of seasonal home development in the Lake Champlain Basin. According to the 1990 Census data, there were 38,530 seasonal homes in the Basin, or 14.6% of all Basin housing units. Of all seasonal homes in the Basin, 9,104 (or 24%) are located in the Lake Champlain Shoreland areas. In contrast to the year-round

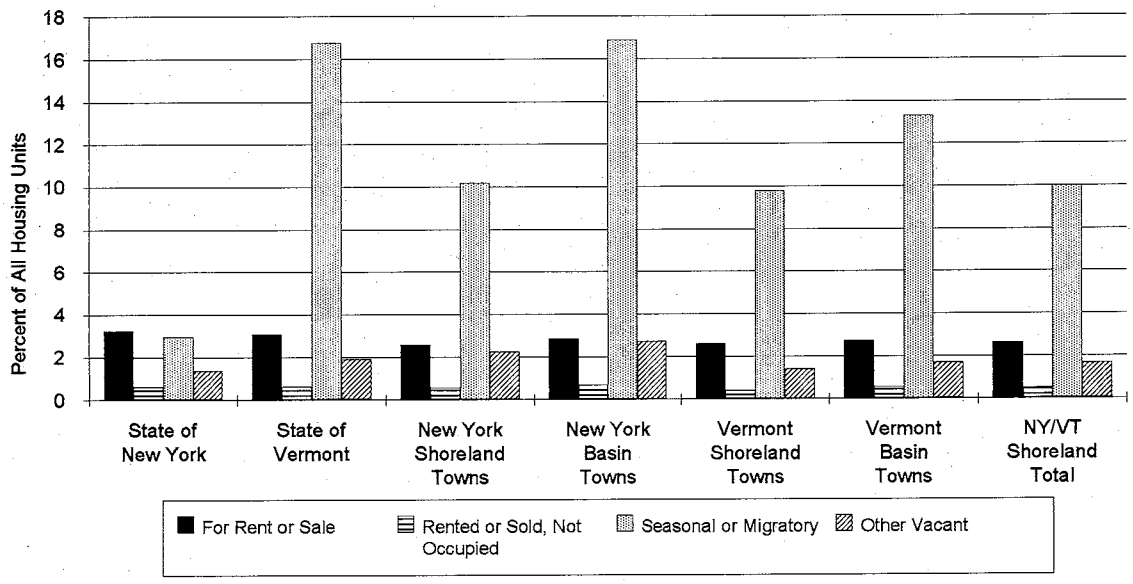
population, of which 40% reside in Shoreland towns, seasonal residents are more evenly distributed throughout the Basin. This finding demonstrates the availability of seasonal home locations in other parts of the Basin besides the lake shore, ranging from areas around numerous lakes in both Vermont and New York, to the many ski developments in the Vermont portion of the Basin.

Table 3-11
Number and Percentage of Housing Units by Vacancy Status: NY, VT, and Lake Champlain Basin Areas (1990)

		Vacancy Status				Percent of Total Housing Units			
Area Name	Total	For Rent or Sale	Rented or Sold, Not Occupied	Seasonal/ Migratory	Other Vacant	For Rent or Sale	Rented or Sold, Not Occupied	Seasonal/ Migratory	Other Vacant
State of New York	7,226,891	231,910	44,962	213,436	97,261	3.2	0.6	3.0	1.3
State of Vermont	271,214	8,325	1,675	45,443	5,121	3.1	0.6	16.8	1.9
New York Shoreland Towns	37,935	965	213	3,867	845	2.5	0.6	10.2	2.2
New York Basin Towns	95,925	2,702	638	16,195	2,605	2.8	0.7	16.9	2.7
Vermont Shoreland Towns	53,238	1,407	238	5,237	736	2.6	0.4	9.8	1.4
Vermont Basin Towns	167,841	4,538	917	22,335	2,814	2.7	0.5	13.3	1.7
NY/VT Shoreland Total	91,173	2,372	451	9,104	1,581	2.6	0.5	10.0	1.7
NY/VT Basin Total	263,766	7,240	1,555	38,530	5,419	2.7	0.6	14.6	2.1

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Figure 3-15
Housing Units by Vacancy Status as a Percentage of All Housing Units: NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

If all of the seasonal homes were occupied at the same time by an average household size of three people, those 38,530 homes would provide a population increase of approximately 116,000, an increase in Basin population of about 20%. While that scenario is unlikely, looking at Shoreland seasonal homes only, it might be assumed that a majority of those 9,104 homes are generally occupied during July and August. According to research on the residents around two lakes in the Basin: Upper Saranac Lake (Holmes 1991) and Lake Placid (Holmes 1992), the average number of people per shoreland household in July and August is five persons. Therefore, the Shoreland population swells by approximately 45,590 people in July and August. This represents an increase of 21% over the year-round Shoreland population in the US portion of the Basin.

According to data for the Missisquoi Bay area in Quebec, the year-round population of 19,030 more than doubles during the summer with the influx of 21,274 summer residents (Simoneau 1992). No documentation was available at the time of this report on how that summer population figure was obtained.

Income And Poverty

A number of income and poverty characteristics from the 1990 Census of Population and Housing, Census Summary File 3A are included in the Lake Champlain Basin socio-economic database. The Summary File 3A data is based on a sample of the population, those households selected to complete the "long form." The database also includes income and poverty variables at the town level available in 1980 and 1970 Census reports. Additional 1970 and 1980 census data for Vermont are available from The Center for Rural Studies, located at the University of Vermont, Burlington.

Table 3-12
Income and Poverty Variables in the Lake Champlain Basin Socio-Economic Database

1990 Census of Population and Housing: New York and Vermont

Household Income (1989)
Family Income (1989)
Per Capita Income (1989)
Households By Source of Income (1989)
Persons By Poverty Status And Age (1989)
Ratio of Income To Poverty Level (1989)
Ratio of Income to Poverty As A Percent Of Total Persons (1989)

1980 Census of Population and Housing: Vermont

Percent of Families Below Poverty Level (1979)
Percent of Population with Public Assistance (1979)

Table 3-12 (cont'd)

1980 Census of Population and Housing: New York *

Median Income, Families & Households (1979)
Number of Families with 2 or More Workers (1979)
Aggregate Household Income (1979)
Farm Self-Employment Income: Number of Households and Aggregate Income (1979)
Public Assistance Income: Number of Households and Aggregate Income (1979)
Per-Capita Income, Non-Institutional Persons (1979)
Number of Persons Above and Below Poverty (1979)

1970 Census of Population and Housing: Vermont

Percent of Persons Below Poverty (1969)

* 1980 New York Census data in this database does not include Franklin county.

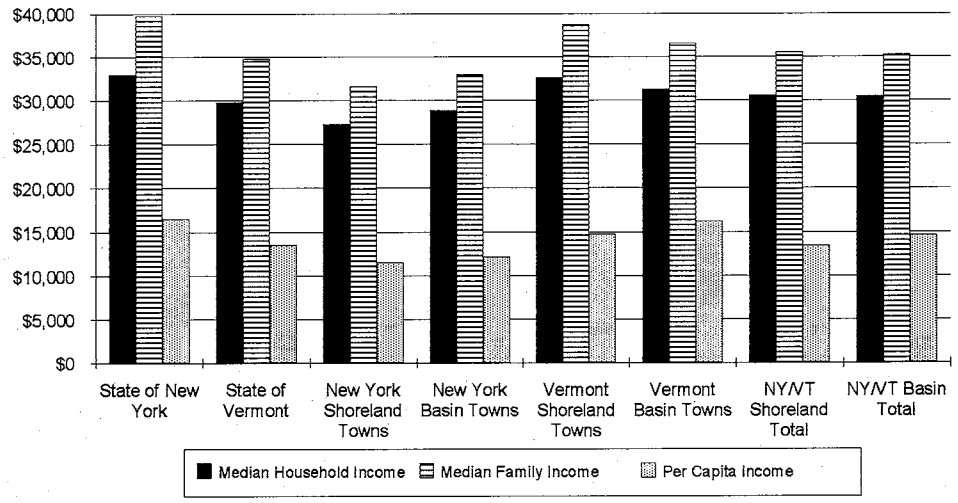
The median income of families in the Lake Champlain Basin was $35,196 in 1989 as shown in Table 3-13 and Figure 3-16. That was slightly more than the median income of all State of Vermont families, and about $4,500 less than that of State of New York families. Median household incomes for the Basin were somewhat closer in value to the State averages, while average per capita income in the Basin was very similar to that for New York and Vermont as a whole. Per capita income was highest in Vermont Basin towns and lowest in New York Shoreland towns. The last column in Table 3-13 shows the adjustment that occurs when the total group quarters population is subtracted from total population before computing per capita income, with the per capita income level rising by $838. The total income for the Lake Champlain Basin population was $8.5 billion in 1989, with approximately 71% earned by Vermont residents and 29% earned by New Yorkers.

Table 3-13
Median Income for Households, Families, and Per Capita: NY, VT, and Lake Champlain Basin Areas (1989)

Area Name	Median Household Income	Median Family Income	Per Capita Income	Per Capita Income less Population in Group Quarters
State of New York	$32,965	$39,741	$16,501	$17,017
State of Vermont	$29,792	$34,780	$13,527	$14,068
New York Shoreland Towns	$27,249	$31,605	$11,559	$12,610
New York Basin Towns	$28,832	$32,938	$12,137	$13,092
Vermont Shoreland Towns	$32,611	$38,709	$14,775	$15,794
Vermont Basin Towns	$31,268	$36,556	$16,202	$16,943
NY/VT Shoreland Total	$30,524	$35,516	$13,407	$14,456
NY/VT Basin Total	$30,470	$35,196	$14,588	$15,426

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Figure 3-16
Median Income for Households, Families, and Per Capita: NY, VT, and Lake Champlain Basin Areas (1989)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. Census Summary File 3A.

Table 3-14 reveals the results of a per capita income ranking of all towns in the database, showing the highest and lowest 25 towns. The researchers subtracted the number of people in group quarters from

Table 3-14
Per Capita Income Rankings by Town: The Fifty Lake Champlain Basin Towns with the Lowest and Highest Income (1989)**

Lowest 25				*Highest 25*			
Town	County	State	Per Capita Income 1989	Town	County	State	Per Capita Income 1989
Stannard town	Caledonia County	VT	$8,076	Fort Ann town *	Washington County	NY	$31,346
Troy town	Orleans County	VT	$8,254	Shelburne town *	Chittenden County	VT	$23,603
Clinton town	Clinton County	NY	$8,757	Warren town	Washington County	VT	$21,579
Belvidere town	Lamoille County	VT	$8,833	Charlotte town *	Chittenden County	VT	$20,769
Richford town	Franklin County	VT	$8,859	South Burlington city *	Chittenden County	VT	$20,535
Sheffield town	Caledonia County	VT	$8,921	Mendon town	Rutland County	VT	$19,960
Glover town	Orleans County	VT	$9,042	Dorset town	Bennington County	VT	$19,277
Hancock town	Addison County	VT	$9,144	Stowe town	Lamoille County	VT	$18,572
Alburg town *	Grand Isle County	VT	$9,154	Sherburne town	Rutland County	VT	$18,355
Lowell town	Orleans County	VT	$9,257	Jericho town	Chittenden County	VT	$18,312
Crown Point town *	Essex County	NY	$9,267	Underhill town	Chittenden County	VT	$18,157
North Hudson town	Essex County	NY	$9,541	Weston town	Windsor County	VT	$18,130
Isle La Motte town *	Grand Isle County	VT	$9,709	Williston town	Chittenden County	VT	$18,090
Hampton town	Washington County	NY	$9,849	Ripton town	Addison County	VT	$17,279
Bellmont town	Franklin County	NY	$9,865	Essex town	Chittenden County	VT	$17,218
Wolcott town	Lamoille County	VT	$9,931	Goshen town	Addison County	VT	$17,064
Hebron town	Washington County	NY	$9,998	South Hero town *	Grand Isle County	VT	$17,047
Sheldon town	Franklin County	VT	$10,007	Middlebury town	Addison County	VT	$17,003
Tinmouth town	Rutland County	VT	$10,115	Colchester town *	Chittenden County	VT	$16,923
Fairfield town	Franklin County	VT	$10,116	Queensbury town	Warren County	NY	$16,803
Eden town	Lamoille County	VT	$10,228	Bolton town	Warren County	NY	$16,732
Moriah town *	Essex County	NY	$10,228	Richmond town	Chittenden County	VT	$16,381
Black Brook town	Clinton County	NY	$10,238	Grand Isle town *	Grand Isle County	VT	$16,348
Orange town	Orange County	VT	$10,260	North Elba town	Essex County	NY	$16,302
Ellenburg town	Clinton County	NY	$10,397	Waterbury town	Washington County	VT	$16,228

* Lake Champlain Shoreland towns.
** Per capita income was computed on total population less group quarters population.
Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. Census Summary File 3A.

the total population before computing and sorting the per capita incomes for this analysis. Included among the towns with the lowest per capita income are nine towns in the New York Basin and 16 on the Vermont side. Although many of the listed towns are located on the periphery of the Basin, it important to note that four of the lowest per capita income towns are on the Lake Champlain Shoreland: two in Essex County, NY and two in Grand Isle County, VT. Map 3-2 illustrates the spatial distribution of the highest and lowest income towns around the Basin.

The ranking of the 25 towns with the highest per capita income reveals a more pronounced difference between the two states, with only four New York towns appearing in the list. There is one New York Shoreland town among the highest twenty-five, Fort Ann, while there are six Vermont Shoreland towns among the top 25. Chittenden County is well represented with nine towns on the top 25 list. As in the lowest per capita income list, two Grand Isle towns are included among those with the highest incomes. Grand Isle and South Hero are at the south end of the island county, in close proximity to Plattsburgh and Burlington. Two of the New York towns on the high income list, Bolton and Queensbury, border on Lake George.

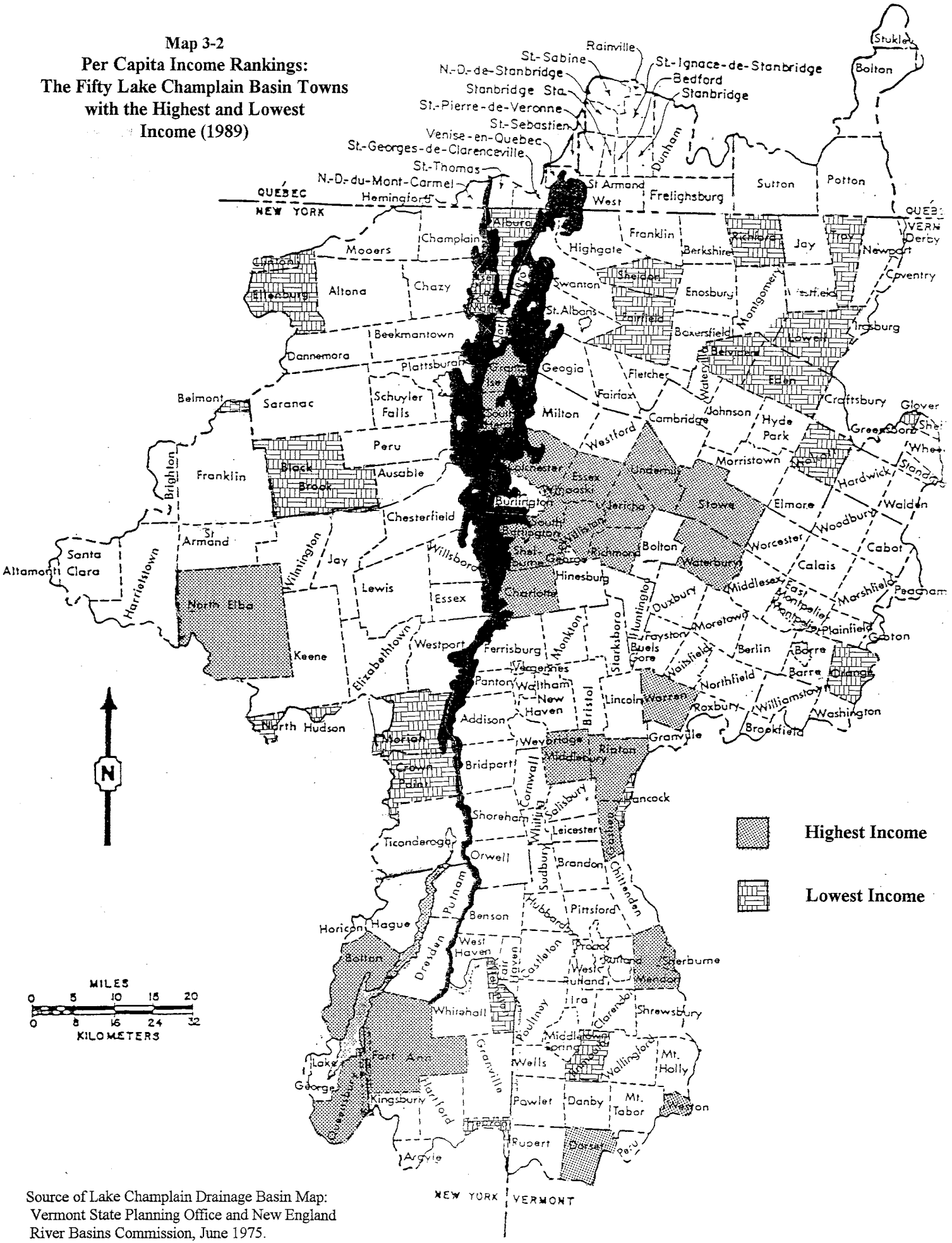
In terms of sources of income, Table 3-15 illustrates the presence of self-employment income obtained from farming. Slightly over 5,000 households, or approximately two percent of the 211,022 Basin households have such income. The census data include only households with self-employment income. Those households with a member earning wage income from farming activities and those whose employment depends on agriculture-related activities are not accounted for. Close to 80% of the self-employed farmers reside in the Vermont portion of the Basin and approximately 30% reside in Shoreland towns. The section on AGRICULTURE, FOREST PRODUCTS, AND MINING, near the end of this chapter, provides more detail on the economic importance of agriculture in the Basin.

Table 3-15
Households with Farm Self-Employment Income:
NY, VT, and Lake Champlain Basin Areas (1989)

Area Name	Households with Farm Self-Employment Income	Self-Employment Farm Income Households as a Percent of All Households
State of New York	59,101	0.89%
State of Vermont	6,156	2.92%
New York Shoreland Towns	500	1.56%
New York Basin Towns	1,165	1.58%
Vermont Shoreland Towns	1,064	2.33%
Vermont Basin Towns	4,026	2.93%
NY/VT Shoreland Total	1,564	2.01%
NY/VT Basin Total	5,191	2.46%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. Census Summary File 3A.

Map 3-2
Per Capita Income Rankings: The Fifty Lake Champlain Basin Towns with the Highest and Lowest Income (1989)



Source of Lake Champlain Drainage Basin Map: Vermont State Planning Office and New England River Basins Commission, June 1975.

Table 3-16 shows the percent of households receiving public assistance income in 1989. The figure was 6.8% for the Basin as whole, and varied from 6.5% for Vermont Shoreland towns to 7.8% for New York Shoreland towns. Except for the New York Shoreland areas, the percentage of households receiving public assistance in each of the Basin areas was less than that in Vermont as a whole, and significantly less than in the State of New York.

Table 3-16
Households with Public Assistance Income:
NY, VT, and Lake Champlain Basin Areas (1989)

Area Name	Households with Public Assistance Income	Public Assist. Income Households as a Percent of All Households
State of New York	602,196	9.07%
State of Vermont	15,068	7.15%
New York Shoreland Towns	2,496	7.79%
New York Basin Towns	4,939	6.69%
Vermont Shoreland Towns	2,971	6.51%
Vermont Basin Towns	9,430	6.87%
NY/VT Shoreland Total	5,467	7.04%
NY/VT Basin Total	14,369	6.81%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Table 3-17 and Figure 3-17 show that the poverty rate among Basin residents was higher than among the general Vermont population. While the poverty rate for the Vermont areas of the Basin was slightly

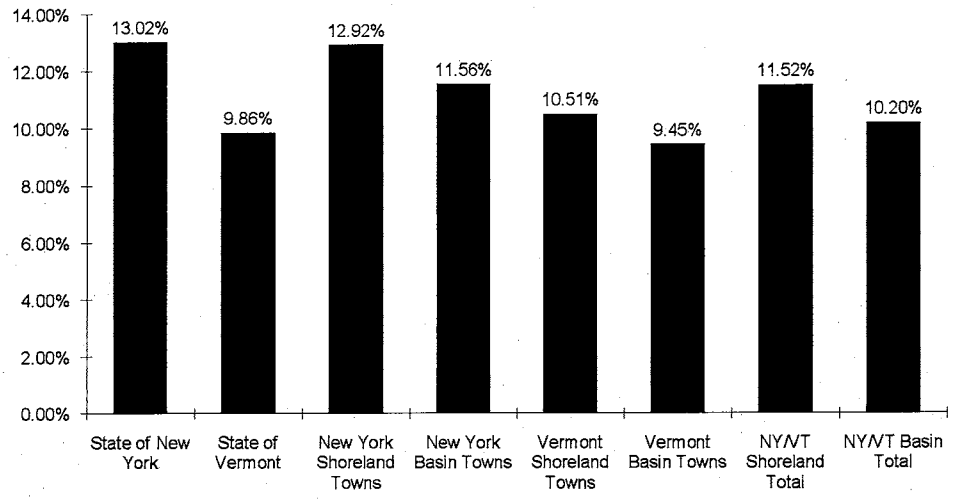
Table 3-17
Poverty Rate: NY, VT, and Lake Champlain Basin Areas (1989)

Area Name	Persons Below Poverty	Poverty Rate
State of New York	2,277,296	13.02%
State of Vermont	53,369	9.86%
New York Shoreland Towns	10,912	12.92%
New York Basin Towns	22,512	11.56%
Vermont Shoreland Towns	12,301	10.51%
Vermont Basin Towns	33,581	9.45%
NY/VT Shoreland Total	23,213	11.52%
NY/VT Basin Total	56,093	10.20%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

below that of Vermont as a whole, the New York portions of the Basin had a poverty rate approximately two percent higher than Vermont. The average poverty rate for the Basin was 10.2%. For 1989, the poverty threshold for a family of four persons was $12,674, for three persons: $9,885. Poverty thresholds used with the 1989 Census data are applied on a national basis and were not adjusted for regional, State, or local variations in the cost of living (Bureau of the Census 1991a).

Figure 3-17
Poverty Rate: NY, VT, and Lake Champlain Basin Areas (1989)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing. Census Summary File 3A.

Education

Table 3-18 shows that almost 80% of Basin residents have a high school degree or higher. At the sub-Basin level this varies from 83% in the Vermont Shoreland areas to 75% in the New York Basin area.

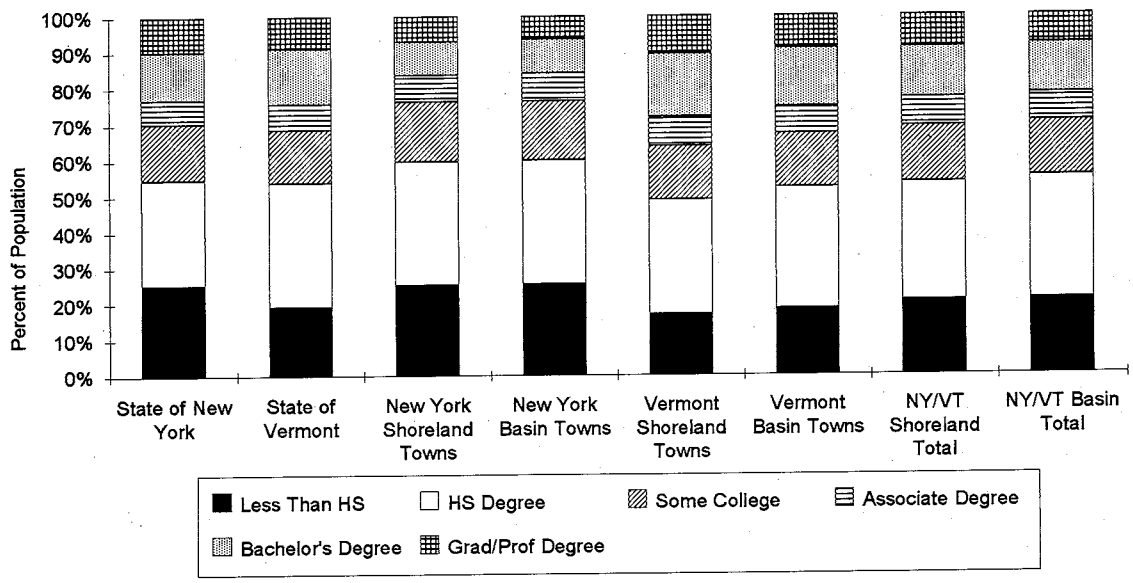
Table 3-18
Educational Attainment of Persons 25 Years and Over: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Less Than 9th Grade	9 to 12th Grade, No Diploma	H.S. Graduate	Some Coll. No Degree	Associate Degree	Bachelor's Degree	Graduate or Professional Degree	Percent w/ High Sch. Degree or Higher
State of New York	1,200,827	1,776,777	3,485,686	1,851,182	770,268	1,561,719	1,172,110	74.8
State of Vermont	30,945	37,692	123,430	52,594	25,730	55,120	31,734	80.8
New York Shoreland Towns	5,784	8,326	19,204	9,222	4,216	5,107	4,002	74.7
New York Basin Towns	13,026	20,286	45,367	21,368	10,151	12,354	8,507	74.6
Vermont Shoreland Towns	5,948	6,645	23,682	11,161	6,018	12,990	7,980	83.1
Vermont Basin Towns	19,599	22,706	78,548	34,391	17,331	37,515	21,603	81.7
NY/VT Shoreland Total	11,732	14,971	42,886	20,383	10,234	18,097	11,982	79.5
NY/VT Basin Total	32,625	42,992	123,915	55,759	27,482	49,869	30,110	79.2

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

As shown in Figure 3-18, approximately 10% of the Basin's population have Bachelor's Degrees and about six percent have a graduate or professional degree.

Figure 3-18
Educational Attainment of Persons 25 Years and Over: NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

EMPLOYMENT, OCCUPATION, INDUSTRY, AND CLASS

The report now turns to a description of the Basin's major economic characteristics. Table 3-19 lists the variables in the socio-economic database that characterize employment, occupation, and industry in the Lake Champlain Basin. The pertinent 1990 Census variables are included, as is data from a variety of state and national sources. This data set also features extensive coverage of relevant 1970 and 1980 Census data available at the town level.

Table 3-19
Employment, Occupation, and Industry Variables in the Lake Champlain Basin Socio-Economic Database

1990 Census of Population and Housing: New York and Vermont
Employed Persons 16 Years And Over By Industry (1990)
Employed Persons 16 Years and Over By Occupation (1990)
Place of Work - State, County And Place Level (1990)
Travel Time To Work (1990)
Class Of Worker (1990)

continued

Table 3-19 (cont'd)

N.Y.S. Department of Labor & Vermont Department of Employment and Training Data
Annual Average Civilian Labor Force (1985-1991)
Annual Average Unemployment Rate (1985-1991)
Average Annual Employment by Industry (1986)
Average Annual Employment By Industry (1991)
Percent Change in Average Annual Employment By Industry (1986-1991)

State and Federal Data Sets
Manufacturing Establishments, Employees, Wages, and Value Added: Basin Counties (1987)
Retail Trade Sales By Store Group: Basin Counties (1991)
Service Industry Establishments, Employees, Payroll and Receipts: Basin Counties (1987)
Wholesale Industry Establishments, Sales, Payroll And Employees - Total Wholesalers: Basin Counties (1987)
Wholesale Industry Establishments, Sales, Payroll And Employees - Merchant Wholesalers: Basin Counties (1987)
Government Employment and Wages: Basin Counties (1990)
Total Employment for NY Boat Liveries/ Marinas/ Yacht Basins: Lake Champlain Basin Counties (1976 - 1990)
Employment in 28 New York Tourism Businesses: NY Basin Counties (1976 - 1990)
Border Crossings for Ports in the Lake Champlain Basin (1986 - 1992)

1980 Census of Population and Housing: New York *
Labor Force Status Persons 16 Years and Older: Total Labor Force and Armed Forces (1980)
Labor Force Status Persons 16 Years Old and Older: Civilian Labor Force (1980)
Labor Force Status Persons 16 Years and Older: Percents (1980)
Labor Force Status Persons 16 Years and Older: Class of Worker (1980)
Labor Force Status Persons 16 Years and Older: Number Employed by Industry (1980)
Labor Force Status Persons 16 Years and Older: Number Employed by Occupation (1980)

1980 Census of Population and Housing: Vermont
Percent Employed in Agriculture, Forestry, Fishing (1980)
Number of Federal Employees (1980)
Number of State Employees (1980)
Number of Local Employees (1980)
Labor Force Status Persons 16 Years and Older: Number Employed by Industry (1979)
Labor Force Status Persons 16 Years and Older: Number Employed by Occupation (1979)

1970 Census of Population and Housing: New York
Percent in Labor Force by Gender (1970)
Employed Persons 16 Years And Over By Industry (1970)
Employed Persons 16 Years and Over By Occupation (1970)
Place of Work - State, County And Place Level (1970)
Class Of Worker (1970)

1970 Census of Population and Housing: Vermont
Percent Employed in Agriculture or Forestry (1970)
Percent Employed in Manufacturing (1970)

* 1980 New York Census data in this database does not include Franklin county.

Employment by Industry

The information on industry supplied by the 1990 census relates to the kind of business conducted by a person's employing organization. For employed persons, the data refer to the person's job during the reference week. For those who worked at two or more jobs, the data refer to the job at which the person worked the greatest number of hours. For unemployed persons, the data refer to their last job. The industry classification system developed for the 1990 census consisted of 235 categories for employed persons, classified into 13 major industry groups. The 1990 census classification was developed from the 1987 Standard Industrial Classification (SIC) Manual (Bureau of the Census 1991a:B-19,20).

As shown in Table 3-20 and Figure 3-19, one of the major characteristics of employment in the Basin on a percentage basis is that it tends to mirror the employment situation in Vermont as a whole. Four

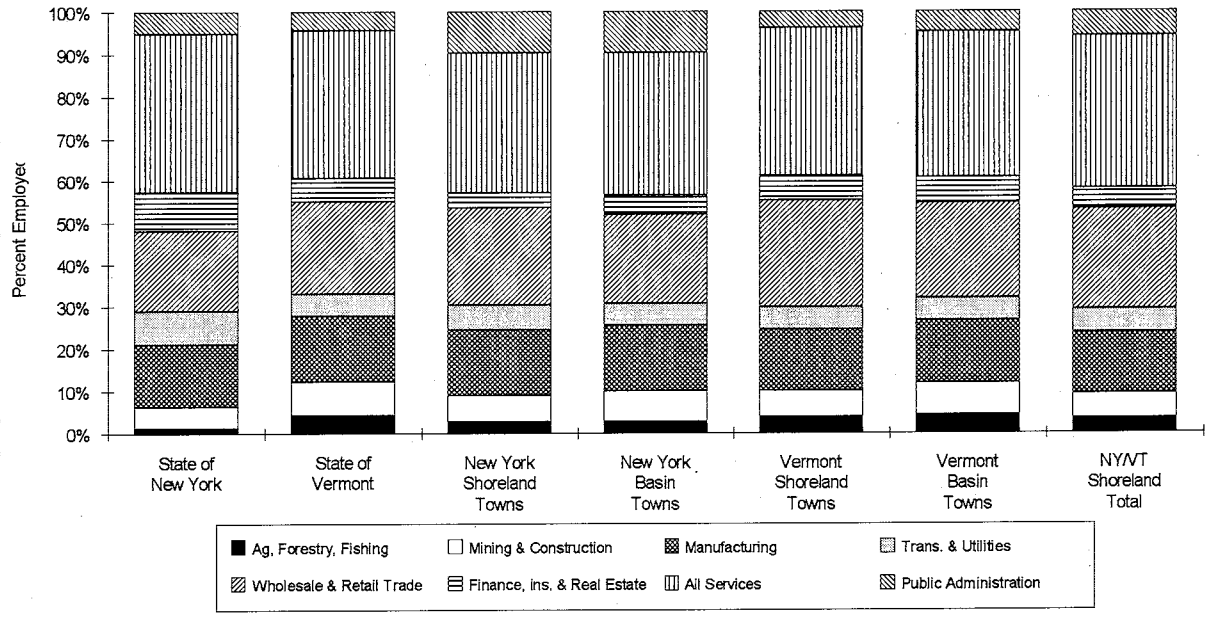
Table 3-20
Number and Percent of Employed Persons 16 Years and Over By Industry: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Agriculture, Forestry, & Fishing	Mining	Construction	Manu-facturing: Nondurable & Durable	Trans-portation	Commercial & Public Utilities	Wholesale & Retail Trade	Finance, Insurance & Real Estate	Enter-tainment & Recreation Services	All Other Services	Public Adminis-tration	Total
State of New York	97,604	7,946	431,962	1,227,170	432,904	227,729	1,599,592	777,401	128,814	3,015,460	424,136	8,370,718
State of Vermont	12,023	790	21,952	44,018	9,131	5,637	62,185	15,971	3,561	95,691	12,187	283,146
New York Shoreland Towns	1,024	104	2,265	5,905	1,612	641	8,787	1,352	423	12,267	3,656	38,036
New York Basin Towns	2,452	204	6,308	13,750	3,219	1,423	18,866	4,001	1,141	29,104	8,655	89,123
Vermont Shoreland Towns	2,474	53	3,986	9,410	2,206	1,299	16,598	3,830	779	22,100	2,578	65,313
Vermont Basin Towns	8,026	611	13,965	28,001	5,947	3,986	43,363	11,328	2,347	63,565	9,132	190,271
NY/VT Shoreland Total	3,498	157	6,251	15,315	3,818	1,940	25,385	5,182	1,202	37,329	6,234	106,311
NY/VT Basin Total	10,478	815	20,273	41,751	9,166	5,409	62,229	15,329	3,488	92,669	17,787	279,394
State of New York	1.2%	0.1%	5.2%	14.7%	5.2%	2.7%	19.1%	9.3%	1.5%	36.0%	5.1%	100.0%
State of Vermont	4.2%	0.3%	7.8%	15.5%	3.2%	2.0%	22.0%	5.6%	1.3%	33.8%	4.3%	100.0%
New York Shoreland Towns	2.7%	0.3%	6.0%	15.5%	4.2%	1.7%	23.1%	3.6%	1.1%	32.3%	9.6%	100.0%
New York Basin Towns	2.8%	0.2%	7.1%	15.4%	3.6%	1.6%	21.2%	4.5%	1.3%	32.7%	9.7%	100.0%
Vermont Shoreland Towns	3.8%	0.1%	6.1%	14.4%	3.4%	2.0%	25.4%	5.9%	1.2%	33.8%	3.9%	100.0%
Vermont Basin Towns	4.2%	0.3%	7.3%	14.7%	3.1%	2.1%	22.8%	6.0%	1.2%	33.4%	4.8%	100.0%
NY/VT Shoreland Total	3.3%	0.1%	5.9%	14.4%	3.6%	1.8%	23.9%	4.9%	1.1%	35.1%	5.9%	100.0%
NY/VT Basin Total	3.8%	0.3%	7.3%	14.9%	3.3%	1.9%	22.3%	5.5%	1.2%	33.2%	6.4%	100.0%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

differences of greater than one-half of 1% are: there is slightly less construction employment in the Basin, on average, than there is in Vermont; there is slightly less manufacturing in the Basin than in Vermont; there is slightly less service employment in the Basin; and, there is almost 2% more public administration employment in the Basin, on average, than there is in Vermont. The public administration employment is influenced by the relatively high percentage in the New York portion of the Basin. The public administration sector includes the executive, legislative, judicial, administrative, and regulatory activities of Federal, State, and local governments.

Figure 3-19
Percent of Employment by Industry:
NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

The service industry comprised approximately one-third (33.2%) of all persons who were classified by industry in the Basin in the 1990 census. The industrial division of services is defined as:

> establishments primarily engaged in providing a wide variety of services for individuals, business and government establishments, and other organizations. Hotels and other lodging places; establishments providing personal, business, repair, and amusement services; health, legal, engineering, and other professional services; educational institutions; membership organizations, and other miscellaneous services, are included (Office of Management and Budget 1987:353).

Services, therefore include many of the tourism facilities in the Basin such as hotels, motels, attractions, and museums. The category also includes all the hospitals, other health care facilities, doctors, lawyers, elementary and secondary schools, and colleges within the Lake Champlain Basin.

Following services, wholesale and retail trade is the next largest sector in the economy, including 22.3% of all classified persons within the Basin. That is slightly more than Vermont as a whole (22.0%). The

level of wholesale and retail trade employment in the Vermont shoreland towns (25.4%) is significantly higher than either in Vermont or the Basin.

Third among industries in the level of employment comes manufacturing, at 14.9% of all classified persons in the Basin. The percentage of manufacturing-related employment in the Basin is very similar to that of Vermont and New York. The economies in the New York portion of the Basin rely on manufacturing to a slightly greater degree than do the Vermont Basin economies.

This overview of the Basin's employment picture in terms of industry highlights another characteristic of the economy in general, and that is its diversity. It exhibits a diversity that is equal to that of the states of Vermont and New York, and the Basin's economy is actual more diverse than New York State's in some ways. For example, the Basin's agriculture, forestry, and fishing sector contains a higher percentage of employed persons than does New York's. Mining and construction also comprise a larger relative portion of the workforce in the Basin, than they do in New York as a whole.

The level of diversity within the Basin economy remained fairly constant between 1980 and 1990, as shown in Figure 3-20, with the exception of the manufacturing sector of the economy. During the decade manufacturing declined by 7%, from 22% of employment to 15%. The decline in manufacturing is a Basin-wide phenomenon. For example, between 1980 and 1990, manufacturing declined from 33% to 24% of covered employment in Addison County, Vermont: from 27% to 20% in Chittenden County, Vermont; from 25% to 20% in Rutland County, Vermont; from 27% to 20% in Clinton County, New York; and, from 18% to 14% in Essex County, New York (Vermont Department of Employment & Training 1992a & 1992b; Saratoga Associates 1991a).

Two sectors that experienced an increase in their share of total employment during the 1980s were services, increasing by 3%, and wholesale and retail trade, increasing by 2%. Those trends will likely continue through the 1990s.

An analysis of the employment picture according to the ecologic-economic zones reveals a much less consistent picture of the Basin. The individual ecologic-economic zones exhibit some of their unique characteristics in Figure 3-21 and demonstrate the employment diversity that exists within the Basin. Some of the more obvious characteristics that become evident around the Basin are as follows.

- Missisquoi Bay is much more dependent on agriculture, forestry, and fishing -- in this case agriculture -- than are the other areas of the Basin. The South Lake zones, in both Vermont and New York, also exhibit a greater than average reliance on agriculture.

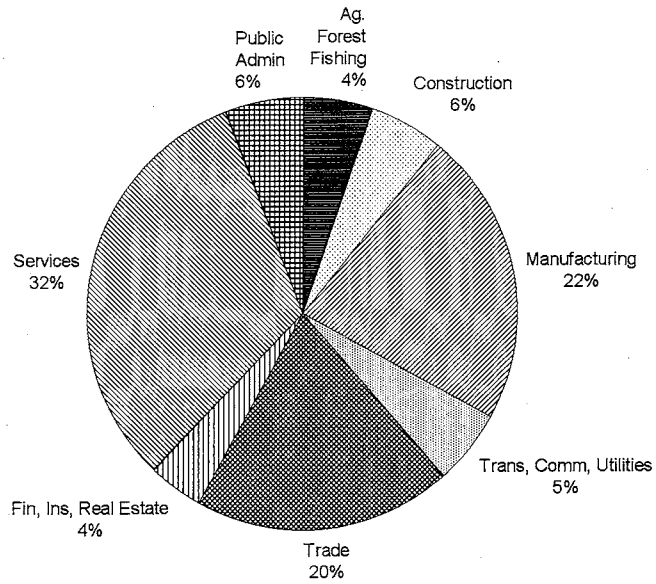
- The Inland Sea zone probably exhibits the most diverse economy, with manufacturing, wholesale & retail trade, and services each playing an almost equal role in the zone's employment picture.

- Manufacturing provides a higher percentage of employment in the South Lake, NY zone than in any other zone, primarily due to the manufacturing base in the Glens Falls and Ft. Edward areas. The influence of commuting to the Albany area is also likely to be playing a role in the employment picture in that zone.

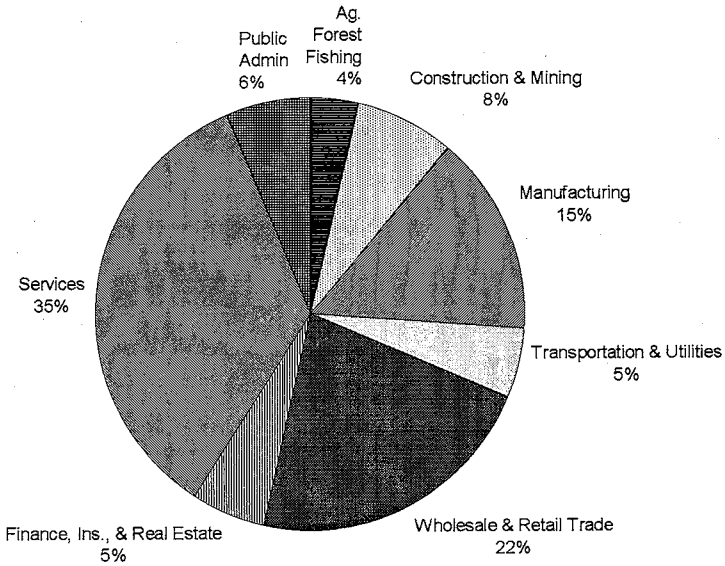
- Overall, the services sector plays the strongest role in the Basin's employment picture, providing more employment than any other industry sector. The service industry provides close to 40% of all employment in the Broad Lake South, NY zone.

Figure 3-20
Percent of Employed Persons 16 and Over by Industry:
Lake Champlain Basin Towns (1980 and 1990)

1980

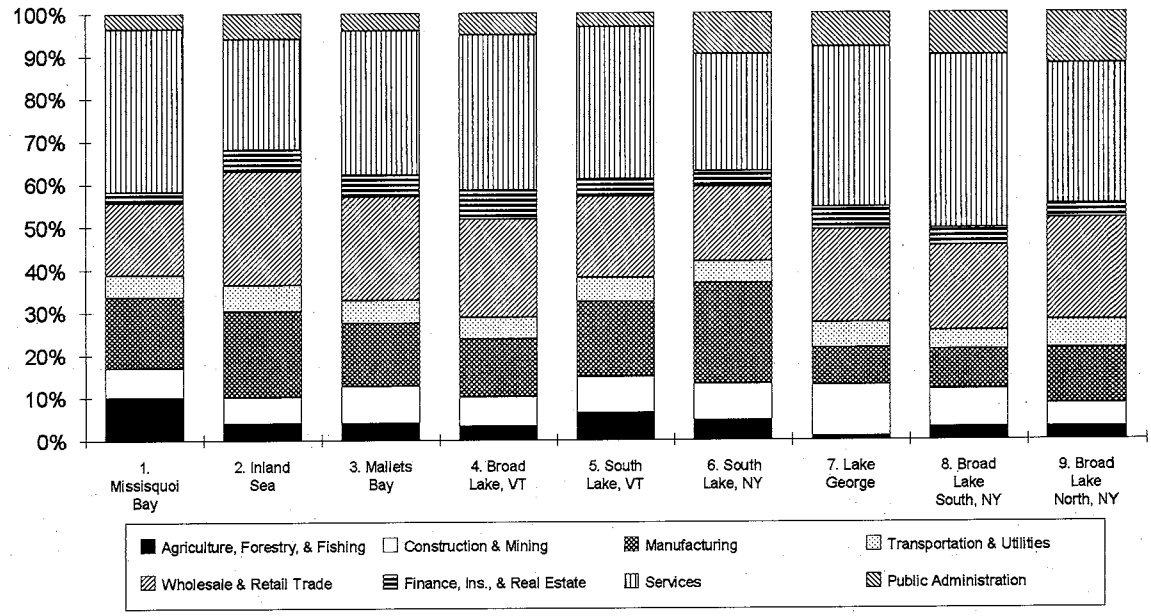


1990



Source: U.S. Department of Commerce, Bureau of the Census, 1980 & 1990 Census of Population and Housing, Census Summary File 3A.

Figure 3-21
Percent of Employed Persons 16 and Over by Industry:
Lake Champlain Ecologic-Economic Zones (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Employment by Occupation

The census data on occupation refers to the employed person's occupation and the unemployed person's most recent occupation. Some occupation groups are related closely to certain industries. For example transportation equipment operators, farm operators, and private household workers account for major portions of their respective industries. However, industry categories include persons in a variety of occupations. For example, persons employed in agriculture include truck drivers and bookkeepers, while persons in the transportation industry include mechanics, freight handlers, and payroll clerks (Bureau of the Census 1991a).

As with industry, the percentage distribution of the general occupation classifications in the Basin is very similar to that of the State of Vermont. One reason for the similarity is that 71% of classified persons resided in the Vermont portion of the Basin. As illustrated in Table 3-21 and Figure 3-22, two Basin occupation sectors that differ from the Vermont situation are the service and the operators, fabricators, & laborers sectors. The service sector in the New York portion of the Basin contains a much smaller proportion of all classified persons than is the case for Vermont.

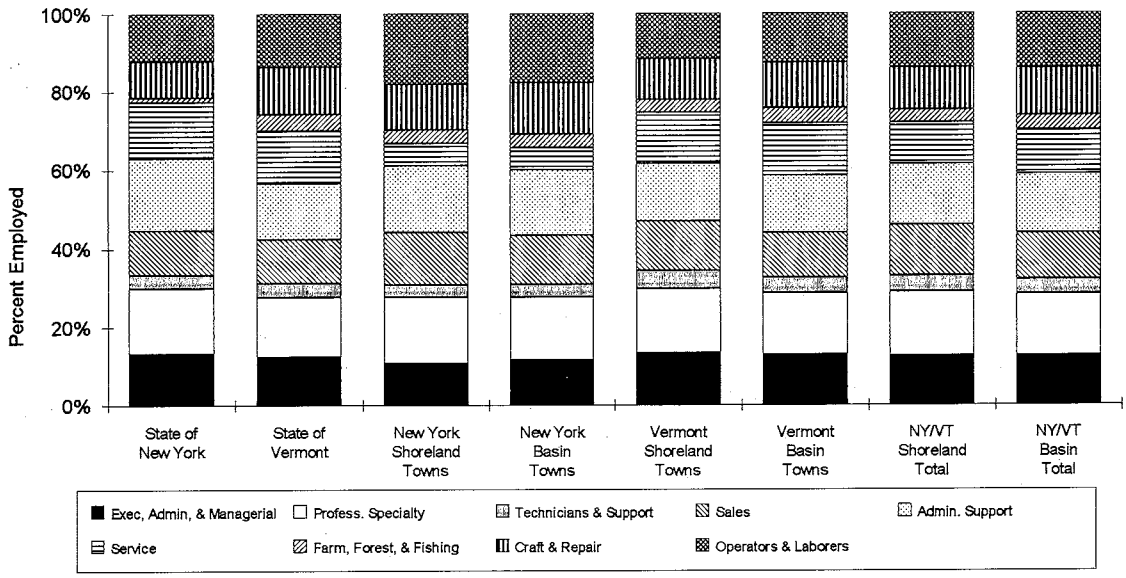
The less skilled workers, identified in the operators, fabricators, & laborers sector comprise almost 18% (17.7%) of the classified occupations in the New York portion of the Basin, compared with 12.5% in the Vermont Basin. This finding would be cause for concern when considering the resilience of the Basin employment base in responding to new employment opportunities.

Table 3-21
Number and Percent of Employed Persons 16 Years and Over By Occupation: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Executive, Admin. & Managerial	Profes-sional Specialty	Technicians & Related Support	Sales	Admin. Support	Service	Farming, Forestry, & Fishing	Precision Production. Craft, & Repair	Operators, Fabricators, & Laborers	Total
State of New York	1,112,178	1,396,763	292,837	937,227	1,543,860	1,202,615	93,536	788,806	1,002,896	8,370,718
State of Vermont	34,957	43,718	9,952	31,496	40,218	38,136	11,711	34,912	38,046	283,146
New York Shoreland Towns	3,574	5,529	1,014	4,427	5,534	1,877	1,125	3,832	5,952	32,864
New York Basin Towns	8,998	12,349	2,525	9,666	12,750	4,439	2,614	10,186	13,651	77,178
Vermont Shoreland Towns	8,718	10,742	2,987	8,214	9,565	8,489	2,189	6,875	7,534	65,313
Vermont Basin Towns	24,579	30,105	7,503	21,569	27,549	25,294	7,600	22,243	23,819	190,261
NY/VT Shoreland Total	12,292	16,271	4,001	12,641	15,099	10,366	3,314	10,707	13,486	98,177
NY/VT Basin Total	33,577	42,454	10,028	31,235	40,299	29,733	10,214	32,429	37,470	267,439
State of New York	13.3%	16.7%	3.5%	11.2%	18.4%	14.4%	1.1%	9.4%	12.0%	100%
State of Vermont	12.3%	15.4%	3.5%	11.1%	14.2%	13.5%	4.1%	12.3%	13.4%	100%
New York Shoreland Towns	10.9%	16.8%	3.1%	13.5%	16.8%	5.7%	3.4%	11.7%	18.1%	100%
New York Basin Towns	11.7%	16.0%	3.3%	12.5%	16.5%	5.8%	3.4%	13.2%	17.7%	100%
Vermont Shoreland Towns	13.3%	16.4%	4.6%	12.6%	14.6%	13.0%	3.4%	10.5%	11.5%	100%
Vermont Basin Towns	12.9%	15.8%	3.9%	11.3%	14.5%	13.3%	4.0%	11.7%	12.5%	100%
NY/VT Shoreland Total	12.5%	16.6%	4.1%	12.9%	15.4%	10.6%	3.4%	10.9%	13.7%	100%
NY/VT Basin Total	12.6%	15.9%	3.7%	11.7%	15.1%	11.1%	3.8%	12.1%	14.0%	100%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Figure 3-22
Percent of Employed Persons 16 and Over by Occupation:
NY, VT, and Lake Champlain Basin and Shoreland Areas (1990)

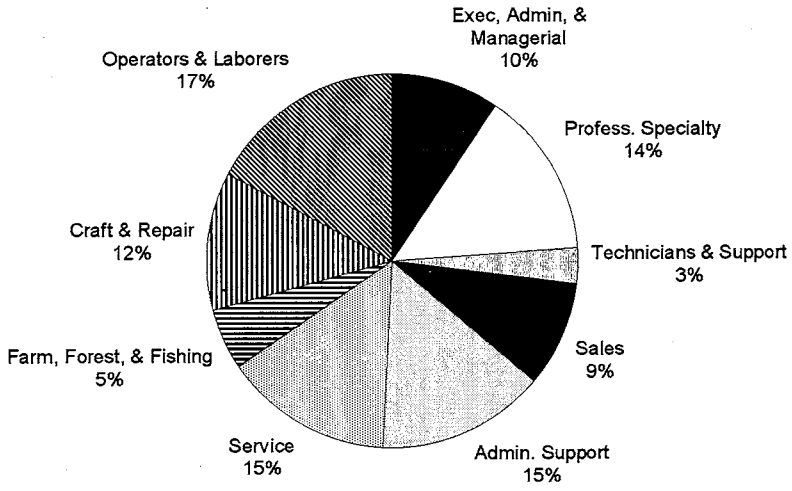


Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

As shown in Figure 3-23, the trend of employment in the Basin, according to occupation, has been towards growth in the executive, administrative & managerial sector and in the sales sector, accompanied by decreases in the service and the operators & laborers sectors.

Figure 3-23
Percent of Employed Persons 16 and Over by Occupation:
Lake Champlain Basin Towns (1980 and 1990)

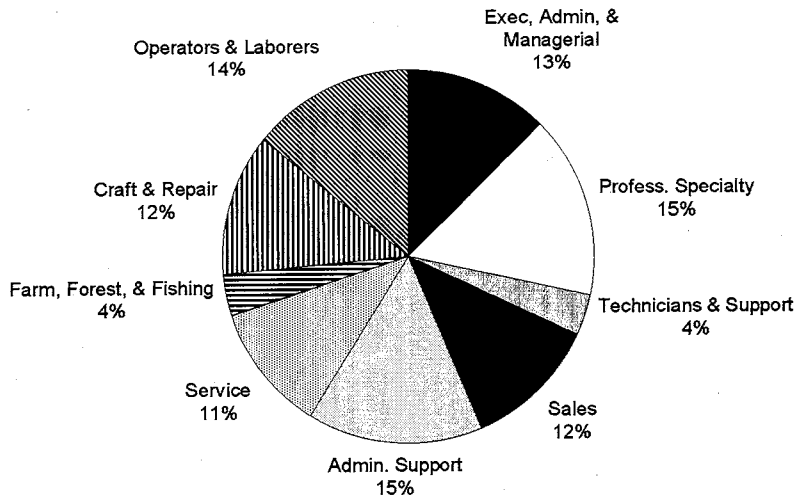
1980



continued

Figure 3-23 (cont'd)

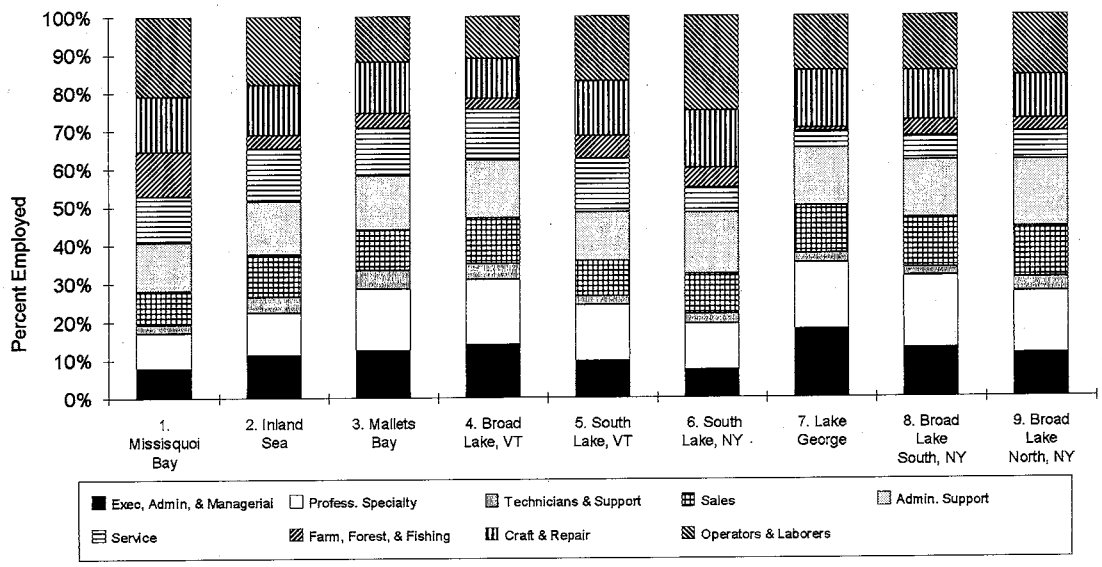
1990



Source: U.S. Dept of Commerce, Bureau of the Census, 1980 & 1990 Census of Population and Housing, Census Summary File 3A.

The ecologic-economic zone analysis displayed in Figure 3-24 provides a different view of the employment picture, one that reveals some of the occupational differences in different areas of the Basin. The Missisquoi Bay and Inland Seas areas show a heavier dependence on operator & labor employment, as do the South Lake areas of Vermont and New York. The Malletts Bay, Broad Lake areas of Vermont and New York, and the Lake George areas show a heavier dependence on the executive, administrative, & managerial, and, the professional occupations. The craft and repair occupations are fairly evenly distributed throughout the Basin.

Figure 3-24
Percent of Employed Persons 16 and Over by Occupation: Lake Champlain Ecologic-Economic Zones (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

In summary of employment in the Lake Champlain Basin, one of the keys to economic health currently exists in the Lake Champlain Basin: a diversified employment base. While one of the main tasks facing economic planners is to maintain and improve that diversity, diversity itself is seldom featured in the Basin as a goal for economic development. Economic planners need to recognize the importance of economic diversity and lend support to retail, manufacturing, and tourism, as well as to agriculture, mining, forestry, education, and prisons, to name just a few of the sectors that comprise a healthy Lake Champlain Basin economy.

Employment by Class

The data on class of worker in the 1990 census "refers to the same job as a respondent's industry and occupation and categorizes persons according to the type of ownership of the employing organization" (Bureau of the Census 1991a:B-20). The categories listed in Table 3-22 are self-explanatory, although it should be noted that "self-employed persons whose business was incorporated are included with private wage and salary workers because they are paid employees of their own companies" (ibid.).

One finding evident from Table 3-22 and Figure 3-25 is that the New York portion of the Basin is

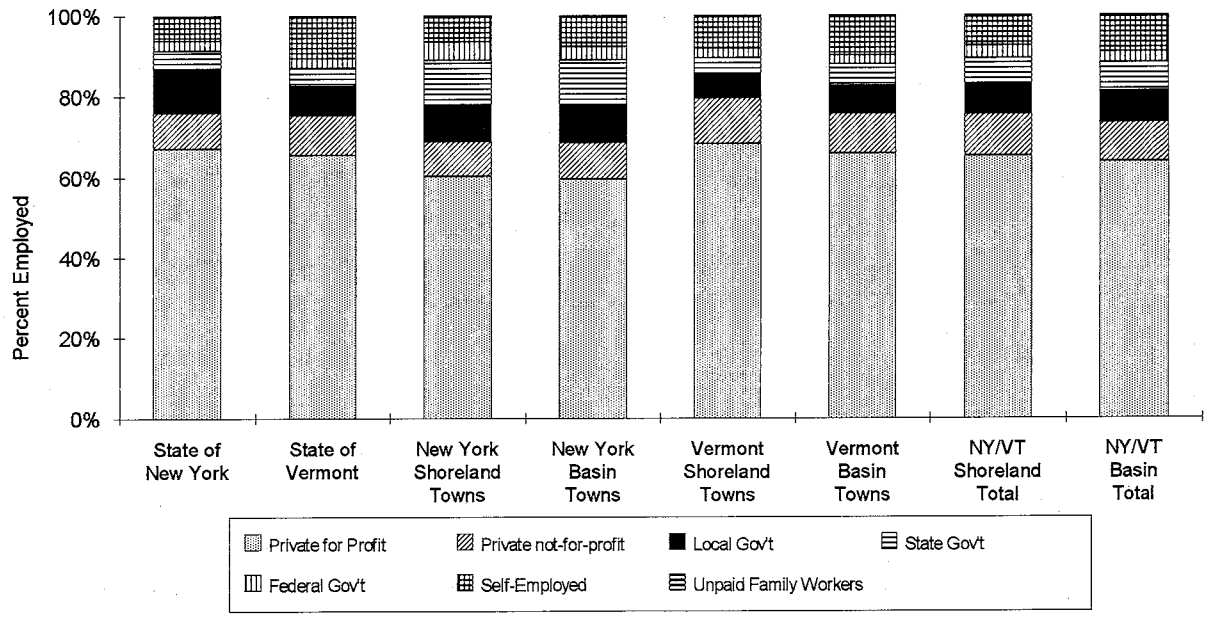
Table 3-22
Number and Percent of Employed Persons 16 Years and Over By Class of Worker: NY, VT, and Lake Champlain Basin Areas (1990)

Area Name	Private for Profit Wage and Salary	Private Not-for-Profit Wage and Salary	Local Government	State Government	Federal Government	Self-Employed	Unpaid Family Workers	Total
				Number				
State of New York	5,611,446	753,460	888,684	384,451	209,214	495,342	28,121	8,370,718
State of Vermont	185,304	28,141	20,044	12,801	6,769	29,019	1,068	283,146
New York Shoreland Towns	22,905	3,256	3,498	4,123	1,779	2,378	97	38,036
New York Basin Towns	53,070	7,951	8,306	9,853	2,934	6,683	317	89,114
Vermont Shoreland Towns	44,563	7,393	3,944	2,423	1,602	5,193	195	65,313
Vermont Basin Towns	125,220	18,794	13,027	9,824	4,421	18,295	690	190,271
NY/VT Shoreland Total	67,468	10,649	7,442	6,546	3,381	7,571	292	103,349
NY/VT Basin Total	178,290	26,745	21,333	19,677	7,355	24,978	1,007	279,385
				Percent				
State of New York	67.0%	9.0%	10.6%	4.6%	2.5%	5.9%	0.3%	
State of Vermont	65.4%	9.9%	7.1%	4.5%	2.4%	10.2%	0.4%	
New York Shoreland Towns	60.2%	8.6%	9.2%	10.8%	4.7%	6.3%	0.3%	
New York Basin Towns	59.6%	8.9%	9.3%	11.1%	3.3%	7.5%	0.4%	
Vermont Shoreland Towns	68.2%	11.3%	6.0%	3.7%	2.5%	8.0%	0.3%	
Vermont Basin Towns	65.8%	9.9%	6.8%	5.2%	2.3%	9.6%	0.4%	
NY/VT Shoreland Total	65.3%	10.3%	7.2%	6.3%	3.3%	7.3%	0.3%	
NY/VT Basin Total	63.8%	9.6%	7.6%	7.0%	2.6%	8.9%	0.4%	

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

considerably more dependent on government employment than are New York, Vermont, and the Vermont Basin area. While the percent employed by local governments is slightly less than New York in general, New York Basin employment at the state and federal levels is a considerably greater portion of total employment. Summing across the three levels of government, government employment accounts for 23% of total employment in the New York Basin area, while it accounts for 18% in New York State, 14% in Vermont, and 14% in the Vermont Basin area.

Figure 3-25
Percent of Employed Persons 16 and Over by Class of Worker: NY, VT, and Lake Champlain Basin Areas (1990)



Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

Employment at the state-level is the largest influence on the relatively high government employment in the New York Basin area, accounting for 10.8% of total employment. The largest State employers in the area include schools, colleges (e.g., SUNY-Plattsburgh, North Country Community College), prisons, and the state hospital located in Tupper Lake.

Looking at the Basin as a whole, the employment break-down by class is very similar to that of the State of Vermont. Minor differences include a slightly higher proportion of employment in the Basin in the government classes, and the slightly smaller proportion of workers in the private for profit and the self-employed classes.

Unemployment

Unemployment is a serious seasonal problem in many areas of the Basin. The January,1993 unemployment rate in Essex County, New York approached 17%. Winter unemployment rates of 12% are not uncommon in other New York counties in the Basin, ranking them among the highest county unemployment rates in New York State Unemployment rates during the winter of 1993 are down slightly from those experienced in 1992. Table 3-23 provides annual unemployment rates for the Basin counties.

Table 3-23
Annual Average Unemployment Rate (1985 - 1991):
Lake Champlain Basin Counties

Area Name	1985	1986	1987	1988	1989	1990	1991
New York State	6.5	6.3	4.9	4.2	5.1	5.2	7.2
Clinton County *	7.4	8.4	6.4	6.4	7.2	5.6	8.2
Essex County *	9.1	10.2	7.1	6.4	7.7	7.3	11.2
Franklin County	9.4	10.9	9.7	7.7	9.2	7.1	10.9
Warren County	7.7	8.3	6.0	5.6	6.6	6.3	10.2
Washington County *	6.6	6.0	4.2	4.1	5.3	5.5	7.9
NY Basin Counties*	7.5	8.0	5.8	5.6	6.7	5.9	8.8
NY Counties	7.9	8.5	6.5	6.0	7.1	6.2	9.4
Vermont	4.7	4.8	3.7	2.7	3.6	4.9	6.4
Addison County *	4.1	4.2	3.5	2.9	3.5	3.9	6.4
Bennington County	6.0	6.5	4.5	3.0	4.1	5.4	5.7
Caledonia County	5.3	5.8	4.3	3.1	4.4	6.2	8.0
Chittenden County *	3.5	3.5	2.8	1.9	2.6	3.3	4.4
Franklin County *	6.5	7.0	12.0	4.3	5.0	6.5	8.6
Grand Isle County *	6.5	8.3	6.0	3.9	5.6	7.3	8.9
Lamoille County *	7.1	7.0	1.3	3.5	4.6	5.8	7.5
Orange County	3.8	4.1	4.8	1.9	3.4	4.9	6.7
Orleans County	7.5	7.8	3.2	5.4	6.5	8.4	11.3
Rutland County *	4.0	4.2	2.1	2.5	3.2	4.4	6.4
Washington County *	4.7	4.8	4.0	3.0	3.8	5.6	7.5
Windsor County	3.7	3.3	3.4	2.0	3.0	4.6	6.3
Vermont Basin Counties*	4.4	4.5	3.5	2.6	3.4	4.4	6.1
Vermont Counties	4.6	4.7	3.6	2.7	3.6	4.8	6.4
NY/VT Basin Counties*	7.5	5.5	4.2	3.5	4.4	4.9	6.8
NY/VT Counties Total	5.6	5.9	4.5	3.7	4.7	5.2	7.3

* Predominantly Basin counties

Source: NY Department of Labor, Division of Research and Statistics, Employment Review, Annual Publication
Vermont Department of Employment and Training, Unpublished Correspondence

Major Employers

To round out the overview of employment in the Lake Champlain Basin, Table 3-24 provides a listing of major employers within counties of the Lake Champlain Basin. Complete, contemporary lists of major employers in the New York and Vermont Basin areas were unavailable to the study team. Therefore, the list in Table 3-24 should be viewed as preliminary. For example, the list of Vermont employers is comprised only of manufacturers.

The available lists of major employers are presented here as a first attempt to compile a list of all the major employers in the Basin. It is an important endeavor to refine the list to represent present reality because large employers are crucial to the health of the Basin's economy. The LCMC needs to be cognizant of the health of major employers and to include them in management decision-making for the Lake and Basin. The loss of a major employer to a small, rural community is a blow that creates shock waves seriously impacting schools, health care, numerous small businesses, community service groups, and the local tax base, in short, the over-all quality of life in the community.

Table 3-23
Annual Average Unemployment Rate (1985 - 1991):
Lake Champlain Basin Counties

Area Name	1985	1986	1987	1988	1989	1990	1991
New York State	6.5	6.3	4.9	4.2	5.1	5.2	7.2
Clinton County *	7.4	8.4	6.4	6.4	7.2	5.6	8.2
Essex County *	9.1	10.2	7.1	6.4	7.7	7.3	11.2
Franklin County	9.4	10.9	9.7	7.7	9.2	7.1	10.9
Warren County	7.7	8.3	6.0	5.6	6.6	6.3	10.2
Washington County *	6.6	6.0	4.2	4.1	5.3	5.5	7.9
NY Basin Counties*	7.5	8.0	5.8	5.6	6.7	5.9	8.8
NY Counties	7.9	8.5	6.5	6.0	7.1	6.2	9.4
Vermont	4.7	4.8	3.7	2.7	3.6	4.9	6.4
Addison County *	4.1	4.2	3.5	2.9	3.5	3.9	6.4
Bennington County	6.0	6.5	4.5	3.0	4.1	5.4	5.7
Caledonia County	5.3	5.8	4.3	3.1	4.4	6.2	8.0
Chittenden County *	3.5	3.5	2.8	1.9	2.6	3.3	4.4
Franklin County *	6.5	7.0	12.0	4.3	5.0	6.5	8.6
Grand Isle County *	6.5	8.3	6.0	3.9	5.6	7.3	8.9
Lamoille County *	7.1	7.0	1.3	3.5	4.6	5.8	7.5
Orange County	3.8	4.1	4.8	1.9	3.4	4.9	6.7
Orleans County	7.5	7.8	3.2	5.4	6.5	8.4	11.3
Rutland County *	4.0	4.2	2.1	2.5	3.2	4.4	6.4
Washington County *	4.7	4.8	4.0	3.0	3.8	5.6	7.5
Windsor County	3.7	3.3	3.4	2.0	3.0	4.6	6.3
Vermont Basin Counties*	4.4	4.5	3.5	2.6	3.4	4.4	6.1
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The available lists of major employers are presented here as a first attempt to compile a list of all the major employers in the Basin. It is an important endeavor to refine the list to represent present reality because large employers are crucial to the health of the Basin's economy. The LCMC needs to be cognizant of the health of major employers and to include them in management decision-making for the Lake and Basin. The loss of a major employer to a small, rural community is a blow that creates shock waves seriously impacting schools, health care, numerous small businesses, community service groups, and the local tax base, in short, the over-all quality of life in the community.

Table 3-24
Major Employers in Lake Champlain Basin Counties: Preliminary Listing

County	Employer	Town	State	Zip Code	Product	Number of Employees
Clinton	Clinton Correctional Facility	Dannemora	NY			1,250
	Wyeth-Ayerst Laboratories Inc.	Champlain	NY	12979	Pharmaceuticals	1,100
	Champlain Valley Physicians Hospital	Plattsburgh	NY	12901		1,100
	State University of New York	Plattsburgh	NY	12901		750
	Georgia Pacific Corp.	Plattsburgh	NY	12901	Paper products	520
	Plattsburgh Air Force Base	Plattsburgh	NY	12901		496
	C & A Wallcoverings, Inc.	Plattsburgh	NY	12901	Wallcoverings	440
	Bow Industrial Corp.	Plattsburgh	NY	12901	Plastics-injection mlding and pipefitng	100 to 499
	Champlain Valley Industries	Plattsburgh	NY	12901	Industrial sub-contract services	100 to 499
	MB International Warehouse, Ltd.	Plattsburgh	NY	12901	Repackaging	100 to 499
	Mold-Rite Plastics, Inc.	Plattsburgh	NY	12901	Plastic goods	100 to 499
	Arpak Plastics, Inc.	Plattsburgh	NY	12901	Plastic Vials, Closures and jars	100 to 499
	Diamond International	Plattsburgh	NY	12901		200
	Bouyea-Fassetts, Inc.	Plattsburgh	NY	12901	Wholesale bakery products	100
	Plattsburgh Foundry	Plattsburgh	NY	12901		100
	A. Schonbek & Co.	Plattsburgh	NY	12901		100
Essex	International Paper	Ticoderoga	NY	12858	Paper products	617
	NYCO Processed Minerals	Lewis,Willsboro	NY	12950	Wollastonite	150
	Alton Jones Cell Science Center	North Elba	NY	12946	Medical Research	70
Franklin	Sunmount Rehabilitation Center	Altamont	NY			1,013
	Wolverine World Wide		NY			934
	Adirondack Medical Center	Harrietstown	NY	12983		525
	Franklin Correctional Facility	Malone	NY			495
	Bare Hill Correctional Facility	Malone	NY			460
	Alice Hyde Memorial Hospital	Malone	NY			396
	North Star Industries	Harrietstown	NY			331
	Paul Smith's College	Brighton	NY			300
	American Management Association	St. Armand	NY			262
	Board of Cooperative Educational Services (BOCES)	Plattsburgh	NY			219
	Bombardier Corporation	Malone	NY			133
	North Country Community College	North Elba	NY			128
	Camp Gabriels Correctional Facility	Brighton	NY			126
	Malone Dress Manufacturing Company	Malone	NY			101
	Franklin County Association for Retarded Children	Altamont	NY			99
	McCadam Cheese Company	Malone	NY			88
Warren	Glens Falls Hospital	Queensbury	NY		Health Care	1,987
	Finch, Pruyn & Co.	Queensbury	NY		Pulp and Paper	1,037
	Sagamore Hotel (peak, 500 off-peak)	Bolton	NY		Hotel	900
	C.R. Bard	Queensbury	NY		Medical devises	900
	Continental Insurance	Queensbury	NY		Underwriters	732
	General Electric	Fort Edward	NY		Capacitors	640
	Mallinckrodt Anesthesia Products	Argyle	NY		Medical devises	562
	Scott Paper	Fort Edward	NY		Paper products	519
	NAMIC (North American Instrument)	Queensbury	NY		Medical devises	490
	Native Textiles	Queensbury	NY		Lace and tricot	415
	Sherwood Medical	Argyle	NY		Medical devises	375
	James River	Moreau	NY		Paper products	375
	Sheridan Catheter	Argyle	NY		Medical devises	340
	First National Bank	Queensbury	NY		Banking	337
	Tampela Sandy Hill	Fort Edward	NY		Paper mill mach.	337
	Niagara Mohawk	Queensbury	NY		Electric and gas	296
	Glens Falls National	Queensbury	NY		Banking	282
	Kamyr-Alstrom	Queensbury	NY		Paper mill mach.	263
	Washington County	Fort Edward	NY		County government	259
	Astro-Valcour	Queensbury	NY		Plastic packing	220
	Travelers Insurance	Queensbury	NY		Claims process.	209
	J & J Lingerie	Queensbury	NY		Lingerie	195
	Nibco	Moreau	NY		Plumbing fixtures	188
	Stevens & Thompson	Greenwich	NY		Paper products	183
	Troy Stirt Makers	Queensbury	NY		Apparel	183
	TV Data	Queensbury	NY		TV listings	180
	New York Telephone	Queensbury	NY		Phone service	180
	Albany International	Queensbury	NY		Paper mill mach.	160
	No. Am. Recycling	Fort Edward	NY		Waste disposal	160
	Decora	Fort Edward	NY		Adhesive products	154
Washington						

Table 3-24 (Cont'd)
Major Employers in Lake Champlain Basin Counties:
Preliminary Listing

County	Employer	Town	State	Zip Code*	Product	Number of Employees
Addison	Johnson, A. Company, The	Bristol	VT	5443	Lumber	50 to 99
	Claire Lathrop Band Mill, Inc.	Bristol	VT	5443	Kiln dried hardwood, hardened lumber, hardwood	20 to 49
	Endicott Contract Manufacturing	Bristol	VT	5443	Circuit board assembly,cable harness assembly	20 to 49
	Vermont Sprout House	Bristol	VT	5443	Alfalfa & mung bean sprouts, sprout related items	20 to 49
	Dakin Farm, Inc.	Ferrisburg	VT	5456	Cob smoked ham & bacon,waxed cheese,maple s	20 to 49
	Granville Manufacturing Co., Inc.	Granville	VT	5747	Quartersawn clapboards,wooden decorative bowl	20 to 49
Caledonia	EHV Weidmann Industries, Inc.	St. Johnsbury	VT	5819	Insulation Boards	250 to 499
	Fairbanks Scales, Inc.	St. Johnsbury	VT	5819	Weighing Equipment	100 to 249
	Caledonia Sportswear	St. Johnsbury	VT	5819	Active sportswear, hosiery	50 to 99
	Maple Grove Farms of Vermont, Inc.	St. Johnsbury	VT	5819	Maple syrup products, fruit syrups, salad dressing	50 to 99
Chittenden	IBM Corporation	Essex Junction	VT	5452	Semiconductor components	1000-1999
	General Electric Company	Burlington	VT	5402	Armament systems for military aircraft,ships	500 to 999
	G.S.Blodgett Corporation	Burlington	VT	5402	Commercial foodservice equipment	250 to 499
	Digital Equipment Corporation	S. Burlington	VT	5403	Systems Integration Services	250 to 499
	IDX Corporation	S. Burlington	VT	5403	Software system design,support for health car	250 to 499
	The Lane Press, INC.	S. Burlington	VT	5403	Commercial printing, magazines	250 to 499
	The Shelburne Museum, INC.	Shelburne	VT	5482	Books and prints publisher	250 to 499
	Belden Wire and Cable	S. Burlington	VT	5452	High temperature wire,high temp. cable	100 to 249
	BIO-TEK Instruments, Inc.	Winooski	VT	5404	Bio-medical test equipment and lab equip.	100 to 249
	Bouyea-Fassetts, Inc.	S. Burlington	VT	5403	Bread and rolls	100 to 249
	The Burlington Free Press	Burlington	VT	5402	Newspaper publishing	100 to 249
	Champlain Cable Corporation	Colchester	VT	5446	Insulated wire and cable	100 to 249
	Cooper Industries/Belden Div.	Essex Junction	VT	5453	High temperature wire and cable	100 to 249
	Harbour Industries, Inc.	Shelburne	VT	5482	High temperture wire and cable	100 to 249
	Harrington's in Vermont, Inc.	Richmond	VT	5477	Smoked meat products	100 to 249
	Hazelett Strip-Casting Corp.	Colchester	VT	5446	Continuous casting machines	100 to 249
	International Cheese Co., Inc.	Hinesburg	VT	5461	Cheese:mozzarella,provolone,feta,ricotta	100 to 249
	S.D.Ireland Concrete Constr.Cor.	Burlington	VT	5402	Ready mix concrete,residential + comm. found.	100 to 249
	The Offset House, Inc.	Essex	VT	5451	Commercial printing	100 to 249
	Pepsi-Cola Bottling Co.of Burl	S. Burlington	VT	5403	Carbonated beverages	100 to 249
	Resolution, Inc.	S. Burlington	VT	5403	Duplication of video cassettes,video product.	100 to 249
	Twincraft, Inc.	Winooski	VT	5404	Fine toilet soaps	100 to 249
	Velan Valve Corporation	Williston	VT	5495	Hi-tech,custom engineered forged,cast valves	100 to 249
	Vermont Heating and Ventilation Co.	Colchester	VT	5446	HVAC fabrication, wood stoves, sheet metal fabr.	100 to 249
	The Vermont Teddy Bear Company	Shelburne	VT	5482	Teddy bears	100 to 249
	Frank W. Whitcomb Construction	Colchester	VT	5446	Bituminous Asphalt,processed aggregate,concr.	100 to 249
	E.B. & A.C. Whiting Co.	Burlington	VT	5402	Plastic monofilaments,brush and broom fibers	100 to 249
	York Capacitor Corporation	Winooski	VT	5404	Industrial capacitors	100 to 249
	Arrowsmith Shelburne, Inc.	Shelburne	VT	5482	Military electronics systems	50 to 99
	Burlington Bagel Bakery	Colchester	VT	5446	Bagels: wholesale and retail	50 to 99
	Champlain Industires	Colchester	VT	5446	Hand & mechanical assembly,packaging,bindery	50 to 99
	Chatham Precision, Inc.	Hinesburg	VT	5461	Close tolerance prototype and complex mach.pt	50 to 99
	Dynapower Corporation	S. Burlington	VT	5407	Full range medi-hi current energy conver.eqp.	50 to 99
	Edlund Company, Inc.	Burlington	VT	5402	Manuf. of comm. & industr.food serv. equipm.	50 to 99
	Fab-Tech, Inc.	Colchester	VT	5446	Sheet metal fabrication,tool vault,widdervacs	50 to 99
	S.T. Griswold & Co., Inc.	Williston	VT	5495	Ready mix concrete,precast con.,reinforce pip	50 to 99
	H.P. Hood, Inc.	Burlington	VT	5401	Manufacture raw fluid milk	50 to 99
	Hayward Tyler, Inc.	Colchester	VT	5446	Circulating pumps and components	50 to 99
	JBI,A Division of Playtex Apparel, Inc.	Williston	VT	5495	Sports support equipment	50 to 99
	Johnson Filaments	Williston	VT	5495	Plastic monofilaments	50 to 99
	Koffee Kup Bakery, Inc.	Burlington	VT	5401	Donuts, breads, rolls	50 to 99
	Lavallee and Ide, Inc.	Winooski	VT	5404	Reamers, gaging blanks, metal cutting tools	50 to 99
	John Mckenzie Packing Co., Inc.	Burlington	VT	5402	Sausage products, smoked ham, and bacon	50 to 99
	Northeastern HVAC, Inc.	Williston	VT	5495	Custom metal and plastic fabrication	50 to 99
	Polhemus Inc.	Colchester	VT	5446	Helmet tracking system,3-D digitizer,3-D compute	50 to 99
	Preci-Manufacturing, Inc.	Winooski	VT	5404	Mech.comp.for computers,aerospace,surg.eqpt	50 to 99
	Queen City Printers, Inc.	Burlington	VT	5402	Commercial printing	50 to 99
	The Shelburne Corporation	Shelburne	VT	5482	Cup,shoulder hooks,caster cups,ski/bike racks	50 to 99
	Shelburne Limestone Corporation	Essex Junction	VT	5453	Crushed stone, agricultural limestone	50 to 99
	Triangle Metal FAB	Milton	VT	5468	Specialty metal fabrication,CNC turning & mil	50 to 99
	Vermont Electromagnetic Company	Williston	VT	5495	Cable assembly for medical & defense industr.	50 to 99
Grand Isle	Alburg Door and Window,LTD	Alburg	VT	5440	Aluminum windows and doors	10 to 19

* Vermont zip codes begin with 0.

Table 3-24 (Cont'd)
Major Employers in Lake Champlain Basin Counties:
Preliminary Listing

County	Employer	Town	State	Zip Code*	Product	Number of Employees
Franklin	The Fonda Group,Inc.	St. Albans	VT	5478	Paper food containers,cans,bowls and cups	250 to 499
	Specialty Paperboard,Inc.	Sheldon Springs	VT	5485	Speciality paperboard	100 to 249
	Eveready Battery Company,Inc.	St. Albans	VT	5478	Flashlights,batteries	100 to 249
	Vermont Whey Company	St. Albans	VT	5478	Protein products,whey products	100 to 249
	Bertek,Inc.	Swanton	VT	5488	Data processing forms,pharmaceutical coatings	100 to 249
	B.D. Press, Inc.	Fairfax	VT	5454	Commercial web printing,composition design,mail	50 to 99
	Housecraft USA	St. Albans	VT	5478	Houseware/kitchen utensil,injection molded plasti	50 to 99
	Pedco, Inc.	St. Albans	VT	5478	Childrens wear	50 to 99
	Superior Technical Ceramics Corp.	St. Albans	VT	5478	Ceramic insulators,ceramic wear parts,welding no	50 to 99
	Van Houten & Zoon,Inc.	St. Albans	VT	5478	Chocolate chips,novelty chocolate,chocolate liquo	50 to 99
	Vestshell Vermont,Inc.	St. Albans	VT	5478	Investment castings	50 to 99
	Vermont Precision Tools,Inc.	Swanton	VT	5488	Steel pins and punches,round ground tools,gages	50 to 99
Lamoille	Vermont Asbestos Group,Inc.	Morristown	VT	5661	Asbestos fiber	50 to 99
	Vermont Precision Woodworks	Morristown	VT	5661	Bedroom furniture,machined hardwood parts	50 to 99
Rutland	General Electric Aircraft Engines	Rutland	VT	5701	Compressor airfoils, special hardware	2000 and up
	Metromail Corporation	Rutland	VT	5701	Mail service	250 to 499
	Tambrands Incorporated	Rutland	VT	5701	Tampons, feminine products	250 to 499
	Dowty Electronics Company	Brandon	VT	5733	Magnetic devices, pot cores, printed circuit boards	100 to 249
	Carrara Joseph P. & Sons, Inc.	Clarendon	VT	5701	Ready mix concrete, pre-cast concrete,sand & sto	100 to 249
	Vermont Marble Company	Proctor	VT	5765	Marble	100 to 249
	Moore Business Forms & Syst. Div.	Rutland	VT	5701	Printed business forms	100 to 249
	Rutland Plywood Corporation	Rutland	VT	5701	Hardwood veneersand plywood, gunstocks, skate	100 to 249
	Skyline Corporation	Fair Haven	VT	5743	Mobile homes	50 to 99
	Vermont Structural Slate Co.,Inc.	Fair Haven	VT	5743	Structural slate, flooring,roofing	50 to 99
	New England Woodcraft, Inc.	Brandon	VT	5745	Bedroom,living room,and dining room furniture	50 to 99
	Herald Association, Inc.	Rutland	VT	5701	Newspaper publishing	50 to 99
	Himolene Corporation	Rutland	VT	5701	Plastic bags	50 to 99
	Mal Tool & Engineering Co.	Rutland	VT	5701	Aircrft engines, engine parts	50 to 99
	Qualitad	Rutland	VT	5702	Disposable containers, disposable closures	50 to 99
	STO Corporation	Rutland	VT	5701	Exterior insulation, wall coatings	50 to 99
	Tuttle Law Print, Inc.	Rutland	VT	5701	Business forms, legal forms, stationery	50 to 99
	Vermont Juvenille Furniture MFG., Inc.	Rutland	VT	5777	Metal playpens	50 to 99
Washington	Rock of Ages Corporation	Barre	VT	5641	Memorials,industrial products,paper rolls	250 to 499
	Ben & Jerry's Homemade,Inc.	Waterbury	VT	5676	Premium ice cream	250 to 499
	Allen Lumber Company,Inc.	Barre	VT	5641	Building materials,millwork cabinetry	100 to 249
	Bombardier Corporation	Barre	VT	5641	Mass transit vehicles	100 to 249
	Booth Brothers Dairy,Inc.	Barre	VT	5641	Milk products, cream mix	100 to 249
	Rouleau Granite Company,Inc.	Barre	VT	5641	Granite monuments,aluminum+bronze plaques,ar	100 to 249
	The Times Argus	Barre	VT	5641	Newspaper publishing	100 to 249
	Cabot Farmers' Co-op Creamery Co	Cabot	VT	5647	Cheddar cheese,low-fat cheese,butter	100 to 249
	Huntington Homes,Inc.	E.Montpel.	VT	5651	Manufactured modular housing	100 to 249
	Capital City Press,Inc.	Montpelier	VT	5601	Journal and book manufacturing	100 to 249
	Anderson, A.G. Company,Inc.	Waterbury	VT	5676	Ready mix concrete,concrete construction,washe	100 to 249
	Beck & Beck,Inc.	Barre	VT	5641	Granite memorials,products,counter tops and tabl	50 to 99
	Whimsicality	Barre	VT	5641	Infant bedding,baby gift items,halloween costume	50 to 99
	Vermont Plastics,Inc.	Montpelier	VT	5601	Custom injection moldings	50 to 99
	Cabot Hosiery Mills,Inc.	Northfield	VT	5663	Mens, womens,and childrens socks,tights legging	50 to 99
	Northfield Wood Products Co.,Inc.	Northfield	VT	5663	Molded wood products,woodenware novelties,toys	50 to 99
	Green Mountain Coffee Roasters	Waterbury	VT	5676	Specialty coffees,mail order service,brewing equip	50 to 99
	Industrial Homework Service	Waterbury	VT	5676	Assembly & apcking,fabric items,wood items	50 to 99
	Karl Suss America,Inc.	Waterbury	VT	5677	Maskaligners,dicing equipment,probers	50 to 99

Sources: Personal Communications: Gordy DeVries, SUNY-Plattsburgh 9/1/92; Mark Galough, Lake George Lake Champlain Regional Planning Board 11/25/92; Vermont State Department of Economic Development, 1992.

* Vermont zip codes begin with 0.

AGRICULTURE, FOREST PRODUCTS, AND MINING

The economy of the Lake Champlain Basin has traditionally been a rural, natural resource-based economy. In addition to agriculture, both renewable natural resources (e.g., timber, tannin, fish, game, ice, maple syrup) and non-renewable natural resources (e.g., iron ore, marble, gravel, slate, wollastonite) have played a central role in the economic history of the Basin. Aside from early farming activities, the settlement in the Lake Champlain area by non-Natives began in earnest in the early 1800s with the cutting of timber and the mining of iron ore. The economic well-being of Lake Champlain Shoreland residents quickly became dependent on the development of these natural resource industries. The lumber camps and mining towns that developed around the resource harvesting and extraction activities fueled additional economic activity such as farms to supply food, and railroads and canal boats to move the resource to market. For example, in the mid-1880s Essex, NY was the site of an extensive canal boat construction industry. As early as 1843 there were 450 canal boats registered at the ports of Lake Champlain or along the Champlain Canal, and "lake ports before 1875 resembled small floating villages where one would have to cross 40 or 50 boats to reach a wharf" (Bellico 1992:239). The boat building industry was only one of many economic linkages to the natural resource economy that existed when the economy of the Basin was much more local in nature than at present.

As the economy of the region diversified beyond that early dependence on timber, iron, and other mining activities, there continued a dependence on natural resources. In addition to harvesting and extraction, the non-consumptive resource use of "vacationing" around Lake Champlain began in the early 1800s, and it quickly became a positive impact on local economies. Between 1870 and 1914 the Adirondack-Lake Champlain area was among the most fashionable and popular resort regions in the country (Trancik 1983). More recently, the growth of the tourism industry in the region has included development of such natural resource-based economic activities as Nordic and Alpine skiing, marinas, sports fishing, white-water rafting, and outdoor guiding. In short, the natural resources of the Basin -- the forests, farm land, minerals, lakes, rivers, and mountains -- have traditionally provided a livelihood to many families in the Lake Champlain Basin.

While the Basin economy continues toward a healthy diversification in such areas as education, health care, tourism services, prisons, and manufacturing, the more traditional rural industries of natural resource harvesting, resource extraction, and farming continue to make significant contributions to local economies. In specific locations around the Basin, agriculture, mining, and forestry are the major employers. For example, the "agriculture, forestry, and fisheries" industry grouping accounts for over 25% of all employment in the Addison County, Vermont towns of Bridport, Shoreham, and Addison (see Table 3-25). As discussed below under Agriculture, secondary agriculture-related employment could comprise an additional 10% to 15% of total local employment. It should be noted for the Lake Champlain Basin, the agriculture, forestry, and fisheries sector is composed almost exclusively of agriculture and forestry employment.

Table 3-25 shows the 20 Basin towns in Vermont and the 20 in New York with the highest percentage of employment in natural resource-related industries of agriculture, forestry, and mining. Even 20th on the list in Vermont, Pawlet Town, still has at least 15% of employed persons relying directly on agriculture and forestry. The New York town with the highest reliance on employment in the natural resource sector is Clinton Town, at 21% of all employed persons. Willsboro Town in Essex County, New York owes approximately 11% of its employment to primary agriculture, forestry, and mining activities, discussed in more detail in the Mining section. The term "primary" employment is used to distinguish direct

harvesting and preliminary processing of natural resource commodities from "secondary" employment which involves the subsequent transportation, processing, packaging, and marketing of the natural resource. While secondary employment is difficult to quantify, natural resource-related secondary employment undoubtedly comprises a significant percentage of employment in the predominately rural Lake Champlain Basin.

Table 3-25
Natural Resource-Related Employment:
The Twenty Towns in NY & VT with Highest Percentage of Primary Employment in the Two Major Natural Resource Industry Sectors

Town	County	Agriculture, Forestry, & Fishing Employment	Mining Employment	Percent of Total Employment in the Two Sectors	Total Employment within the Town
			Vermont		
Bridport town *	Addison	179	0	29.8%	600
Shoreham town *	Addison	149	2	25.7%	587
Addison town *	Addison	131	2	25.5%	521
Fairfield town	Franklin	193	0	23.7%	813
Berkshire town	Franklin	127	0	23.2%	547
Whiting town	Addison	45	0	20.6%	218
Orwell town *	Addison	112	2	20.1%	566
Panton town *	Addison	54	3	19.5%	293
Franklin town	Franklin	100	0	19.0%	527
Irasburg town	Orleans	75	0	18.2%	412
Newport town	Orleans	112	4	18.1%	640
West Haven *	Rutland	28	2	17.9%	168
Greensboro town	Orleans	61	0	17.8%	342
Glover town	Orleans	67	0	17.5%	382
Sheldon town	Franklin	150	0	17.1%	876
Danby town	Rutland	87	10	16.6%	584
Benson town *	Rutland	66	2	16.6%	410
Lowell town	Orleans	35	3	16.1%	236
Tinmouth town	Rutland	31	0	15.7%	197
Pawlet town	Rutland	86	17	15.0%	688
			New York		
Clinton town	Clinton	54	2	21.1%	266
Ellenburg town	Clinton	120	0	16.5%	729
Willsboro town *	Essex	44	43	10.6%	823
Argyle town	Washington	146	0	10.4%	1,405
Essex town *	Essex	10	19	10.0%	291
Belmont town	Franklin	48	0	9.3%	515
Hartford town	Washington	82	2	8.6%	980
Chazy town *	Clinton	154	0	8.3%	1,853
Mooers town	Clinton	102	0	7.5%	1,366
North Hudson town	Essex	5	0	7.4%	68
Westport town *	Essex	45	2	7.3%	644
Crown Point town *	Essex	45	0	6.4%	703
Altona town	Clinton	49	0	6.1%	803
Putnam town *	Washington	11	0	5.9%	188
Granville town	Washington	124	14	5.2%	2,658
Beekmantown town *	Clinton	109	13	4.9%	2,494
Champlain town *	Clinton	129	2	4.8%	2,738
Fort Ann town *	Washington	64	9	4.7%	1,562
Peru town *	Clinton	134	0	4.4%	3,018
Brighton town	Franklin	29	0	4.4%	661

* Shoreland towns.

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

That there is a link between natural resource-related economic activity and Lake Champlain seems evident in the appearance of 17 Shoreland towns among the top 40 towns listed in Table 3-25. In the New York part of the Basin, 10 of the 20 listed towns are Shoreland towns, comprising 59% of the New York Shoreland area. While the majority of listed towns appear to have agriculture as their dominate economic activity, forest products and mining are also represented (e.g., Willsboro, Essex, Westport).

In addition to their more easily measured importance to local economies, the natural resource industries in the Basin have social and cultural importance to local areas. A tradition of working in the woods or working on the land has continued through many generations in some families and such work still carries a high degree of status. In the words of one local town official, forestry-related jobs are "real jobs", as compared to tourism-related employment. While open to interpretation, characteristics of real jobs include such attributes as working outdoors, requiring skill in operating and repairing equipment, and carrying on a family tradition, as well as characteristically higher wages. As local economic development efforts begin to consider the sustainable development programs currently being tested by international development organizations, the social and culture attributes of natural resource industries in the Lake Champlain Basin will require further study and analysis. One criteria of sustainable development is that it be culturally appropriate as well as environmentally appropriate.

The following section provides a brief overview of the major natural resource sectors in the economy, namely agriculture, forestry, and mining. The importance of these sectors in the Basin economy should not be underestimated and the study team suggests that a more detailed economic analysis of their place in Basin economy should be undertaken. In some respects, these sectors are lake impacted economic sectors, because activities and plans for protecting the lake could result in impacts on farming, forestry, and mining activities. This seems to be especially relevant considering the prevalence of Shoreland towns on the list of Basin towns most dependent on natural resource-related industries.

Tourism activities can also be natural resource-based economic activities. The next chapter in this report focuses on tourism in the Basin economy and specifically examines lake related tourism activity.

Agriculture

In the ten predominately Basin counties of New York and Vermont there were approximately 4,840 farms in 1987, with the distribution roughly being 1/3 in New York and 2/3s in Vermont (Stanton et al. 1989; De Geus 1992). As listed in Table 3-26, there were 1.3 million acres in farmland in the Basin counties, comprising close to one-quarter of all land in the Basin. The total value of agricultural products sold from Basin farms was $415.5 million, with 58% of the total attributable to Vermont farms. Sales from Vermont Basin farms accounted for approximately 63.8% of all Vermont farm sales. When considering the distribution of agriculture throughout the Basin, it is important to note that in New York, Washington County accounts for 51% of the New York Basin farm acreage, while in Vermont, Addison and Franklin Counties account for 53% of the Vermont Basin farm acreage.

Dairy products account for the majority of farm sales in both New York and Vermont Basin areas. Data for 1989 indicates that dairy products accounted for 72% of Vermont farm cash receipts, followed by beef and veal (13%), horses (6%), hay (3%), and maple syrup (3%) (De Geus 1992). Data from the New York Agricultural Statistics Service (1992) indicates that in 1990, diary product sales in the three New York Basin counties accounted for about 60% of total farm sales. State wide, dairy product sales accounted for 53% of New York farm cash receipts.

The total value of commodities sold by farmers in itself does not accurately reflect the economic impact of agriculture in the Basin economy. After being sold by the farmer, many farm products -- especially dairy products -- undergo subsequent processing, packaging, and marketing resulting in a significant increase in the value of those products. An accurate evaluation of the total value of farming in the Basin would require research beyond the scope of this project. Dairy-related manufacturing, grain processing, the baking industry, and maple syrup sales at stores and gift shops are examples of farming-related businesses that would have to be analyzed in a comprehensive economic study of agriculture in the Basin.

Table 3-26
Agricultural Data for Lake Champlain Basin Counties (1987)

State and County	Number of Farms	Land in Farms (acres)	Percent of Land in Farms	Value of Agricultural Products Sold (Millions)
New York State	37,743	8,416,228	27.8%	$2,442.0
Clinton County*	591	173,000	26.0%	$49.0
Essex County*	219	60,000	5.2%	$9.0
Franklin	557	157,000	15.0%	$44.0
Warren	61	8,000	1.4%	$1.0
Washington County*	861	241,000	45.1%	$73.0
Total NY Basin Counties*:	1,671	474,000	20.2%	$176.0
Vermont State	5,877	1,407,900	23.8%	$375.5
Addison County*	714	220,900	42.2%	$75.7
Bennington County	169	32,800	7.6%	$6.7
Chittenden County*	452	98,100	25.0%	$22.0
Franklin County*	786	214,300	47.6%	$78.6
Grand Isle County*	127	28,200	23.3%	$8.0
Lamoille County*	213	44,900	14.7%	$14.1
Rutland County*	516	140,200	23.3%	$26.3
Washington County*	361	71,600	15.7%	$14.8
Total VT Basin Counties*:	3,169	818,200	28.7%	$239.5
otal NY & VT Basin Counties*:	4,840	1,292,200	24.8%	$415.5
VT Basin* % of VT Total:	53.9%	58.1%		63.8%
NY Basin % of Basin Total*:	34.5%	36.7%		42.4%
VT Basin % of Basin Total*:	65.5%	63.3%		57.6%

* Predominately Basin counties.

Sources: Stanton et al. 1989; De Geus 1992.

The Vermont Department of Agriculture's economic research chief, Reenie De Geus, has studied the problem of computing the primary and secondary value of agricultural products. While noting that the data is difficult to obtain, she estimates that agriculture contributes significantly more than the 4% of the 1986 Vermont Gross State Product (GSP) accounted for by farm gate cash receipts. In her opinion, accounting for the $290 million spent for supplies and services by those same farmers, and including trucking, veterinary services, slaughter plants, cheese and ice cream manufacturing, and other agriculture-related economic activity in the equation, then the value of agriculture rises to at least 16% of GSP (De Geus 1992). According to research by the Vermont Business Roundtable (1988), Vermont's GSP in

1986 was $7.5 billion, as expressed in 1982 dollars. Using De Geus's estimate, the real value of agriculture in Vermont's economy would be closer to $1.2 billion, a four-fold increase over the $303 million in 1986 farm gate cash receipts.

Carrying the estimate out to the Basin level, the 64% of Vermont agricultural product sales occurring in the Basin would translate to approximately $768 million in agricultural-related economic activity in the Vermont portion of the Basin. By computing the New York Basin's contribution based on it being 42.4% of the Basin total, we can determine a rough estimate for total primary and secondary agricultural-related economic activity in the Basin at $1.3 billion in 1986.

The U.S. census data for Vermont (1991c) indicates that in 1989, 4.2% of employed persons were employed in the agriculture, forestry, and fishing industry, totaling just over 12,000 people. Nationally, the sector accounted for 2.7% of all employment in 1989 (U.S. Department of Commerce 1991:400). However, estimating total agriculture-related employment presents similar problems to estimating gross sales from agriculture.

According to Mel Bevins, University of Vermont agricultural economist, he and his colleagues have been struggling with estimates of agriculture-related employment for years and have concluded that a complete input-output study is required for an accurate assessment of agriculture's true impact on economy of Vermont (personal communication, 3/23/93). An accurate assessment of agricultural employment would have to include employees classified in other sectors, such as manufacturing (e.g., ice cream, bread), wholesale trade (e.g., milk distributors), and retail trade (e.g., butchers, produce departments) Considering that the percentage of employed persons might be very similar to the percent of Vermont GSP accounted for by agriculture, we could use De Geus' estimate to estimate primary and secondary employment in agriculture at 16% of all employed persons, or 45,303 persons in Vermont. Estimating a similar employment ratio for northern New York would result in 14,200 agriculture-related jobs in the New York Basin area. Research is needed to more accurately determine primary and secondary agriculture-related employment in the Lake Champlain Basin.

Forest Products

Forest products includes a wide diversity of commodities and manufactured items including building materials, paper, maple syrup, and furniture. The importance of specific forest products-related industries to local economies varies from one part of the Basin to another. Maple syrup is one product that makes a significant contribution to local, rural economies, although the study team was unable to find data for specific areas of the Basin. It is known that approximately 1/3 of the U.S. supply of pure maple syrup is produced in New York State and that in 1992, close to 400,000 gallons of syrup were made with a production value of almost $9 million dollars (New York Agricultural Statistics Service 1992).

Manufacturing of paper and paper products makes a significant economic impact on the local, rural economies in the vicinity of the paper mills. For example, in 1990 the International Paper's Ticonderoga Mill employed 850 people with a payroll of $21.8 million for hourly employees (Jill-Marie Kurtz, International Paper Communications Manager, personal communication 8/25/92). While not all employees of the mill reside in the Town of Ticonderoga, the employment offered by the mill is equal to 40% of the town's workforce.

As with agriculture, a complete description of the primary and secondary forest product-related economy is beyond the scope of this project. Among available reports on the forest products industry, Healy's (1984) study paper provides one of the better analyses of the importance of the forest products industry

in Vermont's economy. Healy found in his analysis of 1970 and 1980 census data, that the Vermont forest products-related industry accounted for 8.3% of all Vermont employment in 1980. Its share of total employment remained virtually unchanged from 1970, although the number of persons involved in forest products-related industries had increased by 65% during the period. He also found that for every Vermonter working at a primary forest activity, there were another 1.3 persons working in a secondary forest products-related industry.

As discussed by Healy (1984), the percent employed in forest products-related industries in Vermont was more than twice the national average of 4%. By applying Healy's finding to the Lake Champlain Basin, we can estimate that 23,200 persons were employed in forest products-related industries in 1990. Of those, approximately 7,397 resided in the New York portion, while 15,803 resided in the Vermont portion of the Basin. Applying the 8.3% employment percentage to the New York Basin area seems realistic in light of the finding that lumber and wood-using industries in New York "account for 7.3% of all the state's manufacturing establishments, 5.8% of employment, and 4.9% of payroll" (Governor's Task Force on Forest Industry in New York State 1989:4).

The 1970 to 1980 period was one of vitality and growth in Vermont forest products industries, especially in the primary sectors of timber cutting and logging. The 1980s, on the other hand, saw a move towards concentration in the forest products industry, especially in the sawmill sector. The number of commercial saw mills in Vermont declined from a high of 117 mills in 1981, to 70 active mills in 1989. Productivity increased by 39% at the remaining mills, resulting in a relatively stable volume of sawlogs being processed during the period. During the same period the number of portable saw mills increased considerably, although they totaled only 29 by 1989. In terms of the volume of logs processed at mills by county, three counties each account for 14% of the volume: Caledonia, Orleans, and Windsor, totaling 42% of all sawlogs and veneer logs processed in Vermont in 1989. Of the three, only Orleans could be considered a Basin county, and then only about one-half of its area lies within the Basin (De Geus 1990).

Looking at the New York Basin area, a significant amount of the land area is classified as commercial forest land, as follows: Clinton County (69%), Franklin County (61%), Essex County (48%), Warren County (59%), and Washington County (48%) (Considine & Frieswyk 1982). As pointed out by Thomas Martin, NYDEC senior forester-economic development, that portion of New York containing the Lake Champlain Basin has traditionally supported a large, productive forest industry. He concludes that "the area's labor force is well established to meet the needs of the forest industry, and is capable of expanding production to meet increased demand for sawlogs" (Martin 1991:9).

A recent analysis of the wood products industry in northern New York by Yellow Wood Associates, Inc. (1991) included two Basin counties in its six county study area: Clinton and Essex. The research found that as in Vermont, there was a reported decline during the 1980s in the number of saw mills in the Northern Region of New York State. However, in contrast to Vermont, productivity also declined in New York and total output fell by 29%. At the time of the study there was one hardwood sawmill in Clinton County and one in Essex County with production capacities greater than 1,000 million board feet per year. As in Vermont, the major increase in forest products-related employment has been in the woods, at the harvest sites. Between 1980 and 1990 there was a 30% increase in the number of employed loggers in their study area. In terms of the secondary forest products-related industry, Clinton and Essex Counties together contained at least 46 secondary wood processing firms employing roughly 300 people. The average annual wage was $12,840 (Yellow Wood Associates, Inc. 1991).

Yellow Wood Associates (1991) recommended a dedicated effort to improve the wood products industry in northern New York by retaining value-added in the region. The consultants estimated that a successful effort would result in an increase of $46 million in value-added to the region, with $21.7 million in

additional income and 1,646 additional jobs, more than doubling current employment in the industry. One of their research recommendations is currently being put into practice, the employment of a Wood Products Development Specialist, dedicated to maximizing the economic impact of native timber resources in the region. He is based out of the Adirondack North Country Association office in Saranac Lake and will be addressing the specific needs of primary and secondary producers, such as marketing research and developing more cost effective production techniques.

Mining

Primary mining employment accounts for less than 1% of total Basin-wide employment, although accounting for all secondary mining-related employment would significantly increase its percentage of employment. As shown in Table 3-27 , U.S. census data indicates that primary mining employment in the Basin totaled 815 persons in 1990, with 75% of them residing in the Vermont portion of the Basin.

Table 3-27
Mining Industry Employment:
NY, VT, and Lake Champlain Basin Areas

Area Name	Number Employed by the Mining Industry	Percent of Employed Persons in Mining Industry
State of New York	7,946	0.1%
State of Vermont	790	0.3%
New York Shoreland Towns	104	0.3%
New York Basin Towns	204	0.2%
Vermont Shoreland Towns	53	0.1%
Vermont Basin Towns	611	0.3%
NY/VT Shoreland Total	157	0.1%
NY/VT Basin Total	815	0.3%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.

The location of primary mining employment in Vermont was focused in the counties of Rutland (181 persons) and Washington (213 persons). In Washington County, mining employment was concentrated in the Town of Barre and involved the quarrying of granite, the state's leading mineral commodity. In 1989 there were over 60 granite quarrying and manufacturing companies in the Barre area, in addition to other firms that supported the granite industry. There were an estimated 1,700 granite-related jobs in the area that contributed more than $25 million in wages and benefits to the local economy. The Barre Granite Association (BGA) celebrated its 100th anniversary in 1989, a year when the industry also experienced major growth. The granite industry continues as the backbone of the local economy, with many firms building new plants, constructing additions, and upgrading production processes. The

Rutland County mining employment was likely concentrated in slate and marble quarrying. Additional employment opportunities existed in sand and gravel production, and in crushed stone (Harrison & Ratte 1991).

It appears that a large majority of Vermont's mineral production occurs within the Lake Champlain Basin. In total, Vermont's nonfuel mineral production was valued at $88.9 million in 1989. Dimension stone (i.e., granite, slate, and marble) accounted for 35% of the value, or $31.4 million. Crushed stone contributed 32% of total mineral production value, or $28.1 million, and experienced a 56% increase in output and value over the previous year. Sand and gravel production was the third largest component of mineral value in Vermont, totaling $20.4 million, or 23% total value (Harrison & Ratte 1991).

Mining has a long and successful history in the Lake Champlain Basin area in New York, however, it presently is not the driving economic force it once had been for many rural communities. A contemporary mining success story is the wollastonite mine and production facility operated by NYCO Minerals, Inc. in the Town of Willsboro in Essex County. Wollastonite is used as a filler in ceramic tile, paint, and plastics. It also replaces asbestos in certain cement formulations, in ceilings and floor tile, and in friction applications such as brake linings (Potter & Virta 1991).

As of 1992, New York was the only producer of wollastonite in the U.S. and NYCO operated the state's only production facility. At the time, they produced close to 40% of the world's supply (Bill Kelly, New York Geological Survey, personal communication 9/8/92). Although the tonnage of wollastonite sold or used in 1990 decreased compared with that of the previous year, consumptive uses of products containing wollastonite are increasing annually. For example, the U.S. consumption of wall tile is increasing and the remodeling market has held strong through the recent economic downturn. Additionally, asbestos replacement is a possible growth area because of a proposed ban in the U.S. on almost all asbestos-containing materials, with similar legislation being considered in European and Asian countries (Potter & Virta 1991).

In 1989, NYCO constructed a $8.5 million chemical modification plant, known as Plant #2, at its Willsboro headquarters, having an annual capacity for processed wollastonite (known as Wollastokup and Wollastocoat) of 25,000 tons. NYCO also completed a $15 million up-grade to the existing facility, Plant #1, that resulted in a 50 percent increase in its wollastonite production capacity, to 120,000 tons annually. Prices for wollastonite in 1990 averaged $250 to $300 per ton, with the chemical processed product fetching between $600 and $900. The recent discovery of another major wollastonite deposit in Essex County assures that proven reserves are now sufficient to guarantee production of NYCO's products for the next 45 years (NYCO Minerals, Inc. 1992).

According to Bruce Anderson, NYCO vice president of finance, NYCO employs approximately 150 people, with about 75% being production-related employees, including 10 individuals employed at the mine sites (personal communication 11/10/92). Mr. Anderson reports that the economic trend for wollastonite is a very positive one, especially for NYCO because the Essex County deposits are among the highest quality of known reserves. While there are larger deposits that will undoubtedly come on line, most notably in China and India, the quality of the Essex County mineral will ensure its place in the market.

Other promising activities related to mining in the New York Basin include the recent purchase of Cold Stream Granite, located in Ausable Forks, by a Minnesota firm. Basin-area cement plants and crushed stone quarries are doing well and provide significant employment and income to rural areas. There is also the potential for renewed activities at the mine site near Mineville, with the purchase of 20 million tons of the tailings. The intention of the buyer is to work the appetite to extract rare earth metals, however, the

project is slowed by the poor market in rare earths. Reportedly, some 400 windows have been replaced on the mine buildings (Bill Kelly, New York Geological Survey, personal communication 9/8/92). Other mineral production within the Basin includes: garnets, slate, granite, and sand and gravel. In total, there were 25 mineral producing companies and 169 sand and gravel producers within the five New York counties of the Lake Champlain Basin. The sand and gravel producers appear to be fairly evenly distributed throughout the Basin (Schimmrich & Kelly 1991).

State-wide, mineral production was valued at $745 million in New York for 1989. The leading mineral commodities produced, in order of value, were crushed stone, salt, cement, construction sand and gravel, zinc, and wollastonite. Crushed stone accounted for 27% of mineral production value. The value of dimension stone for the entire state, include granite, slate, and marble, totaled only $3.6 million, or less than 1% of total mineral value. Thus, the value of dimension stone in Vermont was almost nine times that in New York (Harrison & Kelly 1989; Schimmrich & Kelly 1991).

To conclude this section of the report, natural resource harvest and extraction, including agriculture for purposes of this discussion, were traditionally important sources of employment and income in the rural areas of the Basin. They remain important today, however, the current economic trends are troublesome. Almost across the board, with the exception of particular commodities discussed above, there is a trend towards increased productivity and increased export of unfinished products, with an associated decline in employment and value-added within the Basin.

Currently, efforts are underway in the Basin to protect and improve natural resource-related employment. One example is the wood products strategy being coordinated by the Adirondack North Country Association (ANCA) that involves the employment of a full-time person to work with small wood products businesses in the difficult areas of marketing and financing. Another is the Community Stewardship Program being explored by planners and concerned citizens in Essex County, New York and in other rural areas in the Basin. It is a grass-roots approach to community development that attempts to include all the human and natural resources of a community in an assessment of where the community is economically, and where it wants to be. For example, the Essex County group recognizes that agriculture, forestry, mining, Lake Champlain, and a rich history going back two centuries are all important aspects of the eastern portion of the county. One approach to putting those pieces together in a plan to improve the economy of the Port Henry area is the development of an historic/recreation walking trail. The plan would capitalize on the valuable historic architecture in the village, as well as on the mining history of the area by displaying historic mining equipment in the central square. On a broader, regional level, another proposal is for an historic trail system along the Lake Champlain shoreline, using the rich history of the area to link the communities along the lake, using the present highway system and a dedicated system of signs and historic markers (William Johnston, Essex County Planning Office, personal communication 11/10/92).

This necessarily brief overview of natural resource industries concludes with two recommendations, both stressing the common problems facing all facets of the natural resource industry.

- Additional research is needed to assess the current status, and the common problems and needs, of natural resource-related businesses. Comprehensive data on the total primary and secondary employment and income provided by natural resource-related industries should be compiled for the Basin. The data should be compiled at the town level so that it can be incorporated in the Lake Champlain Basin socio-economic database and used to analyze costs and benefits from water quality improvement and pollution control.

- A more successful approach to improving local, rural economies might be a melding of the Community Stewardship Program and the Wood Products Industry initiative. In other words, to take the idea of a dedicated office and staff for the development of wood products industries and expand it to include the wide variety of natural resource businesses present in the Lake Champlain Basin. For example, to provide economic data, marketing assistance, and technical business support to small businesses involved in wood products, maple syrup, agriculture produce, and guiding, to name just a few natural resource businesses. The problems facing the small entrepreneur in each of these businesses are very similar in terms of marketing products, arranging financing, and complying with government regulations. The economic well-being of the majority of rural areas in the Basin depends on the success of small, natural resource-related businesses. The same cannot be said of wood products businesses per se, or even of agriculture. Economic development experts have astutely recognized that small, wood products businesses need assistance in order to compete and prosper in the world economy. The same is true of most natural resource industries. A program set-up to assist natural resource industries in general would likely be more cost efficient and more productive than a program targeting only one sector of the natural resource economy.

One example of the economic advantages than can occur when economic planning throws a wide net over the natural resource industry, is mentioned in a Vermont timber harvest impact report. The researchers found that transportation networks constructed for timber harvest activities were commonly used as recreation corridors at the conclusion of the harvest. Their recommendation was that cost-sharing programs funded by a variety of natural resource interests should be explored that would anticipate post-harvest recreational use and incorporate long-term, multiple use options in the initial design of timber harvesting transportation networks (Newton et al. 1990).

As summarized at a broad level by Freudenburg (1992), the long-term trends for virtually all commodity prices have been flat or downward. The underlying causes include the discovery of new reserves, increased efficiency of production, and improvements in extractive technologies. Considering that the economic forces influencing rural, natural resource-dependent economies extend far beyond town, county, and state borders, Lake Champlain Basin economic planners might consider the severe warning offered by two rural sociologists, that "anything less than a comprehensive rural development approach that addresses both local and extra-local dimensions of the resource dependency cycle will inevitably fail" (Krannich and Luloff 1991:16).

IDENTIFYING LAKE RELATED ECONOMIC ACTIVITIES

An important question about the economy of the Lake Champlain Basin is the degree to which it is directly related to Lake Champlain. A number of issues complicate the task of identifying the distinct components of the Lake Champlain Basin economy which are "directly Lake Champlain related." For example, while some businesses depend exclusively upon Lake Champlain, others thrive in both lakeshore and upland locations. Furthermore, a Shoreland town business which has a more contingent relationship to the Lake might be economically unrelated to the Lake. Also, any business which produces water effluent in the uplands of the Basin has an impact in the downstream water quality of Lake Champlain. Finally, much of the current economic information is not available below a county level of aggregation. Thus, it is not possible to completely disaggregate the space-economy of Shoreland towns or particular businesses. Realizing all these different limitations, this section examines the degree to which various economic sectors quantified at the county level, might be apportioned among Lake Champlain Basin and Shoreland areas.

Integrating County and Town Level Statistics

A major difficulty of identifying Lake Champlain related economic activities is the fact that relevant statistics are available only at the county level of aggregation. Since only Grand Isle county is entirely surrounded by Lake Champlain, it becomes necessary to estimate that portion of a county's economy which is Lake Champlain related. While many questions surround this issue, for this report the study team will use the Shoreland towns as the foundation for their analysis. The specific task thus becomes to identify what portion of a particular county's economy is found in its Shoreland towns. The two primary options for computing this ratio are either by total population or by the number or persons employed in a particular sector. For comparative purposes, the following section on manufacturing value-added will compute this Lake Champlain related proportion using both sources.

Manufacturing Value-Added

This section outlines two distinct methods for calculating the value-added by Lake Champlain related manufacturing industries. It should again be noted that this is not an attempt to specify Lake Champlain-dependent businesses. Instead it is a more general effort to identify the manufacturing value-added within the Lake Champlain shoreland towns of the Basin. The first approach utilizes population figures to pro-rate the spatial distribution of value-added by manufacturing within the Basin. The second method utilizes census information about employed persons by industry, which includes manufacturing.

Population Method of Computation

The population approach incorporates two basic calculations on the ratio of population with Basin and Shoreland areas. Using the ratios, it is possible to compute the percentage of a county's economic indicator that exists in each area, thus providing a rough estimate of how much of each county economic sector is "Lake Champlain related."

Looking at Table 3-28, the manufacturing value-added from the 1990 Census is multiplied by the percentages of county population in Shoreland and Basin areas. The result is an estimate of the manufacturing value-added by Shoreland and Basin towns for each county in the Basin. Total value-added for Basin and Shoreland areas is then computed, along with the percentage distribution among the New York and Vermont Basin areas.

Thus, the $880 million of manufacturing value-added in the New York portion of the Basin is 32% of the Basin total ($2.7 billion). The New York shoreland total of $361 million constitutes 41% of the New York Basin total. The Vermont value-added, $1.8 billion, is 68% of the Basin total. The Vermont shoreland, $849 million, constitutes 46.3% of the Vermont Basin total. Finally, the New York and Vermont shoreland total, $1.2 billion, is 45% of the Basin total value-added by manufacturing.

Employed Persons Method of Computation

The employed persons method uses the same two step process to pro-rate the value-added by manufacturing. The difference is that this method uses the ratio of employed persons in manufacturing to establish the value-added estimate (see Table 3-30).

Table 3-28
Manufacturing Value-Added in Lake Champlain Basin & Shoreland Areas: The Population Method of Calculation (1987)

Area	County Value-Added (Millions)	Basin Population Percentage	Computed Basin Value-Added (Millions)	Shoreland Population Percentage	Computed Shoreland Value-Added (Millions)
New York Counties					
Clinton	$357	100%	$357	73%	$261
Essex	$133	93%	$124	49%	$61
Franklin	$43	34%	$15	0%	$0
Warren	$301	62%	$187	0%	$0
Washington	$318	62%	$197	20%	$39
New York Basin Total:	$1,152		$880		$361
NY Shoreland % of NY Basin:					*41%*
Vermont Counties					
Addison	$179	100%	$179	30%	$54
Bennington	$205	8%	$16	0%	$0
Caledonia	$63	23%	$15	0%	$0
Chittenden	$1,042	100%	$1,042	69%	$719
Franklin	$115	100%	$115	61%	$70
Grand Isle	S/D	100%	S/D	100%	S/D
Lamoille	S/D	100%	S/D	0%	S/D
Orange	$72	22%	$16	0%	$0
Orleans	$69	32%	$22	0%	$0
Rutland	$314	99%	$311	2%	$6
Washington	$112	100%	$112	0%	$0
Windsor	$152	4%	$6	0%	$0
Vermont Total:	$2,323		$1,834		$849
VT Shoreland % of VT Basin:					*46%*
NY & VT Total:	$3,475		$2,714		$1,210
Shoreland % of Basin:					*45%*
NY % of Area:	33%		32%		30%
VT % of Area:	67%		68%		70%

Source: U.S. Dept. of Commerce, Bureau of the Census, 1987 Census of Manufactures.

With this method the New York Basin total is $866 million and the New York Shoreland total is $379 million, or 44% of the New York Basin total. In the Vermont portion, the Basin total is $1.919 billion and the Vermont Shoreland total $757 million. The Basin total is thus $2.8 billion with the New York/Vermont Shoreland portion $1.1 billion, or 41% of Basin total. It is noted that the difference between the population and employed persons calculations is less than 3%.

Table 3-29
Manufacturing Value-Added in Lake Champlain Basin & Shoreland Areas: The Employed Persons Method of Calculation (1987)

Area	County Value-Added (Millions)	Basin Employment Percentage	Computed Basin Value-Added (Millions)	Shoreland Employment Percentage	Computed Shoreland Value-Added (Millions)
New York Counties					
Clinton	$357	100%	$357	71%	$253
Essex	$133	96%	$128	77%	$98
Franklin	$43	22%	$9	0%	$0
Warren	$301	59%	$178	0%	$0
Washington	$318	61%	$194	14%	$27
New York Basin Total:	$1,152		$866		$379
NY Shoreland % of NY Basin:					*44%*
Vermont Counties					
Addison	$179	100%	$179	33%	$59
Bennington	$205	49%	$100	0%	$0
Caledonia	$63	23%	$14	0%	$0
Chittenden	$1,042	100%	$1,042	60%	$625
Franklin	$115	100%	$115	63%	$72
Grand Isle	S/D	100%	$0	100%	$0
Lamoille	S/D	100%	$0	0%	$0
Orange	$72	21%	$15	0%	$0
Orleans	$69	30%	$21	0%	$0
Rutland	$314	100%	$314	0%	$0
Washington	$112	100%	$112	0%	$0
Windsor	$152	4%	$6	0%	$0
Vermont Total:	$2,323		$1,919		$757
VT Shoreland % of VT Basin:					*39%*
NY & VT Total:	$3,475		$2,785		$1,136
Shoreland % of Basin:					*41%*
NY % of Area:	33%		31%		33%
VT % of Area:	67%		69%		67%

Source: U.S. Dept. of Commerce, Bureau of the Census, 1987 Census of Manufactures.

Retail Trade Sales

Statistics regarding total retail sales within the Lake Champlain Basin are also available only down to the county level. Consequently, as with manufacturing, it is necessary to utilize other sources of information to estimate that portion of the value-added that might be related to Lake Champlain. This section will use the same two step process outlined above for manufacturing. Since the manufacturing calculations above demonstrated the congruity between the two methods, this section will only use employment figures. Thus, it utilizes census information about employed persons by industry, which includes both wholesale and retail trade (see Table 3-30).

Table 3-30
Retail Trade Sales in Lake Champlain Basin & Shoreland Areas:
The Employed Persons Method of Calculation (1991)

Area	County Retail Sales (Millions)	Basin Employment Percentage	Computed Basin Retail Sales (Millions)	Shoreland Employment Percentage	Computed Shoreland Retail Sales (Millions)
New York Counties					
Clinton	$626	100%	$626	81%	$507
Essex	$264	93%	$246	45%	$110
Franklin	$272	39%	$106	0%	$0
Warren	$703	64%	$450	0%	$0
Washington	$261	57%	$149	14%	$21
New York Basin Total:	$2,126		$1,576		$638
NY Shoreland % of NY Basin:					*40%*
Vermont Counties					
Addison	$202	100%	$202	33%	$67
Bennington	$429	11%	$47	0%	$0
Caledonia	$180	20%	$36	0%	$0
Chittenden	$1,170	100%	$1,170	68%	$796
Franklin	$266	100%	$266	66%	$176
Grand Isle	$19	100%	$19	100%	$19
Lamoille	$144	100%	$144	0%	$0
Orange	$119	24%	$29	0%	$0
Orleans	$164	30%	$49	0%	$0
Rutland	$537	99%	$532	2%	$11
Washington	$438	100%	$438	0%	$0
Windsor	$376	3%	$11	0%	$0
Vermont Total:	$4,044		$2,943		$1,067
VT Shoreland % of VT Basin:					*36%*
NY & VT Total:	$6,170		$4,519		$1,706
Shoreland % of Basin:					*38%*
NY % of Area:	34%		35%		37%
VT % of Area:	66%		65%		63%

Source: Sale and Marketing Management, Survey of Buying Power, Annual Publication, 1991.

With this method the New York Basin total is a total retail sales of $1.576 billion for retail and a New York shoreland total of $639 million, or 41% of the New York Basin total. In the Vermont portion, the Basin total for the value-added by the retail sector is $2.943 billion and the Vermont shoreland total is $1.068 billion. The Lake Champlain Basin total is thus $4.519 billion with the New York/Vermont shoreland portion $1.707 billion, or 38% of Basin total.

LOCAL GOVERNMENT REVENUE AND EXPENDITURES

The socio-economic overview of the Lake Champlain Basin concludes with a description of local government revenue and expenditures. Table 3-31 lists the variables in the socio-economic database that characterize revenue and expenditures for local governments.

Table 3-31
Town Level Revenue and Expenditure Variables in the Lake Champlain Basin Socio-Economic Database

New York Data Sets

Property Values, Tax Rates, Assessments, Revenue, and Expenditures: NY Basin Counties and Towns (1990)

Vermont Data Sets

Property Values, Tax Rates, and Taxes Assessed: Vermont (1991)
Property Ownership Amounts by Category: Vermont Basin Counties and Towns (1991)
Property Ownership Percentages by Category: Vermont Basin Counties and Towns (1991)
Effective Town Tax Rates (1980)
Effective Town Tax Rates (1989)
Percent of Property Owned by Residents (1988)

Property Values and Tax Assessments

Table 3-32 provides the total assessed and full values for property within Lake Champlain Basin towns. The total assessed value of Basin property was approximately $20.5 billion in 1991 and the full market value was approximately $27.5 billion. Close to 80% (79.3%) of the total full market value is within the Vermont portion, however Vermont contains only 56% of the land area and 65% of the population. On the other hand, the New York area holds close to one-half (46%) of the Lake Champlain Basin in square miles, but holds only one-fifth (20.7%) of the Basin's property value. Similarly, the New York Shoreland comprises almost 12% of the Basin in square miles, yet contains less than 6% of the full market value of property.

Surprisingly, per capita valuation in the Vermont Shoreland was over three times that in the New York Shoreland, and the Basin-wide valuations were approximately twice as high in the Vermont. These findings do seem to indicate that the New York Shoreland property is valued at a level considerably less than similar property in Vermont. One influence on the apparent disparity is that there is possibly a much higher percentage of tax exempt property on the New York side of the lake. Another interpretation is that the value of property in the New York Shoreland towns does not reflect its lake-related value.

Turning to the issue of property taxes and tax rates, the Vermont Department of Taxes publishes the "total taxes assessed" by town (Vermont Department of Taxes 1992). New York unfortunately publishes village, town, county, and school taxes in separate tables, requiring researchers to compile the total taxes assessed. The New York analysis presented here does benefit from James F. Dunne's detailed research on revenue and expenditure patterns of the New York Basin counties completed for his Adirondack Park research (Dunne 1990).

Vermont tax data is presented in Table 3-33 and shows an average Basin per capita tax assessment of $886. The average Shoreland assessment is slightly less at $872, and both assessments are lower than the state average of $973. With the average household size in the Vermont portion of the Basin at 2.6

Table 3-32
Town Level Property Valuations:
NY, VT, and Lake Champlain Basin Areas (1990/1991)*

Area Name	Taxable Valuation of Real Property: Assesed (NY) or Listed (VT) Value	Taxable Valuation of Real Property: Full (NY) or Appraised Fair Market (VT) Value**	Assessed Value per Capita	Full Value per Capita	1990 Population (less Group Quarters)	Square Miles***
	Amounts					
State of New York	$195,173,200,000	$641,948,300,000	$11,188	$36,798	17,445,190	47,223.8
State of Vermont	$28,578,908,593	$36,862,286,051	$52,815	$68,123	541,116	9,249.3
New York Shoreland Towns	$933,806,000	$1,593,466,000	$11,031	$18,824	84,651	1,024.0
New York Basin Towns	$3,556,787,000	$5,695,799,000	$18,260	$29,241	194,791	4,380.5
Vermont Shoreland Towns	$5,301,818,504	$7,233,423,173	$45,426	$61,976	116,714	795.8
Vermont Basin Towns	$16,973,847,408	$21,844,519,220	$47,800	$61,516	355,101	5,144.2
NY/VT Shoreland Total	$6,235,624,504	$8,826,889,173	$30,967	$43,835	201,365	1,819.8
NY/VT Basin Total	$20,530,634,408	$27,540,318,220	$37,336	$50,083	549,892	9,524.7
	Percentages					
New York Shoreland Towns	4.5%	5.8%			15.4%	10.8%
New York Basin Towns	17.3%	20.7%			35.4%	46.0%
Vermont Shoreland Towns	25.8%	26.3%			21.2%	8.4%
Vermont Basin Towns	82.7%	79.3%			64.6%	54.0%
NY/VT Shoreland Total	30.4%	32.1%			36.6%	19.1%
NY/VT Basin Total	100.0%	100.0%			100.0%	100.0%

* New York values are for 1990, Vermont values are for 1991.
** Full value does not include the value of tax exempt property.
*** The Basin area includes the total area of all towns with any portion lying in the Basin.

Source: Office of the State Comptroller, 1991; Vermont Department of Taxes, 1992.

Table 3-33
Total Property Tax Assessments:
VT and Vermont Lake Champlain Basin Areas (1991)

Area Name	Appraised Fair Market Value	Total Property Tax Assessment	Tax Assessed per per Capita	Tax Assessed per Household (@ 2.6/House)	Computed Average Year-round Household Tax Bill *	Tax Assessed per $1,000 of Market Value	Assessed Taxes as a Percent of Full Value	1990 Population (less Group Quarters)
State of Vermont	$36,862,286,051	$547,572,729	$973	$2,530		$14.85	1.49%	562,758
Vermont Shoreland Towns	$7,233,423,173	$108,755,495	$872	$2,266	$1,632	$15.04	1.50%	124,772
Vermont Basin Towns	$21,844,519,220	$329,049,949	$886	$2,304	$1,659	$15.06	1.51%	371,350

* Accounts for the property tax responsibility of seasonal home owners, business, and industry.
Source: Vermont Department of Taxes, 1992.

persons per household, and if the local residents were responsible for the entire property tax levy, the average household would pay $2,304 in property taxes annually. Fortunately, the local tax payer is aided by the vacation home owner who resides outside the area, and by commercial and industrial property tax payers. In Vermont as a whole, taxes on vacation property amounted to 13.8% of the total value of property and 9.9% of all property taxes. Commercial properties accounted for 14.8% of property taxes, while industrial land accounted for 2.9% of taxes (Vermont Department of Taxes 1992:30). Accounting for those property tax assessments, the average household in Vermont portion of the Basin would be responsible for a property tax bill of approximately $1,659 .

The Shoreland towns in Vermont account for 33% of the total property taxes assessed in the Vermont portion of the Basin. The proportion of total property tax value accounted for by Shoreland towns is then over twice the proportion of the Shoreland area in square miles (i.e., 15%).

Table 3-34 displays summary statistics on ownership of property in the Vermont portion of the Basin. The average percentage of total property value owned by town residents is slightly higher for the Basin (62.3%) than it is for Vermont as a whole (57.1%). The percentage in local ownership varies significantly from town to town and the interested reader is encouraged to examine the complete dataset within the Lake Champlain Basin socio-economic database. For example, town resident ownership percentages varied from 88.9% in Jerico town, to 32.5% in Isle La Motte town, to 13.9% in Sherburne town.

Table 3-34
Property Ownership Percentages by Category:
VT and Vermont Lake Champlain Basin Areas (1991)

Area Name	Percent Corporate	Percent Town Resident	Percent State Resident	Percent Non-State Resident
State of Vermont	16.6%	57.1%	8.2%	18.1%
Vermont Shoreland Towns	16.3%	65.1%	11.1%	7.5%
Vermont Basin Towns	14.1%	62.3%	9.7%	13.8%

Source: Vermont Department of Taxes, 1992.

In examining the property tax situation in New York, the study team relied on New York data is of a different format than that of Vermont. There was not an easily accessed figure on the total amount of taxes paid by town residents, however, the total tax paid in each county by tax subdivision is published and available for 1990 (Office of the Comptroller 1991). The assessed property taxes for New York counties within the Lake Champlain Basin are shown in Table 3-35. The total assessment for the New York portion of the Basin is approximately $142 million. When added to the total assessment for the Vermont portion, the total property tax assessment for the Basin is approximately $471 million, with about 30% of the total accounted for by New York property. That proportion is somewhat less than the 36% of Basin total accounted for by New York's population and of the 40% accounted for by New York's proportion of the Basin in square miles.

Table 3-35
Total Property Taxes Assessed by Local Government Sub-division: NY Counties and NY Lake Champlain Basin Areas (1990)*

New York County	Subdivision: County	Cities	Towns	Villages	School Districts	Fire Districts	Total	1990 Population (less Group Quarters)
Clinton								
Total for County:	$5,365,000	$2,507,000	$6,581,000	$471,000	$25,881,000	$917,000	$41,722,000	77,971
Basin Portion Only:	$5,365,000	$2,507,000	$6,581,000	$471,000	$25,881,000	$917,000	$41,722,000	77,971
% of County Totals:	12.9%	6.0%	15.8%	1.1%	62.0%	2.2%		
Essex								
Total for County:	$3,846,000	$0	$11,975,000	$2,288,000	$17,851,000	$474,000	$36,434,000	34,824
Basin Portion Only:	$3,573,542	$0	$11,126,668	$2,125,914	$16,586,400	$440,421	$33,852,944	32,357
% of County Totals:	10.6%	0.0%	32.9%	6.3%	49.0%	1.3%		
Franklin								
Total for County:	$3,493,000	$0	$6,146,000	$3,679,000	$17,676,000	$38,000	$31,032,000	42,549
Basin Portion Only:	$1,192,984	$0	$2,099,078	$1,256,510	$6,036,984	$12,978	$10,598,534	14,532
% of County Totals:	11.3%	0.0%	19.8%	11.9%	57.0%	0.1%		
Warren								
Total for County:	$4,212,000	$3,931,000	$9,579,000	$702,000	$35,123,000	$581,000	$54,128,000	58,122
Basin Portion Only:	$2,633,134	$2,457,467	$5,988,317	$438,856	$21,957,163	$363,212	$33,838,149	36,335
% of County Totals:	7.8%	7.3%	17.7%	1.3%	64.9%	1.1%		
Washington								
Total for County:	$7,032,000	$0	$7,074,000	$3,674,000	$18,653,000	$0	$36,433,000	55,682
Basin Portion Only:	$4,242,791	$0	$4,268,132	$2,216,725	$11,254,376	$0	$21,982,024	33,596
% of County Totals:	19.3%	0.0%	19.4%	10.1%	51.2%	0.0%		
Total for Counties:	$23,948,000	$6,438,000	$41,355,000	$10,814,000	$115,184,000	$2,010,000	$199,749,000	269,148
Total for Basin Portions:	$17,007,451	$4,964,467	$30,063,194	$6,509,004	$81,715,923	$1,733,612	$141,993,651	194,791
% of County Totals:	12.0%	3.2%	20.7%	5.4%	57.7%	1.0%		
Basin Tax Per Capita:	$87	$25	$154	$33	$420	$9	$729	

* Basin portions are an approximation based on percentage of county population (less group quarters) within the Basin.

Source: Office of the State Comptroller, 1991.

Although the Basin totals shown in Table 3-35 estimate town-level tax assessment according to the percent of each county within the Basin, the database accompanying this report does include detailed revenue and expenditure data at the town level of government. The total New York Basin town-level property tax revenue determined by summing only those towns located in the Basin was $31.4 million, comparing very favorably to the estimate shown in Table 3-35 of $30.1 million. The estimate of town-level property assessments in Shoreland towns in New York in 1990 was $9.2 million, or approximately 29% of the total town-level assessments of $31.4 million. Using 29% as a general approximation of the percentage of all local government property tax assessments accounted for by New York Shoreland towns, the estimate for total Shoreland tax assessments would be approximately $41.2 million. The total for both New York and Vermont Shoreland towns in the Basin would then be $150 million in property tax assessments.

While it is difficult to estimate by what level that amount would be reduced if Lake Champlain were to drain away tomorrow, or, by how much those property taxes would be reduced were there a serious reduction in the Lake's water quality; it is obvious that some percentage of that $150 million in property tax revenue in Shoreland towns is dependent on Lake Champlain. A rough estimate could be based on the fact that the Shoreland town area is only 21% of the Basin's area, yet it accounts for 32% of all property taxes collected, therefore providing 13% greater revenue than would be expected based solely on land area. That surplus "value" then translates to $19.5 million in surplus property taxes provided by

the presence of Lake Champlain Shoreland. The $19.5 million is 13% of all Shoreland property tax revenue and 4% of all Basin property tax revenue.

On a per capita basis in New York, Table 3-36 shows that the average total property tax for the Basin is $729, while the Shoreland is significantly lower at $486. With an average household size of 2.6, the average New York Basin household would be responsible for $1,895 in property taxes, while the average Shoreland household would be responsible for $1,265 in annual property taxes, assuming that the total property tax bill is the sole responsibility of private property owners.

Table 3-36
Summary of Total Property Taxes Assessed:
NY and New York Lake Champlain Basin Areas (1990)

Area Name	Appraised Fair Market Value	Total Property Tax Assessment	Tax Assessed per per Capita	Tax Assessed per Household (@ 2.6/House)	Computed Average Year-round Household Tax Bill *	Tax Assessed per $1,000 of Market Value	Assessed Taxes as a Percent of Full Value	1990 Population (less Group Quarters)
State of New York	$641,948,300,000	$18,845,400,000	$1,080	$2,809		$29.36	2.94%	17,445,190
New York Shoreland Towns	$1,593,466,000	$41,178,159	$486	$1,265	$911	$25.84	2.58%	84,651
New York Basin Towns	$5,695,799,000	$141,993,651	$729	$1,895	$1,365	$24.93	2.49%	194,791

* Accounts for the property tax responsibility of seasonal home owners, business, and industry.
Sources: Office of the State Comptroller, 1991.

Using the Vermont data as a guide, approximately 28% of the property tax is paid by seasonal home owners, commercial establishments, and industry. Therefore the average New York Basin household would have a total property tax bill in 1990 of approximately $1,364 and the average Shoreland household, $910. The average household property tax bill in the New York portion of the Basin was approximately $295 (18%) less than that in the Vermont Basin.

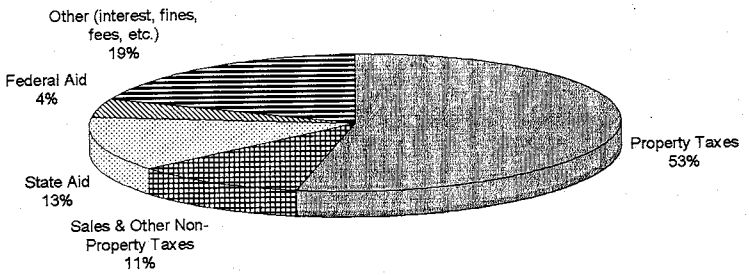
Local Government Revenue by Source

Figure 3-37 illustrates where property taxes fit in the over-all revenue of local governments and school districts within the Adirondack Park. According to 1987 property tax data for the Adirondack Park, property taxes comprise 54% of Adirondack Park town revenue, 18% of county revenue, and 36% of Adirondack Park school district revenue. Local taxes accounted for 41% of all the revenue of Adirondack Park-area local governments (Dunne 1990:58). Intergovernmental programs, on the other hand, supplied 18% of town revenue, 37% of county revenue, and 59% of school district revenue in the Adirondack Park. Over-all, intergovernmental programs provided 42% of the revenue of Adirondack local governments, approximately equal to that of the local property tax contribution to local government revenue.

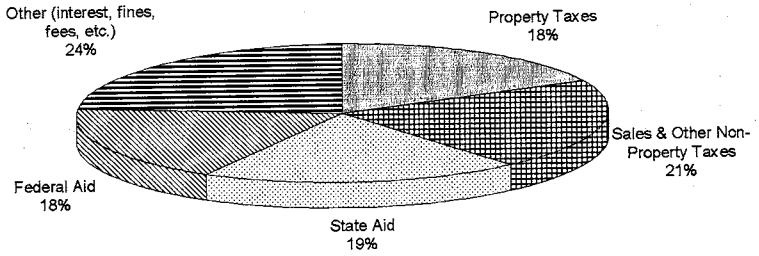
In assessing the Adirondack revenue source situation as compared to the state as a whole, Dunne (1990:58) found that for all local governments in New York, local property taxes comprised 10% more of local revenue than they did for Adirondack local governments. A converse relationship existed as pertains to intergovernmental programs, with the programs providing 6% more revenue to Adirondack governments than they did to New York local governments in general. Dunne (1990) concluded that neither situation was offering a favorable outlook on the future revenue picture of Adirondack local

Figure 3-37
Local Government Revenue by Source:
Adirondack Park Towns, Counties and School Districts (1987)*

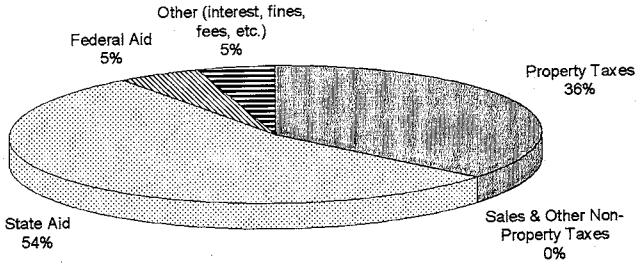
Towns



Counties



School Districts



* Proportions are based on per capita revenue for towns and counties, per pupil for school districts. Population figures are from the 1980 Census and include institutional population.

Source: Dunne, 1990:59.

governments. In terms of local property tax capacity, while it appears that the Adirondack local governments may have additional capacity to draw from, the lower-than-average income levels that currently exist in the area prevent any significant increase from occurring. Meanwhile, Adirondack governments rely more heavily on state and federal funding than is the norm in the remainder of New York. Given the downward trend in funding that is available from those sources, Adirondack governments will have to continue to seek out alternative sources of revenue, or else cut expenditures.

The summary of Adirondack local government revenue provided by Dunne (1990) appears to apply equally to Lake Champlain Basin local governments in New York, and likely applies to many of the rural local governments in the Vermont portion of the Basin. Table 3-38 gives population and area comparisons between the Adirondack Park and New York portion of the Basin. Over two-thirds (67%) of the Park's population also resides within the Basin, although only about one-third (35%) of the Park's land area is within the Basin. The revenue and expenditure situation does appear to be very similar in the Park and the Basin, and that seems reasonable given the similar population base, economic base, and land use in the two areas.

Table 3-38
Population and Area Comparison of the Adirondack Park and the NY Portion of the Lake Champlain Basin

New York Area	Population	Area (Sq. Miles)
Adirondack Park	135,000	10,086
New York Portion of Basin	210,117	4,045
Within both Park and Basin	89,997	3,497
Percent of Park within the Basin	67%	35%
Percent of Basin within the Park	43%	86%

Note: The Basin area includes the entire area of towns that are partially within the Basin.
Source: Holmes & Associates, 1993.

By way of comparison of the Adirondack tax data compiled by Dunne (1990) and the New York Lake Champlain Basin data compiled for this project, it is interesting to note that per capita tax payments by Adirondack Park residents was consistently higher than the per capita averages for New York residents residing in the Lake Champlain Basin. For example the per capita assessment for Park residents was $209 in town-level property taxes and $100 in county taxes; for the New York Basin resident it was $154 in town taxes and $87 in county taxes. A rough estimation of the average county tax paid per capita in the Shoreland towns would be even lower, at approximately $58.

This finding seems to provide further evidence that the value of New York Basin property, and especially of the Shoreland, is comparatively depressed. One conclusion is that rather than being undervalued, the local economies of the New York Basin, especially in the Shoreland areas, are in a depressed state, reflected in part by the value of property. One area of economic opportunity lies with Lake Champlain itself. Shoreland towns could better capitalize on the value that the lake represents, both as a tourist destination, and as a desirable area for living and working. The LCMC could play a role in improving the economic climate in Shoreland areas by encouraging the coordination of Basin-wide, as well as Shoreland-specific development programs. Local towns and villages can not be expected to develop

successful lake-related development programs on their own. A coordinated effort is likely to be more cost-effective and more successful in both improving the local economic climate and protecting the lake resource.

Local Government Expenditures

Turning to local government expenditures, the study team was able to compile information only for the New York portion of the Basin. Table 3-39 provides total expenditures for each county within the New

Table 3-39
Summary of Expenditures by Government Subdivision and Expenditure Function: NY Counties and NY Lake Champlain Basin Areas (1990)*

New York County	Subdivision: County	Cities	Towns	Villages	School Districts	Fire Districts	Total	Percent of Total County	Per Capita All Sub-divisions	1990 Population (less Group Quarters)
Clinton										
General Government	$4,850,000	$2,495,000	$3,927,000	$883,000	$0	$0	$12,155,000	6.9%	$156	
Education	$2,451,000	$0	$0	$0	$85,310,000	$0	$87,761,000	49.5%	$1,126	
Police	$3,228,000	$2,407,000	$11,000	$96,000	$0	$0	$5,742,000	3.2%	$74	
Fire	$198,000	$2,269,000	$312,000	$156,000	$0	$608,000	$3,543,000	2.0%	$45	
Other Public Safety	$791,000	$227,000	$196,000	$29,000	$0	$0	$1,243,000	0.7%	$16	
Health	$8,989,000	$0	$90,000	$2,000	$0	$0	$9,081,000	5.1%	$116	
Transportation	$4,610,000	$1,328,000	$4,906,000	$477,000	$0	$0	$11,321,000	6.4%	$145	
Economic Assistance	$24,022,000	$189,000	$104,000	$0	$0	$0	$24,315,000	13.7%	$312	
Culture-Recreation	$557,000	$930,000	$652,000	$244,000	$0	$0	$2,383,000	1.3%	$31	
Utilities	$0	$10,533,000	$1,412,000	$2,659,000	$0	$0	$14,604,000	8.2%	$187	
Other Community Services	$1,420,000	$2,658,000	$750,000	$403,000	$0	$0	$5,231,000	2.9%	$67	
Total County:	$51,116,000	$23,036,000	$12,360,000	$4,949,000	$85,310,000	$608,000	$177,379,000		$2,275	77,971
% of Total County:	28.8%	13.0%	7.0%	2.8%	48.1%	0.3%				
Per Capita, County:	$656	$295	$159	$63	$1,094	$8	$2,275			
Basin Portion Only:	$51,116,000	$23,036,000	$12,360,000	$4,949,000	$85,310,000	$608,000	$177,379,000	100%		77,971
Essex										
General Government	$3,061,000	$0	$3,903,000	$851,000	$0	$0	$7,815,000	8.7%	$224	
Education	$1,620,000	$0	$0	$0	$33,460,000	$0	$35,080,000	39.0%	$1,007	
Police	$939,000	$0	$316,000	$520,000	$0	$0	$1,775,000	2.0%	$51	
Fire	$29,000	$0	$551,000	$294,000	$0	$369,000	$1,243,000	1.4%	$36	
Other Public Safety	$584,000	$0	$81,000	$104,000	$0	$0	$769,000	0.9%	$22	
Health	$7,121,000	$0	$211,000	$2,000	$0	$0	$7,334,000	8.2%	$211	
Transportation	$5,308,000	$0	$6,437,000	$1,034,000	$0	$0	$12,779,000	14.2%	$367	
Economic Assistance	$12,089,000	$0	$157,000	$14,000	$0	$0	$12,260,000	13.6%	$352	
Culture-Recreation	$305,000	$0	$2,336,000	$106,000	$0	$0	$2,747,000	3.1%	$79	
Utilities	$0	$0	$1,161,000	$4,404,000	$0	$0	$5,565,000	6.2%	$160	
Other Community Services	$665,000	$0	$1,526,000	$299,000	$0	$0	$2,490,000	2.8%	$72	
Total County:	$31,721,000	$0	$16,679,000	$7,628,000	$33,460,000	$369,000	$89,857,000		$2,580	34,824
% of Total County:	35.3%	0.0%	18.6%	8.5%	37.2%	0.4%				
Per Capita, County:	$911	$0	$479	$219	$961	$11	$2,580			
Basin Portion Only:	$29,473,823	$0	$15,497,427	$7,087,618	$31,089,628	$342,859	$83,491,355	92.9%		32,357
Franklin										
General Government	$4,680,000	$0	$2,153,000	$1,247,000	$0	$0	$8,080,000	7.3%	$190	
Education	$1,806,000	$0	$0	$0	$59,501,000	$0	$61,307,000	55.0%	$1,441	
Police	$1,430,000	$0	$2,000	$1,460,000	$0	$0	$2,892,000	2.6%	$68	
Fire	$0	$0	$404,000	$494,000	$0	$49,000	$947,000	0.8%	$22	
Other Public Safety	$329,000	$0	$120,000	$47,000	$0	$0	$496,000	0.4%	$12	
Health	$3,961,000	$0	$61,000	$9,000	$0	$0	$4,031,000	3.6%	$95	
Transportation	$1,550,000	$0	$4,394,000	$1,114,000	$0	$0	$7,058,000	6.3%	$166	
Economic Assistance	$19,181,000	$0	$161,000	$38,000	$0	$0	$19,380,000	17.4%	$455	
Culture-Recreation	$238,000	$0	$345,000	$241,000	$0	$0	$824,000	0.7%	$19	
Utilities	$0	$0	$172,000	$3,954,000	$0	$0	$4,126,000	3.7%	$97	
Other Community Services	$376,000	$0	$671,000	$1,253,000	$0	$0	$2,300,000	2.1%	$54	
Total County:	$33,551,000	$0	$8,483,000	$9,857,000	$59,501,000	$49,000	$111,441,000		$2,619	42,549
% of Total County:	30.1%	0.0%	7.6%	8.8%	53.4%	0.0%				
Per Capita, County:	$789	$0	$199	$232	$1,398	$1	$2,619			
Basin Portion Only:	$11,458,862	$0	$2,897,247	$3,366,517	$20,321,712	$16,735	$38,061,073	34.2%		14,532

continued

Table 3-39 (cont'd)

New York County	Subdivision: County	Cities	Towns	Villages	School Districts	Fire Districts	Total	Percent of Total County	Per Capita All Sub-divisions	1990 Population (less Group Quarters)
Warren										
General Government	$5,450,000	$2,436,000	$4,344,000	$411,000	$0	$0	$12,641,000	9.0%	$217	
Education	$2,043,000	$0	$0	$0	$66,608,000	$0	$68,651,000	49.0%	$1,181	
Police	$4,989,000	$1,492,000	$294,000	$174,000	$0	$0	$6,949,000	5.0%	$120	
Fire	$29,000	$1,789,000	$2,187,000	$80,000	$0	$341,000	$4,426,000	3.2%	$76	
Other Public Safety	$660,000	$231,000	$129,000	$43,000	$0	$0	$1,063,000	0.8%	$18	
Health	$6,262,000	$50,000	$437,000		$0	$0	$6,749,000	4.8%	$116	
Transportation	$4,909,000	$1,871,000	$6,482,000	$271,000	$0	$0	$13,533,000	9.7%	$233	
Economic Assistance	$15,446,000	$114,000	$183,000	$3,000	$0	$0	$15,746,000	11.2%	$271	
Culture-Recreation	$661,000	$1,140,000	$1,221,000	$148,000	$0	$0	$3,170,000	2.3%	$55	
Utilities	$0	$3,460,000	$2,481,000	$497,000	$0	$0	$6,438,000	4.6%	$111	
Other Community Services	$1,220,000	$1,773,000	$2,040,000	$49,000	$0	$0	$5,082,000	3.6%	$87	
Total County:	$41,669,000	$14,356,000	$19,798,000	$1,676,000	$66,608,000	$341,000	$144,448,000		$2,485	58,122
% of Total County:	28.8%	9.9%	13.7%	1.2%	46.1%	0.2%				
Per Capita, County:	$717	$247	$341	$29	$1,146	$6	$2,485			
Basin Portion Only:	$26,049,398	$8,974,661	$12,376,730	$1,047,752	$41,640,028	$213,176	$90,301,746	62.5%		36,335
Washington										
General Government	$4,544,000	$0	$1,881,000	$1,374,000	$0	$0	$7,799,000	6.6%	$140	
Education	$1,720,000	$0	$0	$0	$64,303,000	$0	$66,023,000	55.8%	$1,186	
Police	$2,533,000	$0	$52,000	$1,423,000	$0	$0	$4,008,000	3.4%	$72	
Fire	$29,000	$0	$456,000	$200,000	$0	$0	$685,000	0.6%	$12	
Other Public Safety	$892,000	$0	$134,000	$55,000	$0	$0	$1,081,000	0.9%	$19	
Health	$3,216,000	$0	$59,000	$7,000	$0	$0	$3,282,000	2.8%	$59	
Transportation	$4,728,000	$0	$5,044,000	$1,512,000	$0	$0	$11,284,000	9.5%	$203	
Economic Assistance	$18,088,000	$0	$30,000	$9,000	$0	$0	$18,127,000	15.3%	$326	
Culture-Recreation	$420,000	$0	$266,000	$335,000	$0	$0	$1,021,000	0.9%	$18	
Utilities	$586,000	$0	$114,000	$1,115,000	$0	$0	$1,815,000	1.5%	$33	
Other Community Services	$863,000	$0	$1,139,000	$1,146,000	$0	$0	$3,148,000	2.7%	$57	
Total County:	$37,619,000	$0	$9,175,000	$7,176,000	$64,303,000	$0	$118,273,000		$2,124	55,682
% of Total County:	31.8%	0.0%	7.8%	6.1%	54.4%	0.0%				
Per Capita, County:	$676	$0	$165	$129	$1,155	$0	$2,124			
Basin Portion Only:	$22,697,603	$0	$5,535,780	$4,329,674	$38,797,521	$0	$71,360,578	60.3%		33,596
Total All Counties:	$195,676,000	$37,392,000	$66,495,000	$31,286,000	$309,182,000	$1,367,000	$641,398,000			269,148
% of Total Counties:	30.5%	5.8%	10.4%	4.9%	48.2%	0.2%				
Per Capita, All Counties:	$727	$139	$247	$116	$1,149	$5	$2,383			
Basin Portion Totals:	$140,795,686	$32,010,661	$48,667,184	$20,780,561	$217,158,890	$1,180,771	$460,593,753	71.8%		194,791

* Basin portions are an approximation based on percentage of county population (less group quarters) within the Basin.

Sources: Office of the State Comptroller, 1991.

York Basin. The total Basin expenditure was approximately $460.6 million in 1990 and the average per capita expenditure was $2,383. Looking further at the totals for all five counties, school districts accounted for 48.2% of total expenditures, county governments accounted for 30.5%, towns 10.4%, cities 5.8%, villages 4.9% , and fire districts accounted for .2% of total expenditures. Those percentages varied significantly by county. Counties with city-level expenditures had a much lower proportion of their expenditures at the other levels of government. For example, Clinton and Warren counties had 2.8% and 1.2% of their expenditures at the village level respectively, while Franklin County had 8.8% of total expenditures at the village level.

Over-all, the total per capita expenditures by county are very similar. They are lowest at the north end of Lake Champlain (i.e., Clinton County: $2,275) and at the south end of the lake (i.e., Washington County: $2,124), and highest in the Franklin County (i.e., $2,619), located in the upper reaches of the Basin.

Looking at the expenditure allocations by function, education is the big ticket item, accounting for 39% to 56% of total expenditures by county. The vast majority of the education expenditure occurs at the school district level within each county, and according to Dunne, approximately 36% of school district

revenue was supplied by local property taxes, with 54% supplied by state aid, and the remainder by federal aid, sales tax, and other revenue sources (1990:58).

The "cultural-recreation" expenditure category is one expenditure area that might be particularly more lake-related than the others, representing the allocation of funds to county parks, recreation programs, recreation facilities, museums, libraries, and other cultural and recreational activities. However, it does not comprise the only lake-related expenditures occurring at the local level. For example, transportation expenditures may include funds for road and parking area improvements near the lake; health expenditures may include public health monitoring related to the lake; and, utility and other community services include expenditures for water and sewer, storm sewers, and natural resources, all which may be lake-related in some locations. However, culture-recreation expenditures do serve to make an area more attractive to residents and tourists and reflect a general level of commitment to an improved tourism economy. In other words, if the recreational improvement is not there, for example the beach or picnic area, then it is unlikely that funds are being allocated out of the other expenditures to ensure that the picnic parking area is paved, or that the public health at the beach is being monitored.

Per capita expenditures on culture-recreation range from $79 per person in Essex County to $18 in Washington County and $19 in Franklin County. One relationship that becomes evident from the data collected for this study is that the counties with the highest tourism income, as determined by the New York Department of Economic Development (1992), are also the counties with the highest expenditure per capita in the culture-recreation category. While it is difficult to ascertain the exact relationship between tourism income and culture-recreation expenditures, Warren and Essex county appear to recognize a higher priority in such expenditure than do the other counties in the Basin. It is important to note that the socio-economic database includes detailed town-level expenditure data showing that 53% of the Essex County culture-recreation expenditures were made by the town of North Elba, the location of the Olympic training facilities at Lake Placid. Additionally, an anomaly in the Warren County data is the high expenditure on culture-recreation at the city-level of local government. The city of Glens Falls accounted for approximately 34% of Warren County's expenditure for that category in 1990. Therefore, the lake-related expenditure portion of the culture-recreation budget is relatively low even in Essex and Warren counties. Conclusions seem to be that local governments either do not recognize a relationship between cultural-recreation expenditures and tourism income, or, that they are simply unable to fund the category at higher levels. As alluded to above, the LCMC may be able to play a role in encouraging and funding Lake-related improvements in cultural and recreation facilities. The Partnership Program administered by the New York - Vermont Citizens Advisory Committees on Lake Champlain is a positive step that direction.

STRUCTURE OF THE TOURISM INDUSTRY IN THE LAKE CHAMPLAIN BASIN

OVERVIEW OF THE LAKE CHAMPLAIN BASIN TOURISM INDUSTRY

Research Objectives And Methodology

The primary purpose of this chapter is to compile information regarding the economic structure of tourism within the Lake Champlain Basin. The tourism chapter has three objectives:

- first, to assess the overall economic impact of tourism within the Lake Champlain Basin;
- second, to outline the spectrum of distinct sectors in the tourism industry within the Lake Champlain Basin; and,
- finally, to sketch the need for public balance sheets on tourism.

Archival research for this chapter was conducted at the SUNY-Plattsburgh Library, University of Vermont Library, State of Vermont Library and several institutional libraries within the Basin. This research utilized the computerized data bases for the main library collections, special collections and related periodical data bases. In addition, a total of over 100 personal research contacts were made; including in-person interviews, telephone interviews, and group discussions. Such individual contacts proved essential, since most of the detailed tourist statistics are not available through any of the libraries within the Basin. Furthermore, these personal communications also identified a number of pertinent studies which were not referenced in any of the Basin's libraries.

Lack Of Basin Tourism Studies And Information

A fundamental problem in discussing the economic impact of tourism within the Lake Champlain Basin is the fact that no previous tourism studies have been performed for the entire Lake Champlain Basin. The closest related studies address complimentary portions of the Basin. For the New York portion of the Basin, a study by Tommy Brown and Nancy Connelly (1984), analyzed tourism in the Adirondack Region of New York. The applicability of this study is limited by the fact that the Lake Champlain Basin constitutes a small portion of the overall Adirondack region. In addition, over half of the 210,117 New York residents living within the Lake Champlain Basin in 1990 were located outside the blue line of the Adirondack Park.

Finally, while this Adirondack tourism study does include one page of detailed observations for the area within the Adirondack Park which is within the Lake Champlain Basin (Duane/Dannemore and Keesville/Westport sub-region of the Adirondack Park), overall the study includes very limited consideration of the Lake Champlain Basin. Consequently, while it can perhaps be utilized for comparative or strategic purposes, it does not provide an accurate informational base to consider tourism in the New York portion of Lake Champlain Basin.

The other relevant study of the economic impact of tourism is the Haupt (1987) study of the entire state of Vermont. As with the New York study, this tourism impact assessment has a larger regional focus than the Lake Champlain Basin. Yet, since 57% of the total population of the State of Vermont resides within the Lake Champlain Basin, the Haupt study provides more regional congruity than the Brown and Connelly report. Furthermore, the Haupt study included the economies of Vermont's largest urban areas -Burlington, South Burlington, Essex Jct., Montpelier, Barre, St. Albans and Rutland, all of which lie within the Lake Champlain Basin. Thus, it provides the best empirical foundation to estimate the economic impact of tourism for the Lake Champlain Basin.

At the national level, one of the best sources of tourism information is the U. S. Travel Data Center in Washington D. C. This private agency collects and distributes a variety of tourism information in regard to the United States as a whole. This national organization utilizes a tourism model which is based primarily upon an annual program of twelve monthly travel surveys. Unfortunately, the sample size for this travel research is only 1,500 individuals for the entire United States. While this number of surveys provides adequate statistical accuracy for national tourism trends, it clearly does not provide sufficient reliability for regions such as the Lake Champlain Basin. Thus, while U.S. Travel Data Center information and estimates are available for comparative purposes, the information was considered inappropriate for estimating the economic impacts of the tourism industry within the Lake Champlain Basin.

Another source of comparative statewide tourism statistics is the 1991-92 Green Index (1992). This book presents a state-by-state, statistical portrait of the nation's quality of life. For example, the quality of life measures provided in Chapter 7, entitled "Farms, Forest, Fish and Fun" are particularly relevant to tourism within the Lake Champlain Basin. This chapter gives state-by-state figures for the number of fishing licenses per capita, percentage of the population who fish or hunt, per capita spending by sportsmen, motor boat registration per capita, and other relevant tourist, forestry and agricultural elements.

The best regional effort to compile a recreation and tourism data bank, that the consultants are aware of, was Malcolm Bevins' and Daniel Wilcox's study by the Department of Agricultural and Resource Economics at the University of Vermont. In 1978 they wrote a report entitled, "Vermont Recreation and Tourism Data Bank". This report catalogued various sources of information regarding recreation and tourism. Given its Vermont focus, it does not address the distinct data sources for the New York portion of the Basin. Furthermore, their proposal to create a statewide data bank was never funded.

It should also be noted that a number of related Lake Champlain Basin Program studies concerning recreation have been underway during 1992. One of these is a major recreation study in both the Vermont and New York portions of the Basin. Contact persons for the recreation study are Susan Bulmer, State Recreation Planner in Vermont and Bob Reinhardt, State Recreation Planner in New York. Another study related to tourism is being conducted by Dr. Alan Gilbert at the University of Vermont. He administered a Lake Champlain user survey in January of 1992, including detailed questions about expenditures while boating, swimming, boardsailing, fishing and/or water skiing. The contact person for this study is Jon Anderson at the Vermont Dept. of Fish and Game. These studies are on-going and data was unavailable at the time of this reporting.

In order to address the lack of comparable information about the tourist industry within the Lake Champlain Basin, the consultants have used the best available information to estimate the overall economic impact of tourism and assembled an outline for the distinct tourist industry sectors within the Lake Champlain Basin.

Defining Tourism In The Lake Champlain Basin

Travel and tourism researchers have developed a variety of ways to define tourism and categorize different kinds of tourists. Recent efforts in this regard include the report on definitions concerning tourism statistics by the World Tourism Organization (1983), a supply-side definition of tourism by Smith (1988) and the International Conference on Travel and Tourism Statistics held in 1991. A research report of this most recent International Conference on Travel and Tourism Statistics by Var (1992) provided the tourist classification scheme shown in Table 4-1. This table shows that studies of tourism generally utilize two major distinctions in their definitions of tourism, one in time and the other in space.

Applying this analytical matrix to the Lake Champlain Basin means differentiating between internal tourists (whether Vermont or Adirondack residents) and visitors from outside the region of study. Second, it notes differences based upon the length of time a person spends within the Basin. This attention to the length of stay may distinguish between residents, visitors, and excursionists (same-day-visitors). Realizing this spectrum of tourism within the Lake Champlain Basin, the consultants note that almost no attention has been given to the economic impacts and/or policy implications of internal tourists. In order to provide a more comprehensive analysis and address this gap in Lake Champlain research, the next section will assess the topic of the economic impacts of internal tourists within the Lake Champlain Basin.

It is important to note that the Lake Champlain Basin includes portions of both Canada and the United States. Thus, Quebec and the rest of Canada, have a pronounced economic impact on tourism within the Basin. This specific impact is noted where relevant and is systematically included in the chapter's general analytical approach. Since 96% of the Lake Champlain Basin population in 1990 resided within the U.S. portion, the tourism discussion is written from the perspective of the U.S. portion of the Basin.

The Economic Impacts Of Internal Tourism

Given the spatial identifiers on current economic information, this section of the report will distinguish three major spatial domains for its economic analysis of tourism: international tourists, out-of-the-region U.S. tourists, and internal tourists. Using the tourism definitions of Table 4-1 above, international tourists are all visitors, tourists and excursionists from a foreign country. While foreign visitors arrive from many countries, due to proximity, the greatest number are Canadian. Out-of-the-region U.S. tourists include United States visitors, tourists and excursionists who reside outside the Vermont-Adirondack region, roughly the area shown on Map 4-1. Internal tourists are defined to include visitors, tourists and excursionists who permanently reside within the Adirondack-Vermont region. For the purpose of this research, the area includes all residents of Vermont, as well as residents of the Adirondack Park and Lake Champlain Basin within New York State.

While the mainstream tourism literature clearly considers seasonal residents of the Lake Champlain Basin to be tourists, their economic impact has seldom, if ever, been considered within either the New York or Vermont portion of the Basin. For example, for the New York portion of the Basin, the only study of the economic impact of seasonal residents was Zinser's (1980) examination of the economic impact of second homes within the entire Adirondack Park. The most recent study of tourism related to the New York portion of the Lake Champlain Basin was Brown and Connelly's (1984) study of tourism in the entire Adirondack region. They acknowledge the significance of internal tourists but, after explaining that

Table 4-1
Tourism Definitions

I. International Tourism

Resident
A person is considered to be a resident in a country if he has lived in that country for at least a year or twelve consecutive months prior to his arrival in another country for a period not exceeding one year.

Visitor
A person who travels to a country other than that in which he has his usual residence and that is outside his usual environment, for a period not exceeding one year, and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited.

Tourist
A visitor who travels to a country other than that in which he has his usual residence for at least one night but not more than one year, and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited.

Excursionist
A visitor who travels to a country other than that in which he has his usual residence, and that is outside his usual environment, for less than 24 hours without spending the night in the country visited, and whose main purpose of visit is other than the exercise of an activity remunerated from within the country visited.

II. Internal Tourism

Resident
A person is considered to be a resident in a place if he has lived in that place for at least six consecutive months prior to his arrival at another place in the same country for a period not exceeding six months.

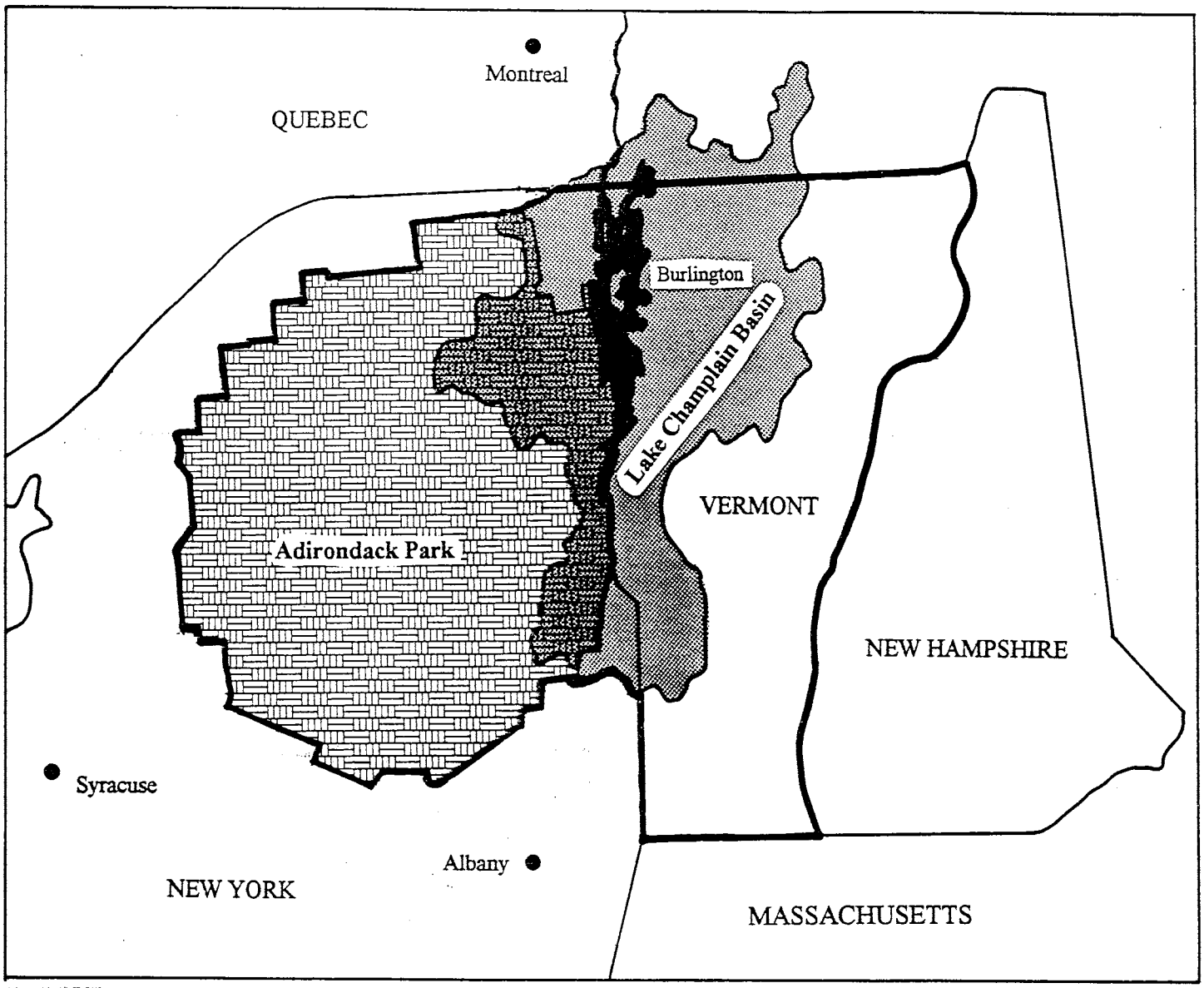
Visitor
A person residing in a country, who travels to a place within the country, but outside his usual environment, for a period not exceeding six months, and whose main purpose of visit is other than the exercise of an activity remunerated from within the place visited.

Tourist
A visitor residing in a country, who travels to a place within the country, but outside his usual environment, for at least one night but not more than six months, and whose main purpose of visit is other than the exercise of an activity remunerated from within the place visited.

Excursionist
A visitor residing in a country, who travels to a place within the country, but outside his usual environment, for less than 24 hours without spending the night in the country visited, and whose main purpose of visit is other than the exercise of an activity remunerated from within the place visited.

Source: Var, 1992.

Map 4-1
Adirondack-Vermont Tourism Region



this sector was beyond the focus of their project, proceed to focus only the impacts of external visitors. With respect to the Vermont portion of the Basin, the most recent related study of the economic impacts of tourism had the entire state of Vermont as its focus. As with the New York study, it also only considered travel by non-Vermont-residents (Haupt 1987). The Vermont study gave two reasons for ignoring internal tourists: the significance of "exports", and, difficulties in obtaining data about internal tourists.

While the study team concurs that it is a challenge to obtain information in regard to the economic impacts of internal tourists, it should be noted that it is likewise difficult to acquire empirical information about out-of- state and/or overnight tourists at a spatial level appropriate for analysis of the entire Lake Champlain Basin. Thus, such difficulty should not by itself preclude investigation of an entire tourist sector. Furthermore, the consultants note that the internal sector is important because spending by one group of internal tourists: the region's residents who are also seasonal homeowners, has a much different economic impact. For example, their purchases of home furnishings, repair supplies, groceries, and home maintenance services has a different impact on the regional economy than the meals or lodging purchased by overnight visitors from outside the region. Thus, while previous studies have only considered the

economic impact of seasonal homeowners who reside outside the Adirondack-Vermont region, this analysis will appraise and incorporate the economic impact of seasonal homeowners who are internal tourists.

As a first step it is important to gauge the size of the internal tourist sector within the Lake Champlain Basin. Given the difficulty of disaggregating information for only the Lake Champlain Basin, the domain of internal tourists includes residents of the Lake Champlain Basin, as well as residents of Vermont and the Adirondacks. Probably the best statistical indicator of this tourism sector is found in Vermont property tax records. Using the Vermont Department of Taxes Annual Report (1992), it is possible to estimate the number of seasonal housing units owned by internal tourists. This tax report specifies the total Grand List property value for "town residents", "in-state residents" and "non-Vermont residents" for every town within Vermont in 1991. Table 4-2 below gives the total dollars of property owned by Vermont residents who do not reside within the Town where they own property. In addition, it also provides the relative percentage of this ownership value for all the counties and of select towns within the Lake Champlain Basin.

Table 4-2
Internal Tourist Property Ownership in Vermont

Vermont Counties	Total Dollars	Percentage of Grand Lists
Addison	$145,010,403	10%
Chittenden	$499,029,418	10%
Franklin	$132,503,904	10%
Grand Isle	$103,248,400	21%
Lamoille	$87,268,503	8%
Rutland	$236,104,040	8%
Washington	$218,436,869	10%
Vermont Towns		
Addison County		
Addison	$10,983,914	17%
Ferrisburg	$21,389,400	14%
Lincoln	$4,320,800	13%
Chittenden County		
Colchester	$13,330,996	13%
Hinesburg	$3,702,029	9%
Milton	$5,345,168	7%
Grand Isle County		
Alburg	$12,484,100	13%
Grand Isle	$14,825	18%
South Hero	$44,227,500	26%
Franklin County		
Fairfax	$17,880,300	13%
Georgia	$8,764,000	6%
Highgate	$8,936,100	9%
Vermont Lake Champlain Shoreland Towns:	$879,536,625	13%
Vermont Lake Champlain Basin Towns:	$1,553,871,826	10%

Source: Vermont Department of Taxes Annual Report, 1992.

Although not all of these properties represent internal tourism, the popularity of summer camps in the Lake Champlain valley and seasonal mountain camps within the Basin uplands has resulted in a significant number of housing units in which Vermonters are internal tourists within the Lake Champlain Basin. It is also noted that 57% of this Vermont total comes from counties which have extensive shorelines on Lake Champlain. Also, remembering this study's Basinwide perspective, it should be noted that while similar tax information is not available for the New York portion of the Basin, related studies and key informant interviews seem to confirm a similar pattern. Note, though, that not all of this in-state, but out-of-town, property ownership is for seasonal tourist use by Vermonters. Some of these units are simply rental property, unrelated to seasonal tourist use.

One way to distinguish between these distinct alternatives is to compare 1990 U.S. Census statistics on "Housing Units by Vacancy Status" with the percentage of Town property ownership by "non-town" residents (the sum of out of state and in-state owners), as shown in Table 4-3. Examining these two key variables demonstrates that, within the Vermont portion of the Lake Champlain Basin, the percentage of out-of-Town ownership is usually closely related to seasonal housing units. With a few exceptions, the percentage of seasonal housing units shown in the first column closely corresponds to the percentage of "non-town" property owners presented in the second column. This correspondence supports the relevance fo property tax data in internal tourism analysis.

Table 4-3
Seasonal Housing Units and Percentage of "Non-Town Property Taxes for Vermont Counties and Select Towns

Vermont Counties & Towns	Housing Units: Percentage Seasonal *	Property Taxes: All Non-Town Owners**
Addison County	14%	20%
Addison	29%	29%
Shoreham	18%	19%
Chittenden County	3%	15%
Burlington	1%	13%
Charlotte	14%	15%
Franklin County	12%	17%
Georgia	13%	18%
Highgate	16%	14%
Grand Isle County	46%	47%
Grand Isle	30%	32%
North Hero	70%	62%
South Hero	41%	41%
Lamoille County	21%	26%
Stowe	41%	30%
Rutland County	18%	30%
Benson	31%	31%
West Haven	14%	38%
Washington County	14%	21%

Source: * U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary File 3A.; VT Dept. of Taxes, 1991.

The substantial percentages of seasonal ownership documented in the 1990 U.S. Census means that a significant percentage of local property taxes are the result of internal tourist use. While some of the seasonal use of "non-town" property owned by Vermonters is rental time for out-of-state residents, field interviews suggest that this constitutes a small percentage. In addition, it should also be noted that some property owned by "in-town" residents is also occasionally rented as seasonal units to Vermont residents and thus should technically be pro-rated as an internal tourist expenditure. But, for the purposes of this Basin-wide study, the consultants will regard the two previous rental levels to be roughly equal. Consequently, for most towns, the property ownership level for "out-of-town" Vermonters is considered to be an accurate reflection of internal tourist contributions to local property taxes.

Finally, in order to factor out those towns with a large population and a low percentage of seasonal units (e.g., Burlington with less than 3% seasonal units), one final adjustment will be made. The towns of this type, to be excluded as part of this internal tourism adjustment, and their 1991 property tax levels are shown in Table 4-4.

Table 4-4
Property Taxes Assessed by
Towns with a Low Percentage of Seasonal Housing

Vermont Towns	1991 Total Property Tax
Addison County	
Middlebury	$7,648,367
Vergennes	$1,955,921
Chittenden County	
Burlington	$29,355,450
South Burlington	$18,849,569
Winooski City	$4,864,437
Franklin County	
St. Albans City	$5,082,056
Rutland County	$349,921
Rutland City	$15,139,156
Washington County	
Barre City	$8,207,904
Montpelier City	$9,951,910
Waterbury	$349,921

Source: Vermont Dept. of Taxes 1992.

With this adjustment, it is possible to more accurately estimate the total taxes paid by Vermonters for seasonal homes. Table 4-5 presents the estimated tax paid by such internal tourists within the Vermont portion of the Lake Champlain Basin. It is also noted that, according to the 1990 U.S. Census, there are a total of 167,841 housing units in the Vermont portion of the Basin. Thus, 35% of Vermont's Basin housing units are in Shoreland towns as well as 24% of the seasonal housing units within the Vermont portion of the Basin. In comparison, the ratios are very similar for the New York portion of the Basin, where 40% of all housing units, and 24% of the seasonal housing units are in Shoreland towns. Looking at Vermont's Basinwide figures, the overall percentage of seasonal housing units for the entire Vermont Basin is 13% and slightly less, 9%, for Vermont's Shoreland towns. In summary, this analysis estimates that Vermont's internal tourists paid a total of $21 million in local taxes during 1991.

Table 4-5
Adjusted Town Tax Paid by Internal Tourists

Vermont County	Tax Assessment	In-State Percentage	Net Result
Addison	$29,000,000	10%	$2,900,000
Chittenden	$71,000,000	10%	$7,100,000
Franklin	$20,000,000	10%	$2,000,000
Grand Isle	$7,000,000	21%	$1,470,000
Lamoille	$20,000,000	8%	$1,600,000
Rutland	$40,000,000	8%	$3,200,000
Washington	$29,000,000	10%	$2,900,000
		Total:	$21,170,000

Source: Vermont Dept. of Taxes 1992.

To ascertain the additional economic expenditures of this seasonal tourist sector, it is possible to utilize the "Vermont Travel Expenditure Model" developed by George Donovan of the Vermont Agency of Development and Community Affairs. This model was used to estimate tourist expenditures in the Haupt (1987) study. Of course, given the wide variations in property values within the Basin, the absolute numbers would vary considerably. Also, since the consultants found no studies about spending patterns of seasonal home owners among different income groups, this analysis assumes the percentages remain the same for each category. The empirical foundation for this estimate is the Haupt study (1987, p.43), which used surveys and other information to estimate the total annual cost of an average seasonal home. The result of this empirical study was that local property taxes amounted to $616 out of a total, annual average cost of $7,300 per unit for seasonal home ownership. The Haupt study therefore indicates that property taxes constitute 8.4% of the total annual cost of seasonal homes. This means, assuming the same relative percentages in seasonal home cost in 1991, that total expenses for the seasonal homes of internal tourists within the Vermont portion of the Lake Champlain Basin are estimated to have been $249 million in 1991.

Due to a paucity of regional tourist expenditure information, it is more difficult to calculate related travel expenditures for internal tourists. National studies of all tourist sectors indicate the following distribution of expenditures: lodging 17%, food 25%, entertainment and recreation 10%, transportation 38% and incidentals 9% (McIntosh and Goeldner 1989). In the case of seasonal camps though, it is likely that transportation, food, entertainment, and incidentals constitute a substantially lower percentage of total expenditures. As a conservative estimate, this study will assume that the non-lodging categories are only one third as large and conversely that lodging is three times as relatively significant. Thus, the total estimated expenditures by internal tourists within the Vermont portion of the Basin would be: $498 million.

The relative significance of internal tourist expenditures may then be judged by a comparison to estimates of the economic impact of out-of-state tourists. For example, Haupt's study (1987) estimated $940 million in total travel expenditures for the entire state of Vermont. Using a combination of indicators, it is possible to indirectly estimate the proportion of this figure that is expended within the Lake Champlain Basin. Table 4-6 shows the Basin proportion of five indicators, the average Basin proportion being 68%.

Table 4-6
Percentage of Selected Vermont Indicators Occurring within the Lake Champlain Basin

Vermont Indicator	Percentage within Lake Champlain Basin
Total Population	57%
Total Annual Retail Sales	69%
Total Annual Service Industry Receipts	75%
Total Annual Wholesale Industry Sales	64%
Total Value Added in Manufacturing	76%
Average:	68%

Source: Lake Champlain Socio-Economic Database, 1993.

Using this indirect measure, the result is estimated to be $639 million, in 1985, for out-of-state travel expenditures within the Vermont portion of the Lake Champlain Basin. The overall economic impact of tourism in the Vermont portion of the Basin is thus estimated to be $1.137 billion. This includes $639 million of international and out-of-the-region tourist expenditures and $498 of internal tourist expenditures.

Thus, internal tourism's projected total expenditures of $498 million would equal roughly forty-four percent of the total tourist expenditures in the Vermont portion of the Basin. Although no comparable property ownership information is available for New York State, a similar general pattern is indicated. Overall then, it is estimated that 44% of the overall economic impact of tourism within the Lake Champlain Basin comes from internal tourism. In addition to this aggregate impact, the comparison of the property ownership by in-state and out of state residents for select towns shown in Table 4-7 shows that within the parameters of this estimate four of six lake shore towns have been influenced more by internal tourism than by out-of-state.

Table 4-7
Percentage of Property Taxes from Out of State and Internal Tourists

Select Vermont Towns	Out of State Tourists	Internal Tourists
Addison	11%	17%
Alburg	33%	13%
Georgia	12%	6%
Grand Isle	14%	18%
Highgate	5%	9%
South Hero	15%	26%

Source: Vermont Department of Taxes Annual Report 1992.

It should also be noted that a high percentage of "out of state" seasonal property owners in the region are Quebec residents, especially in the northern realm of the Lake Champlain Basin. Although no detailed property ownership information is available to quantify this international economic relationship, it has been anecdotally documented on both the northern New York and Vermont portions of the Lake Champlain Basin. Since spending patterns and behavioral preferences are distinct for each of these ownership groups, it is important to note the three distinct tourist groups involved with seasonal property ownership:

1. Quebec residents
2. Non New York-Vermont, U.S. residents
3. Adirondack-Vermont residents

Finally, it should be highlighted that to ignore the dynamics between internal and external tourists significantly underestimates the overall economic impact of tourism within the Lake Champlain Basin. In addition, it overlooks important sub-regional economic patterns of tourism in the Lake Champlain Basin and the policy implications for development. It is therefore recommended that future studies dealing with the economic impacts of tourism take more care to address the impact of internal tourism within the Lake Champlain Basin economy. Unraveling the distinct social components of tourism will become especially important when the preferences and spending patterns of internal tourists diverge from out-of-state tourists and/or year round residents. These distinctions could reveal profound differences in support for policy initiatives and potentially undermine the legitimacy of broad planning efforts, especially those seen to cater to an out-of-state clientele.

Overall Economic Impact of Tourist Sectors

One perspective on the relative importance of different tourist sectors can be found in general studies at the national level. Detailed studies by the U.S. Travel Data Center indicate that the average dollar of tourist expenditure is distributed between the five tourist sectors listed in Table 4-8.

Previous studies of tourism regarding the Lake Champlain Basin have refrained from using national averages in their models of economic impact. For example, the Haupt (1987) study used a Vermont Travel Expenditure Model, based upon detailed statistics which had been assembled by George A. Donovan of the Vermont Agency of Development and Community Affairs. The use of Vermont tourist indicators was clearly a plus for this report. A hidden disadvantage of this locally developed model was the fact that some of the information came from conversion studies. The problem with conversion studies is that they base their spending projections exclusively upon tourists who have made an inquiry with the State's tourism office. In the tourism literature, conversion studies have recently been criticized as an inappropriate surrogate for visitor surveys and ill-suited for estimating tourist expenditures (Perdue and Botkin 1988). Thus, the Vermont Travel Expenditure Model is not without its problems. Despite this, the Haupt report has been widely accepted and offers the best available foundation for a current estimate of tourist expenditures in the Lake Champlain Basin. The Haupt study estimated total Vermont tourist expenditures in 1985 of $940 million, a total tourist payroll of $220 million, the number of

Table 4-8
Average Tourist Expenditures:
Percent of Average Dollar Spent by Sector

Tourist Sector	% of Average $ Spent
Transportation	38%
Food	25%
Lodging	17%
Entertainment and Recreation	10%
Incidentals	10%
Total	100%

Source: McIntosh and Goeldner 1990.

travel industry jobs at 26,000 and the travel industry's contribution to state and local taxes at $68 million. Finally, it estimated that the Vermont travel industry directly and indirectly supported 15 percent of the state's economy. Unfortunately, this report did not include sufficient information explaining the derivation of all the variables incorporated. Without this documentation, it was not possible to compute a 1992 estimate.

The best study of tourism relating to the New York portion of the Basin was Brown and Connelly's (1984) report. However, given the limited spatial congruence of this study and the New York portion of the Basin, it is of limited value in assessing the economic impacts of tourism within the Lake Champlain Basin.

In contrast, the relatively high spatial congruity of the Haupt (1987) report with the Lake Champlain Basin makes it the preferred alternative as a basis to estimate the overall economic impact of tourism within the Basin as a whole. To perform this preliminary assessment requires pro-rating tourist expenditures within three different regions:

1. Vermont: outside the Lake Champlain Basin;
2. Vermont: within the Basin; and,
3. New York: within the Basin.

The simplest way to compute these regional shares would be to sum the economic indicators of tourism for each area. A difficulty arises though, because the relevant economic statistics are only available at the county level of aggregation. But, using county level data is problematic within the New York portion of the Basin. This is due to the fact that, although significant portions of Warren and Washington county lie within the Basin, most of these counties lie outside the Lake Champlain Basin. Thus, it is not possible to simply use county level economic data to determine economic impacts for the New York portion of the Basin.

Estimating tourist expenditures within the Vermont portion of the Basin is somewhat easier. This chapter's previous analysis determined that the best estimate for weighting tourist expenditures within the Vermont portion of the Basin was 69% (See Table 4-6). This means that in 1985 the Vermont portion of the Basin had $639 million in out-of-state tourist expenditures and $498 million in internal tourist expenditures, for a total of $1.137 billion. According to research sponsored by the Vermont Business Roundtable (1988), the Gross State Product (GSP) for Vermont in 1986 was $7.6 billion. Tourism then

could roughly be estimated to account for approximately 15% of Vermont's GSP. However, the percentage is approximate given that the dollar amounts relied on are not expressed in constant dollars.

The next step is to calculate the economic impact of tourism within the New York portion of the Lake Champlain Basin. Table 4-9, below, depicts the ratios for select population and economic indicators in the New York and Vermont portions of the Basin. A rough synthesis of these distinct rates is their average of 29% within the New York portion and 71% in the Vermont portion of the Basin. The result is an estimated $464 million in total, tourist expenditures within the New York portion of the Basin in 1985. The final step in this process is to add together the Vermont and New York subtotals. Thus, total estimated tourist expenditures within the Lake Champlain Basin were $1.601 billion in 1985.

Table 4-9
Percent of Select Indicators in New York and Vermont Portions of the Lake Champlain Basin

Lake Champlain Basin Indicator	% by State New York	Vermont
Population	40%	60%
Persons employed in transportation	35%	65%
Persons employed in services	32%	68%
Total retail sales	29%	71%
Eating & Drinking Sales	22%	78%
Annual service industry receipts	16%	84%
Manufacturing value added	31%	69%
Average:	29%	71%

Sources: U.S. Department of Commerce, Bureau of the Census, 1990

In 1990 George Donovan, state research analyst at the Vermont Agency of Development and Community Affairs estimated that 8 million visitors to Vermont spent a total of $1.3 billion. The average expenditure per day was $82.30 which included food, lodging, gas and activities. Since the total estimated tourist expenditures for Vermont ($1.3 billion) was a 38% increase from 1985 ($940 million) the simplest approach is to increase the various Lake Champlain Basin estimates by 38%. Using the ratio given in table 4-6, that 68% of Vermont's tourist expenditures occur within the Basin, this means that $884 million in Vermont tourist expenditures were made within the Basin during 1990. Assuming the same relative percentage increase with internal tourist spending, 38% more than $498 million, the net result is $687 million of Vermont internal tourist expenditures. This presents a Vermont total of $1.571 billion in total tourist expenditures within the Lake Champlain Basin during 1990. Assuming the same relative distribution between New York and Vermont discussed previously (New York constituting 29% of the Basin's tourist expenditures and Vermont 71%) the New York total (including $360 million of out of state and $282 million of internal tourist expenditures) is $642 million. **This makes total estimated tourist expenditures within the Lake Champlain Basin $2.213 billion in 1990.**

The consultants observe a slight difference between the New York estimate of $327 million in travelers' expenditures, based upon New York Economic Development statistics in 1987 (as shown in Table 4-10), and external tourist expenditures extrapolated from the Haupt study (1987) of Vermont. Given the 38% increase projected by the Vermont Travel and Tourism agency, during the next 5 years, this means an average increase of 7.6% per year. Thus, by 1990, the tourist expenditures within the New York portion

Table 4-10
Estimated Travelers' Expenditures in New York Counties within the Lake Champlain Basin (1987)

New York County	Travelers' Expenditures 1987 (millions)	Estimated Basin Portion	Pro-rated Basin Amount (millions)
Clinton*	$57.6	100%	$57.6
Essex*	$97.6	93%	$90.8
Franklin	$59.0	34%	$20.1
Warren	$244.8	62%	$151.8
Washington*	$11.5	62%	$7.1
Total:	$470.5		$327.3

* Predominately Basin counties.

Source: NY Dept. of Economic Development, 1992.

of the Basin would increase to over $400 million. The remaining difference between this figure and the $642 million estimate is could be explained by differing methodologies for defining or calculating tourist expenditures. For example, a personal interview with New York officials indicated that the New York figures were based only upon those businesses who report to the New York Department of Labor (personal communication, Craig Wakefield, Tourism Marketing Analyst, 2/9/93). Thus, family operations and other small enterprises, who do not submit information to this agency, are not included in the New York estimate. Additionally, the Vermont tourism expenditure estimate appears to include a much wider component of the economy.

Now that the total expenditures in the Basin has been determined, we are able to estimate the total amount of Lake Champlain-related tourism expenditures. Table 4-11 provides ratios for select population and economic indicators for Lake Champlain Shoreland areas. With an estimated 40% of the $2.2 billion in tourism expenditures occurring in Shoreland towns, they accounted for total tourism expenditures of approximately $880 million in 1990. Of that amount, $624.8 million occurred in Vermont Shoreland towns and $255.2 million in New York Shoreland towns.

Table 4-11
Percentage of Selected Variables Occurring within Lake Champlain Shoreland Areas

Shoreland Variable	New York Shoreland	Vermont Shoreland	Total Shoreland
Population	44%	34%	37%
Industry Classification: Entertainment & Recreation Services	37%	37%	38%
Occupation Classification: Sales	46%	44%	44%
Average:	42%	38%	40%

Source: U.S. Department of Commerce, Bureau of the Census, 1990 Census of Population and Housing, Census Summary Files 1A and 3A.

In summary, a maximum of $880 million in Lake Champlain-related tourism expenditures occurred in 1990. That figure comprises approximately 40% of all tourism expenditures occurring within the Lake Champlain Basin.

A similar approach can provide an estimate of Lake Champlain related employment. Table 4-12 lists the total employment in 28 travel related industries for the five New York counties in the Basin. Using the variables listed in Table 4-11, we have estimate the percentage of tourism employment occurring in the Shoreland area of each New York county. In the New York Lake Champlain shoreline towns, 4,756 individuals were employed in some facet of the tourist industry. That figure equals 31% of all tourist related jobs within the five New York counties within the Lake Champlain Basin. With Vermont containing an estimated 71% of the employment in the Basin, there are approximately 11,644 jobs linked to the lake in the Vermont portion of Basin. **In total, there are a maximum of 16,400 jobs directly dependent on Lake Champlain-related tourism in New York and Vermont.**

Table 4-12
Annual Average Tourism Employment in New York Basin Counties and Shoreland Towns (1990)

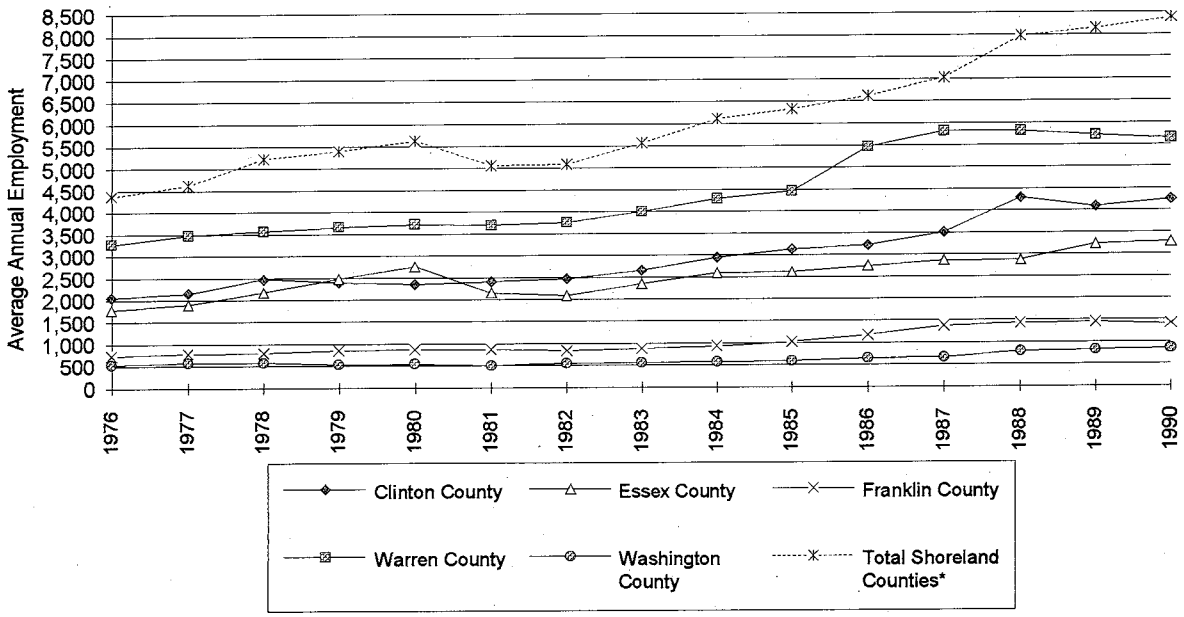
New York County	Average Annual Employment 1990	Estimated Percentage Occuring in Shoreland Towns	Total Employment in Shoreland Towns
Clinton	4,251	79%	3,358
Essex	3,272	38%	1,243
Franklin	1,408		
Warren	5,642		
Washington	857	18%	154
Total:	15,430	31%	4,756

Source: NY Dept. of Economic Development, 1992.

According to the 1990 Census, 260,000 individuals were classified by industry in the Basin. Therefore, approximately 6.3% of all employment in the Basin is linked to Lake Champlain. Lake Champlain-related employment in Vermont (i.e., 11,644 jobs) comprises 5.8% of the 201,826 individuals counted as the total average annual employment in all Vermont industries in 1990.

Before turning to a discussion of the individual Lake Champlain tourist sectors, one additional aspect of the tourism industry is the general trend in employment over the past ten to fifteen years. Figure 4-1 illustrates the trend for New York counties in the Basin. Employment in this sector grew slowly but steadily between 1976 and 1990. The increase due to the Olympics in Essex County is 1980 is noticeable, as is the decline that occurred the next year. Warren County exhibited growth in 1986, as did Clinton County in 1988. Growth rates moderated somewhat in the 1989-1990 period.

Figure 4-1
Total Employment for 28 New York Tourism Businesses:
Lake Champlain Basin Counties, 1976 - 1990



* Shoreland counties are Clinton, Essex, and Washington Counties.

Source: NYS Department of Economic Development, 1992.

INDIVIDUAL LAKE CHAMPLAIN TOURIST SECTORS

This report now sketches the distinct tourist sectors found within the Lake Champlain Basin. When detailed information was available a summary and or description is included. In addition, some of the individual sections list regional contacts for additional information.

Lake Champlain Related Activities

Boating and Marinas

During the summer months Lake Champlain is a very popular sailing area. Given the 100+ mile length and the occasionally demanding conditions encountered, large sailboats are commonly found on Lake Champlain. The high expense of these boats and the parallel spending power of this sailing clientele indicates significant expenditures related to this sector. It is also significant that a high percentage of these boats, especially in the northern half of Lake Champlain, are owned by Canadians. In addition, little sailboats are found on many of the Basin's smaller lakes. Despite the scale of this economic activity, the consultants located no studies of the economic impact of the sailing sector. As mentioned below, a Lake Champlain boating study is currently in progress that specifically addresses the economic expenditures of boaters.

Motor boating is a popular activity on Lake Champlain. Motor boating as a category may also include picnicking, water skiing, fishing, swimming, and other related activities. The State of Vermont publishes a pamphlet "Vermont Boating, Rentals & Marinas" and both New York and Vermont record the number of motor boats registered within their State.

The consultants were not able to find any studies or statistics relative to the use of canoes in the upper Lake Champlain Basin. However, the many canoe rental/guide services available within both New York and Vermont indicate the extent of this sector within the Basin. Besides these outfitters, many visitors bring their own canoe and organize their own trips.

Board sailing is also a popular sport within the Basin. Equipment sales, rental and lessons are available at many sites.

Kayaking is primarily found on the Lake's tributaries while sea kayaking is focused on Lake Champlain proper. No studies or statistics regarding this sector were found.

Use of the Lake Champlain resource as a boating destination has myriad economic implications and has been recognized as a focus for study by a variety of agencies and entities. Detailed data on the level and economic impact of boating is difficult to gather and collate. Studies currently in progress may help to shed some light on the issue. The States of New York and Vermont are carrying out a cooperative Lake Champlain Recreation User Survey, with results possibly available as early as spring, 1993. The questionnaire survey being distributed to boaters inquirers as to expenditures for the current boat trip for the following categories:

rental fees, parking, and boat launching;
groceries, beverage, and ice;
fishing tackle/bait;
restaurant and bar;
boat gasoline and oil;
lodging;
entertainment, souvenirs, and miscellaneous;
boat repairs and parts; and,
other.

The expenditure data distinguishes among three possible expenditure locations: at home, in transit, and at Lake Champlain. When available, the data will allow for the most accurate assessment to date of boating-related expenditures around Lake Champlain (personal communications: Susan Bulmer, Vermont Agency of Natural Resources, 12/9/92; and, Bob Reinhardt, New York State Office of Parks, Recreation, and Historic Preservation, 9/9/92).

A.H. Gilbert, resource economist at the University of Vermont has completed research related to marina use and recreational lake activities on Lake Champlain, however, his findings were unavailable at the time of this study. When Gilbert's research does become available, it will provide additional expenditure data related to Lake Champlain recreation activities.

A portion of Gilbert's research is reported on in the Lampricide Final Environmental Impact Statement (New York State Department of Environmental Conservation and U.S. Fish and Wildlife Service 1990). The EIS's discussion of Lake Champlain marina capacity sites Gilbert as the source of data displayed here in Table 4-13.

Table 4-13
Lake Champlain Marina Capacity in 1986

Type of Berth	Vermont Number	Vermont *Percent*	New York Number	New York *Percent*	Total
Dockage	865	*43.9%*	1,105	*56.1%*	1,970
Slips	345	*100.0%*	0	*0.0%*	345
Moorings	488	*61.2%*	309	*38.8%*	797
Total	1,698	*54.6%*	1,414	*45.4%*	3,112

Source: New York State Department of Environmental Conservation and U.S. Fish and Wildlife Service (1990a:181).

The Lake Champlain marina capacity was estimated at 3,112 boats in 1986. The division of this capacity was 1,414 in New York (45%) and 1,698 in Vermont (55%). Expected growth rates in marina capacity was estimated at 4.7 and 1.9 percent for Vermont and New York respectively. In 1986 there were an estimated 1,100 users on waiting lists for marina facilities (New York State Department of Environmental Conservation and U.S. Fish and Wildlife Service 1990a:180).

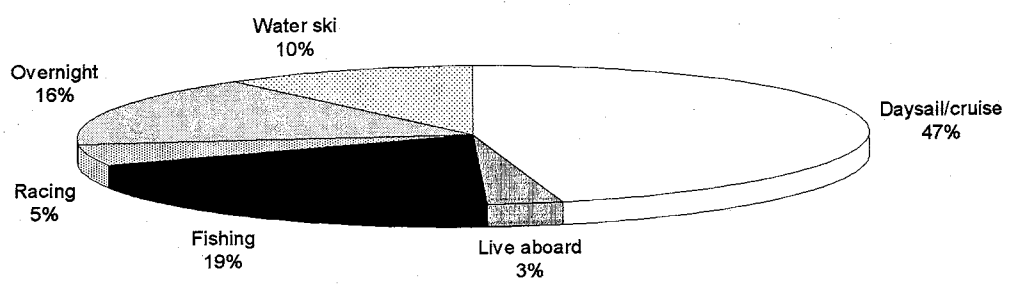
The boating and marina business appears to be a high growth sector, as discussed below, and the 1986 data considerably underestimates the current situation on Lake Champlain. A 1990 annual marina survey conducted by the Vermont Boat and Marine Association (VBMA) determined that there were at least 650 moorings and 1,400 slips or dock spaces on the Vermont side of the lake, for a total of 2,050 berths (Vermont Boat and Marina Association 1991). That same study estimated the need for additional berths at approximately 1,700. Estimating the number of boaters waiting for moorages is a fickle, weather-dependent endeavor, as demonstrated by a more recent VBMA survey that determined that there were 303 boaters waiting for moorages on the Vermont side (personal communication: Doug Robertson, Vermont Boat and Marine Association 1/8/93).

The 1991 VBMA survey (in progress) offers other insights into usage patterns of the marinas by estimating the percent of business accounted for by Canadian boaters. Reported proportion of customers that were Canadian varied from zero to 75% of customers, with the average being about 20%. A representative of the VBMA offered his impression that the percentage was likely much higher on the New York side. The reason being a discrepancy between Vermont and New York taxing policies, with Vermont collecting a 5% tax on the value of any boat held in Vermont for more than 90 days (personal communication: Doug Robertson, Vermont Boat and Marine Association 1/8/93). His analysis was that this caused many Canadian boaters to discriminate against Vermont facilities.

In terms of the major activities Lake Champlain boaters participate in, the on-going boating and recreation surveys will be providing the most accurate data available. The VBMA (1991) survey did inquire into perceived participation levels as perceived by the marina owners themselves. Figure 4-2 provides the primary boating activities of boaters using marinas in Vermont.

In terms of employment in the Lake Champlain boating and marina sector, the 1990 VBMA survey reported that 110 permanent and 235 seasonal individuals were employed by the 28 boat business in the Lake Champlain area, although all are not located directly on the lake (Vermont Boat and Marine Association 1991). The 1991 survey report, currently still in draft report form, will contain statistics for payroll, property taxes etc.

Figure 4-2
Primary Boating Activities of Marina Users,
as Perceived by Vermont Marina Owners and Operators



Source: Vermont Boat and Marine Association 1991

Looking at the New York side of the lake, as shown in Table 4-14, in 1990 there were an average of 114 employees in the "Boat Liveries/Marinas/Yacht Basin" sector in Clinton, Essex, and Washington Counties, with an annual payroll of $1,765,000. The "Boat Dealers and Suppliers" sector employed 49 individuals, with an annual payroll of $680,000. In total, direct boating-related employment and payroll for the New York counties bordering on Lake Champlain totaled at least 163 people and $2,445,000.

Table 4-14
Lake Champlain Boating-Related Employment and Payroll, for New York Shoreland Counties (1990)

Boat Liveries/Marinas/Yacht Basins (SIC: 4493)

New York County	Year	Reporting Units (1st Qtr)	Annual Average Employment	Total Payroll ($000)	Average Pay ($)
Clinton	1990	5	48	630	13,131
Essex	1990	8	54	815	15,093
Washington	1990	1	(D)	(D)	(D)
Average per Unit:			8	126	14,338
Estimated Total:		14	114	1,765	

Boat Dealers and Suppliers (SIC: 5551)

New York County	Year	Reporting Units (1st Qtr)	Annual Average Employment	Total Payroll ($000)	Average Pay ($)
Clinton	1990	4	28	389	13,886
Essex	1990	2	(D)	(D)	(D)
Washington	1990	1	(D)	(D)	(D)
Average per Unit:			7	97	13,886
Estimated Total:		7	49	680	

(D) indicates non-disclosed data.
(SIC) indicates the most recent Standard Industrial Classification code.

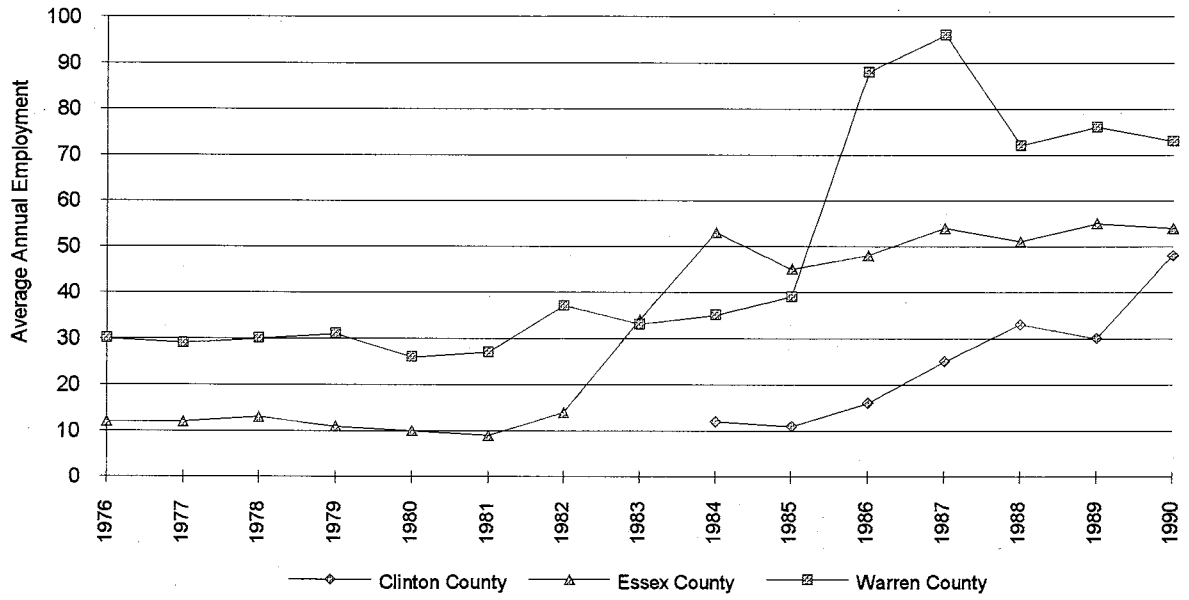
Source: New York State Department of Economic Development, 1992.

Figure 4-3 illustrates the phenomenal growth that occurred in the marina business sector in the early to mid-1980s. Clinton and Essex county both experienced a change in total marina employment from 10 or less in the early 1980s to approximately 50 employees each in 1990. Much of that change could be attributed to increased demand along Lake Champlain. The growth in Warren County is related almost entirely to demand on Lake George.

The actual number of marinas appears to much greater than reported by the NY Department of Economic Development, due in part to classification and reporting, and, because the State data is current only to 1990. According to a recent article in the magazine Strictly Business, as of August, 1992, there were 15 permitted marinas in Clinton County, with a total of 2,201 slips/moorings, for an average of 147 slips/moorings per establishment (Strictly Business 1992). Applying the average of 8 employees per marina, as shown in the top half of Table 4-19, the 1992 employment by Clinton County marinas was 120 persons. Considering that in 1990, tourism business employed 4,200 people in Clinton County (New York State Department of Economic Development 1992), marina-related employment appears to comprise approximately three percent of the total tourism business employment in Clinton County.

Table 4-15 provides an estimate of the over-all employment impact of the marina industry around Lake Champlain. The study team estimates that there were slightly over 300 marina-related jobs around Lake Champlain, with an annual total payroll of close to five million dollars.

Figure 4-3
Total Employment for Liveries/Marinas/Yacht Basins (SIC: 4493): New York Counties in the Lake Champlain Basin (1976-1990)



Note: Franklin and Washington Cty data undisclosed, Clinton Cty data undisclosed until 1984 (i.e., < 3 units reporting).
Source: New York State Department of Economic Development, 1992.

Table 4-15
Lake Champlain Marina Employment and Payroll (1990)

Area	Estimated Number of Marinas	Average Employ-ment per Unit	Total Annual Average Employment	Average Payroll per Unit ($000)	Total Payroll ($000)
New York	21	8	168	126	2,646
Vermont	22	8	176	126	2,772
Total	43	8	344	126	5,418

Note: Payroll is in 1990 dollars.
Sources: Employment and Payroll data: New York State Department of Economic Development, 1992;
Marina count: McKibben (1990). Strictly Business (1992), Doug Robertson ,VBMA (personal communication, 1993).

The boat dealer and supplier sector likely contributed an additional 100 jobs and a payroll of over one million dollars around Lake Champlain in 1992. The boat dealer and marina sectors account for direct boating-related employment, additional, indirect, boating related-employment would occur in the hardware, restaurant, service station, and lodging sectors.

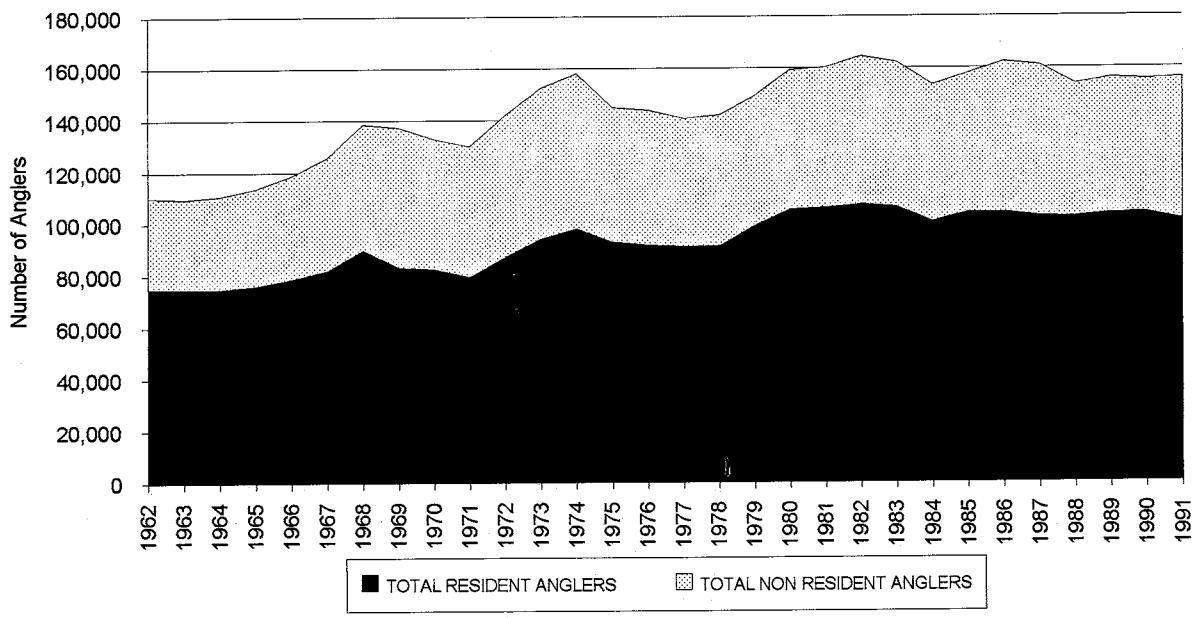
Because of the importance of the marina and boating industry to lake shore communities, and, given the difficulty in obtaining accurate data on marina employment, payroll, and sales receipts, we advocate that the Management Conference encourage and offer technical assistance to the data collection and collation efforts of the Vermont Boat & Marine Association.

Fishing

There are a number of ways to assess the magnitude and impact of fishing on a region. Indirectly, the number of licenses sold is an important indicator. It is less clear, however, whether those who purchase licenses will actually fish in the Lake Champlain Basin. Also, estimates are slightly over 20% of anglers are between ages six and fifteen who are not counted by license statistics (NYDEC and USF&W 1990a:174).

Vermont fishing license sales during the 29 year period 1962-1991, are shown in Figures 4-4 and reveal a fairly consistent level of fishing activity. The average sales for the last decade (1981-1991) were 103,619 for residents, and 54,706 for non-residents, for a total average of 158,325 sales per year. Approximately 35% of all fishing licenses were purchased by out-of-state residents.

Figure 4-4
Vermont Fishing License Unit Sales (1962-1991)



Source: Vermont Fish & Wildlife, personal communication, 1992.

Using the ratio developed by this research (see Table 4-6), approximately 68% of the Vermont license sales occur within the Lake Champlain Basin, or 107,661 licensed fishermen within the Lake Champlain Basin. That means that close to one-third (29%) of all Vermont Basin residents hold fishing licenses.

The New York State Department of Environmental Conservation (1992) provided information on the number of license sales in each of the New York Basin counties. As displayed in Table 4-16, a total of 60,213 fishing licenses were purchased in the New York Basin counties between September 1990 and August 1991. A total of 80,907 fishing and combination licenses were purchased, providing over $1 million in revenue to the state.

Table 4-16
Fishing License Sales and Revenue: New York Basin Counties (1990-91 License Year)

		Type of Fishing License:						Type of Combination License:				
New York County		Fishing	3 Day Fishing	Non-Resident Fishing	Non-Resident 5 Day Fishing	Total	Percent of Total by Non-Residents	Senior	Combination	Sportsman	Total All License Types	Percent of Total by Non-Residents
Clinton	# Sold:	7,885	298	1,838	1,201	11,222	27%	476	298	4,087	16,083	19%
	$ Revenue:	$70,965	$894	$49,626	$18,015	$139,500	48%	$1,190	$4,768	$94,001	$239,459	28%
Essex	#:	6,093	514	2,224	3,017	11,848	44%	552	145	3,292	15,837	33%
	$ Revenue:	$54,961	$1,578	$60,092	$45,378	$162,008	65%	$1,392	$2,325	$75,790	$241,514	44%
Franklin	#:	5,590	464	1,764	2,008	9,826	38%	527	111	3,149	13,613	28%
	$ Revenue:	$50,321	$1,397	$47,641	$30,153	$129,512	60%	$1,317	$1,776	$72,427	$205,032	38%
Warren	#:	9,922	2,489	2,328	5,899	20,638	40%	643	104	3,163	24,548	34%
	$ Revenue:	$89,501	$7,581	$62,930	$88,758	$248,770	61%	$1,617	$1,667	$72,805	$324,858	47%
Washington	#:	4,903	151	1,068	557	6,679	24%	505	149	3,493	10,826	15%
	$ Revenue:	$44,131	$453	$28,836	$8,355	$81,775	45%	$1,263	$2,384	$80,367	$165,789	22%
Total:	#:	34,393	3,916	9,222	12,682	60,213	36%	2,703	807	17,184	80,907	27%
	$ Revenue:	$309,879	$11,903	$249,124	$190,659	$761,564	58%	$6,778	$12,920	$395,390	$1,176,652	37%

Source: New York State Department of Environmental Conservation, 1992.

An average of 36% of the New York fishing licenses were purchased by residents of other states, very similar to the level in Vermont. Essex, Franklin, and Warren counties were most successful in attracting out-of-state fishermen to their waters. Out-of-state fishermen accounted for 44% of the total in Essex County, while they were only 27% of the total in Clinton, and 24% in Washington. The ratio of in-state to out-of-state purchases is likely an indicator as well of the prevalence of "out-of-county" purchases, those visitors from other parts of New York who decide to fish while visiting the Lake Champlain region.

In Warren County, where fishing license sales approached $250,000, 40% of the licenses and 61% of the license revenue is can be attributed to non-residents. It is unlikely that many of those licensed were purchased for fishing on Lake Champlain, rather, the majority were likely purchased for fishing on Lake George. Areas seeking to assess the impact of their sports fishing economies would be advised to study the Lake George/Warren County experience.

In summary of the fishing license discussion, approximately 167,874 fishing licenses were purchased in the Lake Champlain Basin, with 64% of those purchased on the Vermont side of the lake. An additional 20,694 combination licenses were purchased in the New York area of the Basin, indicating that between

Table 4-17
Lake Champlain Angler Data: New York Licensed Anglers (1988)

Region of Residence	Anglers Number	Anglers Confidence Limits	Angler Days Number	Angler Days Confidence Limits
4	6,850	1,590	46,150	16,150
5	23,740	2,110	353,310	88,130
Out of State	5,580	1,460	61,640	18,470
Other	4,920	1,390	26,090	12,190
Total	41,000	3,970	482,170	75,181

Estimated Expenditures	Total (avg./day)	Confidence Limits
At Location	$9,455,350 $19.61	$1,805,730
En Route	$4,652,940 $9.65	$1,155,180
Total	$13,944,360 $28.92	$2,697,610

Estimated # of Trips	430,850 (+-97,180)
Mean # of trips per Angler	10.5 Trips
Mean Trip Length	1.7 Days
Mean Distance Traveled	86 Miles

Fished Primarily For:	% of Days
Lake Trout	18.3%
Yellow Perch	16.6%
Walleye (Yellow Pike)	15.1%
Bass	9.4%
Northern Pike	8.4%
Atlantic/Landlocked Salmon	5.8%
No Specific Type	17.2%
Other	9.2%

Estimated net economic value (above current expenditures), of the Lake Champlain and Lake George fisheries (based on "willingness to pay").

	Net Economic Value	Confidence Limits
Lake Champlain	$6,847,000	$2,777,000
Lake George	$7,426,000	$2,066,000

Source: Connelly et al., 1990:33,91.

The 1988 New York Statewide angler survey (Connelly et al. 1990) estimated that 73% of the total angler days for licensed anglers fishing Lake Champlain were made up of people who resided in counties bordering or fairly close to Lake Champlain, pointing to the importance of internal tourism to local economies. The prevalence of local anglers is apparently the basis for predictions that although a successful lamprey program will result in an additional 65,000 angler days on Lake Champlain, the extra load on infrastructure, the need for lodging etc. are assumed to be relatively small.

Table 4-18 provides additional detail on fishing activity in New York Basin counties.

Table 4-18
Estimated Angler Effort and Expenditures in New York Basin Counties (1988)

New York County	Number of Anglers	Confidence Limits	Number of Angler Days	Confidence Limits	At Location Expenditures	Confidence Limits
Clinton County*	25,050	3,490	369,990	71,960	$4,301,540	$1,049,810
Essex County*	56,460	5,150	535,940	80,760	$11,544,680	$1,631,440
Franklin County	36,860	4,210	399,780	71,520	$7,037,370	$1,249,140
Warren County	52,300	4,970	540,870	78,230	$11,993,850	$2,050,230
Washington County*	22,190	3,290	275,050	63,210	$2,004,150	$716,250
Total Shoreland Counties:	103,700		1,180,980		$17,850,370	
Total All Basin Counties:	192,860		2,121,630		$36,881,590	

* Lake Champlain Shoreland Counties.
Source: Connelly and Brown, 1990:13,19,20,56,57.

The Lake Champlain International Fishing Derby gives some indication of the level of fishing activity for the Lake, . The number of participants have ranged from 2,400 in 1982, to 9,250 in 1986, to 7,610 in 1989. Ticonderoga also holds fishing tournaments, and according to Chamber of Commerce personnel, they continue to grow in popularity. The Chamber estimated from participant surveys of a few years ago, that each participant spent approximately $150 per day while in the area, with some participants staying as long as 10 days in order to familiarize themselves with the lake. The Chamber plans to up-date their survey next year. The study team observed that early in 1993, the first Lake Champlain International Ice Fishing Derby was held on the lake. Finally, it has been reported that the leasing of ice shacks is growing business on Lake Champlain, having been lucrative for local residents around lakes in Maine for a number of years.

There is some commercial market value in at least two of the Lake Champlain fisheries, although there is not actual a "commercial" fishery on Lake Champlain, with the exception of an inactive commercial eel fishery (personal communication: George LaBar, School of Natural Resources, UVM 1/26/93). George LaBar has studied the environmental impact, and to some extent the economic impact, of Lake Champlain commercial ice-fishing. In summarizing data on smelt fishing, he reported that 344,000 smelt weighing 11,800 kg (25,960lb) were caught by New York fishermen in 1977 and that 17,500 kg (38,500 lb) (or approximately 504,000 smelt) were caught by the Vermont fishermen he studied in 1987 (1989:19). In 1987 smelt were selling for $1.49/lb whole and $2.25/lb dressed. His research found that an estimated total of 1,170 pounds of smelt were sold through commercial markets. While the estimated value of the commercial market appeared to be in the vicinity of $3,000, and unknown amount was sold to individuals (LaBar 1989). The total value of the sale of smelt could be as high as $50,000.

In a similar study of the winter perch fishery, LaBar was able to develop a more specific estimate of the commercial value of that fishery, by interviewing owners or managers of 38 stores and wholesalers. He estimated that about 31.6 metric tons of perch (69,684 lb; 365,000 fish) were sold at approximately $.85 each, for a total value of $59,000 (1988:20) The largest buyer in the area bought about 10,000 lbs. of yellow perch in January-March 1988.

While there is no official commercial fishery for smelt and perch, LaBar's research shows that an industry has developed nevertheless. The smelt and perch fisheries together likely contribute as much as $100,000 to the economies around the lake, with the actual value two or three times that amount if all sales and/or barter to friends and family were included. However, the situation is predicted to change in near future, with both New York and Vermont planning to place limits on the catch of perch, where none now exist (personal communication: George LaBar, School of Natural Resources, UVM 1/26/93). While the sales to friends and families will likely continue, the commercial market will likely be reduced with the imposition of bag limits.

There may be increased economic opportunity in a regulated commercial fishery, whereby individuals who have traditional fished to supply needed income for their families, would be permitted to continue commercial perch fishing. The location, timing, and amounts could all be controlled on the advice of fishery biologists. While the over-all value of the commercial fishery is only a minor portion of the Lake Champlain economy, it may be of great importance to certain individuals and families in the high-unemployment, low-income portions of the Basin. The LaBar studies (1988 and 1989) does not discuss the socio-economic characteristics of "commercial fishermen", nor does it provide a case study of the economy of a commercial fishing family.

In addition to reports discussed here, the lamprey eel EIS calls for the collection of baseline data survey collected in year one of the program (NYDEC and USF&W 1990a). Although the study team was unable to confirm the status of the surveys, baseline data being collected reportedly includes:

1. a survey of 4000 anglers (approx. 5% of L. Champlain anglers from an earlier creel survey);

2. a survey of 400 non-anglers who live within a 5 mile radius of the Lake (this will probe individuals' willingness to pay for a variety of environmental options related to the Lake); and,

3. a survey of businesses to include personal interviews of all fishing charters and a stratified 50% random sample of boat dealers, boat rentals, marinas, and bait and tackle shops.

This baseline data will later be compared to a re-survey in Year 7 of the lamprey control program.

Ferryboat Service

The Lake Champlain Transportation Company (LCT) provides ferryboat service across Lake Champlain at three different locations:

Vermont	New York
Grand Isle -	Plattsburgh
Burlington -	Port Kent
Charlotte -	Essex

The Grand Isle - Plattsburgh crossing operates year round. It carried 77% of LCT's annual vehicle traffic and 69% of LCT's passengers in 1991. It is significant that overall, vehicle traffic has more than doubled during the past ten years.

Other Transportation

The primary means by which tourists travel to/in the Lake Champlain Basin are by airplane, Amtrak, motorcoach, and automobile. The only regional estimate the consultants were able to find regarding the distribution between the different forms of transportation was that of the Haupt (1987) study. This study quoted a 1977 National Travel Survey by the U.S. Census, stating that 91% of all Vermont's tourists travel by automobile. It is reasonable that a similar figure would have applied to the New York portion of the Basin. That meant that 9% of the total number of out-of-state visitors used airlines, train, bus or other means. The lack of more up to date estimates is problematic.

Given difficulties obtaining information for the exact same time period it has not been possible to compare the relative performance of these different transportation sectors. It is possible though, to demonstrate dramatic fluctuations in the number of tourist arrivals by different forms of transportation. For example, the number of enplanements at Burlington International Airport increased from 153,252 in 1977 to 405,346 in 1991; a 164% increase during this period. Yet, during the more recent period from 1985 to 1991, enplanements decreased from 442,411 to 405,346; an 8% decrease. The trend in automobile travel may be estimated by considering the number of welcome center visitors at Fair Haven (US-4, New York Line). In July of 1985 there were 8,941 and in August of 1991 12,215; an increase of 37%. Additional transportation figures are included in the separate sections of this chapter.

Airline Industry

National studies of intercity passenger travel in the United States indicate that in 1988 Airlines constituted 17.2% of all miles traveled (McIntosh and Goeldner 1990). This compares with 81.3% for automobile travel and 2.5% for all "other" forms. This means that airline connections are a crucial component in a region's accessibility.

There are two major airports within the Lake Champlain Basin; Burlington Vermont and Plattsburgh, New York. The following tables, 4-20 and 4-21, show annual enplanements for these two airports. Also, although no statistics are available, it should be noted that many of the enplanements at Plattsburgh are actually commuter flights to make connections in Burlington.

Table 4-20
Estimated Annual Enplanements for Clinton County Airport

Year	Enplanements	% Change for Period
1983	5,260	
1985	6,900	16%
1989	13,141	90%
1990	21,999	67%
1991	18,409	-16%

Source: Clinton County Airport, personal communication, 1992

Table 4-21
Estimated Annual Enplanements for Burlington International Airport

Year	Enplanements	% Change for Period
1970	76,934	
1975	112,996	9%
1980	207,075	17%
1983	374,275	27%
1985	442,411	9%
1989	447,784	0%
1990	425,750	-5%
1991	405,346	-5%

Source: Burlington International Airport, personal communication, 1992

The enplanement statistics from Plattsburgh and Burlington indicate that in 1991 the Lake Champlain Basin had 423,755 total enplanements. Of this total, the regional distribution shows that Burlington had 96% and Plattsburgh 4% of all Lake Champlain Basin enplanements. To accommodate the significant increase during the 1980's, Burlington International Airport significantly expanded its parking and terminal facilities.

Table 4-22 shows the percentage change in yearly enplanement for each month at the Burlington International Airport. This table also reveals the seasonal fluctuations in enplanements. It demonstrates that the annual averages declined in late 1990 and 1991, with the bulk of this decline occurring during the months of January, February, March and April. Of course, this regional decline in air traffic mirrors the national and international decline in air travel during this period, related to onset of the Gulf War and a deteriorating national economy.

Table 4-22
Percentage Change in Yearly Enplanement

Month	% Change 1992/1991	% Change 1991/1990	% Change 1990/1989	% Change 1989/1988
January	-6.2%	-4.9%	-4.0%	-6.9%
February	8.0%	-10.6%	-7.7%	-9.2%
March	10.5%	-15.4%	-9.8%	-8.7%
April	-9.7%	2.9%	-8.2%	-5.8%
May	1.9%	-6.5%	-3.8%	-6.8%
June	12.4%	-3.3%	-7.7%	4.7%
July	15.0%	0.2%	-3.9%	-2.0%
August	18.1%	-6.0%	-2.4%	-3.0%
September	12.0%	-4.7%	3.3%	-5.2%
October	-28.3%	-0.6%	-3.8%	-0.4%
November	0.0%	-7.7%	-5.1%	-3.7%
December	0.0%	4.3%	-5.7%	-3.1%

Source: Burlington International Airport, personal communication, 1992.

As of December 1992, Burlington International Airport is directly served by three major carriers: USAir, United, and Continental. It also has supplemental service from commuter carriers such as Business Express, TW Express, Commutair, Roadair and Northwest Airlink. The distribution among these different carriers for Fiscal Year 1992 is shown in Table 4-23. USAir has the largest share of enplanements with 37%, United is second with 21%, and Delta Connection is third with 10%.

The only evaluative comments the consultants found with regard to this sector were two letters to the editor in the Burlington Free Press. The first was written by Arthur Kreizel (July 19,1992), a former Vermont State Development Secretary. This letter criticized Burlington's airport services as second class. The second letter was written by Jack Stanton (August 2, 1992), chair of the transportation committee of the Lake Champlain Regional Chamber of Commerce. His letter disputes Kreizel's claims and suggests the airport service is fine, for a community of its size.

Table 4-23
Distribution of Airline Enplanements at Burlington

FY 1992	Delta Connection	Continental Express	Continental	United Express	United	Commutair	Northwest Airlink	USAIR	Total
July	4,470	2,124	3,605	331	9,432	3,107	1,450	13,379	37,898
August	4,522	2,786	3,607	384	10,478	3,312	1,525	14,409	41,023
September	3,893	1,607	3,929	63	7,156	3,234	1,477	12,703	34,062
October	4,404	2,135	4,764	63	8,616	3,751	1,833	15,091	40,657
November	2,956	1,380	3,945	49	5,876	2,902	1,176	11,147	29,431
December	3,369	2,253	3,593	35	7,609	2,804	1,474	13,128	34,265
January	3,155	2,318	3,062	34	6,114	2,621	1,123	11,298	29,725
February	3,049	2,847	3,797	22	7,224	2,697	1,305	12,551	33,492
March	3,141	2,737	4,147	961	5,218	2,968	1,287	12,616	33,075
April	3,022	3,840	1,812	1,143	4,127	2,837	1,060	11,408	29,249
May	3,119	4,444	1,016	1,349	5,172	2,878	1,270	10,918	30,166
June	3,805	4,412	1,533	1,478	7,177	3,109	1,633	14,413	37560

Source: Burlington International Airport 1992

Information Sources

Burlington International Airport Airport Drive, Box 1 South Burlington, VT 05403 802/863-2874	Clinton County Airport 198 Airport Road Plattsburgh, NY 12901 518/565-4795

Amtrak

The consultants found it difficult to obtain statistics about Amtrak use within the Lake Champlain Basin, although ridership figures are supposedly available for each Amtrak station within the Basin. Two Amtrak lines run through the Basin. One runs north and south in the New York portion of the Basin, and the other runs from north to south in the Vermont portion.

Information Sources

Amtrak
National Railroad Passenger Corporation
Washington, D.C. 20024
1-800-872-7245

Motorcoach

Numerous attempts to obtain information about number of travelers on Greyhound and Vermont Transit were unsuccessful. The consultants found no studies or statistics about this sector.

Information Sources

Bridgewater Transport 12 Grant Street Plattsburgh, NY 12901 518/563-3672	Green Valley Group Tours Brick Church Road Fairfax, VT 05454 802/479-5528	Greyhound Bus Lines 135 St. Paul Street Burlington, VT 05401 802/864-6811	Mountain Transit, Inc. Railroad St. Milton, VT 05468 802/893-1334	Vermont Transit Lines 135 St. Paul Street Burlington, VT 05401 802/864-6811

Automobile

National studies of intercity passenger travel in the United States (1988) indicate that 81.3% of all travel is by automobile. In addition the U.S. Travel Data Center indicates that two-thirds of households use automobiles as their means of taking a family vacation. It should be noted that the Lake Champlain Basin is, on the average, more rural than the rest of the United States. It should also be noted that large portions of the Basin are minimally served by public transportation. Thus, it is likely that automobile use is higher within the Basin than national averages.

The Haupt (1987) study quotes a 1977 National Travel Survey by the U.S. Census indicating that 91% of all Vermont's tourists traveled by automobile. This information is dated, but the consultants have found no more recent data for the Basin. Other, more detailed information may be obtained from federal records of state-by-state motor fuel consumption, vehicles registered, drivers licensed, taxes collected, highway finance and mileage on public roads. Furthermore, the New York and Vermont Departments of Transportation have detailed information concerning highway traffic flows within the region. This State agency information includes traffic flow maps for State highways, automatic traffic recorder reports, traffic recorder reports for ski areas, and traffic counts where tourists commonly enter a region. In addition, the urbanized areas of Chittenden and Clinton counties have performed much more detailed transportation studies regarding traffic flows within their respective areas. A final source of information about automobile use is the American Automobile Association in Vermont and the North Country for New York.

As of September 1992, Vermont had a total of 331,992 cars registered within the state, which was 1.2% more than the previous year. Assuming the cars are spatially distributed in the same ratio as the 1990 population, it is estimated that 188,239 cars were registered in the Vermont portion of the Basin and 75,296 in the New York portion. This makes an estimated total of 263,535 cars registered within the Lake Champlain Basin.

Information Sources

Superintendent of Documents U.S. Government Printing Office Washington, D.C. 20402	Vermont Transportation Agency Department of Planning 133 State Street Montpelier, VT 05633 802/828-3441	New York Transportation Agency Albany, New York	American Automobile Association in Plattsburgh, New York and Burlington, VT.

Lodging Industry

The lodging industry includes motels, hotels, and bed and breakfast enterprises within the Basin. National surveys have indicated that 15% of all tourist expenditures go for lodging. While various state and local lodging statistics are presented below, the consultants found that it was not possible to simply compare lodging figures for New York and Vermont. Thus, it is not possible to systematically evaluate the economic impacts of lodging within the New York and Vermont portions of the Basin.

In Vermont, the Planning Division of the Agency of Development and Community Affairs has recorded select lodging indicators from 1987 until the present. Overall the average annual occupancy rate for Vermont, recorded by the American Hotel and Motel Association, was 53% in 1991 and 59% in 1990. This compares with U.S. average occupancy rates of 60.9% in 1991 and 63.3% in 1990.

The spatial distribution of lodging facilities in the Vermont portion of the Basin is shown in Table 24. It shows that 47% of all Vermont's lodging establishments and 54% of all the rooms are within the Basin. It should be noted though, that both these figures are lower than other Basin/Vermont distribution ratios. For example, other Basin ratios include 57% for population, 69% of total retail sales, and 75% for total service industry receipts. This could be explained by much higher room rates and/or lower vacancy rates within the Basin portion, both of which would result in larger overall economic outputs. This table also indicates the uneven distribution of the lodging industry within the Vermont portion of the Basin, since 77% of all Vermont rooms are located in Chittenden, Lamoille and Rutland counties.

Table 24
Vermont Basin Lodging Industry

County	Number of Lodges	% of Basin	% of State	Number of Rooms	% of Basin	% of State	Average Size of Lodge
Addison	49			1,421			29
Chittenden	91			8,462			93
Franklin	29			930			32
Grand Isle	20			484			24
Lakeshore Total:	189	38.7%	18.1%	11,297	36.3%	19.6%	45
Lamoille	94			5,532			59
Rutland	114			9,847			86
Washington	91			4,420			49
Basin Total:	488		46.8%	31,096		54.1%	64
State Total:	1,042			57,493			55

Source: Vermont Department of Health, personal communication, 1992.

A rough estimate of what portion of the lodging industry is directly related to Lake Champlain would be the lodging totals for Addison, Chittenden, Franklin and Grand Isle Counties. While tourist visits to these establishments clearly include attractions besides Lake Champlain, most of the lodging facilities in these localities are located within a few miles of Lake Champlain. Additionally, tourists staying at hotels and motels further inland also utilize Lake Champlain. Thus, a rough estimate of lodging expenditures directly related to Lake Champlain would be 37% of the Basin total, since 38% of the number of lodges and 36% of the total number of rooms are found in Vermont counties which border Lake Champlain.

In the New York portion of the Lake Champlain Basin the lodging industry is heavily concentrated in Essex County, which has 85% of the New York portion of the Basin's lodging payroll, as shown in Table 4-25.

Table 4-25
New York Basin Lodging Industry in 1990

Lodging Attribute	Clinton County	Average per Hotel/Motel	Essex County	Average per Hotel/Motel
Number of Hotels/Motels	23		83	
Annual Average Employment	223	10	860	10
Total Payroll	$2,116,000	$92,000	$11,826,000	$142,482
Average Pay	$9,488		$13,751	

Source: Craig B. Wakefield, Tourism Marketing Analyst, New York State Department of Economic Development, 1992.

Food Service Industry

National studies indicate that 25% of all tourist expenditures are for food. This includes purchases of food in grocery stores, restaurants, and vending machines. The spatial and financial organization of this sector constitutes a significant component of the Lake Champlain tourist industry. As with the lodging industry, the lack of similar statistical bases for New York and Vermont makes it impossible to simply compare and contrast the food service industry in the New York and Vermont portions of the Basin.

Table 4-26 shows that 54% of all the restaurants and 57% of the total restaurant seats in Vermont are located within the Lake Champlain Basin. Within the Basin, 68% of the total restaurant seats are located in just three counties: Chittenden, Lamoille and Rutland counties.

In terms of food service expenditures directly related to Lake Champlain, it is again possible to sum the four lake shore counties within Vermont. A rough estimate is thus 47%, since 47% of the number of restaurants and 48% of the total restaurant seats are in Addison, Chittenden, Franklin and Grand Isle counties.

In the New York portion of the Lake Champlain Basin, 58% of the total payroll for eating and drinking places occurs in Clinton County, as shown in Table 4-27. This is in marked contrast to the lodging industry, where Essex County had the highest level of hotel and motel payrolls.

Table 4-26
Restaurants in the Vermont Portion of the Lake Champlain Basin (1990)

County	Number of Restaurant	% of Basin	% of State	Total Seats	% of Basin	% of State
Addison	72			5,794		
Chittenden	321			33,484		
Franklin	91			8,010		
Grand Isle	20			870		
Lakeshore County Total:	504	46.8%	25.2%	48,158	48.3%	27.5%
Lamoille	133			12,207		
Rutland	244			22,106		
Washington	196			17,321		
Basin County Total:	1,077		53.9%	99,792		57.0%
Total Vermont	1,997			174,924		

Source: Vermont Department of Health, personal communication, 1992

Table 4-27
Eating and Drinking Places in the New York Portion of the Lake Champlain Basin (1990)

County	Reporting Units	Average Annual Employment	Average per Unit	Total Payroll ($000)	Average per Unit ($)
Clinton	149	2,864	19	$20,288	$136,161
Essex	110	1,164	11	$10,179	$92,536
Washington	105	607	6	$3,965	$37,762
NY Basin Total	364	4,635	13	$34,432	$94,593

Source: Craig B. Wakefield, Tourism Marketing Analyst, New York State Department of Economic Development, 1992.

Attractions/Events

Within the Lake Champlain Basin, the two largest tourist attractions the consultants were able to obtain visitation figures for were the Ben & Jerry's ice cream plant in Waterbury and the Cold Hollow Cider Mill in Waterbury. Both of these say they drew between 200,000 and 300,000 visitors in 1991. Close behind are the Shelburne Museum with 175,000 visits per year and Ausable Chasm with 90,000-100,000 visits. While figures were not available for the Great Escape or Frontier Town, in the Lake George portion of the Basin, the scale of these operations would also make them among the top tourist attractions.

It is also significant that most tourism attractions/events information includes only either the New York portion, or, the Vermont portion, of the Lake Champlain Basin. Very few tourism guides or marketing schemes have Lake Champlain as their foundation. Also, the consultants found no studies of tourists' travel patterns within the Basin. Thus, questions such as: "How many tourists visit only one side of Lake Champlain?", "How many visit both?", "What is the potential to expand a focus on Lake Champlain?", all await further study.

It is also interesting to note that industries within the Lake Champlain Basin have recently become popular tourist attractions. In fact, the two most popular tourist destinations (i.e., Ben & Jerrys and Cold Hollow Cider) are industries instead of traditional tourist sites such as Ausable Chasm or the Shelburne Museum. This is not only true for large industries, but also includes smaller businesses where tourists watch a product being manufactured such as the Vermont Teddy Bear Company, Wildflower Farm, and Sugarhouses throughout the Basin. In a parallel trend, ski areas have also developed a degree of industrial tourism by conducting tours of their snowmaking operations. Although few tourists come to the Basin solely to visit a factory, it is clear that they frequently take industry tours, subsequently developing loyalty for that product. Consequently, these tours of industries within the Basin have an economic impact beyond their price of admission or related visitor expenditures.

During almost every week of the year, some special event within the Lake Champlain Basin is featured. Up to date listings are available from the New York, Quebec, and Vermont tourism bureaus. Examples include:

American Ski Marathon
Arts Alive
Champlain Valley Exposition
Great Benson Fishing Derby
Green Mountain and Plattsburgh Chew Chew
Lake Champlain Balloon & Craft Festival
Discover Jazz Festival (Burlington)
Lake Champlain International Fishing Derbies
Shelburne Craft Fair
Vermont Reggae Festival
Vermont State Fair

Although such events clearly constitute a significant component of tourist expenditures, the consultants found no detailed studies concerning either the economic impact of any particular event/attraction or the cumulative effect.

Conventions also produce economic expenditures within the Basin. For example, tourist surveys in Vermont indicated that in 1991 conventioneers spent an average of $165 a day, while out-of-state skiers spent $76 per day. The larger hotels in the Basin clearly depend upon a significant portion of their business coming from conventions. For example, the Sheraton in Burlington has stated that 40% of its business was from meetings while the Radisson in Burlington has indicated that 30% of its business was from conventions. The consultants did not find any systematic studies of conventions or their economic impacts within the Basin.

In some cases the Basin even hosts national conventions. For example, in 1992 Burlington hosted the National Association of Homemakers, the International Llamas Association, and the National Association of the League For Cities and Towns. Newspaper advertisements within the Basin also suggest that smaller hotels as well as bed and breakfast operations have likewise geared their operations to small conventions and workshops.

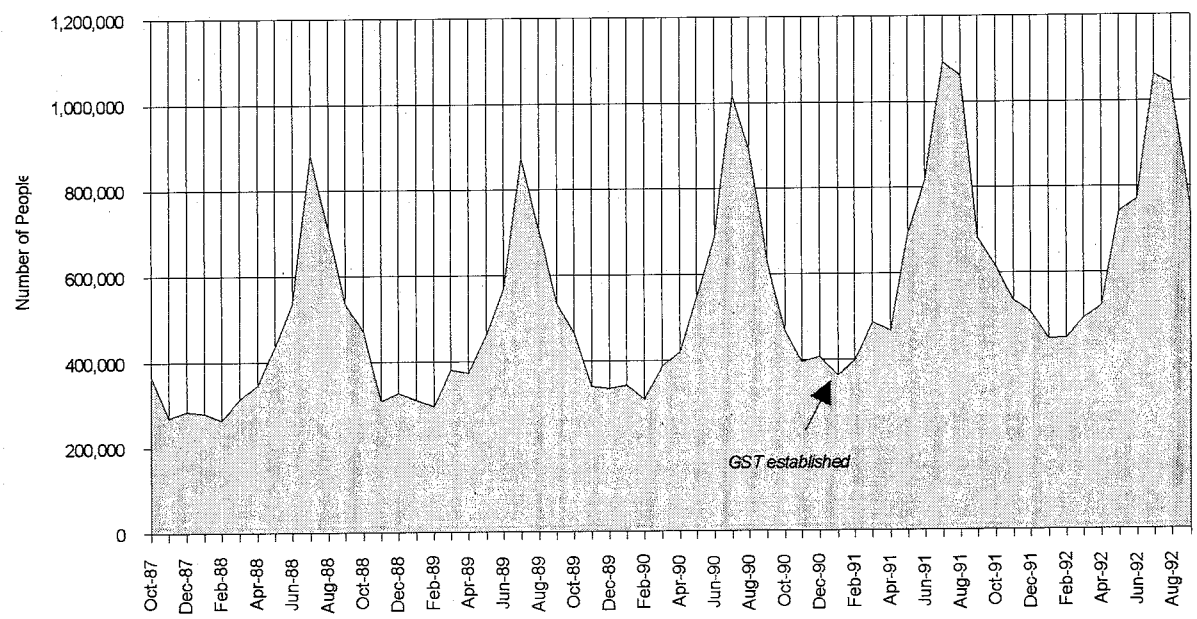
Table 4-32
Border Crossings by Boat at Rouses Point, NY:
Total Number of Non-U.S. Citizens by Year (1988-92)

Year	Number of Alien Crossings
1988	24,826
1989	29,502
1990	29,084
1991	27,097
1992	21,205
Average:	26,343

Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

Figure 4-5 shows the total monthly crossings of people into the Lake Champlain Basin area for the period October, 1987 through September, 1992. The trend is towards an increase in crossings during the period, peaking at approximately 1.1 million alien crossings during July in both 1991and 1992. The imposition of the General Sales Tax (GST) on January 1, 1991 seems have had a favorable influence on cross-border travel by Canadians, however its exact level of influence is difficult to gage.

Figure 4-5
Total Non-U.S. Citizen Border Crossings by Month for the 14 Ports in the Lake Champlain Basin (FY 1987-FY1992)



Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

Information Sources

Clinton County Chamber of Commerce P.O. Box 310 Plattsburgh, NY 12901	Essex County Dept. of Tourism Hospital Rd.,P.O. Box 10 Mineville, NY 12956	Lake Champlain Regional Chamber of Commerce 209 Battery Street Burlington, VT 05401	Vermont Dept. of Travel and Tourism Montpelier, VT 05602

Other Outdoor Recreation

In conjunction with the Lake Champlain Basin Program, the States of New York and Vermont are currently developing a Lake Champlain Recreation Management Program. On January 28, 1993 it was presented to a joint meeting of the New York and Vermont Citizens Advisory Committee. As of January 1993, none of the detailed information being collected for this projects has been available to Holmes & Associates. In addition, Dr. Al Gilbert et.al. conducted detailed surveys of expenditures by various recreational users of Lake Champlain during July of 1992. None of this information was made available to the consultants. In the absence of current, detailed information, this section will outline the structure and scope of the outdoor recreation industry. When detailed information about a specific sector was available it is included.

The consultants found a limited number of studies regarding the outdoor recreation industry or its different sectors. Some of the larger recreation industries with more concentrated ownership, such as ski resorts, have received detailed attention and consideration from New York and Vermont government agencies. In contrast, the status and economic impacts of smaller and more dispersed recreation businesses have less frequently been systematically addressed.

During the past ten years the international, outdoor recreation industry has experienced tremendous growth and diversification. Within the United States this has included the appearance of whole new tourism sectors (e.g., adventure tourism and ecotourism). While limited information is currently available regarding these trends locally, this report has identified a wide spectrum of outdoor recreation enterprises in order to emphasize the scope, complexity, and alternatives developing within the tourism industry of the Lake Champlain Basin.

Ballooning, Gliding & Skydiving

While these recreation sectors are relatively new, the recent growth of adventure tourism opportunities has clearly reached the Lake Champlain Basin. Balloon flights are offered at the Stoweflake Resort and in early June the annual Lake Champlain Balloon Festival is held at the Champlain Valley Fairgrounds. Rental of gliders and skydiving may be arranged at various airports throughout the Basin. No studies or statistics regarding this sector were found.

Hiking and Climbing

There are hundreds of miles of hiking trails within the Basin. Many hiking guides have been published, although none of them have the Lake Champlain Basin as their focus. As with other tourist topics, the information and marketing about this sector is divided between either the New York or Vermont markets. Hiking and walking less strenuous paths has recently become so popular that Inns and touring business

within the Basin have organized special trips and support for this sector. See New York tourist information and Vermont: An Explorer's Guide by Christina Tree and Peter Jennison for more details. No studies or statistics regarding this sector were found.

Horseback Riding

The Basin has many riding stables which offer trail, hay, and sleigh rides; overnight tours; and pony rides. Also, some operations offer inn-to-inn trail rides in conjunction with bed and breakfast operations. For details, see New York and Vermont Tourism Offices and Vermont: An Explorer's Guide.

Llama Trekking

Although still in its infancy within the Basin, llama trekking has finally arrived. The local potential was further demonstrated when the International Llama Convention was held in Burlington, Vermont in the summer of 1992. No llama tourist figures are presently available.

Bicycling and Mountain Biking

The state of Vermont estimates that 15,000 bicyclists engage in organized bicycle tours throughout Vermont. No figures were available for the New York portion of the Basin. The State of Vermont publishes a special bicycle touring brochure and a one page handout which lists organizations providing touring services. Two relevant bicycle publications are available: 25 Bicycle Tours in Vermont and 25 Mountain Bike Tours in Vermont, and, Bicycle Vermont Map and Guide. Although figures are not available regarding the economic impact of this growing sector, numerous businesses either rent bicycles, repair bicycles, or organize tours. A number of bicycle and mountain biking races are also periodically held throughout the Basin. Finally, for the more up-scale tourist, numerous businesses organize inn-to-inn bicycle tours throughout the Basin.

In addition to those participating in an organized bicycle tour, thousands of other bicycle tourists rent or use their own bicycles throughout the Basin. The Burlington bike path and the flat topography of the lake valley make the Lake Champlain shoreland a popular location for recreational cycling. Finally, both formal and informal bicycle racing clubs are found throughout the Basin.

Skiing, Bobsledding, and Luge

Skiing is a prominent sector of the tourist industry. The consultants calculated that 13 downhill ski operations and 36 cross-country ski touring centers are found within the Basin. Figures calculated by the Vermont Agency of Development and Community Affairs, and shown in figures 4-19, 4-20, and 4-21, indicate that from the 1986-87 season until 1989-90, the number of estimated skier-days (for the entire State) steadily declined from 5,200,000 to 4,500,000. The most recent figures available report that in the 1991-92 season there were 4,300,000 skier days in Vermont; annual skier expenditures were $258 million by out-of-staters and $22 million by Vermonters; and, the average out-of-state skier spent $77 per day, while the average Vermonter spent $23 per day (Donovan 1992).

It can also be noted that the Vermont Ski industry as a whole ranks third within the entire U.S., after Colorado and California. Since 1986-87, when skier days peaked at 5.2 million, visits have declined both nationally and within the Basin. Furthermore, Vermont's share of the national market has also declined from 9.7% in 1986-87 to 8.5% in 1991-92. The 14 members of the Vermont Ski Areas Association (With members both within and outside the Basin.) reported total profits of $7.4 million in 1987 and a net loss of $14 million in 1991.

The consultants identified ten alpine ski areas within the Vermont portion of the Basin. The Vermont ski information in the attached tables did not include sufficient geo-coding to be able to distinguish skiing which occurs within and outside the Lake Champlain Basin. Some of Vermont's largest ski operations are within the Basin, however, including Jay Peak, Smugglers Notch, Mount Mansfield, Sugarbush, and Pico. At the same time, a significant number of large ski operations also lie outside the Basin, including Killington, Okemo, Stratton and Mt. Snow. It is also noted that during 1991-92, Killington had the highest number of skier days of any resort in the east, Mount Snow was second and Okemo was fourth (Burlington Free Press, September 11, 1992). Given the lack of individual ski area information, the consultants were unable to disaggregate the Vermont expenditure statistics.

In the New York portion of the Basin, Whiteface, Mt. Van Hovenberg and Pisgah all lie within the Basin. The sum of the number of skier days for these three New York operations is significant, but probably less than the sum of all the Vermont areas outside the Basin.

The Lake Placid area of the Lake Champlain Basin also has a ski jump, bobsled track, and luge run. As a past site of the Olympics on two different occasions, the bobsled run and the luge run are the only such runs found anywhere within the entire United States. While the economic impact of these specialty facilities is not large, they indicate the world class character of recreational opportunities within the Basin.

Camping and Picnicking

The consultants located 33 state parks and recreation areas within the Basin (25 in Vermont and 8 within New York), as well as 41 private campgrounds (25 in Vermont and 16 in New York). A rough indication of the intensity of use can be ascertained from statistics regarding Vermont and New York parks on Lake Champlain, shown in Table 4-28. Total use at all Lake Champlain parks totaled over 777,000 people. Use at Vermont State Parks and Recreation Areas on the lake constituted roughly half of all the camping days at Vermont State Parks and Recreation Areas and 44% of total attendance at day use areas. It is also noteworthy that the most popular Vermont park, Grand Isle, is located on the Lake Champlain shoreline. The most popular park in Vermont for day use was the Sand Bar, also located on the Lake Champlain shoreline.

Table 4-28
Use of Parks on Lake Champlain

New York Parks on Lake Champlain

Site	County	Year Estab.	Attendance (000's) 85-86	86-87	87-88	88-89	89-90	90-91	91-92
Cumberland Bay	Clinton	1934	162	145	161	192	160	160	166
Point Au Roche	Clinton	1975	14	58	71	90	99	109	118
Point Au Roche Boat Launc	Clinton	1978	7	15	15	12	13	14	16
Great Chazy Boat Launch	Clinton		6	9	18	43	66	47	39
Crown Point (NHL)	Essex	1910	39	39	40	61	66	62	68
		Total:	228	266	305	398	404	392	407

Vermont Parks, 1992 Summer Attendance, thru 10/17

Site: Summer Areas	Day Use Vermont	Day Use Out of State	Day Use Total	Camping Vermont	Camping Out of State	Camping Total
Burton Island	568	1,205	1,773	4,849	9,570	14,419
Button Bay	16,357	1,582	17,939	9,285	6,906	16,191
D.A.R.	990	366	1,356	3,193	5,387	8,580
Elmore	15,267	2,330	17,597	7,472	5,193	12,665
Grand Isle	391	894	1,285	13,007	19,960	32,967
Half Moon	357	68	425	4,935	4,914	9,849
Lake Carmi	10,054	3,398	13,452	12,070	12,210	24,280
Little River	2,546	391	2,937	13,044	14,467	27,511
Mt. Philo	7,975	4,874	12,849	670	2,389	3,059
North Hero	1,020	1,815	2,835	2,807	7,637	10,444
Silver Lake	14,611	4,148	18,759	4,438	5,861	10,299
Smugglers Notch	325	2,268	2,593	1,248	7,511	8,759
Underhill	6,548	2,611	9,159	1,520	1,963	3,483
Knight Island	49	11	60	367	142	509
Day Use Areas						
Kill Kare	8,804	761	9,565			
Kingsland Bay	11,131	815	11,946			
Knight Point	5,787	5,393	11,180			
Sand Bar	51,105	135	51,240			
Total:	153,885	33,065	186,950	78,905	104,110	183,015

Source: NY & VT Parks Departments, personal communication, 1992

In terms of expenditures, the Haupt (1987) study indicated the distribution of expenditures by lodging type shown in Table 4-29. Expenditures by tourists who stay in campgrounds is estimated to be 3% of the total tourist expenditures.

Table 4-29
Vermont Expenditures by Type of Tourist Lodging (1985)

Type of Lodging Used	Total Expenditures (millions)	Percentage
Hotel/Motel/Inn	$330	35%
Vacation Home/Condo/Camp	$330	35%
Friends and Relatives	$130	14%
Campground	$32	3%
Day Trips	$110	12%
TOTAL:	$932	100%

Source: Haupt, 1987.

Hunting

Licensing and game harvest information is published annually for Vermont and New York.

While hunting is popular and produces significant expenditures, the consultants did not investigate information regarding the amount of expenditures for this sector. Perhaps the Lake Champlain Basin recreation management studies and related research will produce relevant information.

Golf & Tennis

In New York, the consultants found a total of 17 golf courses. In Vermont, the consultants found that 21 out of 52 golf courses in the State were located within the Basin. Roughly half of these are 18-hole courses. Their economic impact includes green fees, equipment, food, lodging and lessons. The consultants found no studies of this specific sector.

According to Tree and Jennison (1992), Vermont has as many tennis courts per capita as any state in the U.S. Although the consultants could find no similar figures for New York, anecdotal evidence also indicates a high ratio. Tennis expenditures include use fees, equipment, and food. Also, some of the larger resorts within the Basin feature intensive tennis programs which combine lessons, food and lodging for an extended period.

Rockhounding

The geological formations of the Adirondack Mountains and the Green Mountains offer many rockhounding opportunities. The State of Vermont publishes a summary of rockhounding sites, special events, and geological history. The presence of large granite and marble quarries as well as former iron mines adds an opportunity to tour these mineral industries. Finally, in early August a Rock Swap and Mineral Show is held annually in Burlington.

Foliage Viewers

The Basin is a popular destination for foliage viewers each fall, especially in the upland areas. Both State's take this tourist activity very seriously. Interested parties will find guides available, as well as 800 number telephone listings for up to date information. The concentration of tour bus visits and out-of-state visitors during the last weekend of September and the first two weeks of October, constitutes a distinct economic pulse for this period. The consultants found no specific studies of the kind or extent of expenditures with this activity.

Fish & Wildlife Areas and Ecotourism

Internationally, ecotourism has been one of the fastest growing tourism sectors. For general references on this topic see the bibliography regarding Nature Based Tourism (Whitlock et.al. 1991), Policies for Maximizing Nature Tourism's Ecological and Economic Benefits (Lindberg 1991), and Ecotourism: The Potentials and Pitfalls (Boo 1990). While the Lake Champlain Basin has tremendous potential with regard to ecotourism, the consultants note that relatively few locations or tourist enterprises emphasize this theme.

Wildlife areas within the Basin include the Missisquoi National Wildlife Refuge (5,831 acres), portions of the Green Mountain National Forest, New York and Vermont Fish and Wildlife Management Areas, and five areas under the private management of the Nature Conservancy.

In terms of tourist use at such sites, the U.S. Forest Service keeps annual records regarding recreational visitor days. This user information is provided only for the entire Green Mountain forest, so it is not possible to ascertain activity summaries for only that portion within the Basin. Table 4-30 provides a summary of these figures for 1991 and 1992. It should also be noted that a more detailed breakdown of recreational activities is available for each of the categories below. For example, within the category "hiking, horseback riding and water travel", separate figures are available for hiking and walking, horseback riding, canoeing, sailing, other water craft, and mountain climbing.

One of the major changes between the National Forest's recreational use in 1991 and 1992 is the significant difference in the number of camping, picnicking and swimming RVDS. This was due to the fact that during the summer of 1991 a national organization arranged to have its annual assembly, called the Rainbow Gathering, in the Green Mountain Forest. Consequently, the thousands of attendees at this week-long gathering dramatically increased the size of this recreational category in the 1991 survey.

Table 4-30
Recreational Use on National Forest Lands

Activity	RVDS (Thousands) 1991	RVDS (Thousands) 1992	% of Total 1991	% of Total 1992
Camping, Picnicking, & Swimming	320	107	21%	7%
Mechanized Travel & Viewing Scenery	224	284	14%	18%
Hiking, Horseback Riding, & Water Travel	71	68	5%	4%
Winter Sports	722	832	47%	54%
Resorts, Cabins, & Organized Camps	46	58	3%	4%
Hunting & Fishing	81	87	5%	6%
Non-consumptive Fish & Wildlife	31	31	2%	2%
Other	52	73	3%	5%
Total:	1,547	1,540		

Note: RVDS = Recreation Visitor Days.

Source: Green Mountain National Forest, personal communication, 1992.

The State of Vermont manages a total of 71 wildlife management areas. Of the 46 wildlife management areas noted in the State of Vermont publication "Vermont Guide to Hunting", 25 are within the Lake Champlain Basin. In New York, seven of the State's 86 fish and wildlife management areas are located within the Basin.

Information Sources

Susan	Bulmer	State Recreation Planner	Vermont ANR/ Forests, Parks, & Rec.	103 South Main St, 10 South	Waterbury	VT	05671-0601	802/244-8713
Bob	Reinhardt	Assist. Dir. of Planning	NY OPRHP - Bureau of Planning & Research	Agency Bldg. 1, Empire State Plaza	Albany	NY	12238	518/474-0414

Gaming & Tobacco

Although people usually do not associate gaming or tobacco with the Lake Champlain Basin, for the past few years a large gambling and tobacco sales venture has been operated by the Mohawk Indians at the Ganienkeh Reserve in the Altona, New York portion of the Basin. This business includes high stakes bingo, select electronic gambling devices and the discount sale of both U.S. and Canadian cigarettes. No economic information is available regarding this industry, but the size of its bingo jackpots indicates an annual operation involving hundreds of thousands of dollars. It should also be noted that while many of the patrons at this business are Basin residents, a significant number arrive from Canada and other areas outside the Basin.

Cruises

As previously described, ferryboat transportation is offered at three locations by the Lake Champlain Transportation Corporation. During the summer, regularly scheduled tourist excursions on Lake Champlain are also available on the Juniper in Plattsburgh, the M/V Carillon from Larrabee's Point in Shoreham and the Ethan Allen in Burlington. It is also possible to arrange sailing cruises as well as scuba charters through local marinas in the Basin. The study team found no systematic studies on the economic scope of this sector.

Shopping

Shopping has become one of North America's most preferred tourist activities. Although it is difficult to distinguish between retail sales to tourists and residents, it is clear that tourists constitute an important component of retail sales within the Basin. (See tables and analysis of the general retail sector in this report.) In addition, cross-border shopping by Canadians has recently been very significant, as discussed below under Canadian Tourists.

Travel Agents

One way in which tourist travel outside the Lake Champlain Basin provides direct economic impacts within the region is with local travel agencies. A rough indicator of the sector may be calculated from the number of travel agencies listed in the yellow pages of local telephone books. In this regard it should be noted that the telephone listings for the entire Lake Champlain Basin include over seven different telephone books. Also, in some cases less than half of a book's listings lie within the Basin. As a result, this section will only mention the Plattsburgh and Burlington listings. In 1991-92 the Plattsburgh yellow pages had 10 travel agencies and the 1992-93 Burlington book had 23. While some of the travel bookings by these agencies are for local attractions, most of their livelihood comes from arranging travel by Basin residents outside the region. For example, a 1988 survey by Travel Weekly indicated the following sources of travel agency revenue: Air 59%, Cruise 16%, Hotel 11%, Car rentals 8%, Rail 3%, and Other 3% (McIntosh and Goeldner 1990).. Assuming this distribution applies locally, a majority of the Basin's travel agency earnings come from airline travel. Thus, although this travel primarily occurs outside the Basin, some of the economic impacts are retained within the region. The consultants found no studies or detailed information about this sector.

CANADIAN TOURISTS

Canadian use of the environmental and economic resources of the Lake Champlain Basin is well known. One method to gain a sense of the extent of this use is to monitor the flow of non-citizens across the border from Canada. The study team obtain border crossing data for the period October,1987 to September, 1992 on the 14 ports that serve as "ports of entry" to the Lake Champlain Basin for Canadian visitors (U.S. Department of Justice, Immigration and Naturalization Service 1992 and 1993. After studying that data, we have concluded the following:

1. The number of individuals crossing the border varies seasonally, peak months being the summer months of June, July, August and September which constitute an average of 49% of the flow. Figure 4-3 shows this seasonality for the Vermont crossing stations. Table 4-28 shows the five year monthly average.

2. The number of individuals crossing the border has increased substantially over the past five years. The Immigration and Naturalization Data shows a 52% increase in the number of non-citizen crossings within the Lake Champlain Basin, to a total of 7,932,840 non-U.S. citizens entering the Lake Champlain Basin in FY 1992.

3. The impact of the General Sales Tax in Canada in January 1991 is coincident with a large rise in individual border crossings. An analysis of the last five fiscal years shows that the largest percentage increases (in monthly flows compared to those of the previous year) came in 1991 and 1992.

4. Summer months migration seems to be increasing over time; however, the weather seems to play a role in these flows, with the summer of 1992 levels dropping over previous years in both June and August.

As shown in Table 4-31, 41.1% of all non-citizen border crossings into the U.S. portion of the Basin occur at the Champlain, New York port. This reflects the importance of I-87 a major North/South artery connecting Montreal and New

York City. The percent of all Basin border crossings allocated among the two states is thus skewed by the preponderance of crossings at Champlain. Removing the crossings at Champlain from the totals, results in an approximate 50/50 split between Vermont and New York in the remaining number of crossings.

Border crossings by plane and by boat are insignificant in relation to total annual crossings. For the purposes of this study, however, border crossings by boat are of interest. Table 4-32, providing boat crossing data at a finer level of detail, shows that an average of 26,343 non-U.S. citizens per year crossed by boat into Lake Champlain at Rouses Point over the past five years. According to month reports released by the Champlain Office of the Immigration and Naturalization Service, the average number of people per boat has been approximately 3.6 over the past two summers, therefore, the average number of boat crossings per year stands at about 7,318 (U.S. Department of Justice, Immigration and Naturalization Service, Champlain, New York Office 1993). The monthly reports for May, June, and July report that boat crossings in 1992 as compared with 1991 decreased in each of the three months in 1992. Boat crossings were down by 181 boat in May, 624 boats in June, and by 30 boats in July.

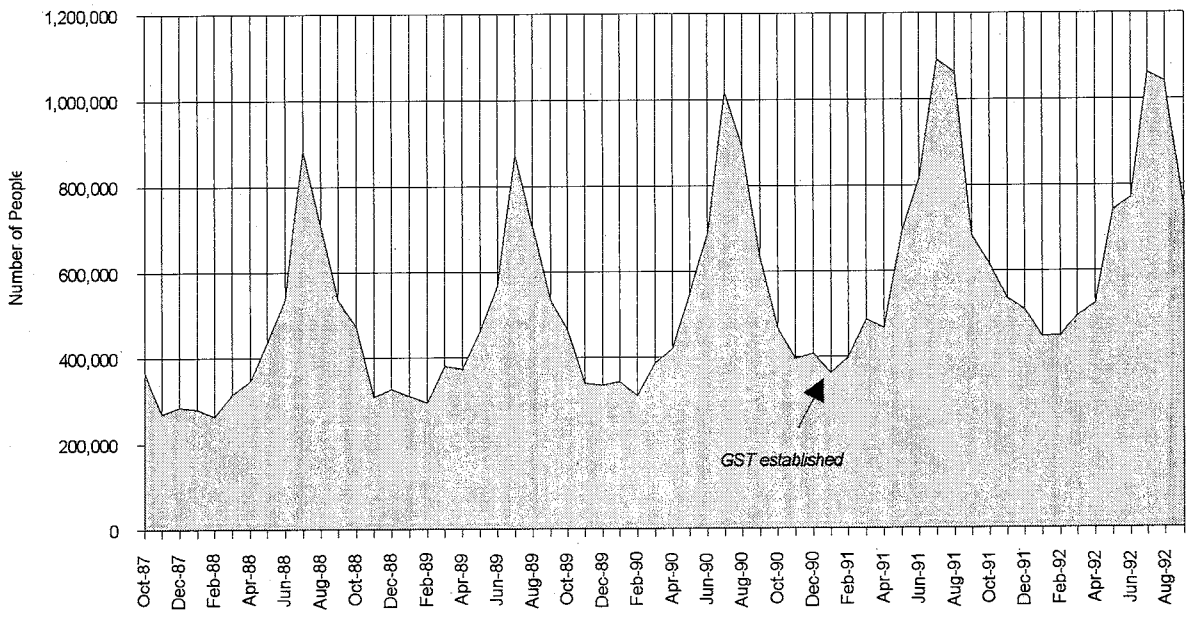
Table 4-32
Border Crossings by Boat at Rouses Point, NY:
Total Number of Non-U.S. Citizens by Year (1988-92)

Year	Number of Alien Crossings
1988	24,826
1989	29,502
1990	29,084
1991	27,097
1992	21,205
Average:	26,343

Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

Figure 4-5 illustrates the increasing rate of alien crossings at Lake Champlain Basin ports. The imposition of the General Sales Tax (GST) on January 1, 1991 seems have had a favorable influence on cross-border travel by Canadians, however its exact level of influence is difficult to gage.

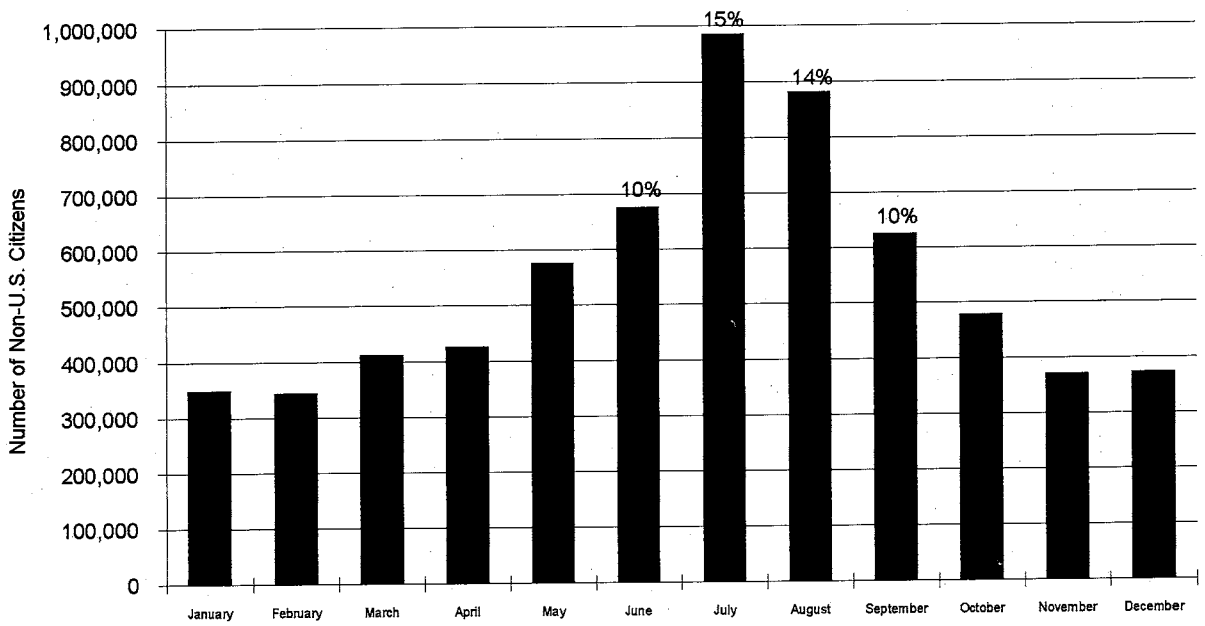
Figure 4-5
Total Non-U.S. Citizen Border Crossings for the 14 Ports in the Lake Champlain Basin (FY 1987-FY1992)



Source: Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

Figure 4-6 points to the profound importance of Canadians to the tourism economy of Basin. While there seems to be a background level 350,000 crossings a month into the Basin in the period November - February, that number jumps by a factor of almost three in July, to close to one million people. While it is true that not all those people are tourists, and, that not all of them make a stop within the Lake Champlain Basin, a significant number of them do favorably influence the Basin economy. An average of 6,496,752 non-U.S. citizens per year, or 541,396 per month, have been crossing into the Lake Champlain Basin during the past five years. The number of non-citizens crossing the border monthly is almost equal to the entire population of the Lake Champlain Basin.

Figure 4-6
Average Monthly Border Crossings by Non-U.S. Citizens at the 14 Ports within the Lake Champlain Basin (FY 1987-FY1992)



Source: Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

According to a study of the economic influence of Canadian shoppers on the Plattsburgh, New York economy, retailers in Plattsburgh "estimate that 33% of their sales come from Quebecers" (Heroux et al. 1991). The estimate was as high as 50% for retailers located in one of the city's malls.

One attraction contacted for this study, Ausable Chasm in the shoreland town of Ausable, New York, reported that Quebec is their main market, providing approximately 39% of the annual visitation of approximately 100,000 people (Personal Communication: Russel Blaise, Ausable Chasm 11/2/92). Two other attractions, both further south in the Basin than Ausable Chasm, reported significantly lower percentages of Canadian visitation. The Shelburne Museum, south of Burlington, reported that approximately 6% of their 175,000 in annual visitation is attributable to Canadian visitors. That ratio has stayed fairly constant over the past few years (Personal Communication: Janis Sabo, Shelburne Museum 11/2/92). Fort Ticonderoga, New York, in the southern part of the main lake, is not sure whatpercentage

of their visitors are Canadian, but perceiving them to be a relatively small percent (less than 5%) of their approximately 100,000 visitors annually (Personal Communication: Delight Gartlein, Marketing Director, Fort Ticonderoga 11/2/92). Research performed at the Adirondack Museum in Blue Mt. Lake, just outside the Basin, found that only 1% of visitors were from Canada (Holmes, 1991a).

According to Neil Seymour, Franklin County Tourism Director, the preliminary findings from an on-going study of Adirondack Park tourism activity indicate that approximately 20% of tourists in the Adirondacks are from Canada. The ratio is higher is some areas than others, with the average in Franklin County closer to 30% (Personal Communication: Neil Seymour, Franklin County Tourism 12/10/92).

NEED FOR PUBLIC BALANCE SHEETS REGARDING TOURISM

Tourism clearly has both advantages and disadvantages as a sector of the economy. While some promoters have viewed tourism as a panacea, others warn of ensuing negative consequences. To appreciate this spectrum of impacts, consider McIntosh and Goeldner's (1990) brief summary of the advantages and disadvantages of tourism.

Advantages of Tourism

1. Provides employment opportunities, both skilled and unskilled, because it is a labor intensive industry.
2. Generates a supply of needed foreign exchange.
3. Increases incomes.
4. Creates increased gross national product.
5. Requires the development of an infrastructure that will also help stimulate local commerce and industry.
6. Justifies environmental protection and improvement.
7. Increases governmental revenues.
8. Helps to diversity the economy.
9. Creates a favorable worldwide image for the destination.
10. Facilitates the process of modernization by education of youth and society and changing values.
11. Provides tourist and recreational facilities that may be used by a local population who could not otherwise afford developing facilities.
12. Gives foreigners an opportunity to be favorably impressed by little-known country or region.

Disadvantages of Tourism

1. Develops excess demand.

2. Creates leakages so great that economic benefits do not accrue.

3. Diverts funds from more promising forms of economic development.

4. Creates social problems from income differences, social differences, introduction of prostitution, gambling, crime, and so on.

5. Degrades the natural physical environment.

6. Degrades the cultural environment.

7. Poses the difficulties of seasonality.

8. Increases vulnerability to economic and political change.

9. Adds to inflation of land values and price of local goods and services.

The consultants note that tourism experts also caution that a region should not place too much dependency on tourism as a subsistence industry. Tourism experts also forewarn that although tourism frequently has excellent potential in economic development, it is not a panacea for economic ills. Finally, the tourist literature reminds tourism supporters that given the spectrum of social and environmental impacts, the focus should be on maximizing net benefits rather than simply increasing tourist expenditures.

One example of a critical perspective within the Basin can be sketched with regard to the lodging industry. While the lodging industry provides an important source of employment within the Basin it is not without its liabilities. One of its downside features is that much of the employment in the hotel/motel industry is part-time. Haupt's (1987) study indicated that 42% of Vermont employees in the hotel/motel sector were part-time. In contrast, about 10% of manufacturing jobs were part-time and the statewide average was 24% part-time. Another disadvantage is the low wages of many employees in this sector. A final point is that medical insurance is problematic for this sector. As a result, the social cost of providing supplemental support is frequently assumed by government.

Although the detailed Lake Champlain Basin recreation study has been coordinated by Vermont and New York, the more generalized studies of Lake Champlain Basin tourism have not. For example, in February of 1993 the Vermont Travel and Tourism Department announced a $35,000 research partnership with the University of Vermont. The goal of this study is to acquire new information about the economic impact of tourism within Vermont. While there is clearly a need for more systematic study on this topic, no counterpart effort or coordination with the New York portion of the Basin was included. Given the continuing lack of a Lake Champlain perspective, the consultants recommend additional Basin Program funding and attention in regards to a Basin-wide perspective of the tourist industry. Such research funding may include studies about the economic impacts of tourism, demand studies, marketing studies, development of public balance sheets, value conflicts and/or tourism planning in general.

The consultants note that recent studies of the economic impacts of tourism in the Basin tend to emphasize only the positive impacts of tourism, without realistically addressing problems, limitations or negative impacts. In the Lake Champlain Basin literature the consultants reviewed for this project, analysts primarily commented on the enormous economic multipliers and tremendous overall economic impacts. What these studies and overall estimates, including those within this report, usually fail to consider are the costs of related public impacts. For example, what additional public infrastructure will be required or how will a particular employment structure effect the cost of public education. The contemporary literature on growth management and capital improvement planning provides many examples of how to apportion and regulate the costs of development. Unfortunately, at the present time most towns within the Lake Champlain Basin do not have adequate capital improvement planning or fiscal impact assessment capabilities to deal with such complex issues. Thus, the consultants recommend Lake Champlain Basin research into evaluating the present use of local growth management techniques and fiscal impact analysis in regards to economic development. This may include the development of public balance sheets and/or improved methods for local capital improvement planning. Whatever the precise direction of this research, it should address the advantages and disadvantages of tourism, consider a full range of social and environmental impacts, and analyze the question of who benefits and who pays for a given development.

The tourist industry of the Lake Champlain Basin has an international reputation as a quality destination to appreciate both its environmental and cultural heritage. In order to promote and maintain this high quality, the consultants recommend that the Basin's tourist industry consider developing and adopting a code of ethics for sustainable tourism. A starting point might be the Code of Ethics enthusiastically accepted by the Tourism Industry Association of Canada (TIAC) at its annual meeting in 1992 (D'Amore 1992).

Sustainable Tourism Ethics

Code of Ethics for Tourists

1. Enjoy our diverse natural and cultural heritage and help us to protect and preserve it.

2. Assist us in our conservation efforts through the efficient use of resources including energy and water.

3. Experience the friendliness of our people and the welcoming spirit of our communities. Help us to preserve these attributes by respecting our traditions, customs, and local regulations.

4. Avoid activities which threaten wildlife or plant populations, or which may be potentially damaging to our natural environment.

5. Select tourism products and services which demonstrate social, cultural and environmental sensitivity.

Table 4-31
Border Crossings at Lake Champlain Basin Ports: Total Annual Crossings by Air, Land, and Sea (FY 1992)

AIR

Port	Total	Citizen	Alien
Derby, VT	NA	NA	21
Burlington, VT	NA	NA	3,803
Champlain, NY	1,997	1,853	144
Rouses Point, NY	21	5	16
Total Air:	2,018	1,858	3,984

LAND

Port (East to West)	Total	Citizen	Alien	% of Alien Land Crossings
North Troy, VT	415,429	33,760	381,669	4.8%
East Richford, VT	39,682	5,768	33,914	0.4%
Richford, VT	437,599	34,839	402,760	5.1%
West Berkshire, VT	252,075	25,588	226,487	2.9%
Morses Line, VT	64,602	8,848	55,754	0.7%
Highgate Springs, VT	1,305,853	415,442	890,411	11.3%
Alburg Springs, VT	168,052	7,905	160,147	2.0%
Alburg, VT	164,341	12,416	151,925	1.9%
Rouses Point, NY	1,647,067	576,748	1,070,319	13.5%
Champlain, NY	4,835,798	1,585,032	3,250,766	41.1%
Mooers, NY	593,524	207,518	386,006	4.9%
Chateaugay, NY	357,547	126,084	231,463	2.9%
Trout River, NY	439,374	153,735	285,639	3.6%
Fort Covington, NY	584,364	206,824	377,540	4.8%
Total Land:	11,305,307	3,400,507	7,904,800	

SEA

Port	Total	Citizen	Alien
Fort Covington, NY	6,036	3,185	2,851
Rouses Point, NY	21,790	585	21,205
Total Sea:	27,826	3,770	24,056

				% of Total
Total All Ports:	11,335,151	3,406,135	7,932,840	
Vermont Ports Total:	2,847,633	544,566	2,306,891	29.1%
New York Ports Total:	8,487,518	2,861,569	5,625,949	70.9%

Source: U.S. Department of Justice, Immigration and Naturalization Service, 1993.

Code of Ethics for the Industry

1. Commit to excellence in the quality of tourism and hospitality experiences provided to our clients through a motivated and caring staff.

2. Encourage an appreciation of, and respect for, our natural, cultural and aesthetic heritage among our clients, staff, and stakeholders, and within our communities.

3. Respect the values and aspirations of our host communities and strive to provide services and facilities in a manner which contributes to community identity, pride, aesthetics and the quality of life of residents.

4. Strive to achieve tourism development in a manner which harmonizes economic objectives with the protection and enhancement of our natural, cultural and aesthetic heritage.

5. Be efficient in the use of all natural resources, manage waste in an environmentally responsible manner, and strive to eliminate or minimize pollution in all its forms.

6. Cooperate with our colleagues within the tourism industry and other industries, towards the goal of sustainable development and an improved quality of life for all Lake Champlain Basin residents.

7. Support tourists in their quest for a greater understanding and appreciation of nature and their neighbors in the global village. Work with and through national and international organizations in helping to build a better world through tourism.

SUMMARY AND CONCLUSIONS

PROJECT SUMMARY

A primary objective of the Comprehensive Pollution Prevention, Control, and Restoration Plan being developed by the Lake Champlain Management Conference is to restore and maintain recreational and economic activities in and on the lake. However, the economic interrelationships between and among Lake Champlain, its residents, and its visitors are complex. The purpose of this project was to identify and interpret socio-economic data necessary for defining the Lake's role in the economy of the Lake Champlain Basin area within Vermont and New York. This timely report and database provide socio-economic data necessary for evaluating the public and private implications of restoring and maintaining the chemical, physical, and biological integrity of Lake Champlain's waters.

The study team has compiled the most complete and detailed socio-economic database for the Lake Champlain Basin that has yet been available. The report contains summary statistics gleaned from the socio-economic database, accompanied by an outline of the over 50 socio-economic variables that comprise the database. Two over-arching goals for the database and report have been accomplished. First and foremost, we have compiled and organized data in a manner to maximize accessibility for all interested parties. The database is clearly and consistently organized so that other researchers can perform statistical and GIS-based analysis. The report's TABLE OF CONTENTS provides the file names, table numbers, and variable descriptions necessary to access the database. Database disks are available from the Lake Champlain Basin Program office in Grand Isle, Vermont.

Second, researchers can now begin a more rigorous analysis of the relationship between key socio-economic variables and the various water quality parameters currently being monitored. The database is comprised primarily of U.S. census data listed at the town level, with summary data computed for the Lake Champlain Basin and Shoreland areas in Vermont and New York. The town-level data for the 144 Vermont towns and the 54 New York towns within the Basin provide a much finer level of detail than was previously available. For example, the interested researcher can now extract type of sewage disposal system or per capita income for a specific sub-basin of the watershed by compiling the data for those towns lying within the particular sub-basin. In summary, the socio-economic database contains information necessary for linking human activities and characteristics with environmental processes and conditions, thereby providing the first opportunity to systematically integrate the needs of people and the environment within the Lake Champlain Basin.

An important component of this report is the detailed consideration of the tourism industry within the Basin. The study team documented the lack of Lake Champlain Basin tourism studies and compiled a wide variety of New York and Vermont economic data on tourism within the Basin. This research, for the first time, estimates the significant economic expenditures by internal tourists (i.e., local residents within the region). The overall economic impact of tourism in the Basin and the contributions from distinct sectors are also assessed. A major recommendation is for systematic evaluation of the advantages and disadvantages of tourism development as a step towards sustainable tourism in the Lake Champlain Basin.

MAJOR FINDINGS FROM THE RESEARCH

General Findings and Caveats

As a general introduction to more specific findings and recommendations, we feel that readers should be alerted to a number of broad observations and important caveats about the data compiled for this study.

1. **The findings represent the results from a detailed analysis of Lake Champlain Basin and Shoreland characteristics.** With 197 towns in the Basin, it was necessary to keep this report at the general level in order to provide Basin and Shoreland data on as many of the variables as possible. The ecologic-economic zone analysis discussed in the report represents the type of more specific, sub-Basin analyses that can be performed. In addition, once the Lake Champlain Basin GIS system become operational, the database can easily be brought into the GIS system and maps produced that illustrate more clearly the distinctions between individual towns, and between groups of towns aggregated at the sub-Basin level.

2. **The summary statistics include data for all the towns in Vermont and New York having any of their land area fall within the Lake Champlain Basin.** This is the first time that data for all Lake Champlain Basin towns have been included in a profile of the Basin. There are two main reasons for using this methodology. First, subsequent researchers have the benefit of a socio-economic database that is complete for all human settlements that exist within the Basin, giving them the option to decide which bordering towns to remove from their analyses. Secondly, this methodology offers many residents of the Basin the first opportunity to see the characteristics of their towns included in a socio-economic profile of the Basin, thereby educating Basin residents on the extent of the Basin, while providing them with data they can use to learn about the characteristics of their towns.

   Because of this methodology, the summary statistics that involve total numbers, for example total population, tend to slightly over-estimate the actual situation within the boundary of the Basin. On the other hand, summary statistics that characterize the population in terms of percentages, for example percent employed in the service industry or the per capita income, are less affected because the towns along the Basin boundary tend to be sparsely populated and have homogeneous characteristics. One exception is the Town of Queensbury in the southern portion of the New York Basin. While over 50% of the town area is within the Basin, the area lying out of the Basin is the more heavily populated and more urban portion. Therefore, Queensbury exerts a slight urban influence on the New York Basin data. Shoreland data is unaffected by the inclusion of all Basin towns.

3. **Summary statistics about the human population of the Lake Champlain Basin are influenced by higher percentage of population and economic activity attributable to the Vermont portion of the Basin.** Descriptive summaries characterizing the human population living in the US portion of Lake Champlain Basin are influenced by Vermont's characteristics because the Basin area and population are not evenly divided between

Vermont and New York. For example Vermont portion of the Basin contains 64% of the Basin population (58% with the inclusion of the Quebec population); at least 54% of the Basin land area; and 70% of employed persons living in the Basin. Looking at county level economic sector data, the Vermont portion of the Basin contributes approximately 69% of annual retail sales; 75% of annual service industry receipts, 64% of annual wholesale industry sales, and 76% of total value added in manufacturing for the Lake Champlain Basin. (see Tables 3-2, 3-4, 4-9)

4. **Total summary statistics for the Vermont Shoreland area are strongly influenced by the impact of the Burlington area.** There are approximately 75,000 people in the Shoreland towns in the Burlington area, or about 53% of the Vermont Shoreland population. This characteristic of the Vermont Shoreland points to the importance of a more detailed analysis of the characteristics of individual towns on the Shoreland, of groups of Shoreland towns on particular areas of the lake, and of towns aggregated at the sub-Basin level. (see Appendix Table 1)

5. **The percentage of population in group quarters (e.g., correctional institutions, nursing homes, hospitals, colleges) for some towns in the Basin is high enough to skew the town's characteristics towards that of the group quarters population.** For example, the population of Fort Ann consists of 47% group quarters population. With group quarters population include, the per capita income of the town in relatively low compared to the rest of the Basin, however, with group quarters population removed from the total, Fort Ann's per capita income is among the highest in the Basin. Group quarters population in the Basin is higher than that of either Vermont or New York. The New York Shoreland has the highest percentage at 8%, followed by the New York Basin at 7%, and the Vermont Shoreland at 6%. The group quarters population is subtracted from the total for some of the analyses in this report. Other researchers are cautioned to consider the impact of group quarters population on their analyses. (see Tables 3-8, 3-9; Figure 3-10)

6. **The general characteristics of the human population of the Lake Champlain Basin, including both Vermont and New York residents, tend to be similar to that of the population of Vermont as a whole.** This finding confirms the obvious: that Vermont is a fairly homogenous state, and, that the Champlain Basin portion of New York is a rural area with population characteristics more similar to that of Vermont than to those characterizing all New Yorkers. Population density is one example, with the New York Basin area at 48 persons/sq. mile and the Vermont Basin area at 72 persons/sq. mile; while the State of Vermont has a density of 61 and the State of New York has a density of 381. Percent of households with public assistance is another, with the New York Basin area at 6.7% and the Vermont Basin area at 6.9%, while the State of Vermont averages 7.2% of all households and the State of New York averages 9.1%. (see Tables 3-4, 3-16)

7. **When comparing the New York Basin population to the Vermont Basin population, they demonstrate very similar characteristics.** One example is percent of employed persons by occupation. Farming, Forestry, and Fishing comprises 4% of the Vermont Basin employed persons and 3.4% of those in the New York Basin. Looking at employment by industry, Wholesale and Retail Trade comprises 21% of the New York

Basin employed persons and 23% of those in the Vermont Basin. However, there are some very obvious distinctions, pointed out below. (see Tables 3-20, 3-21)

8. **The Lake Champlain Shoreland towns in Vermont and New York tend to differ more than do the overall New York and Vermont areas within the Lake Champlain Basin.** Population change between 1950 and 1990 is a prime example. New York Basin towns grew by 44% and Vermont Basin towns grew by 58%, while Vermont Shoreland towns grew by 85% and New York Shoreland towns grew by 46%. (see Table 3-2, and Figure 3-3)

Specific Findings and Interpretations

1. **The total population of the Lake Champlain Basin was 607,788 people in 1990**. The population increased by 9% between 1980 and 1990, the lowest increase by decade since the 1950-60 decade when the Basin population also increased by 9%. The increase was 11% between 1960 and 1970, while the increase was 13% between 1970 and 1980. Population distribution among the states and Quebec was Vermont: 61%, New York: 35%, and Quebec 4%. (see Table 3-2 and Figure 3-1).

2. **The general Basin areas of highest population growth during the past decade were the Vermont Shoreland (13%) and the Vermont Basin (11%).** The New York Basin population increased by 7% and the New York Shoreland by 5%, while the Quebec population decreased slightly (-1%). (see Table 3-2)

3. **Population growth in the Malletts Bay area of the Basin has far out-paced that of the rest of the Basin.** Those towns that comprise the Mallets Bay ecologic-economic zone experienced a population increase of 139% between 1950 and 1990, as compared to 58% for the US Basin area as a whole. The Missisquoi Bay, VT and the South Lake, NY ecologic-economic zones experienced the lowest population increase during the period, at about 20%. (see Figure 3-5)

4. **Over one-third of the Basin population and an undetermined number of businesses rely on Lake Champlain for their drinking water.** Preliminary data indicate that Lake Champlain is the source of drinking water for approximately 188,000 people, or 32% of the Basin population. Over 95% of the people relying on Lake Champlain for their drinking water are Vermont residents, and the vast majority of people who drink Lake Champlain water (98%) are connected to public or private water systems (i.e., supplying 5 or more housing units). For example, the Champlain Water District serves 50,000 people, the Burlington Water District serves 50,000 people, and the South Burlington Water District serves 12,670 people (Susan Mitchell, VT Water Supply Division, personal communication 8/28/92). Overall, the New York and Vermont Basin populations are very similar in the percentage of population relying on public or private systems, wells, and other sources.

   Besides residential water use, an undetermined number of businesses rely on Lake Champlain for their water. Impending changes in surface water treatment regulations could have a tremendous economic impact on businesses that serve the public by requiring small, seasonal operations such as restaurants and campgrounds to purchase water

treatment equipment to meet the new regulations. The study team perceives a need for research to identify the potential economic impact of current or proposed water quality regulations on small businesses in the Basin.

5. **Over one-half of the households and many tourist facilities in the Basin are not connected to a public sewer system.** In terms of sewage disposal, more households in the Basin rely on septic tanks and cesspools (55%) than are connected to public sewer systems (43%). The percent of Shoreland households connected to public systems is somewhat higher than that in the Basin at 55%. About 50% of the New York Shoreland population rely on septic tanks or cesspools, equaling 46,176 people or 17,760 households, while the same holds true for about 40% of the Vermont Shoreland population, equaling 49,910 people or 19,196 households. Considering that individual systems, if not properly constructed and maintained, could increase the amount of nutrients flowing into Lake Champlain Basin streams; and, since the primary technique for monitoring individual systems is on-site inspection, the data indicates that a monitoring program for individual septic systems should be included in the lake management plan. Additionally, the data indicates that construction of public septic systems continues to be a high priority for some areas of the Basin. Also, an undetermined number of these homes are seasonal tourist homes, campgrounds and other tourist facilities on Lake Champlain. Town planning regulations and enforcement play a major role with the management of these systems. (see Figure 3-14)

6. **According to 1990 census data, there are approximately 9,118 seasonal housing units in the Shoreland and 38,530 seasonal housing units in the Basin.** One interesting finding is that the proportion of seasonal housing units to total housing units is less in Shoreland areas than in the Basin as a whole: approximately 9% of all housing units in the Shoreland are seasonal units, while close to 15% of all Basin housing units are seasonal units. Another to assess the prevalence of seasonal homes in the Shoreland is to look at the relationship between seasonal housing and land area: 24% of all seasonal units are in the Shoreland towns, while the Shoreland towns comprise about 21% of the Basin land area. Longitudinally, the comparison of 1980 to 1990 census data is confounded because of different approach to reporting on seasonal units. It appears that the number of seasonal units increased by 14% in the New York Shoreland area and 41% in the New York Basin area. These findings seem to indicate that over-development of seasonal homes does not appear to be a general problem in the Shoreland area, however, this is the type of general finding that may not apply to specific areas. Seasonal home development needs to be analyzed in conjunction with population density, land use, land type, and water quality before its status can be accurately assessed. (see Table 3-11).

7. **Median family income was highest in Vermont Shoreland towns ($38,709) and lowest in New York Shoreland towns ($31,605).** The average for the Basin was $35,196. The difference in family income is one of the many disparities between Vermont and New York Shoreland towns. One of the reasons for difference is the large economic impact of the Burlington area on the Vermont Shoreland totals. (see Table 3-13, 3-14 and Figure 3-16).

8. **Of the ten major industrial divisions, the service industry is the single largest employer in the Basin with 34% of all employed persons.** Following services is wholesale & retail trade (22%) and manufacturing (15%). The agriculture, forestry, and fishing industry comprises 4% of all employees, or 10,478 people. The Vermont and New York areas of the Basin are very similar in employment by industry. One difference is that public administration, referring to government establishments, employs 10% of New York Basin work force and only 5% of the Vermont Basin work force. (see Table 3-20 and Figure 3-20)

9. **Between 1980 and 1990 the manufacturing sector experienced the largest decline of all sectors, decreasing from 22% to 15% of the work force.** Industries showing an increase in percentage of employment were: services (+3%); wholesale & retail trade (+2%); construction (+2%); and, finance, insurance, and real estate (+1%). These findings for the Basin mirror that in the US in general, and indicate the growing importance of the service sector. Businesses within the service industry include hospitals, schools, and professional offices, as well as the tourism-related business of hotels, amusement and recreation services, and museums. (see Figure 3-20)

10. **Of the nine major occupational categories identified in the census, the predominate categories in terms of percent of total employment are professional specialty (16%); administrative support (15%); operators and laborers (14%); and executive, administrative, and managerial (13%).** The main differences between the New York and Vermont Basin areas are in the service and in the operator & labor occupations. The service occupations in Vermont comprise 13% of the work force, while they comprise only 6% of the New York Basin work force. On the other hand, operators and laborers comprise 18% of the New York Basin work force and only 12% of the Vermont Basin work force. The farming, forestry, and fishing occupations are fairly consistent between Basin areas, comprising 3.4% of the New York Basin work force and 4.0% of the Vermont Basin work force. The ecologic-economic zone analysis reveals a greater reliance on agricultural employment in the Missisquoi Bay area at approximately 10% of the work force, and in the South Lake areas of Vermont (6%) and New York (5%). A related characteristic is the annual average unemployment rate in each area: 8.8% for the predominately Basin counties in New York and 6.8% for the Vermont Basin counties in 1991. The employment mix within a given area of the Basin will influence its unemployment rate, as well as its capacity to raise revenue for infrastructure improvements (see Tables 3-21, 3-23; Figures 3-22, 3-23, 3-24; and Appendix Table 33a)

11. **While the Basin economy continues toward a healthy diversification in such areas as education, health care, tourism, prisons, and manufacturing, the more traditional, rural industries of agriculture, timber harvesting, and mining continue to make significant contributions to local economies.** In specific locations around the Basin, agriculture, mining, and forestry are the major employers. For example, the "agriculture, forestry, and fisheries" industry grouping accounts for over 25% of all employment in the Addison County, Vermont towns of Bridport, Shoreham, and Addison. Table 1-1 shows the 20 Basin towns in Vermont and the 20 in New York with the highest percentage of primary employment in natural resource-related industries. Even 20th on the list in Vermont, Pawlet Town, still has at least 15% of employed persons relying directly on

agriculture, forestry, and mining. The New York town with the highest reliance on employment in the natural resource sector is Clinton Town, at 21% of all employed persons.

According to the 1990 U.S. census, the agriculture, forestry, and fishing industry directly employed 10,478 people, or about 4% of all employed persons in the Basin. The mining industry directly employed another 815 people. However, an accurate assessment of natural resource employment in the Basin would have to include secondary natural resource-related employment consisting of those individuals involved in the subsequent transportation, processing, packaging, and marketing of natural resources. According to agriculture experts in the Basin, an accurate profile of the Basin's agriculture-related economy would require a detailed input-output analysis of all agriculture-related income and employment, an effort beyond the scope of this project. While secondary employment is difficult to quantify, natural resource-related secondary employment undoubtedly comprises a significant percentage of employment in the predominately rural Lake Champlain Basin.

For example, secondary employment linked to agriculture would have to include employees classified in other sectors, such as manufacturing (e.g., ice cream, bread), wholesale trade (e.g., milk distributors), and retail trade (e.g., butchers, produce departments). One Vermont agricultural official estimated primary and secondary agricultural production at 16% of Vermont's Gross State Product (De Geus 1992). Primary and secondary employment in agriculture could then comprise 16% of all employment, while Healy (1984) estimated that Vermont forest products-related employment accounted for 8% of all Vermont employment. With the Lake Champlain Basin's employment situation being very similar to the State of Vermont's, at least 25% the Basin's work force could be employed in natural resource-related activities. Additional research is needed to accurately determine the importance of natural resource-related economic activity in the Lake Champlain Basin.

That there is a link between natural resource-related economic activity and Lake Champlain seems evident in the appearance of 17 Shoreland towns among the 40 towns listed in Table 3-25. In the New York part of the Basin, 10 of the 20 listed towns are Shoreland towns and comprise 59% of the New York Shoreland area. Although the majority of listed towns appear to have agriculture as their dominate economic activity, forest products and mining are also represented (e.g., Willsboro, Essex, Westport). One conclusion is that plans for managing and protecting the lake need to consider potential impacts on natural resource-related economic activities.

Besides their importance to local economies, the natural resource industries in the Basin have social and cultural importance to local areas. A tradition of working in the woods or working on the land has continued through many generations in some families and such work still carries a high degree of status. In the words of one local town official, forestry-related jobs are "real jobs", as compared to tourism-related employment. While open to interpretation, characteristics of real jobs include such attributes as working outdoors, requiring skill in operating and repairing equipment, and carrying on a family tradition, as well as characteristically higher wages. If local economic development efforts begin to consider the sustainable development programs currently being tested by international

development organizations, the social and culture attributes of natural resource industries in the Lake Champlain Basin will require further study and analysis. One of the criteria of sustainable development is that it be culturally appropriate, as well as environmentally appropriate. (see pages 3-44 thru 3-53)

12. **The Shoreland towns around Lake Champlain contain almost two-thirds (32.1%) of the total value of real property in the Basin, while the Shoreland towns contain only 21% of the Basin land area.** The fair market value of real property within the Basin is approximately $27.5 billion, or approximately $50,000 per Basin resident, not including group quarters population. While the property tax and assessment situation is difficult to analyze, especially when trying to account for two states, the project has compiled preliminary data for this very important aspect of the Basin economy. The average taxes assessed per Vermont Basin year-around household was $1,659 in 1991, while the average per New York Basin year-around household was $1,265 in 1990. While the average household property tax was lower in New York, the tax assessment was actually higher, at approximately $24.93 per $1,000 of market value in New York and $15.06 per $1,000 of market value in Vermont. These data are preliminary and indicate that the LCMC should pursue a detailed study of property assessments and taxes, along with the fiscal capacity of local governments, in order to have an accurate basis for determining potential sources of funding for infrastructure improvements. (see Tables 3-32 thru 3-36)

13. **Approximately 67% of the New York residents living with the Lake Champlain Basin reside within the boundaries of the Adirondack Park.** Additionally, 86% of the Basin's land area in New York is contained within the Adirondack Park boundary. The presence of the Adirondack Park Agency as a New York State land use planning agency currently over-seeing more than two-thirds of the New York Basin population and over three-fourths of the New York Basin land area has important ramifications for LCMC land use planning policy and recommendations. (see Table 3-38)

14. **Per capita expenditures by local governments are very similar in each of the five New York counties having land within the Basin, at an average of $2,383 per person in 1990.** School district expenditures consume the major portion of local expenditures, varying from 39% of local government budgets in Essex County, to 56% in Washington County. The study team did not compile Vermont local government expenditure data. As with the property tax data, the distribution of local government expenditures, both between expenditure categories, and between levels of government, has ramifications on funding the construction and improvement of sewage treatment facilities. (see Table 3-39)

15. **Total tourism-related expenditures in the Basin are estimated at $2.2 billion in 1990, apportioned as 71% in Vermont ($1.6 billion) and 29% in New York ($642 million).** By comparison, in 1991 the Basin produced roughly $2.8 billion in value-added to manufacturing and $4.5 billion in total retail sales. County data indicates that within the Basin in 1991, there were approximately $1.8 billion in wholesale industry sales and $1.1 billion in service industry receipts. Thus, tourism expenditures are a major component of the Basin economy, comprising approximately one-fifth (22%) of total sales and value-added within the Lake Champlain Basin economy. (see pages 4-11 thru 4-15)

15a. Total tourism-related expenditures in the Lake Champlain Shoreland towns are estimated at $880 million in 1990. The estimated Shoreland total is based on selected variables indicating that 40% of tourism expenditures in the Basin occur in Shoreland towns. The $880 million figure represents the maximum value of Lake Champlain-related tourism expenditures, since not all tourism expenditures in Lake Champlain Shoreland towns can be attributed to Lake Champlain. The maximum value is equal to approximately 9% of total sales and value-added within the Lake Champlain Basin economy. (see pages 4-14 & 4-15)

15b. The tourism-related expenditures of internal tourists within the Basin are estimated at $969 million in 1990. This amounts to 44% of all tourism-related expenditures within the Basin. There is significant variation within the Basin in regards to whether out-of-state tourists or internal tourists are the prevailing force in the local tourist economy. Unraveling the different tourist components (e.g. local, Quebec, United States and Europe) is important for tourism marketing, planning and development. (see pages 4-3 thru 4-13)

15c. Marinas on Lake Champlain in 1990 employed approximately 344 people, with a total annual payroll of $5.4 million. The marina data is preliminary, as recreation facility inventories are currently underway in the Basin. The report provides data that can be used in conjunction with the information from the inventories to estimate marina-related employment and payroll. (see Tables 4-14, 4-15 and Figure 4-3)

15d. Fishing related expenditures are estimated at $61.6 million for the Basin and $31.7 million for the Shoreland towns 1988, comprising approximately 4% of all tourism expenditures in the Basin. An analysis of fishing license purchases in New York Basin counties indicates that there is economic opportunity in the promotion of fishing, especially to non-residents. For example, non-residents contribute 65% of total revenue from fishing license sales in Essex County, yet contribute only 48% in Clinton County and 45% in Washington County. Boating and fishing studies are currently underway in the Basin that will provide additional information on the economic impact of fishing in the Lake Champlain Basin. (see pages 4-22 thru 4-27)

16. During the 1992 fiscal year (i.e., October, 1991 through September, 1992), a total of 7.9 million non-US residents entered the United States through the 14 ports that serve as ports of entry to the Lake Champlain Basin. Looking at the five year period of 1988-1992, border crossings in a single month peaked in July, 1991 at 1.1 million aliens entering the Basin. The five year trend in border crossings shows an annual summer peak, with 10% of crossings occurring in June, 15% in July, 14% in August, and 10% in September. The average for number of aliens crossing by boat into Lake Champlain at Rouses Point was 26,343, or approximately 7,318 boats per year. Boat crossings were below average in 1992 by about 1,472 boats, while total border crossings were down slightly from the previous year. Research data and anecdotal evidence indicates that purchases by Canadians comprise approximately one-third of all retail sales in the

Plattsburgh area. However, Fort Ticonderoga personnel estimate that less than 5% of their visitors are from Canada, while the data on the Adirondack Museum in Blue Mt. Lake, lying just outside the western boundary of the Basin, indicates that only 1% of their visitors are from Canada. There appears to be economic opportunity in cooperative marketing of the entire Lake Champlain Basin area to Canadian visitors, boosting both local sales tax collections and local income opportunities. (see Tables 4-31, 4-32; Figures 4-5, 4-6)

SPECIFIC POLICY RECOMMENDATIONS TO THE LAKE CHAMPLAIN MANAGEMENT CONFERENCE

1. **The LCMC should develop policy and procedures for integrating data and analyses from the physical sciences with that supplied by socio-economic research.** The overlap of environmental management and human activities should be at the heart of the planning process. Where specific recommendations are predicted to have an economic impact on the Basin or a sub-area within, the description of the activity should be accompanied by economic data obtainable from the socio-economic database that specifically describes the economy and the human population of the area to be affected. The LCMC should challenge all researchers to attempt a more rigorous analysis of the link between human activities and water quality to account for human needs and economic conditions while striving to protect and enhance the Lake's water quality.

2. **The LCMC should evaluate the appropriate spatial and political level of policy initiatives.** In other words, at what level will a particular incentive be most effective: basin, state, county, town or village? While the socio-economic database points out the homogeneity of the Basin on many characteristics, there are some other very real differences between the states, between the Shoreland, and especially between individual towns within the Basin.

   For example, the LCMC should consider the adoption and extension of ecological zones as a basis for planning and policy. Bioregionalism has been revived as a basis for planning. It allows for analysis at a more local level than the county, but with clear physical rationale and therefore a clear link between the environment and peoples' lives. It makes the resource of the lake much more tangible for local populations if they feel like others in their physical zone are discussing and developing solutions. It also helps to overcome interstate disagreements by de-Stating the process and bioregionalizing. This does not have to mean another layer of bureaucracy, rather some clearing house-type staffing relying on the cohesion of interests of different Towns. Also, geographically specific problems like weeds in the South Lake and phosphorus in Mallets Bay and Inland Sea become socio economically situated in this holistic and bioregional framework.

3. **The Program should establish a data clearing house and request that all members of the LCMC Research Consortium and other active researchers provide annotated entries for a Basin-Wide information repository.** Furthermore, the Program should request that raw data itself be made available to other researchers and interested parties (in the appropriate machine-readable form). This would allow motivated members of a

broader community to contribute to the analysis and discussion of policy relevant materials in a timely and relevant manner. The research team is prepared to assist in the initiation of this task.

In addition, we recommend that LCMP staff (perhaps the Education and Outreach Coordinator) solicit and publish summaries of relevant research and thereby alert the public to on-going research. The tabloid "Casin' the Basin" might be an appropriate vehicle or perhaps a semi-annual special report would be feasible. This is not to detract from existing reporting efforts, but to recommend that the net be cast wider to include all State, Federal, Province and, where possible, privately funded research efforts. The intention would be to allow wider access (both academic and public) to the data and information that has been and is being gathered. This recommendation is considered central to the planning and public participation process in the Basin.

4. **The LCMC should embark on an aggressive assessment of policy initiatives and evaluation of alternatives.** In developing this characterization of the socioeconomic profile of the Lake Champlain Basin, it has become apparent that research on planning and policy itself within the Basin is virtually non-existent. The research team recommends that the LCMC consciously encourage and include such research and assessment techniques in its plan formulation and policy implementation process. Identification of a series of policy agendas (with clearly stated alternative and implications) on an ecologic zone basis would be a good foundation. Such a process could be disaggregated to inform Town-level discussions of policy and the financing of public improvements. It could also be aggregated to demonstrate and support interstate and international concerns in a geographically relevant and environmentally sensitive manner.

5. **The LCMC should encourage a Lake Champlain perspective in tourism information, research, planning or development.** The states of New York and Vermont have primarily focused their tourism efforts on the images and development of the upland areas of the Basin including mountains, cows, and the rural landscape. Much less systematic attention has been given to the issues of Lake Champlain tourism. Without a Lake Champlain outlook, it will be difficult to develop sustainable tourism.

   The LCMC could act as a catalyst for discussing and designing regional efforts to enhance the Lake Champlain tourism economy. Tourism is one economic sector that is especially conducive to a cooperative effort between Vermont, New York, and perhaps Quebec. While the competition between states will undoubtedly continue for tourism dollars and the jobs they bring, the LCMC could encourage a focus on cooperative national and international marketing of the area and encourage cooperation in developing complementary attractions and amenities around the Basin. A historic Lake Champlain highway designation and a bike trail system around the lake are two such efforts currently being explored. The joint New York - Vermont Lake Champlain fishing license proposal is another example of regional effort to enhance local tourism economies. These efforts requiring funding, as well as research and grant-writing expertise. One step the LCMC could take would be to supply seed money for the creation of a Lake Champlain tourism development office that would act solely as a clearing house and grant-writing office for the pursuit of tourism projects that would enhance local economies.

6. **The LCMC should take the initiative in advocating sustainable tourism development.** Recent studies of the economic impacts of tourism in the Basin tend to emphasize only the positive impacts of tourism, without realistically addressing problems, limitations or negative impacts. In the Lake Champlain Basin literature the consultants reviewed for this project, analysts primarily commented on the enormous economic multipliers and tremendous overall economic impacts. What these studies and overall estimates, including those within this report, usually fail to consider are the costs of related public impacts. Thus, the consultants recommend Lake Champlain Basin research into evaluating the present use of local growth management techniques and fiscal impact analysis in regards to economic development. This may include the development of public balance sheets and/or improved methods for local capital improvement planning. Whatever the precise direction of this research, it should address the advantages and disadvantages of tourism, consider a full range of social and environmental impacts, analyze the question of who benefits and who pays for a given development, and consider carrying capacities and other measures of tourism potential in a effort to develop guidelines for sustainable tourism development.

7. **The LCMC should convene a special working group consisting of representatives from major industries, local trade associations, municipalities, etc., to investigate linkages between local economies and Lake Champlain.** This report compiles readily available economic data. The gathering of additional data will involve contacting each individual industry, business, and municipality within the Basin. While additional economic data collection will have to be carried out, the working group would act to increase communication and the flow of information between the various economic players and Basin planners. This recommendation corresponds to that made in the Volume III summary that recommends a similar working group to investigate and propose potential uses of economic instruments as part of the pollution control program.

8. **Considering that LCMC recognizes the importance of agriculture to the Basin's economy, and that pollution control measures could impact agricultural and forestry activities, the LCMC could serve as a catalyst to developing cooperative marketing agreements between New York and Vermont small businesses involved in farming and forestry.** As with tourism, it is not jobs that are the issue with small business farmers and foresters, it is rather finding a market for their products. Although the LCMC was not created to encourage economic development projects, the success of its recommendations will be enhanced by using its Basin perspective to encourage the creation of Basin-wide economic development efforts to aid those sectors that would possibly be affected by LCMC activities. a program was recently developed to aid small forest product businesses in the Adirondacks that employs one individual full-time to work with small business on problems related to obtaining loans and developing markets. The LCMC could consider supporting that program and encouraging a similar, cooperative effort with Vermont Basin small business involved in forest products.

SUGGESTIONS FOR FURTHER RESEARCH

1. **The LCMC should fund a research project which examines the economic, social, and environmental impacts of tourism from the perspective of small businesses**

around Lake Champlain. Lake Champlain Basin tourism studies have been limited to visitor/user surveys. Determining the economic perspective of the small business owner would clarify the goals and development potential of tourism within the Basin. Our knowledge about the economic impacts of tourism on local businesses is incomplete because New York and Vermont State databases rely almost exclusively on employment-related data for estimating tourism impacts. Therefore, information on the family owned and operated businesses that predominate in much of rural New York and Vermont is virtually non-existent. A systematic survey of small business would provide accurate, contemporary data on the relationship between Lake Champlain and rural, local economies. Such information would also provide a means for comparing pre- and post-Plan economic conditions.

2. **Additional research is needed to assess the current status, and the common problems and needs, of natural resource-related businesses.** Comprehensive data on the total primary and secondary employment and income provided by natural resource-related industries should be compiled for the Basin. The data should be compiled at the town level so that it can be incorporated in the Lake Champlain Basin socio-economic database and used to analyze costs and benefits from water quality improvement and pollution control.

3. **The LCMC should fund a research project which evaluates the current use of growth management techniques by local levels of government in the Basin.** Many of the controversies associated with tourism development (and economic development for that matter) are the result of inadequate local planning. Assessing the status of local growth management would clarify the role of local planning issues within the Basin. Also, almost all the Basin funding to government agencies has been at the State level. How about a more balanced and systematic approach?

4. **The LCMC should fund a research project which examines alternative scenarios regarding the public trust doctrine.** Numerous tourism experts emphasized the fundamental importance of dealing with the conflict over public trust doctrine in Vermont and New York. Many development questions regarding public and private use of the lake shore revolve around this question.

5. **The LCMC should fund a project to investigate and access citizen perceptions of ecologic zones as a feasible alternative to regional or state planning.** The study team has used the ecologic-economic zone analysis to demonstrate that the Lake Champlain, Basin is not economically homogeneous and to provide the LCMC with an alternative view of the Basin, a view that may lead towards improved environmental planning and decision making. An emphasis on bioregionalism also would pull planning and implementation closer to the local level, closer to the grassroots, and therefore improve the prospects for implementation and the opportunity for effective public input.

6. **The Lake Champlain Basin Program (LCBP) should fund a demonstration project to establish a Basin-wide system of information about the economic impacts of tourism.** Different state agencies in New York and Vermont collect a variety of information regarding the economic impact of tourism. Presently, this tourism information is incomplete, fragmented, and almost never studied from a Basin-wide perspective. One

goal would be to develop a Basin-wide marketing scheme that would strive to consolidate marketing efforts and to more effectively distribute limited advertising budgets.

7. **The LCBP should fund a demonstration project to improve local fiscal planning for communities experiencing rapid development.** Projections about the economic benefits of a development project often do not consider the related public infrastructure costs. Developing improved public balance sheets and local fiscal planning will enhance the development potential of Basin communities. This will not only help local levels of government but hopefully also clarify the process for developers.

8. **The LCBP should fund a demonstration project for the tourism industry to develop a code of ethics and guidelines for sustainable tourism.** The tourism industry understands the importance of environmental quality in their businesses. Developing sustainable tourism guidelines would integrate environmental conservation and marketing promotion for the Basin's tourist industries.

9. **The LCBP should fund a demonstration project which empowers a diversity of actors to develop a sustainable tourism plan for the Basin.** The Lake Champlain Basin Program has funded very few projects which empower community participation. Promoting the development of a sustainable tourism plan would foster community development and environmental conservation.

10. **The LCBP should support the socio-economic research activities of public and private organizations.** The annual questionnaire survey performed by the Vermont Boat and Marine Association is one example of on-going research that can contribute to our knowledge of human activities in the Lake Champlain Basin. The Vermont Boat and Marine Association has a proven track record in surveying its members for the past three years. They are creating a useful database about boating and boating-related business on Lake Champlain that could be made more valuable and effective with financial and technical assistance from the Lake Champlain Basin Program. The Ticonderoga Chamber of Commerce's efforts to survey fishing derby participants is another example of an on-going private research effort that contributes to our knowledge about human use of Lake Champlain.

DESCRIPTION OF THE STUDY TEAM

Holmes & Associates, a small research firm located in the Adirondack community of Saranac Lake, New York, specializes in accurately representing human social, economic, and cultural characteristics by use of scientific research methods.

Timothy P. Holmes: Mr. Holmes is a social scientist actively involved in socio-economic research in the private sector for over ten years. He has participated in 12 significant research projects in Alaska, Idaho, and the Adirondack-Lake Champlain region. Before establishing his firm in Saranac Lake in 1989, he was the field director on a three year study of the hunting and fishing activities of the Inupiat Eskimo in Barrow, Alaska. He has a MA in rural sociology from the University of Idaho and a BS in sociology from the University of Iowa.

Dr. Bryan Higgins: Dr. Higgins is Chair of the Geography and Planning programs at SUNY-Plattsburgh. During the past ten years, Dr. Higgins has received a total of 11 planning and research grants, including detailed economic development studies in both New York and Vermont. In addition, he has served on a variety of public planning boards in the Lake Champlain basin, including the Clinton County Planning Board in New York and the Franklin-Grand Isle Regional Planning Board in Vermont. He has also chaired the Town of Grand Isle Planning Board in the Lake Champlain Islands. Dr. Higgins has recently returned from a research trip to Chile and Argentina, where he is developing a study of ecotourism in the Southern Cone of South America.

Gordon DeVries: Mr. DeVries is currently the Information Services Manager in the Office of Analysis and Assessment, SUNY-Plattsburgh. He is the Census and State data resource person for Northern New York.

Dr. Richard S. Kujawa: Dr. Kujawa is assistant professor of geography at Saint Michael's College. He has extensive teaching and research experience related to economic development and environmental planning. While a resident of rural western Maine, he was involved in a number of planning/development projects.

Anthony Artuso: Mr. Artuso has extensive hands-on experience in the economics of resource management. In his various managerial positions, he has directed extensive water use and water pollution control programs. A Ph.D. student at Cornell, his specialty is the economic aspects of natural resource policy and management.

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