

**Lake Champlain Basin Program
Technical Advisory Committee meeting
Held remotely over MS Teams
Wednesday, January 5, 2022, 8:45 AM – 2:00 PM
Approved TAC meeting summary**

TAC Members: Bill Ardren, Jennifer Callahan, Ryan Cunningham, Laura DiPietro, Bryan Dore, Curt Gervich, Peter Isles, Neil Kamman, Steve Kramer, Mario Paula, Oliver Pierson, Andrew Schroth, Leigh Walrath, Lauren Townley, Ryan Waldron

LCBP Staff: Mae Kate Campbell, Eric Howe, Lauren Jenness, Meg Modley, Matthew Vaughan, Sarah Coleman, Katie Darr, Erin Vennie-Vollrath

Guests: Eric Roy, Adrian Wiegman, Kelly McKean, Amy Macrellis, Les Carver, Andrea Morgante, MaryJo Feuerbach, Tom Berry, Laura Lapierre, Emily Bird

1. Updates, announcements

- Oliver: The VT legislature is back in session and is considering a few lake-related bills. House Bill 503 would regulate wake boats (for sports involving wake surfing). Identical to the 2019 bill, this bill seeks to come up with parameters to regulate wake boats in smaller, shallower lakes. We also expect a bill to be introduced to establish a fee-based decal for non-resident boaters to pay to use waters, funds would go to aquatic invasive species spread prevention efforts. Another update, a working group of state and non-state actors is coming up with a structure for water quality enhancement grants. They are considering structure, prioritization, how they could complement work of Clean Water Service Providers in the Lake Champlain and Memphremagog basins.
 - Neil: There's an opportunity with new funding sources in VT to establish complementary swim lanes between those grants and LCBP technical work.
- Lauren T: The NY Water Quality Improvement Project program did not run last year due to COVID, so more funds were available this year (\$272 million). Quite a number of wastewater and non-point projects have been funded in this basin.
 - Neil: Are these established projects, or requests for proposals?
 - Lauren: It's split, but the majority is for implementation. There are also funds for planning grants.
- Matt: Update on technical budget development process, thanks to TAC for ranking pre-proposals. The Steering Committee accepted TAC's recommendation and moved those proposals forward. Full proposals are due on Feb 9th. TAC will review proposals in mid-February and discuss them at our March meeting. A solid team of collaborators co-authored a paper on the Lake Champlain cyanobacteria monitoring network that will be published at the end of February. It gives the history and major outcomes of cyanobacteria monitoring on Lake Champlain. A subcommittee meeting was held to discuss the future of in-situ high-frequency monitoring on Lake Champlain. In general, the subcommittee agreed on the need to continue the consistency of the Long-Term Monitoring Program, but to build upon it. Their long-term vision would include 6 in-lake monitoring buoys (Missisquoi Bay, NE arm, Mallets Bay, Main Lake, South Lake, St. Albans Bay), and possibly having an extra buoy in the northern main lake segment. They

wanted to focus on vertical data for dissolved oxygen, temperature, pigments like chlorophyll in eutrophic sites. 5-6 additional smaller buoys would be placed in the tributaries, and could be moved around, allowing for flexibility.

- Neil: Thanks Matt for facilitating a great conversation. It's exciting to know there may be resources to move on this.
- Leigh: With regards to the monitoring system, was there any discussion into the location of USGS gauging stations? I know in the past, DEC has funded monitoring stations at USGS sites, monitoring could be linked.
 - Matt: We discussed co-locating with USGS monitoring sites and agreed that would be preferable. It's not possible in all locations, though, since the best place for flow monitoring is often not the best for water quality data. We would try to keep buoys as close as possible to the USGS stations. We can still use flow data to trigger sampling events even if they are not perfectly co-located.
- Lauren J: 2022 is a big year for the basin, since the Clean Water Act turns 50, LCBP turns 30, and NEIWPC turns 75. An email was distributed to allow you to stay connected on activities taking place over the next year.
- Meg: The Rapid Response task force has been meeting about round goby and the Champlain Canal. We worked with USGS to approve a workplan for eDNA and trawling work. We added viral hemorrhagic septicemia sampling on any round goby samples that are collected. Sampling will begin this spring. We are still working on developing a recommendation from the task force for a response to trigger certain actions to prevent the round goby from coming into the watershed. We presented phase 2 of the Champlain Canal barrier feasibility study. Phase 2 would bring an alternative to full design. It would take 2-3 years to get to the shovel ready process and cost ~2-3 million dollars. Phase 2 was approved by the Steering Committee. We are exploring options for local match.
 - Neil: Did the Champlain - Hudson fiber line get permitted?
 - Meg: I'm unsure. If I find out, I'll let you know.
- Meg: We are working to start recruiting boat launch stewards for the 2022 field season. Please circulate the posting to your networks. We are reviewing the habitat and native species and aquatic invasive species spread prevention grants for Executive Committee consideration. The mudpuppy project will be initiated this spring. We are selecting a graduate student candidate to populate the Great Lakes Aquatic Nonindigenous Species Information System-style database for Lake Champlain.
- Mae Kate: The International Joint Commission Lake Champlain – Richelieu River Flood Study released one of its major reports “Flood Water Storage using Active and Passive Approaches: Assessing Flood Control Attributes of Wetlands and Riparian Agricultural Land in the Lake Champlain-Richelieu River Watershed”. The report and an accompanying summary are available at ijc.org/lcrr.
- Oliver: VTDEC received a permit application from USFWS as part of the sea lamprey control program to install a trap in Highgate. They also have a report out on how permitted stream traps went in 2021. This is a non-chemical lamprey control measure, preferable to chemical. We are reviewing the application and will be reaching out to

partners for input; I will keep TAC updated on VTDEC's response to the permit application.

- Eric: LCBP is deep in the FY22 budget process. We are looking at a healthy budget. It should be an interesting and exciting conversation come April.
- Neil: Oliver and I have discussed how we could use VT state revolving loan fund for capital expenses around aquatic invasive species spread prevention efforts (to purchase decontamination stations, for example). Local match could be provided by LCBP funds. This would be eligible under the state Revolving Loan Fund.
 - Meg: We have had an idea to hold a summit between VT and NY DEC and FWS to talk about boat launches and decontamination stations. It would be great to include VTRANS to discuss roadside decontamination opportunities in Vermont.

Review and approve summary of previous TAC meeting

Motion: To approve the meeting summary from the December 2021 meeting

By: Jenn Callahan

Second: Bill Ardren

Discussion: Neil: The notes are complete and well-done.

Vote: all in favor

Abstentions: Andrew Schroth

2. Discussion and feedback: 2022 Opportunities for Action (OFA) timeframe for implementation

Clean Water

- Matt: To give you a refresher of where we are at: OFA is LCBP's management plan and is renewed every 5 years. This year, committees and staff been hard at work revising it for renewal in 2022. We've spent a few meetings talking about how to add to the 2017 version in the Clean Water and Healthy Ecosystems goal areas. The Steering Committee in December reviewed and informally approved what was provided. We have tables that include strategy levels and task areas. For today, we want to talk about a new concept: taking strategies and tasks and grouping them into topical areas/categories. Before we get to 2023 when the plan first takes effect, we want to plan a timeframe for when we'd want to work on different parts of this plan.
- Neil: The first 4-5 rows is work that is happening already in implementation programs for LCBP and State programs. I almost think that they should be taken into a section like 'this is what we do', and not prioritized. All of these, in my opinion, are important.
 - Matt: I agree that focusing on other topics wouldn't take away from normal implementation programs.
- Curt: I think it would be helpful to have an analysis of what LCBP has been concentrating on in the past. That way we can prioritize if that level of effort should be maintained, increased, or decreased.

- Neil: Looking further down the list, actions to reduce beach closures.
 - Matt: We have funded a few research projects in past for beach closures. For example, the City of Plattsburgh DNA tracking for E. coli. Work. Also stormwater reduction projects.
 - Curt: From my perspective in Plattsburgh, reducing beach closures has been a strong and consistent effort. It's one of the baseline activities that I would like to see continued. I don't know if that level of effort is generalizable across the basin or if Plattsburgh has been more of the focus.
 - Oliver: In 2022 we are working on standardized signage for interested municipalities related to cyanobacteria: do municipalities have signs in their warehouse that they can put up if a beach has to close? We don't know if it will reduce beach closures, but it would standardize outreach/education efforts.
 - Peter: Centralizing information on where there are beach closures would be a useful goal. Right now it's not easy to track down, beyond the tracker. Different municipalities are reporting differently.
 - Matt: The tracker is just for visual reports, but not beach closures.
 - Neil: It sounds like there is energy around the idea, especially from the communications side. We could utilize data.lcbp.org!
- Neil: De-icing salts, this is an area of research with lots of inquiries.
 - Jenn: It feels like this is perennial issue, it's not going away. It's a big issue and I don't know anyone who wants to tackle it. There's public safety and environmental impact concerns. It seems like NY is more interested in technology, VT feels like the state has maxed out technology, towns could use more help.
 - Neil: Liability shield legislation - is that a direction that we as a community should go?
 - Jenn: It would be helpful. Anyone can go around in VT private locations right now, stepping on kernels of salt not needing to be there. Liability is often an issue. Some kind of assistance training to private contractors would be helpful. Maybe education to private landowners as well.
 - Oliver: I agree with Jenn's comments. I think the New Hampshire green snow pro program has held up and VTDEC does monitoring in lakes proximal or near roads with a lot of road salt application. We don't do a good job of sharing information with VTRANS. if it's worthwhile, we can share those data.
 - Jenn: It could be helpful getting that information out, knowing where chloride impaired streams are but also identifying increasing trends.
 - Leigh: I'd like to understand how this could work in conjunction with the NY road salt reduction task force. They are formed and operating through 2024. Do we want to get out there and fund reduction strategies when their report is supposed to come out with reduction strategies? It would be nice to marry them together.
 - Jenn: I'm not involved but VTRANS is. It's a tri-state program whose initiative is to get departments of transportation together. A lot is known what needs to be done, it's the public safety issue that's hard to get around. Again, it can be expensive for small towns to implement best management practices.

- Neil: Now that sounds like what LCBP could support. If VTRANS and NY are working on it and funding is the gap, perhaps that is where LCBP fills in support. There is activity progressing, implementation by state agencies and municipal crews, versus private groups. There is energy amongst partners, and we have seen grant applications. With increased funding we may be able to carve out a chunk specifically for that.
- Jenn: I would add private contractors to small towns.
- Matt: We have a pilot for that work with Mirror Lake.
- Andrew: When talking about research, there's a lag between the time the research gets done that informs implementation.
- Neil: climate change.
 - Curt: I would say that this one should be consistent. It's difficult because it's easy to discount the urgency due to the long-term slow burn of climate change. LCBP already funds many projects that would fall under climate change action, they just aren't labeled that way. And there is space for improvement and strategies.
 - Matt: We do have a new objective about climate change in the tables. That gives us the communications tool to directly loop back and give our partners and applicants the opportunity to check off objectives.
 - Curt: It's also giving a pathway for more people, researchers, practitioners, to be involved in LCBP work without having to be natural and physical scientists. Now planners and resource managers can now hook into ongoing work.
 - Neil: Thinking about work that's happened over the last 5-10 years in this specific space, how does that translate into what can be done on the ground, that is the next iteration of what we should do?
 - Curt: Floodplain emergency planners, etc. a lot can happen in this space. This is a place where we can enhance our work
 - Neil: We could move away from high level technical research space, into translating into implementation space through local actors.
 - Leigh: Climate migration isn't specifically called out in this area, but that's a good area to look at. It will affect all aspects of our work: stormwater, agriculture, more land use development with climate migration, rural lands, wastewater.
 - Eric: We do have climate migration identified in the Thriving Communities section.
 - Curt: In the climate objective, we are still connecting to natural and physical sciences. We have a good handle on the science but not to why local organizations have or do not have the support and capacity to implement what we know.
 - Neil: That is the space we can occupy as a high priority. Non-governmental organizations actively working on easements, etc. Communicating through a climate change lens would be useful.
- Neil: Agrochemicals, we've already seen significant conversation about this topic at various committee levels. I think it is something that we, in terms of understanding how impactful their usage is, should be a high priority in a short timeframe.

- Andrew: It looks like 11-14 might fall in the same category that Neil mentioned at the beginning of this conversation, things already happening in this space.
- Neil: The line about innovative practices, can you clarify what is meant?
 - Matt: What we had in mind was nutrient reduction best management practices. This is not necessarily something LCBP does every year. We focused on it heavily a few years ago, but have done less in the previous few, with some exceptions including like tile drains and stormwater ponds.
 - Neil: Also, soil health, things like FarmPREP.
 - Matt: For soil health, there's a lot of work going on around this topic at the State, including payment for ecosystem services. Maybe this can be in the middle timeframe for LCBP.
 - Neil: I agree and offer that there is activity on both sides of the lake, particularly in terms of the energy in the payment for ecosystem services working group in VT.
- Andrew: I'd push for groundwater modeling as a high immediate priority. There's a long-term gap that someone needs to fill.
 - Matt: It's here because it didn't fit into any other category, it's something we don't understand yet.
- Matt: General contaminants not covered by the Long-Term Monitoring Program. Is this something that should be looped into agrochemicals?
 - Neil: Yes, that is how the conversation started anyways with the Citizens Advisory Committees.

Healthy Ecosystems

- Meg: Reviewed the Healthy Ecosystems table task areas and strategies.
- Leigh: Going back to objective 2b1b, unhighlighted text, if you go down there it basically says that only VT's protective species are looked at, only NY's wildlife management plans.
 - Meg: That's unintentional, we will correct it.
- Bill: The point I was bringing up before about species refugia still applies. Lake trout are great for in-lake indicators, but there's important refugia in rivers for salmon and brook trout. If you are using fishes as bioindicators and thinking about using them to identify priorities for habitat restoration, you should include all.
 - Meg: We can add that information.
 - Bill: It's an important priority to have now; it would overlap with connectivity and riparian priorities. This information could be used to help prioritize projects with other benefits. More dams and culverts than we can afford to work on, this would be good for that. I'm less familiar with actions we'd take to protect refugia within the lake.
 - Matt: We can poll Margaret by email.
- Bill: Row 3, we are doing actions with the UVM project, floodplain connectivity work.
 - Neil: The Functioning Floodplains Initiative, too.

- Bill: I would think this would remain a high priority since floodplains are so important for nutrient removal; they have lots of value outside of the ecosystem component.
 - Neil: They are a huge part of the strategy for nutrient control and long-term passive restoration.
- Neil: With row 4, lots of partner actors working in the soil health space. LCBP should follow that lead.
 - Bill: I agree. I would say high priority again.
- Bill: From a fisheries perspective, we are most interested in headwaters, riparian corridors, and floodplains.
 - Leigh: I agree, and I would translate that to other benefits as well. Sediment movement and water temperature, for example. If we protect those areas, we're doing a lot more.
 - Neil: Protection of headwater habitat is obviously a great thing to do. Should we identify it as a high priority in the short term?
 - Bill: If we prioritize climate change research first, that would help us be better able to prioritize other projects. I would keep high priorities where we have them, then have headwaters and riparian areas as next level priority, then the next one lower for remaining projects.
- Neil: Endangered species projects feel more site-specific, I feel like we underprioritize these projects in the technical budget. We recently funded good assessment work. Maybe we should be putting an emphasis on continuing that tempo, learning from those assessment projects.
 - Bill: Other habitat programs are more landscape scale; these are more site-specific. We could move forward with them before having assessment work complete. Climate impacts would give us high-priority areas to apply across the landscape.
- Bill: For the understanding the food web piece, I would add in thinking about aquatic invasive species impacts, especially fishhook and other species that have come in. This would be a high priority, in addition to natural lake trout coming on. They represent a new piece of the puzzle that puts uncertainty around the levels of forage fish, and how that will impact stocking levels. More information could help avoid a federal listing.
- Meg: Fish community research, also related to food web dynamics.
 - Bill: This is a good one to put under current work. UVM has a new vessel, which will be key to continuing that work more efficiently. The community work is tied to the forage priority up top. We want to differentiate. If we're going to pass out highest priorities, what do you see as overlap here?
 - Meg: Aquatic invasive species impacts are interesting; we also want to look at the potential impacts of species that aren't here yet. That wouldn't be covered in the existing fish community monitoring project.
 - Bill: Sea lamprey was about alternatives to control.
 - Meg: That's a piece of it, also if we better understand the status of the forage fish community, it helps inform our thinking on sea lamprey control.

- Bill: I like how this could help cover different species impacts under climate change because of the overlap in spawning windows as a climate effect. I would rank this one as medium. There is some overlap, but there are also novel parts associated with this. There's lots of funding going to related topics already, especially around sea lamprey management work.
- Meg: Line 15, reducing fragmentation for native species.
 - Neil: This is already an active area of management. It's well covered, I don't think we need to prioritize it any more than what is already occurring. I want to tie back to Oliver's comment on the enhancement and protection grant program. Nutrient money won't be available for culvert or dam work.
- Meg: Evaluating ecosystem management programs and policies.
 - Curt: I think this is one that deserves a lot of consideration and enhancement. We have new programs and policies focusing on aquatic invasive species, and penalties for transfer, but we don't know how the public perceives those policies or how effective they are. The challenge is there's often a time delay after policy implementation. Evaluations need to be considerate of that and focus on multiple benefits. I'm wondering if placement of this topic in the Healthy Ecosystems category puts too fine a point on what those evaluations are supposed to do, since they are multiple value policies. There might be another place to put this, but I think it's a super important goal. I don't know how we define the difference between policy and program. I think it's important work, we want to understand the value of investments being made, both by LCBP and state and local governments. This is how we improve those policies and programs. We can only improve what is measured, so it needs to be measured.
 - Neil: I agree on this line and direction. The priority is important, but when we do it doesn't necessarily need to be immediate. There's lots of governance changes happening right now, but those will take time to take root. Towards the back end of this implementation should be when we put a press on evaluation. That doesn't take away from the importance, I'm just considering timing.
 - Curt: I agree, but also evaluation is always something that's easy to push off. It's difficult when weighted against the urgency of other needs. I don't know in this context how to make it a looming need.
- Bill: Aquatic invasive species work is part of the core, funded work of LCBP. It's a high priority. It's just a matter of which new parts of these would be relatively higher than the others.
- Meg: Early detection monitoring for invasives, rapid response to invasives, installing barriers on canals, managing existing populations, conducting aquatic invasive species outreach. This is one of my highest priorities.
 - Eric: Rows 16 and 17 seem like they are something that would be high priority. Response to new aquatic invasive species infestations would be high priority, but as needed.
 - Neil: For conducting monitoring, the pivot that we're making is a good example of that. We are using eDNA technology now. If we have people doing that

monitoring, any tools we can put in their hands to monitor additional taxa is high priority.

- Bill: In the canal, we have options of ways to decrease the probability that a species can make it into Lake Champlain. Other monitoring might just be giving us a heads up that new species are here. We have a management option in the canal, which makes it a higher priority to me. That's only an option until the species comes in or the barriers are implemented. The canal work is really high priority in my mind.
- Meg: 18, coordinate with regional and national programs. This is ongoing and part of my job description. Do not think it needs more resources. We will continue this work.
- Neil: For the canal barrier, you are looking at a 2-year timeframe to raise local match, correct?
 - Meg: Correct.
 - Eric: We need to find that match sooner rather than later.
 - Neil: I wonder whether the state Revolving Loan Funds are an option. Money becomes the property of the borrower, so it's no longer considered federal dollars.
 - Eric: That's an interesting idea. We can discuss that with the Army Corps.
 - Meg: What we used in section 542 counts as non-federal dollars.
 - Neil: A high priority activity could be to get a conversation started with both states.
 - Curt: This is a high priority and should be maintained. We would fall behind and never be able to regain ground if we don't continue resourcing this work.
- Meg: Boat launch steward program. We have a recommendation to increase the number of stewards and to add another decontamination station on the VT side. This work is ongoing. It's well-resourced on the NY side too.
 - Neil: We should have the conversation we discussed earlier about funding schema to increase the availability of decontamination stations on the VT side of the lake.
- Meg: Manage existing populations, conducting aquatic invasive species outreach. If you stop funding either, you can see huge rebounds in populations. I think this needs to remain high priority.
 - Bill: Thumbs up, we should continue to support this.
 - Leigh: There's an interest in doing work around boat launches, should that be included here?
 - Meg: It could be. We have some good ideas about that since we have growth of certain populations right at boat launches. A benefit of investing in management of populations around boat launches is that we can track whether it's working or not, since we have 15 years of data around launch areas.
- Meg: Aquatic invasive species outreach. We do have a strong program on watercraft inspection. We need to expand it to make it more interpretable to different types of communities, and expand the languages we release information in.
 - Neil: Clarification on spiritual releases?

- Eric: Some religions have spiritual events in which they release animals or fish as part of an event.
- Bill: This should be a medium priority since the states also have an outreach component. We are already targeting specific threats through the boat steward program and other outreach. If we identify other components, those can be highest priority. This could be a medium priority with the idea that all of these are supposed to move forward in the next five years.
- Leigh: I do know of reports where people have been going to markets in NYC, collecting live organisms, then releasing them. Expanding to 'intentional' releases might be better phrasing.

3. Final report review and approval: Quantifying phosphorus retention in restored riparian wetlands of the Lake Champlain Basin (*Drs. Eric Roy, Adrian Wiegman, Kristen Underwood, and Breck Bowden, UVM*)

- Eric Roy presented.
- Neil: This work is absolutely incredible. I'm wondering about the relationship between anaerobic conduction, soils underlying soils redox flip would retain their anaerobic state?
 - Eric: I think lab conditions best reflect winter conditions as the lights are turned off. Dissolved oxygen stays lower than spring conditions. It's a good representation to what is happening in field. I'm glad we did this both ways, it captures different dynamics in different seasons.
 - Adrian: We didn't measure redox in soils, we measured oxygen in the water column. If you're assuming that phosphorus mass transfer is occurring in surface waters, then you're interested in the oxygen levels of surface waters.
- Matt: Was that last plot included in your final report?
 - Eric: We can include it; it may have been part of Adrian's dissertation.
- Matt: Such an amazing project, it's fun to see what you've come up with. You are summarizing one of the main findings of modeling, relevant benefits of retention, upstream phosphorus concentrations. In your executive summary you indicate that retention is positively correlated with upstream total suspended solids. I follow you there, that's supported. Concerning the following sentence in the summary about upstream watershed management, when you refer to an increase in legacy phosphorus, are you referring to the relative importance of soluble reactive phosphorus, or do you mean there will be more soluble reactive phosphorus release due to low concentrations?
 - Eric: Both. Soluble reactive phosphorus dynamics are driven by soil water gradients. If we decrease the amount of soluble reactive phosphorus in the water column by doing better upstream management, that potentially uncaps the instream phosphorus load. At our site we didn't see much difference, but soluble reactive phosphorus concentrations were higher. As you decrease soluble reactive phosphorus concentrations, that can potentially create conditions where more soluble reactive phosphorus can be released by soils. It's an unfortunate fact.

- Matt: I need to spend a lot more time with the report, but do you explain the relative tradeoff there? For x amount of concentration reduction in the river, how much would that be released in the wetland?
- Eric: We can try to make that clearer, but it's in the report. We present scenarios. Net retention at one site switches from negative to positive based on that change.
- Matt: Maybe that can be as simple as explaining a scenario in the executive summary.
- Dan: You mention that some of these sites had had restoration done several years ago. I'm with one of the Clean Water Service Providers, is there a way to get a report on how wetland restoration work was done?
 - Eric: We have summarized that information in the report,
 - Emily: This is an opportunity. We need to process your research more, but we would love to know from a tracking perspective how we can operationalize this report for tracking and formula grant work. We can follow up on that.
 - Eric: That is what we are trying to achieve with the Functioning Floodplains Initiative work. The way we built model, if we have information on soils, hydrology, and the water quality of a river, we can come up with reasonable estimates for phosphorus reduction. We are currently working with a host of folks to create a tool that incorporates science and data and can give a number for estimating phosphorus retention. That allows us to not treat all projects the same.

Motion: To approve the project final report pending a 14-day comment period from TAC.

By: Jenn Callahan

Second: Leigh Walrath

Discussion: none

Vote: all in favor

Abstentions: Andrew Schroth

4. Discussion and feedback: International Joint Commission Lake Champlain – Richelieu River flood study

Debbie Lee and Curt Gervich presented key findings and draft recommendations from the Lake Champlain – Richelieu River Flood Study. Participants were asked to respond to the following questions:

1. Do you think that this recommendation is (will be) acceptable to (residents, lake-related businesses, recreationalists and environmentalists, local/state governments) in the basin? Why or why not?
2. Do you think that this recommendation can be feasibly implemented by local, provincial, state and federal governments and agencies? Why or why not?
3. What obstacles to implementation do you foresee?
4. What plans, programs, or communication and coordination needs to fall into place in order for implementation to occur smoothly?

5. What can federal, state and local governments do to increase the potential for successful implementation of this recommendation?

Theme 1 (Structural Solutions) Discussion

- Neil: The cost of these measures does not seem prohibitive, funds could be raised by the governments.
- Eric: Lakeshore residents are highly concerned about flooding. Further away from the lakeshore, interest diminishes.
- Leigh: I don't see any obstacles to implementation by the governments. Permitting of a project like this will depend on who does it. It would be built in Canada, so no US permitting is necessary.
- Matt: I imagine there'd be some resistance to altering the hydraulic system. The Study could communicate that there are already alterations in the system and part of this plan is to bring it back to a more natural state.
- Leigh: I'm not sure where the numbers came from for the economic forecast. One of the proposals is on the cusp as to whether it's economically beneficial or not. Has the quickly changing economic forecasts/inflation been factored in?
 - Bill Werick: We looked at uncertainties, which are clearly an issue in general for major projects. The costs for final construction can vary throughout the lifetime of a project. The first option is more robust than the other one because it provides additional benefits.

Theme 2 (Watershed Storage) Discussion

- Neil: This fits with part of VT's river corridor management. They've invested in developing modeling tools to move rivers towards equilibrium, reduce downstream flooding risk, etc. There is a healthy investment of state and federal funds towards watershed storage.
- Curt: This would provide added support to the keep doing what you're doing.
- Neil: There's good support for prioritization of projects, and a balance of spending dollars to manage those sectors. The IJC recommendations would incentivize this investment. Challenges to continuing this work include landowner interest and approval to modify land that is currently held. The report could recognize this difficulty.
- Meg: Talking about obstacles- lakeshore owners would ask how much watershed storage would impact flooding for them. You need to explain how it benefits owners and those downstream as well, especially in terms of drought benefits for recreation and launching. Thinking about how this might impact aquatic invasive species, I don't see an impact from just a weir, and a diversion to the north should not impact organisms in Lake Champlain.
- Matt: Clarifying question you're suggesting continuing restoration and protection of wetlands, but advising against invest in that work for the purpose of reducing lake levels during flooding?

- Curt: Discouragement of protection for lake levels isn't included in the recommendation.
- Matt: Wetlands provide many other benefits at the tributary level (tributary flood mitigation). I know that's not what the Study is focused on, but it will be on people's minds. Keep that in mind for communications. I don't foresee an issue in recommending that currently protected wetlands continue to be protected.

Theme 3 (Forecasting/Emergency Response) Discussion

- Neil: new modeling tools will be of high interest to all sorts of lake users. This will help us in the future with other types of studies
- Matt: There will be a lot of interest for lakeshore property owners
- Neil: Upkeep of these tools will need to be done by federal agencies.
- Matt: I don't see any obstacles to implementation.

Theme 3 (Climate Change) Discussion

- Neil: Communities have learned a lot from the 2011 flood, new measures have been put in place since then. States are in a better place than they were.
- Matt: Has the study looked at the distribution of impacts from flooding in the US and Canada? Impacts were greater in Canada, there's less interest in shoreline preparedness in the US.
 - Eric: Irene and Lee in NY were a bigger deal for different US communities than the spring 2011 flood. I don't think there were that many lakeshore communities affected by Irene and Lee up north.
 - Bill: At the level of the 2011 flood, most of the damages were in Canada. Looking at megafloods, you see US damages increase as areas that have not faced flooding previously would be flooded.

Theme 4 (Floodplain Management) Discussion

- Neil: Here's an opportunity to provide an emphasis to local municipalities on work they could be doing.
- Eric: Those communities affected by flooding will have an interest in floodplain management policy change.
- Matt: There's differences between shoreline communities and those in a floodplain. Floodplain communities contribute to the flooding downstream, shoreline communities are impacted by what happens upstream.
- Neil: There are already developed communities in floodplains. From a general perspective, the state has regulations around the development of floodplains. The appetite for municipalities to adopt floodplain protections is not universal, and there's a long process of education to get select boards to do this work.
- Matt: Lake shoreline properties might be very high value; floodplains might be homes of people who have fewer resources to relocate.

- Andrea: This is a complicated issue. You're correct that in the past, the communities most impacted by flooding have been located on marginal land that is cheap. Hinesburg attempted to adopt floodplain regulations, there is still development happening in the floodplain because conditional use allows developers to say they are protecting those individual houses from flooding. Continued development in the floodplain compromises the ability of the floodplain to properly function. The floodplain is really part of the river corridor, rivers are part of the public trust. Floodplain regulation should be a state law.
 - Curt: Have you seen an example of a community willing to tackle that?
 - Andrea: No, I haven't. I thought we had that in Hinesburg, but I was proven otherwise. Flat places in the floodplain are easy to develop. I'm not sure if other communities have been more successful.
- Leigh: For permitting at the Adirondack Park Association, when an applicant comes in, they propose to develop in a location and we can approve or deny the application. We have no authority to look at a different property in the community. If the applicants are engineering for an 100-year storm, it's difficult to deny the permit. There's pressure to get things approved – the system is not set up to push development out of floodplains.
- Neil: Watershed division folks have been involved with the IJC study - some positive outreach to them would be helpful.
- Eric: Work with regional planning commissions in Vermont, County planning in NY to make sure they're on board with these approaches/ maps.