

IJC Lake Champlain – Richelieu River Flood Study



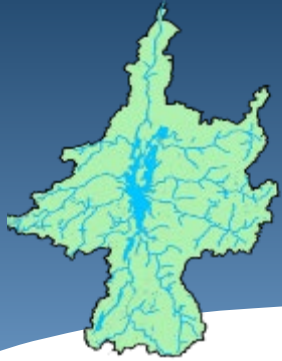
Fisk Point – Isle La Motte, VT; Lake Champlain Basin Program

Update to the NYCAC

November 30th, 2020

Mae Kate Campbell, US Study Manager

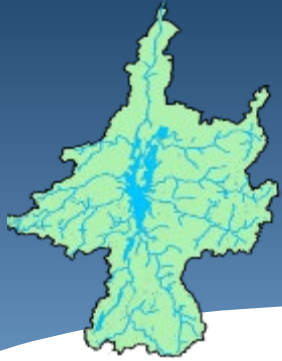




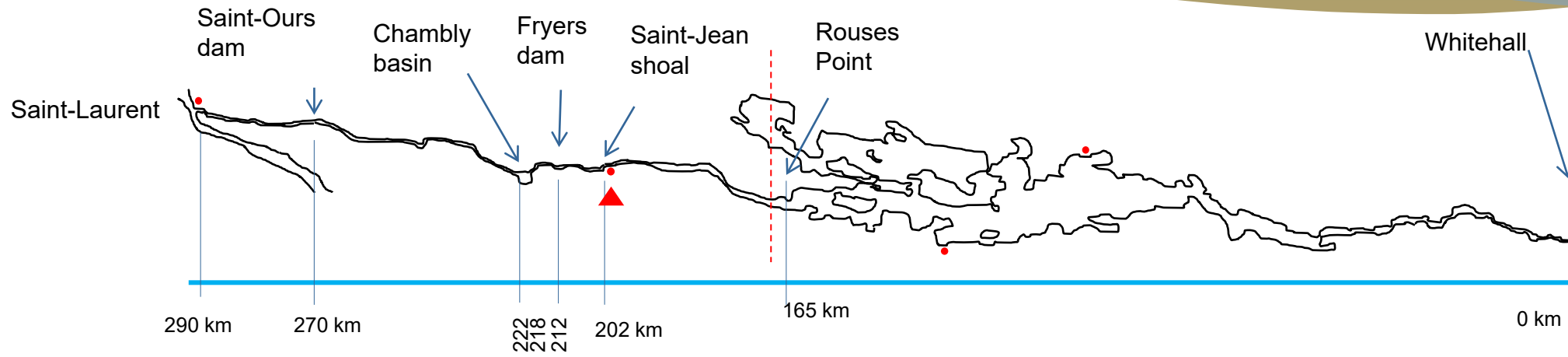
The IJC commissioned this study, which has several areas of focus

- Causes and impacts of past floods
- Floodplain best management practices
- Flood adaptation strategies
- Advance binational flood forecasting
- Potential flood management and mitigation measures
- Social and political perception to measures

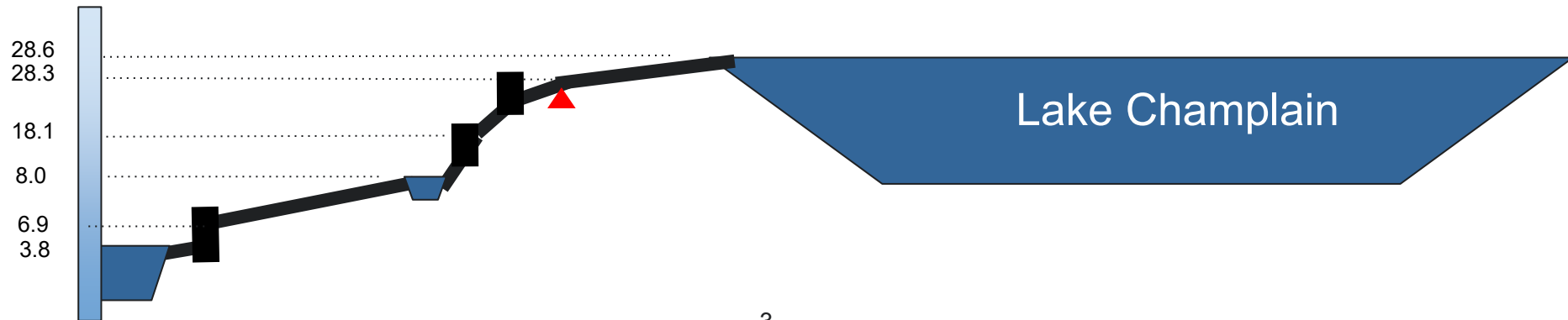


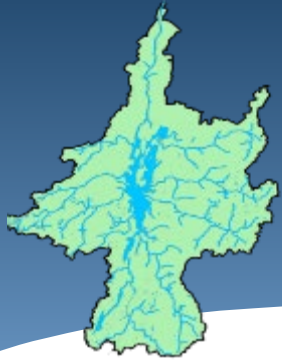


Lake and River Profile



Élévation (m-NAVD88)

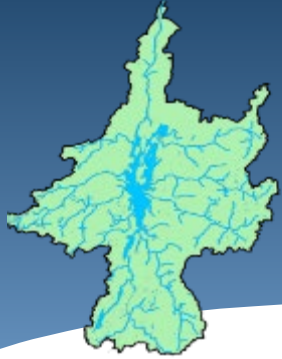




Study explores a range of flood mitigation solutions to reduce flood levels and build resiliency

- **Goal 1: Reduce high water levels and limit flooding impacts**
 - Reduce flood water levels with structural solutions
 - Impede water inflows to the lake by enhancing wetlands or storing water
- **Goal 2: Reduce flooding vulnerability and build flood resiliency**
 - Enhance flood response capabilities
 - Improve floodplain management
- Final recommendations will include results from all four areas of focus and will be provided to the governments in 2022

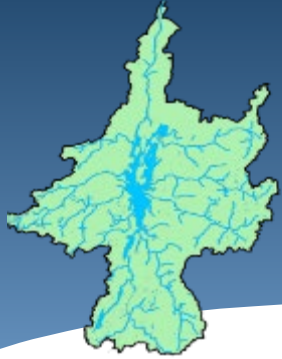




To reduce water levels, six possible structural alternatives have been investigated

1. Dredge at Saint-Jean shoal to remove obsolete man-made structures
2. Divert water through the Chambly Canal during floods
3. Combine parts of 1 and 2
4. Install a fixed submerged weir 6.8 miles upstream from Saint-Jean-sur-Richelieu
5. Install an inflatable weir at the same upstream location
6. Install an inflatable weir at Saint-Jean Shoal

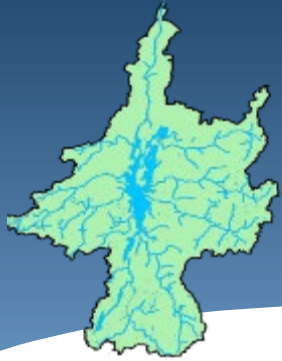




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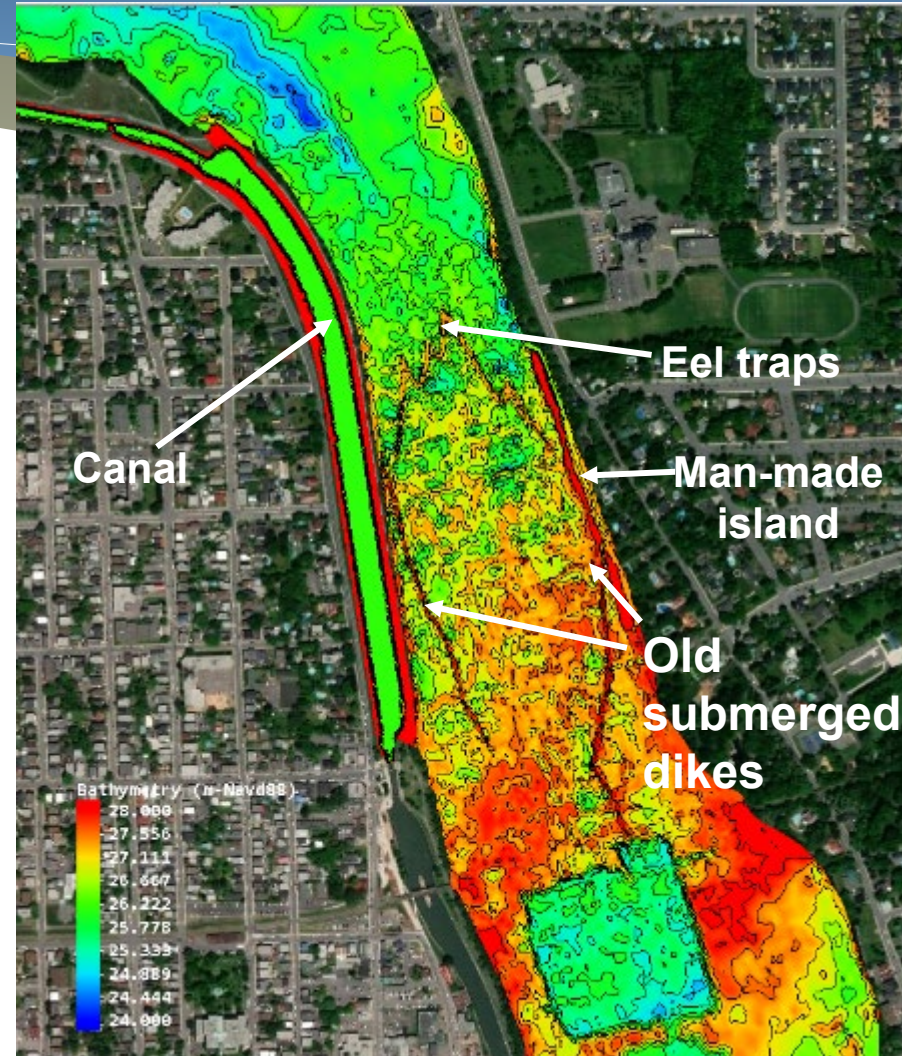
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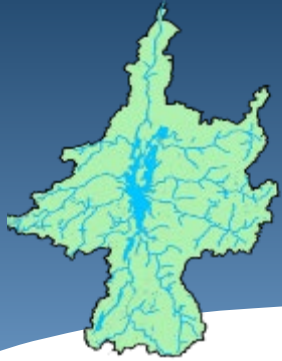




Removing Man-Made Structures and/or Diverting Water through the Chambly Canal

- Removing obsolete man-made structures from the river could reduce water levels during a 2011-sized flood by 6 cm on the Lake
- Diverting water through the Chambly Canal could reduce water levels by 15 cm
- Implementing parts of both solutions would reduce water levels by 12 cm

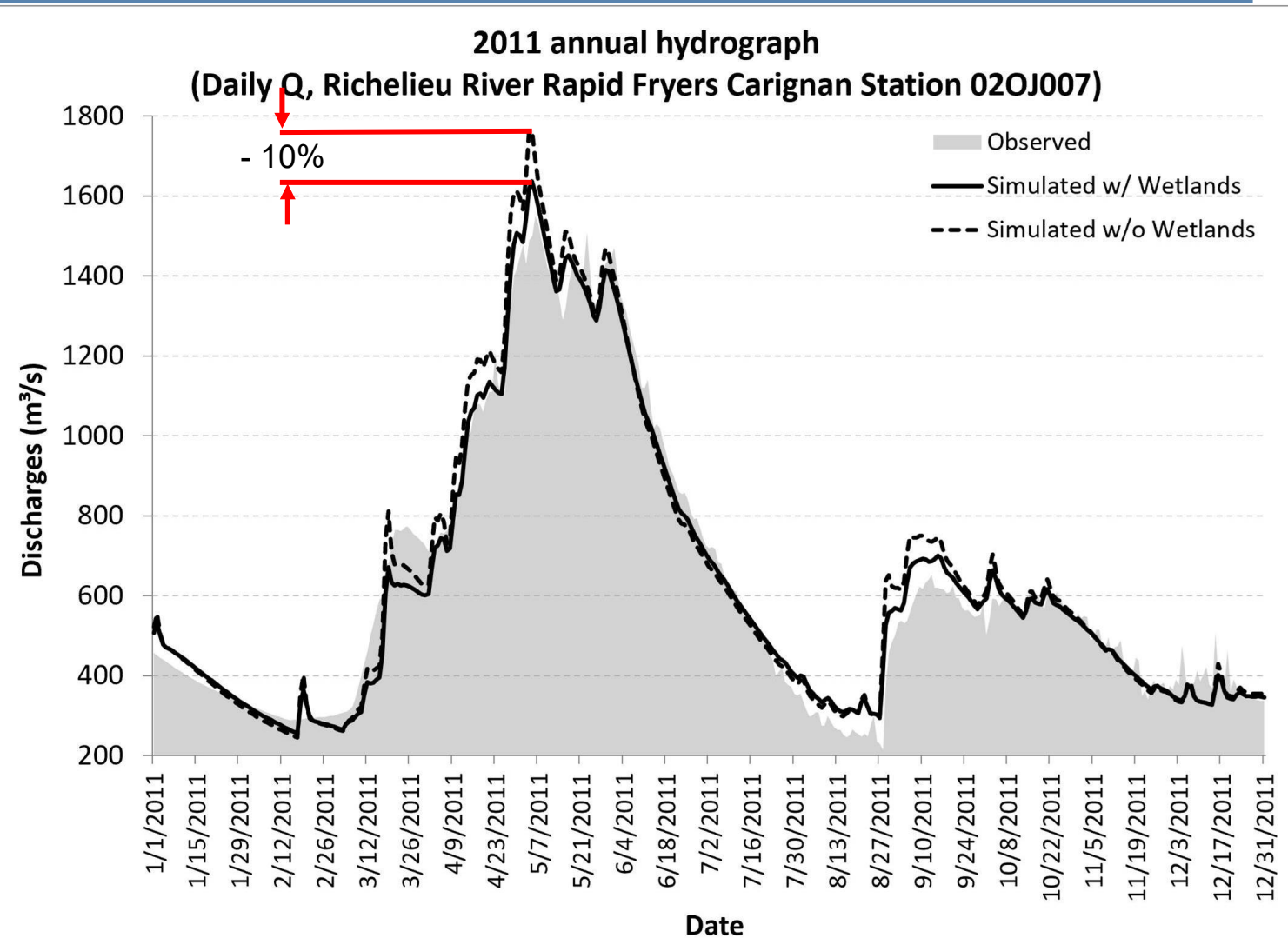


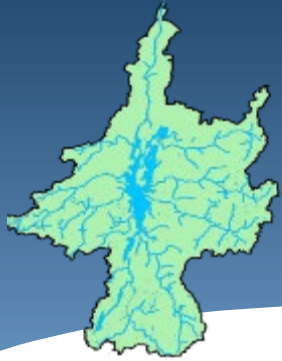


Enhancing wetlands in upland locations is unlikely to reduce Lake or Richelieu River flooding

Nonetheless:

- Existing wetlands are key in natural regulation
 - Reduced spring 2011 maximum flood flow by 10%
- Critical to preserve existing wetlands





Improving flood prediction and emergency preparedness capabilities

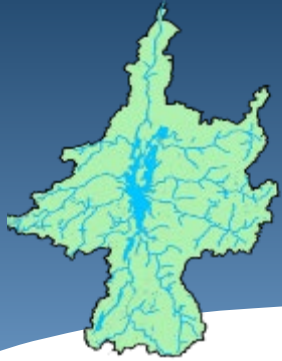
- Developing and will make recommendations to implement operational, real-time forecasting and flood inundation mapping system
- Surveyed the public regarding risks
- Analyzing hazard mitigation plans
- Researching early warning systems
- Planning workshop with emergency response coordinators and modelers to ensure a proper needs response (*delayed due to COVID-19*)



2018 Vermont State Hazard Mitigation Plan

Making Vermont safer and more resilient in the face of climate change and natural disasters

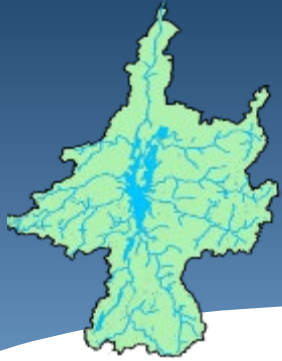




Improving floodplain management

- Study will develop tools (e.g., numerical models, databases) to determine different flood exposure scenarios and vulnerabilities
- Tools will help local stakeholders assess the best way to manage floodplains
- Experts are suggesting floodplain best management practices
 - Flood risk maps
 - Better communication of flood risk
 - Management of floodplain occupancy
 - Development of flood insurance programs
- Study Board will review ideas and recommend the most promising

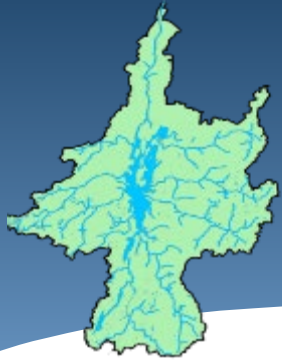




Social acceptability and political feasibility of flood mitigation measures were assessed in the US

- More concerns expressed about tributary flooding than lakeshore flooding
- Political representatives desire improved flood predication capabilities and communications
- Households that had experienced flooding had a higher perception of the risk of flooding than households that had not
 - However, most households had taken no action to reduce risk even if a high risk of flooding
- TV, radio and word of mouth via neighbors are primary sources of flood hazard information for residents
- Hazard Mitigation Plan analysis: lakeshore flooding not a concern at any level of gov't; focus of plans is on maintenance of infrastructure (e.g., roads, bridges)

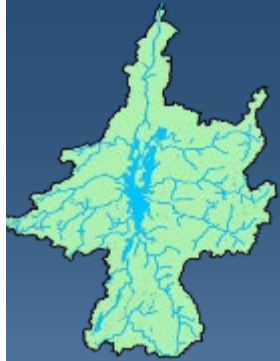




Where to Learn More About the Study

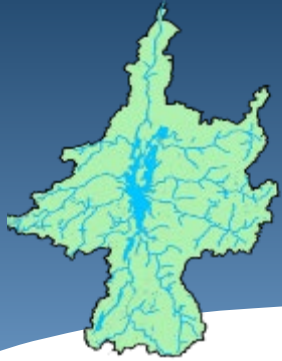
- Study website: ijc.org/lcrr
 - Reports like the Causes and Impacts of Past Floods
 - Short, informational videos about the Study's work
 - Sign up for the bi-monthly newsletter
- Watch recorded webinars on technical aspects of the Study (on the website) or register for remaining webinars:
 - How the Study is assessing climate change: 12/2 @ 10am
 - The Chambly Canal diversion: 12/9 @ 10am
 - Floodplain management considerations: 12/16 @ 10am
 - Results of the risk perception surveys, vulnerability work and other social science studies: January TBD





Questions?





Possible structural alterations have potential to decrease water levels in the river and lake

Alternatives	Flood relief at record high (2011)	
	at SJSR	in Lake Champlain
1: Dredge shoal to remove obsolete structures	9 cm	6 cm
2: Divert water through Chambly Canal	30 cm	15 cm
3: Parts of 1 and 2	23 cm	12 cm
4: Install fixed submerged weir upstream of SJSR	113 cm	40 cm (or more)
5: Install inflatable weir upstream of SJSR	113 cm	40 cm (or more)
6: Install inflatable weir at the SJSR shoal	44 cm	27 cm



IJC links:

- Real time flood inundation mapper:
<https://fim.wim.usgs.gov/fim/>
- Recorded technical webinars and other Study videos:
<https://www.ijc.org/en/group/8/videos>
- Sign up for remaining technical webinars:
https://ijc.org/en/lcrr/virtual-technical-webinars-lake-champlain-richelieu-river-study?_ga=2.198088239.1094292752.1606945236-1049360478.1579025704
- The Causes and Impacts of Past Floods report:
<https://www.ijc.org/en/lcrr/causes-and-impacts-past-floods-lake-champlain-richelieu-river-basin-historical-information>