

International Lake Champlain- Richelieu River Flood Mitigation Study

Lake Champlain Citizens Advisory Committee
October 16

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International Lake Champlain-Richelieu River
Study Board

Groupe d'étude international
du lac Champlain et de la rivière Richelieu



Today's Presentation

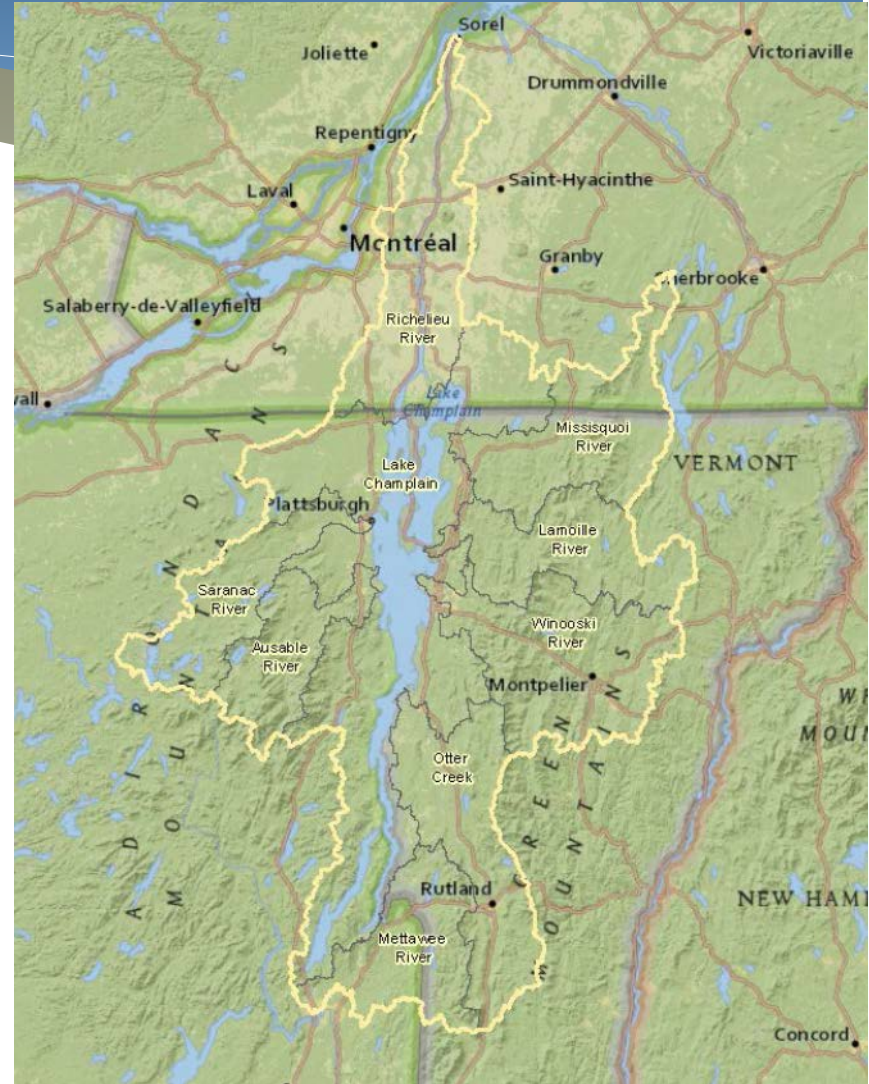
- Why are we doing this study?
- What do we want to accomplish?
- What we are proposing
- Your input and awareness is critical



This Study



- Being conducted by the International Joint Commission (IJC)
- Equally shared responsibility of the US and Canadian governments
- \$12.5 million over five years
- A broad and diverse study involving many experts and stakeholders
- Recommendations to be made to the governments

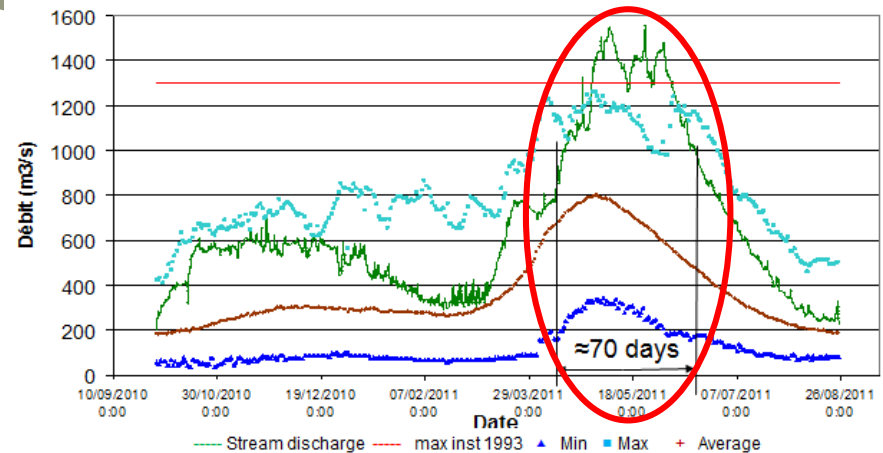


Floods of 2011



- 2011 lake levels and flows in the Richelieu River were the highest on record
- A combination of spring snowmelt and rainfall gave rise to an extended flooding event
- Impacts much greater in CA
- Long history of flooding and IJC involvement

Richelieu à Fryers, Débit





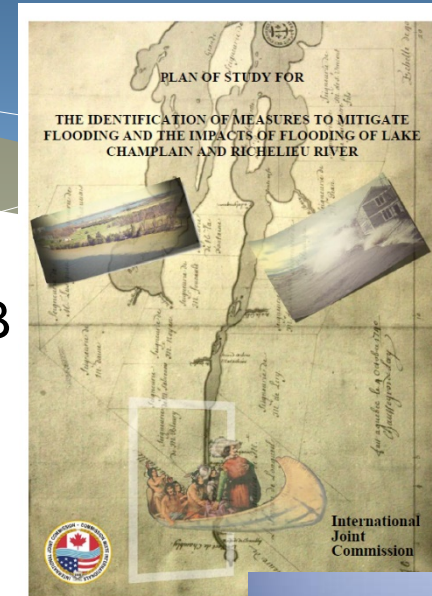
IJC Following the 2011 Flooding

2013 Plan of Study

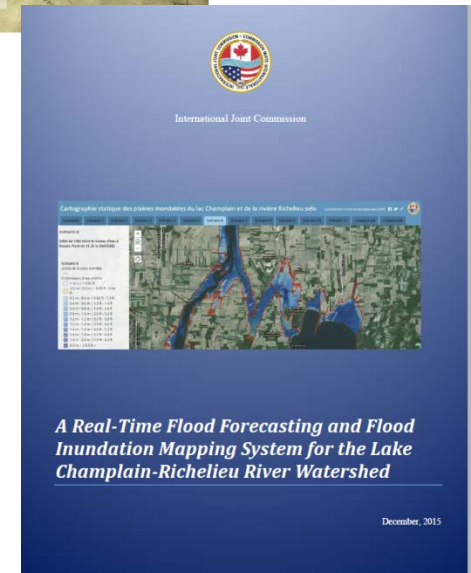
- Out of the 3 options proposed, Option B was selected

2015 Reference

- Better defined future flood forecasting system
- Gathered data; modeled lake and upper Richelieu River
- Produced initial static inundation maps



http://www.ijc.org/en_/Lake_Champlain_Basin



Starting the LCRR Flood Mitigation Study



- In 2016, US and Canadian federal governments instructed IJC to conduct Option B in the Plan of Study
- Funding for the study has been provided by both governments
- For the past 9 months a governance structure was set up and technical experts were identified
- A 5 year work plan was prepared





Objectives of the LCRR Study

The study has 3 main objectives:

- Recommend measures – structural and otherwise - to mitigate flooding
- Develop a real-time flood forecasting and flood mapping system for further implementation.
- Assess public opinion on the flood mitigation measures





Governance Structure

Independent Review
Group (IRG)

Study Board (10 members)
IJC support

Public Advisory
Group (PAG)

Study Managers (1 Canada, 1 U.S.)
Secretariat support
IJC Communication support

IM / IT Support Group

Social, Political
and Economic
Analysis Group

Hydrology,
Hydraulics and
Mapping
TWG

Resource
Response
TWG

Flood Management
and Mitigation
Measures TWG





Public Advisory Group (PAG)

Role

- Advise the Study Board on public consultation, involvement and information exchange;
- Serve as a conduit for public input to the study process and for public dissemination of study outcomes;
- Provide feedback on Study Board approaches, reports, products, findings and conclusions as requested; and
- Advise the Study Board on the effectiveness of the study process in addressing public concerns.

PAG members will be asked to draw on their knowledge, contacts and experience to provide informed input to the study.





Secretarial Duties

Lake Champlain Basin Program – US



Lake Champlain Basin Program

Organisme de bassin versant de la Baie Missisiquoi - CA





Option B of the Plan of Study

U.S. and Canadian Governments require this study to:

1. Evaluate the **causes and impacts** of past floods, with a focus on the event of 2011.
2. Develop and make recommendations for an **operational, real-time flood forecasting and flood inundation mapping system** for Lake Champlain and the Richelieu River.
3. Evaluate **strategies for managing future water levels** and flows based on possible extremes in water availability.
4. Assess benefits of floodplains and related **best management practices**.





Option B of the Plan of Study (cont.)

U.S. and Canadian Governments require this study to:

5. Understand **current social and political perceptions** regarding structural and non-structural flood control measures.
6. Assess how flood control and mitigation measures (structural and non- structural works) influence lake and river levels and their **impacts on important resources of the system** (wetlands, wildlife, fisheries, recreational, domestic, industrial and municipal uses of water, shoreline and floodplain built environment, and agriculture).
7. Develop a **decision support tool** to evaluate how measures impact water levels, **resources** and **society** in the LCRR system. This would support the evaluation and ranking of flood mitigation solutions.



Major Work Plan Components

How are we planning to deliver – the science

Numerical Modeling of the LCRR (weather, climatology, hydrology, hydraulics)

- Develop hydrologic and hydrodynamic modeling to support study activities
- New lake and tributary water level and flow data, meteorological data
- Meteorological modeling of basin/region
- 2-dimensional modeling of Lake and Richelieu River
- Assess possible Lake and River conditions during potential future conditions





Major Work Plan Components

How are we planning to deliver – the science

Evaluating causes/impacts of past floods, esp 2011 flood

- Hydro-meteorological analysis of past floods
- Social, political, economic and public health perspectives
- How ecological and economic resources impacted

A report presenting this work is an early first product.





Major Work Plan Components

How are we planning to deliver – the science

In-depth Study of Current of Social & Political Perception of Flood Mitigation Measures

- Assess existing info on social/political/economic impacts on floods
- Vulnerability/resiliency assessment of local communities
- Risk perception analysis





Major Work Plan Components

How are we planning to deliver – the science

Development of a Collaborative Decision Support Tool

- Selection performance indicators to evaluate resource responses to flood mitigation/management measures
- Inventory important water users/uses
- Analyze the shoreline/built environment/agriculture to help establish stage-damage relations.
- Create an integrated tool for determining flood impacts on critical resources - include social/political/economic
- Develop performance metrics for selected flood mitigation measures
- Create the Collaborative Decision Support Tool





Major Work Plan Components

How are we planning to deliver – the science

Assess structural and non-structural measures to mitigate and manage flooding

- Inventory potential flood management/mitigation measures/literature review
- Engage stakeholders/decision makers and identify jurisdictions involved in flood management/mitigation/extensive outreach
- Assess and prioritize various mitigation measures with performance metrics
- Engineering feasibility assessments/hydrologic modeling of how measures impact lake/river levels
- Cost/benefit analysis of measures





Major Work Plan Components

How are we planning to deliver – the science

Develop a bi-national flood forecasting and flood inundation mapping system for future operational forecasting

- Finalize operational Lake and River level/flow models
- Create a real-time flood inundation mapping system
- Determine an appropriate governance mechanism for long-term operations of the binational forecasting and mapping system





How can you get involved?

Public and stakeholder participation

Public participation

- At public meetings
- Electronically, through <http://www.participateijc.org/Champlain-Richelieu>
- Through the PAG Co-Leads (Lesley-Ann Dupigny-Giroux and Madeleine Papineau)



Technical and elected-officials stakeholders

- Elected officials are getting involved
- Public servants, experts, etc. are welcome

Keep yourself informed on the Study's progress:
http://ijc.org/en_/LCRR





LCRR Flood Study – Next Steps

- Initiate new studies and work based on the recently completed Study Work Plan
- Complete a Public Engagement Plan and set goals for this year (1 or more annual public meetings)
- Produce initial products so the public and stakeholders see progress
- Complete all activities by Fall, 2021





Take home message

The Study Board, after conducting its investigations, which includes engaging the public and stakeholders, will make recommendations to the International Joint Commission on measures to mitigate flooding and improve flood forecasting and real-time mapping.



Thank you!



Fisk Point – Isle La Motte, VT; photo courtesy of the Lake Champlain Basin Program





Lake Champlain and Richelieu River

- 23,899 km² (9,227 mi²) of which 84% is in the United States and 16% is in Canada
- The 2011 Flooding
 - 4,000 homes were damaged
 - about \$90M in damages
 - 79% were recorded in Quebec (QC), 10% in Vermont (VT) and 11% in New York (NY)
 - More than 30 municipalities were directly affected

