International Niagara Board of Control

2015 Open House

Niagara Falls, ON
September 10, 2015

Presentation Outline

1. Introduction to the International Joint Commission, International Niagara Board of Control/International Niagara Committee (INC)
2. Overview Great Lakes water levels and Niagara River flows
3. Chippawa-Grass Island Pool Operations
4. 2014-15 Ice Season
5. Measurements of discharge conducted for the Board
6. Horseshoe Falls recession
7. Questions/ Discussion

Introduction to the International Joint Commission

1909 Boundary Waters Treaty between U.S. and Great Britain (on behalf of Canada)

- **Provides mechanism for prevention and resolution of water disputes**
- **Created the International Joint Commission (IJC)**
  - Jurisdiction over and approval of the use, obstruction, or diversion of Boundary waters
  - Investigation and reporting

International Joint Commission

Canada

Mr. Gordon Walker, Chair

Hon. Benoit Bouchard

Mr. Richard Morgan

United States

Ms. Lana Pollack, Chair

Mr. Rich Moy

Ms. Dereth Glance

Transboundary Waters

Introduction to the International Niagara Board of Control

International Niagara Board of Control

Niagara Board's Area of Responsibility

Board Membership

The Board is currently comprised of two members from Canada and two members from the U.S. with a broad diversity of expertise and interests

United States Section

BG Richard Kaiser, Chair
U.S. Army Corps of Engineers

Mr. Stephen Durrett, Alt Chair
U.S. Army Corps of Engineers

Mr. William Allerton, Member
Federal Energy Regulatory Commission

Canadian Section

Mr. Aaron Thompson, Chair
Environment Canada

Ms. Jennifer Keyes, Member
Ontario Ministry of Natural Resources and Forestry

Secretaries

Mr. Arun Heer
U.S. Army Corps of Engineers

Mr. Derrick Beach
Environment Canada

Working Committee Composition

The working committee supports the Board and INC

United States Section

LTC Karl Jansen, Chair
U.S. Army Corps of Engineers

Mr. Keith Koralewski, Alt. Chair
U.S. Army Corps of Engineers

Ms. Lori Gale
New York Power Authority

Mr. Gerald Cross
Federal Energy Regulatory Commission

Canadian Section

Dr. Frank Seglenieks, Chair
Environment Canada

Ms. Joan Frain
Ontario Power Generation

Mr. Jonathan Staples
Ontario Ministry of Natural Resources

Dr. Herman Goertz
Environment Canada

Niagara River Water Diversion Treaty 1950 and the International Niagara Committee

In order to preserve the scenic beauty of the Falls, the Treaty of 1950 stipulated that no water diversions would be allowed that would reduce the flow of water over Niagara Falls as follows:

- No less than 100,000 cubic feet of water per second (ft^3/s) from April 1st to September 15th (inclusive) between 8 a.m. and 10 p.m. and 50,000 ft^3/s at any other time.
- No less than 100,000 ft^3/s from September 16th to October 31st (inclusive) between 8 a.m. and 8 p.m. and 50,000 ft^3/s at any other time.
- No less than 50,000 ft^3/s from November 1st to March 31st (inclusive)

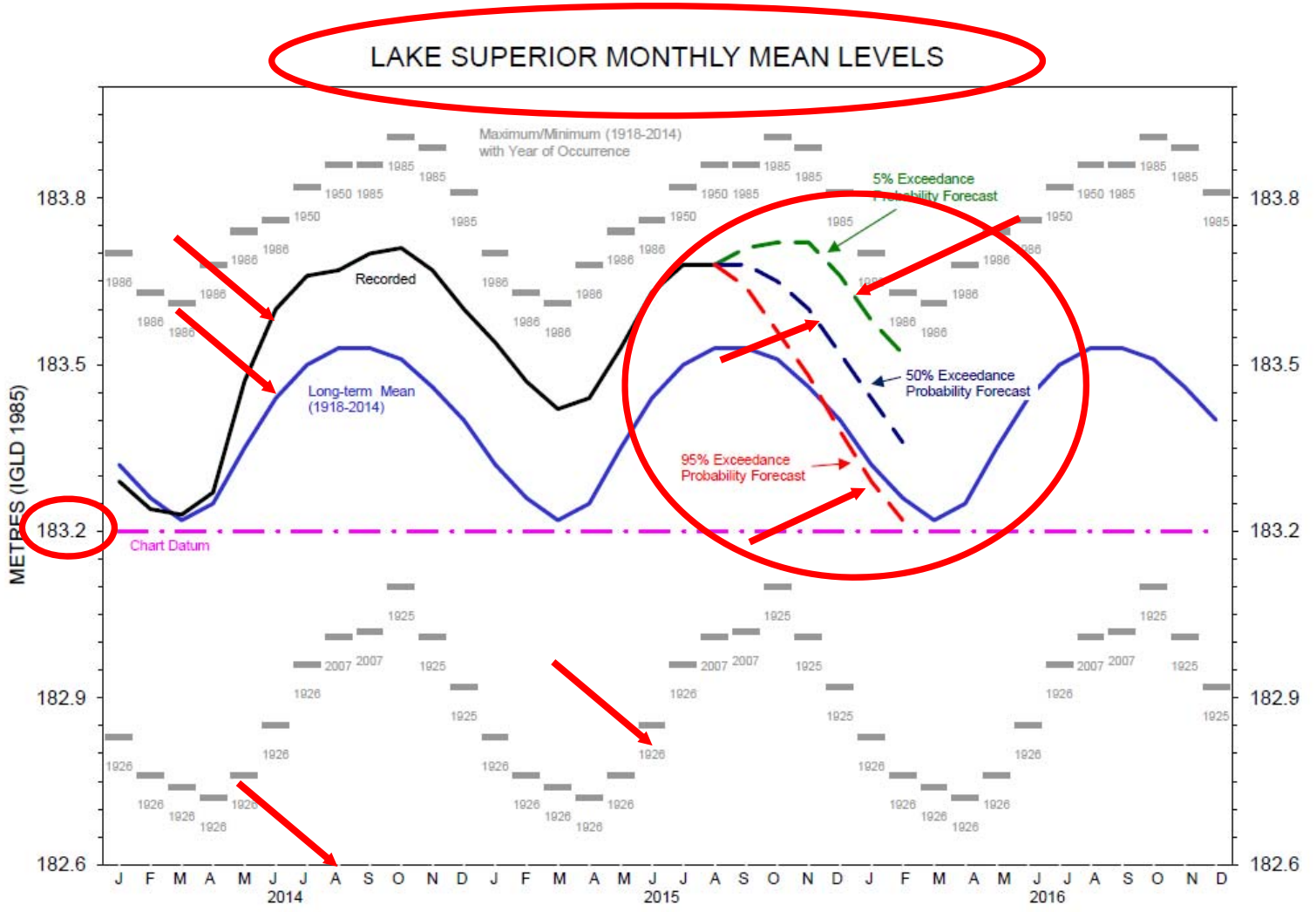
100,000 ft^3/s = 2832 m^3/s 50,000 ft^3/s = 1416 m^3/s

International Niagara Committee

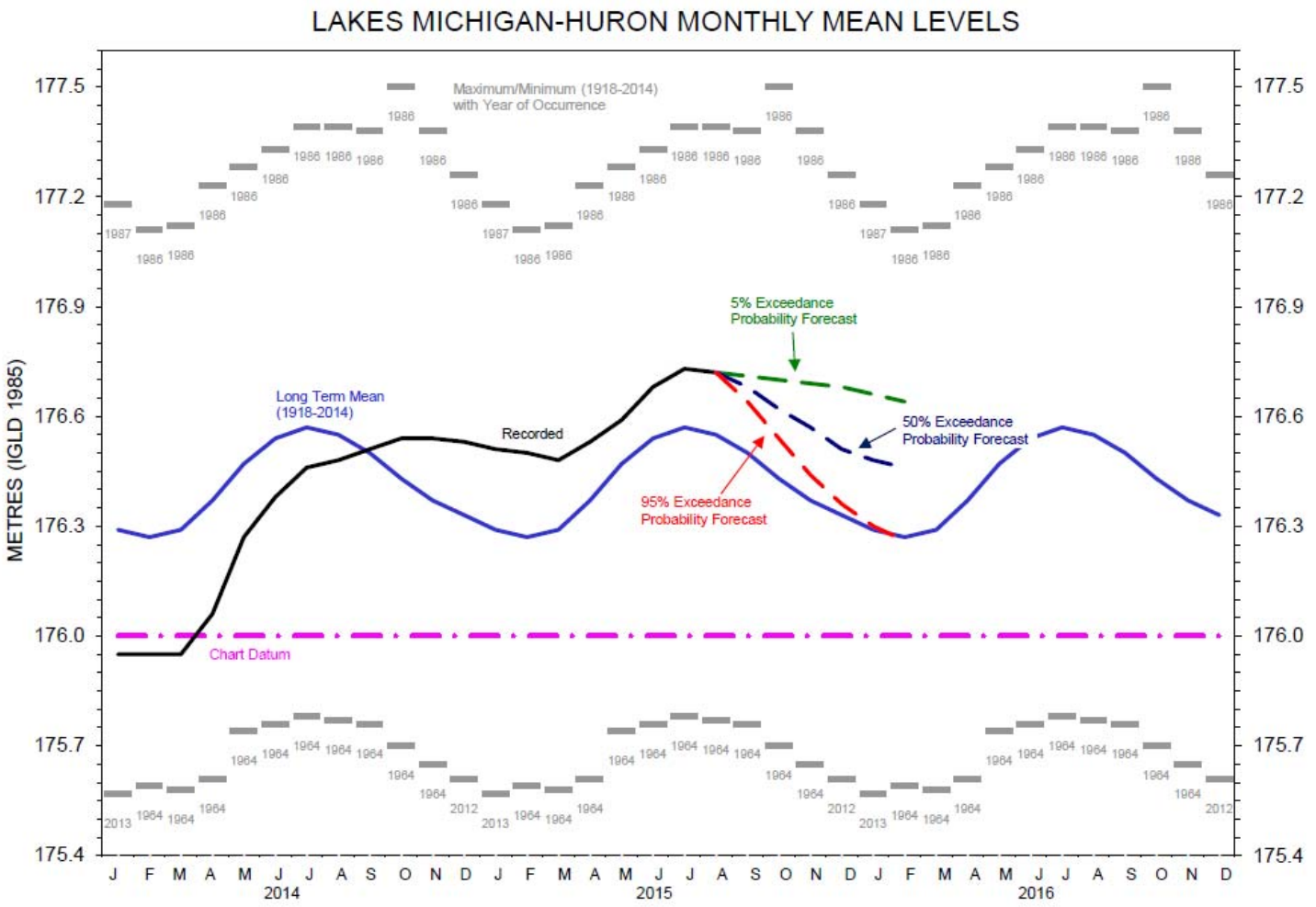
Canada	United States
Aaron Thompson	BG Richard Kaiser
Member	Member
Dr. Frank Seglenieks	LTC Karl Jansen
On-site Representative	On-site Representative
Derrick Beach	Arun Heer
Secretary	Secretary

Great Lakes and Niagara River Conditions

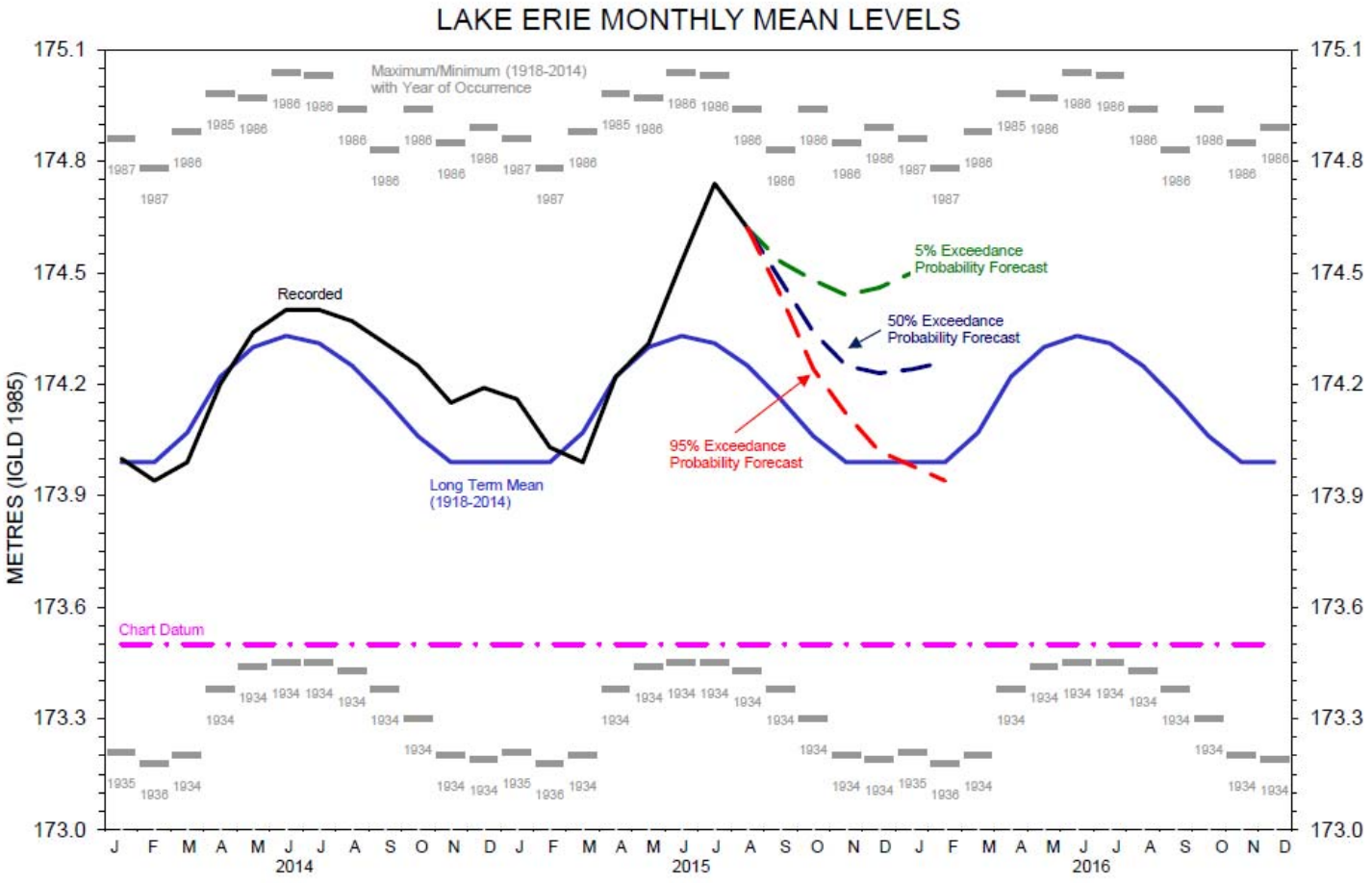
Lake Superior Water Levels



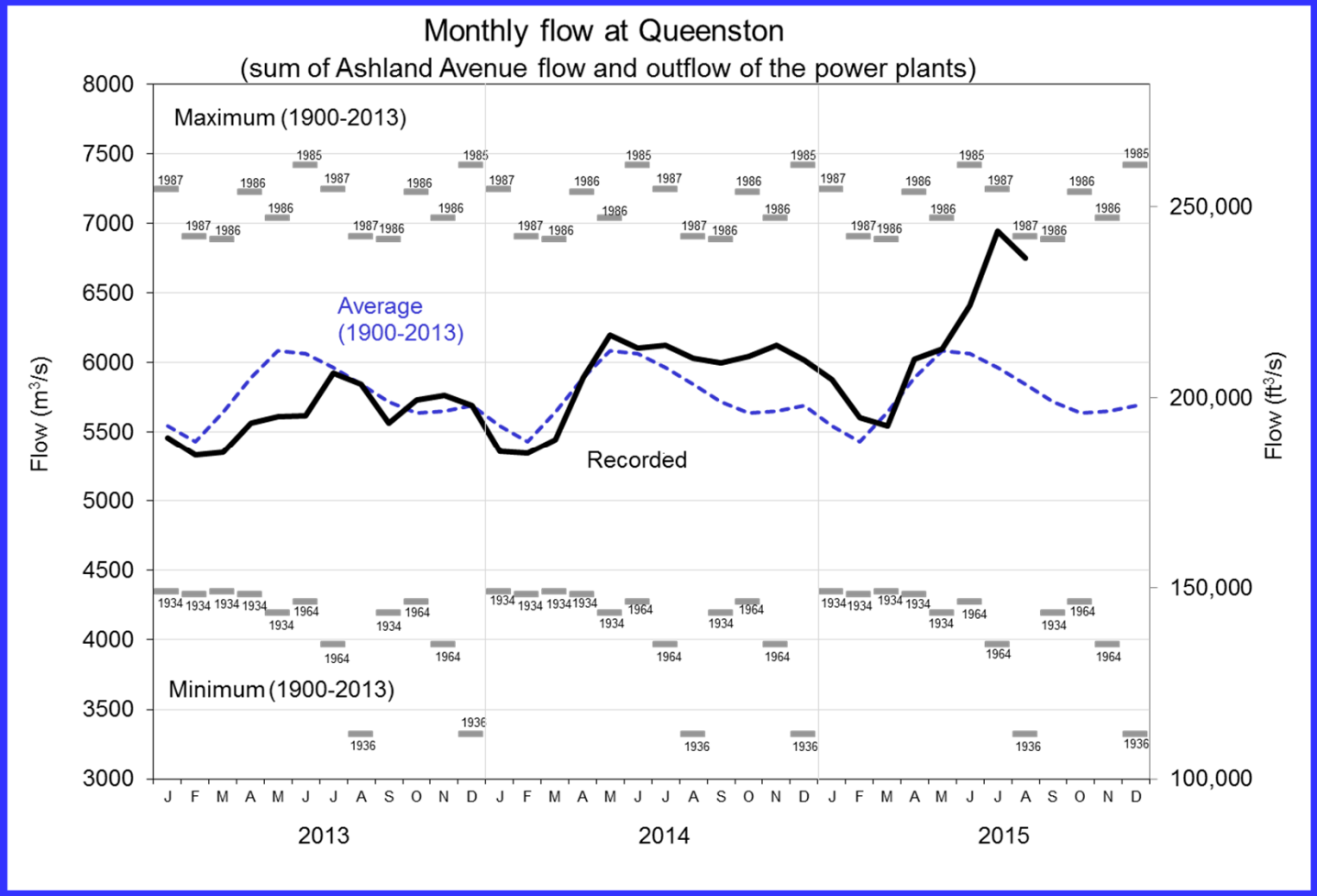
Lake Huron/Michigan Water Levels



Lake Erie Water Levels

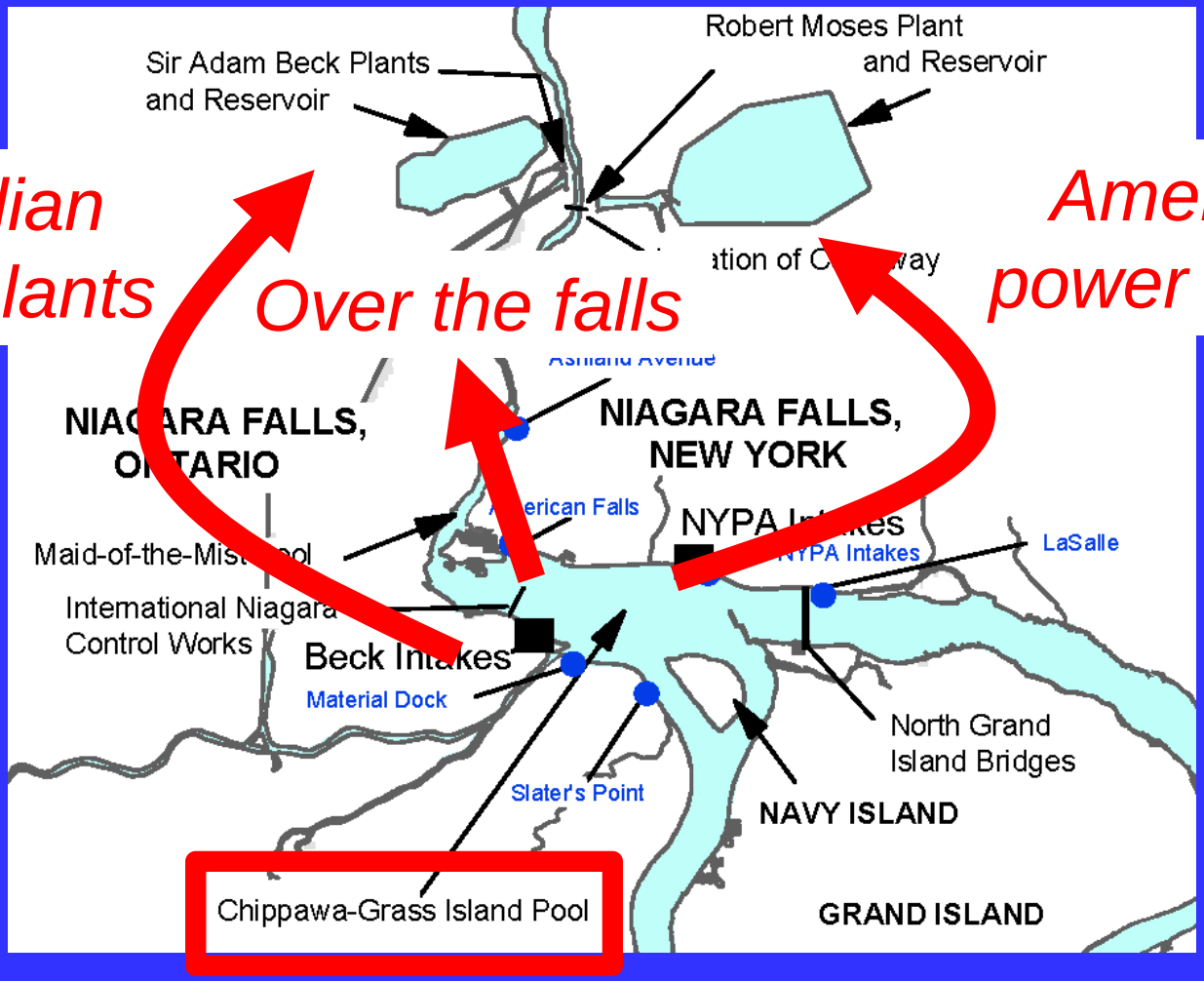


Niagara River Flows



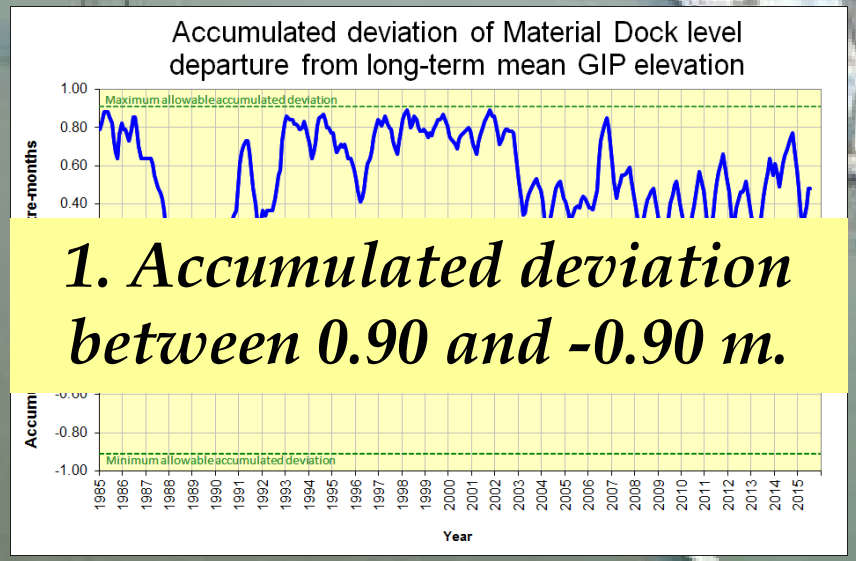
Chippawa- Grass Island Pool Operation

Water in the Chippawa-Grass Island Pool (CGIP) can only leave in one of three ways:



International Niagara Control Works

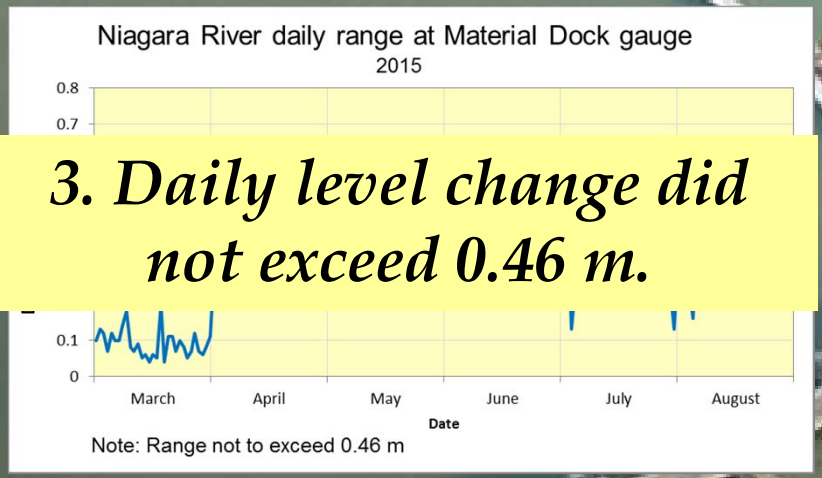
The four GIP tolerances set out in the 1993 directive:



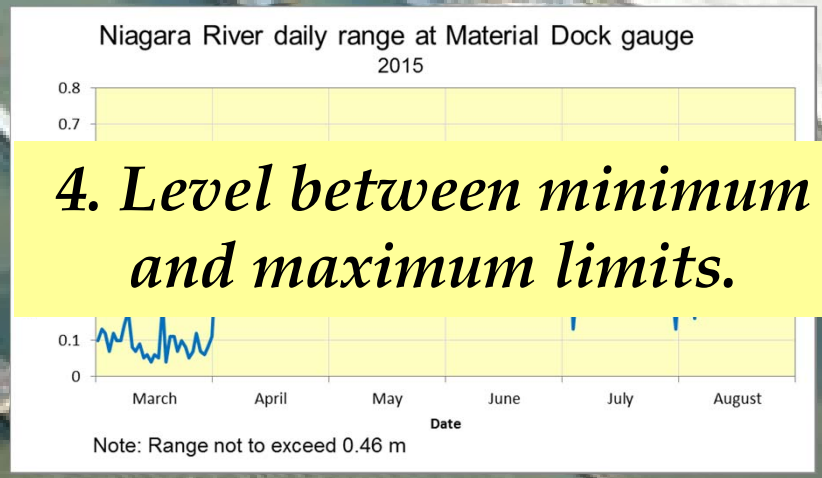
1. Accumulated deviation between 0.90 and -0.90 m.

Month	Change in monthly mean level (m)
June	0.02
July	-0.03
August	-0.01

2. Monthly change did not exceed 0.15 m.



3. Daily level change did not exceed 0.46 m.



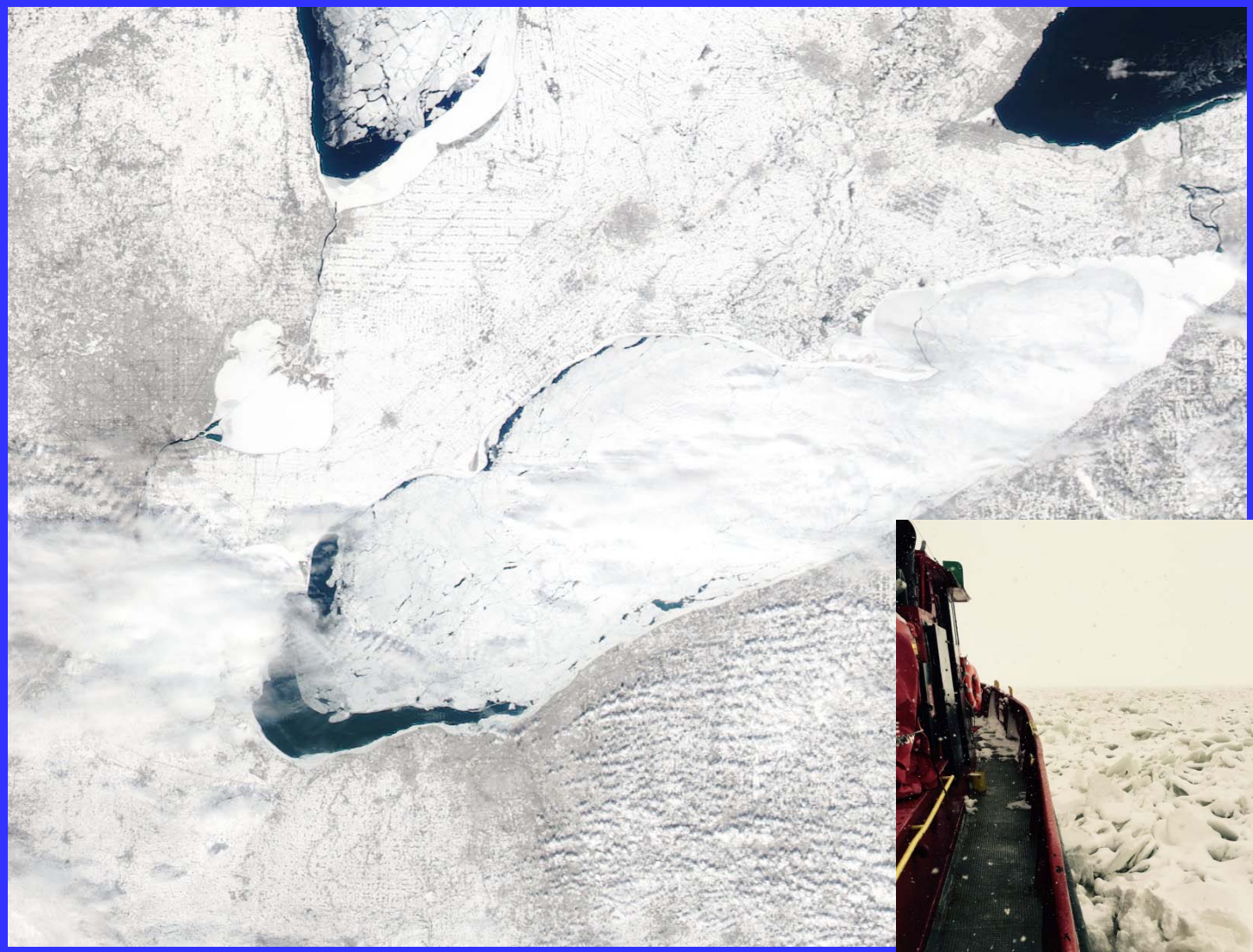
4. Level between minimum and maximum limits.

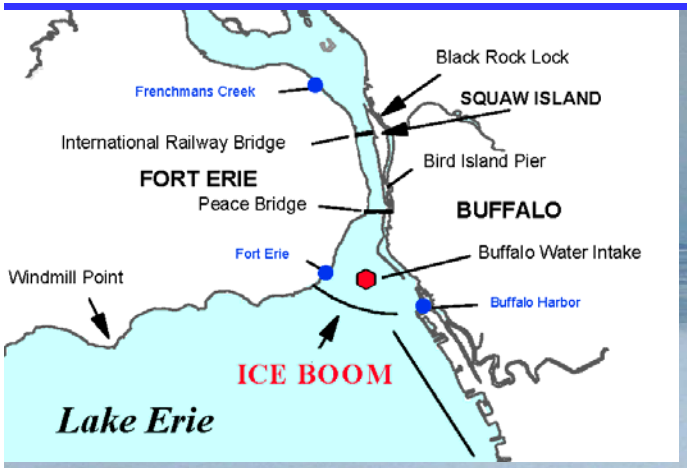
Chippawa-Grass Island Pool Operations and Emergency Actions

The flow over Niagara Falls went below the minimums set by the 1950 Niagara Treaty 2 times since the last public open house:

- April 22, 2015 at 1 pm – This violation was a result of a rescue operation by the Niagara Parks Police
- July 20, 2015 at 8 am – This violation was a result of a search and rescue operation by the New York State Parks Police

2014-15 Ice Season





Lake Erie-Niagara River Ice Boom

First installed in 1965

Designed to help form and sustain a natural ice arch at the mouth of the Niagara River

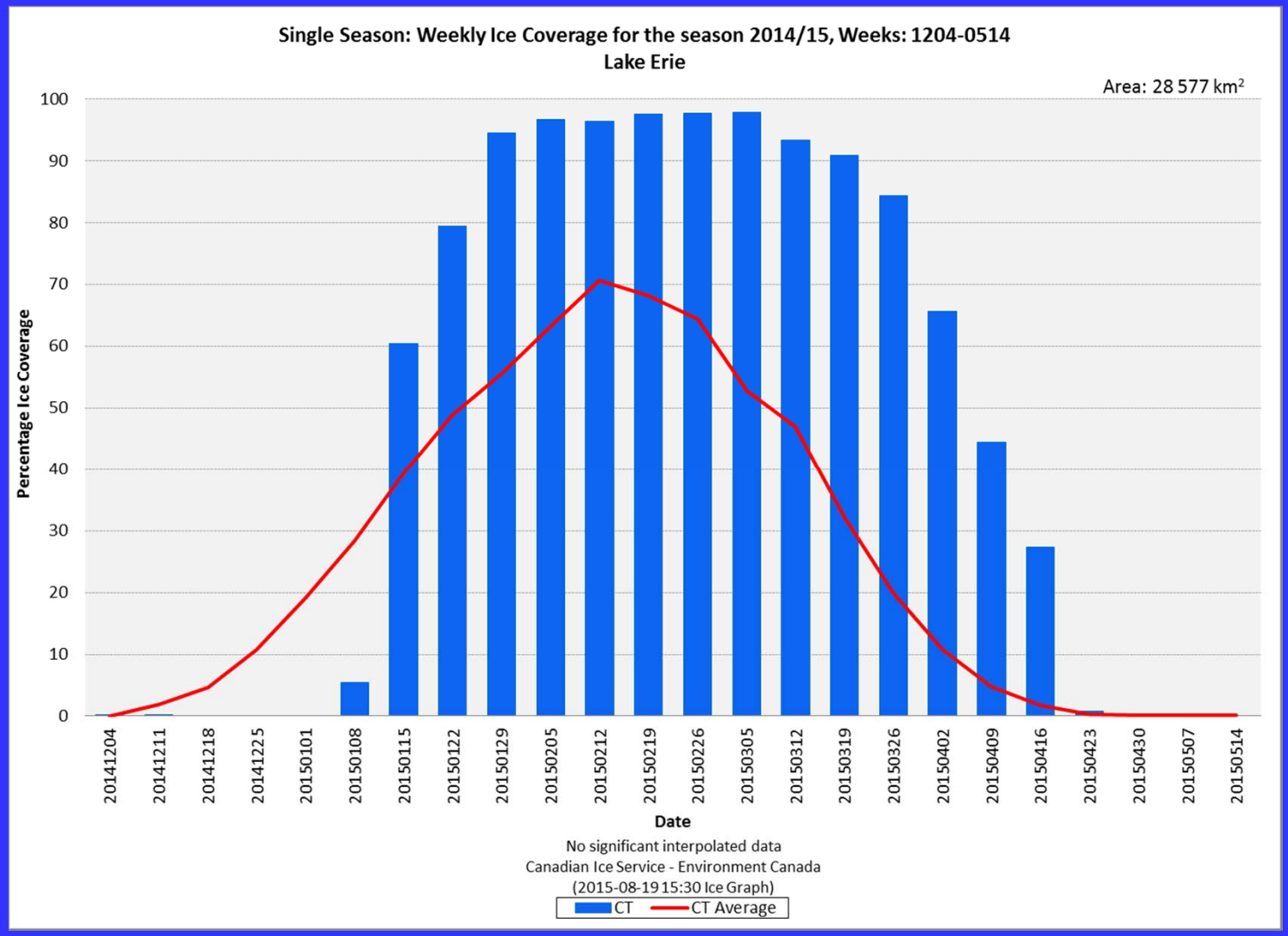
Minimizes power losses caused by ice at the intakes in the CGIP

Lake Erie-Niagara River Ice Boom Installation

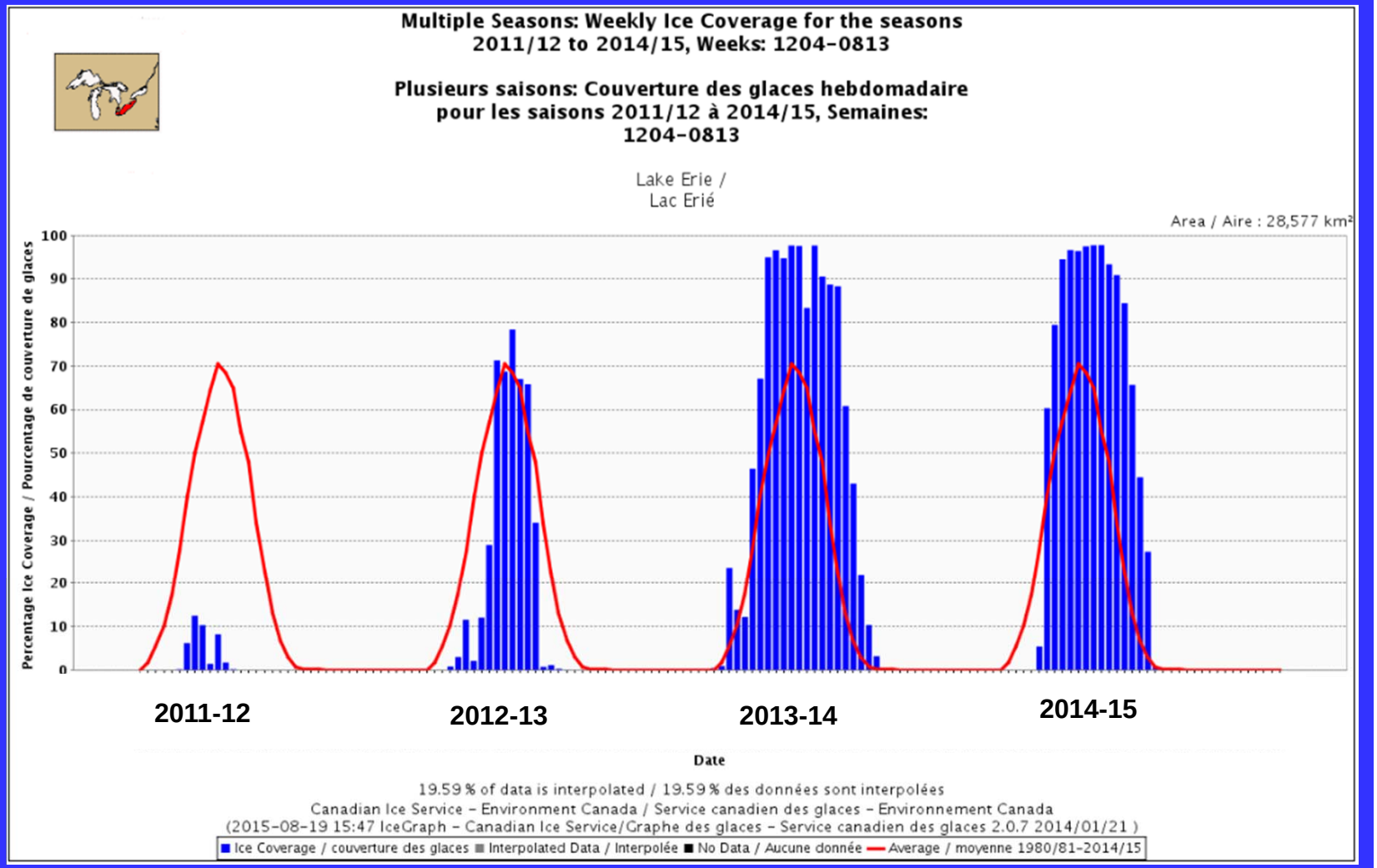
In the order of approval, the ice boom may begin to be installed when the Lake Erie water temperature reaches 4°C (39°F) or on December 16, whichever comes first.

- *Lake Erie water temperature was 4°C (39°F) on December 5 allowing the ice boom to be installed*
- *However, as a result of poor weather conditions, pontoons were installed from Dec 15 to Dec 16*
- *During the operation of the ice boom, broken spans were repaired from Jan 12 to Jan 18*

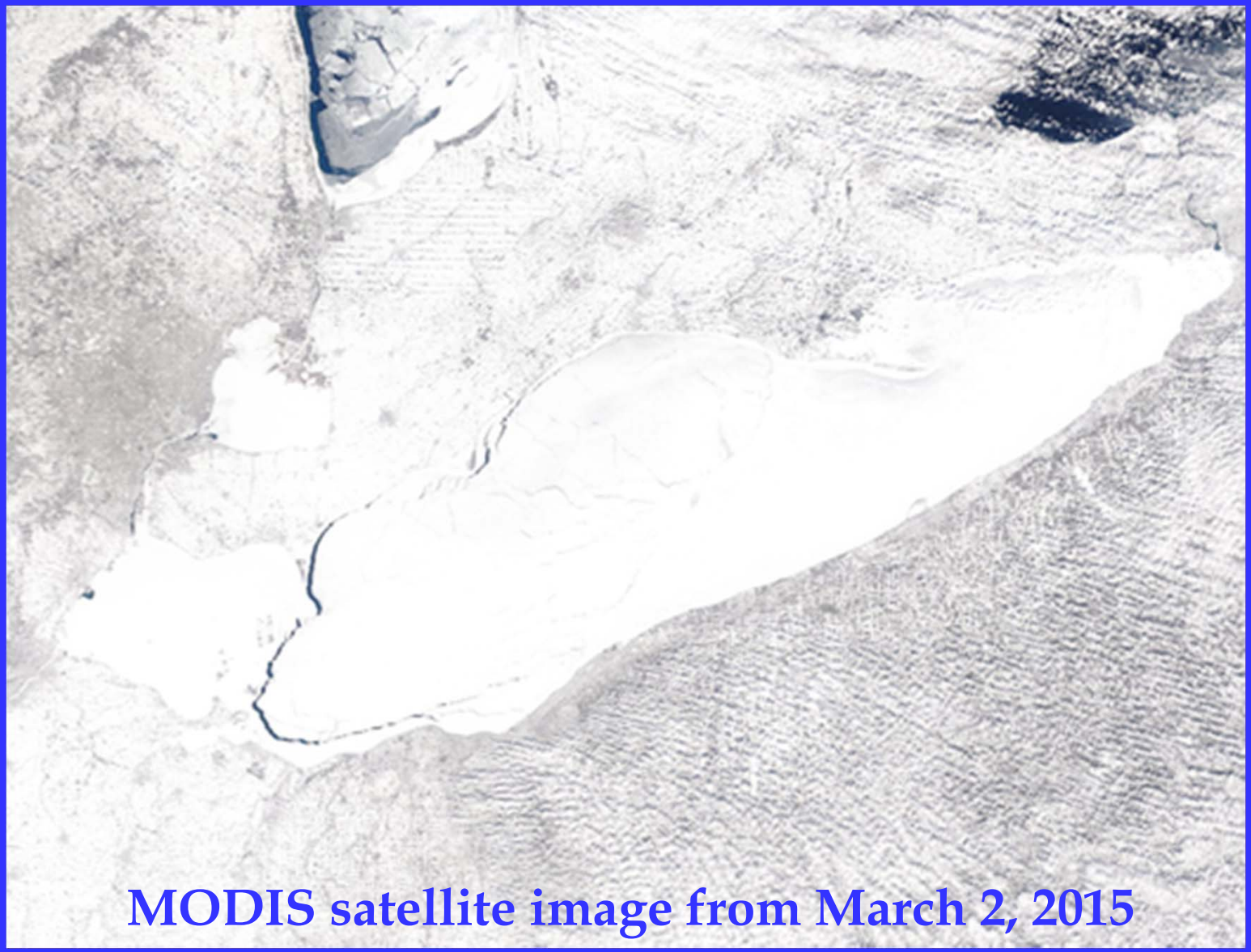
Lake Erie Percent Ice Cover by Week



Recent Ice Cover by Season

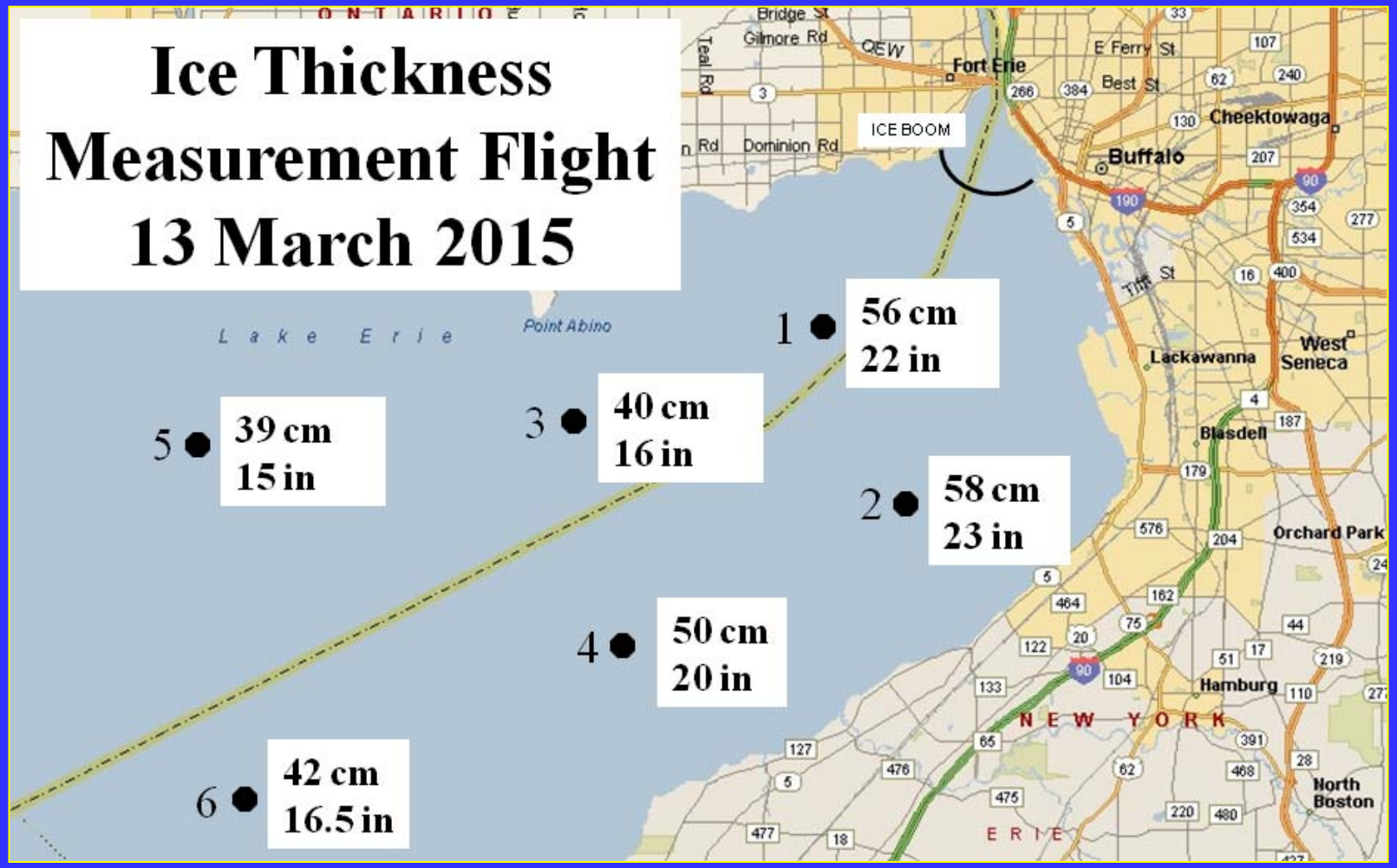


Ice Monitoring Activities 2014-2015 Season

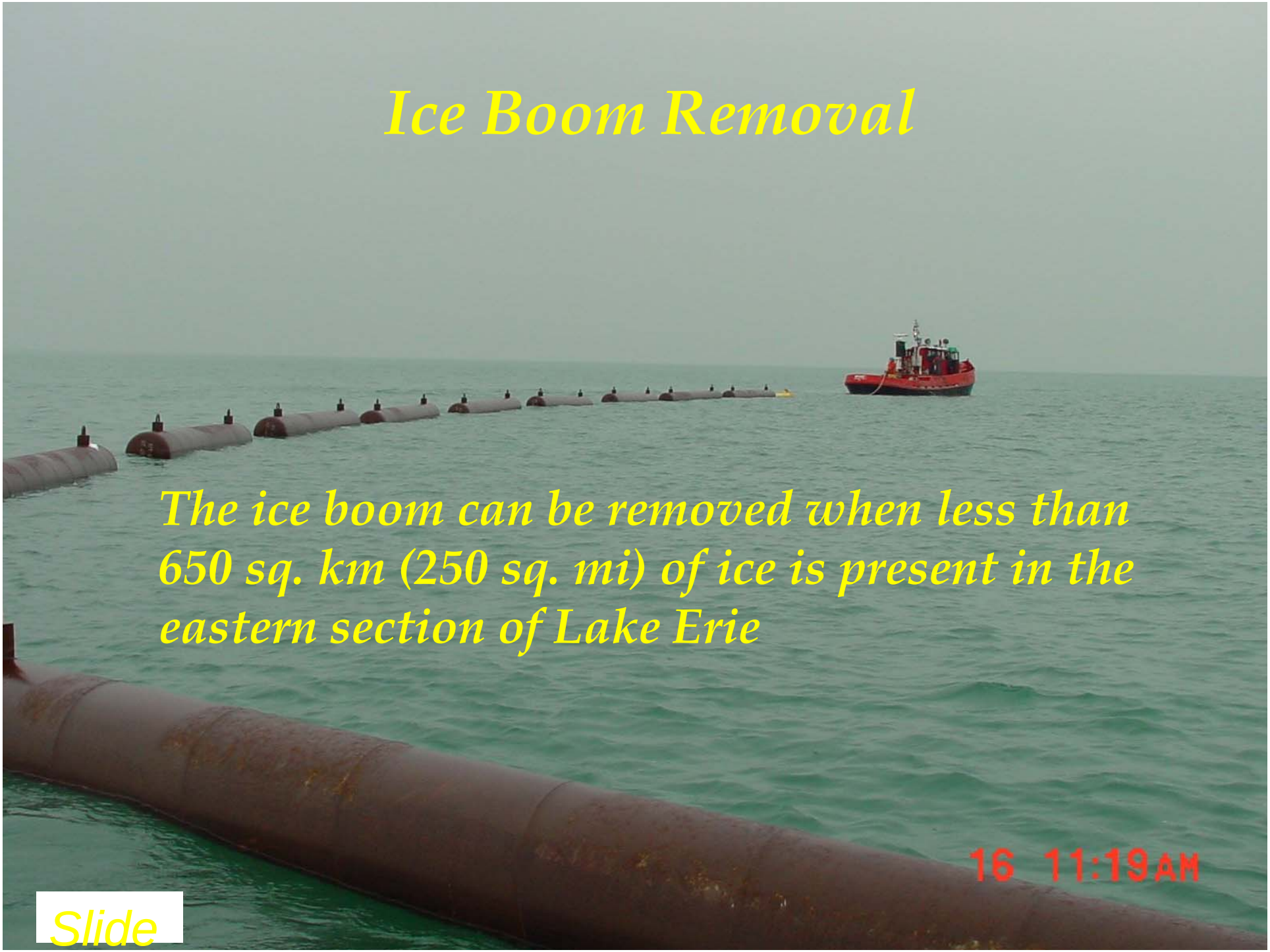


MODIS satellite image from March 2, 2015

Map of Standard Ice Thickness Measurements



Ice Boom Removal



The ice boom can be removed when less than 650 sq. km (250 sq. mi) of ice is present in the eastern section of Lake Erie

Slide

Ice Boom Removal

MODIS satellite image from March 28, 2015

Ice Boom Removal

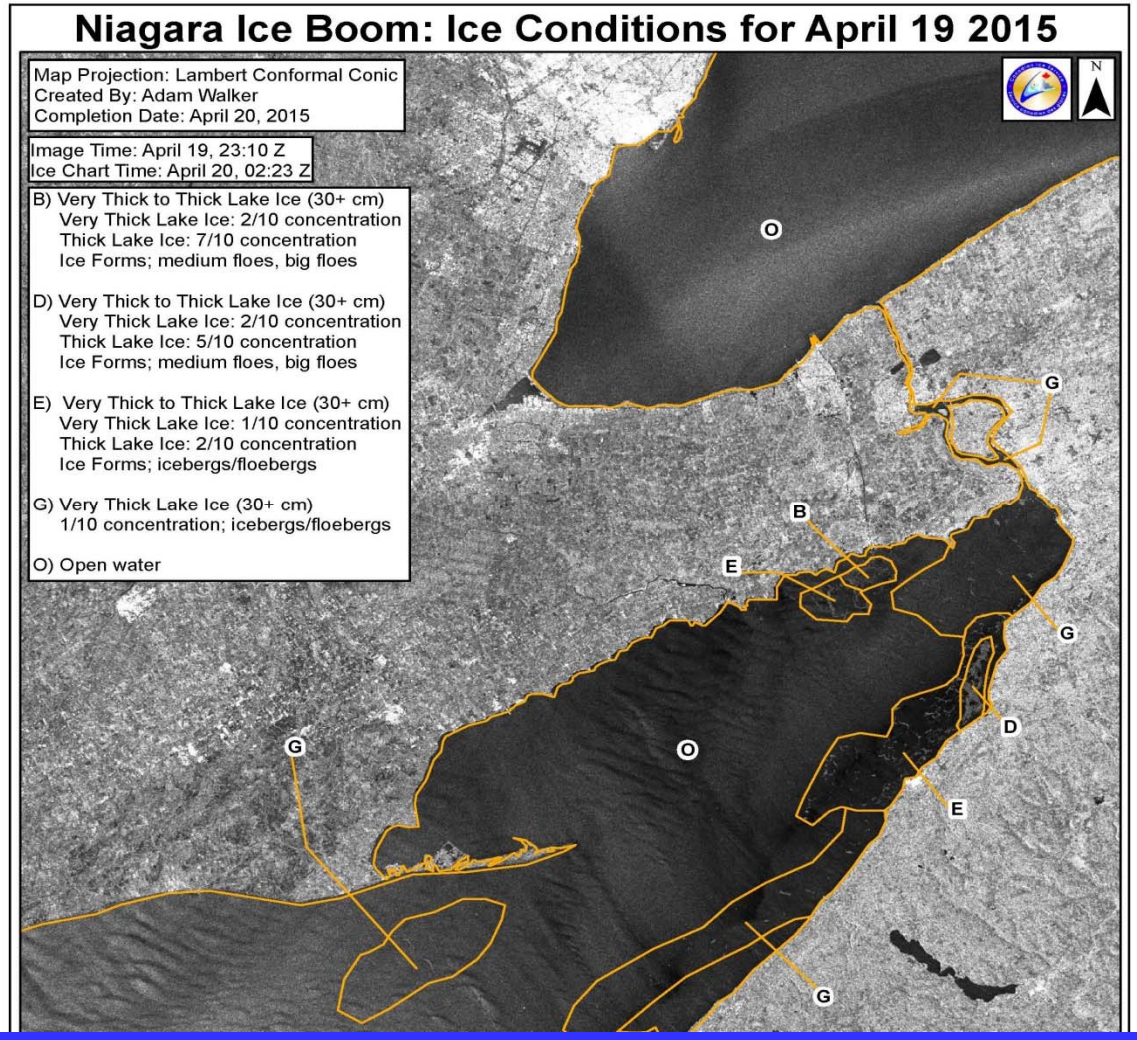


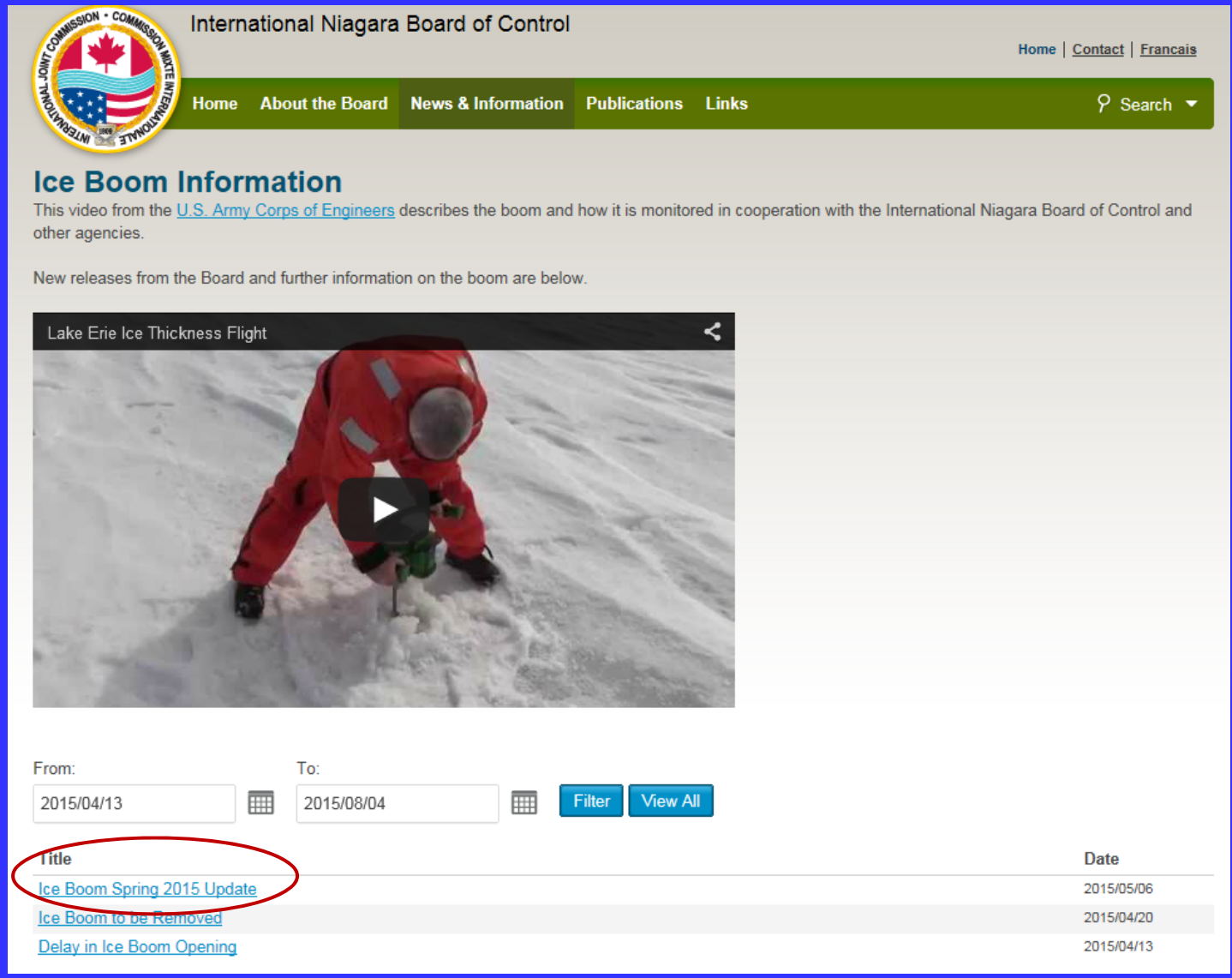
Image supplied by the Canadian Ice Service (Environment Canada)

Fixed Wing Aircraft Flights

- April 15th flight – Ice cover 2175 km^2
- April 19th flight – Ice cover 218 km^2

Ice boom opening commenced on April 20th and was completed on May 5, 2015

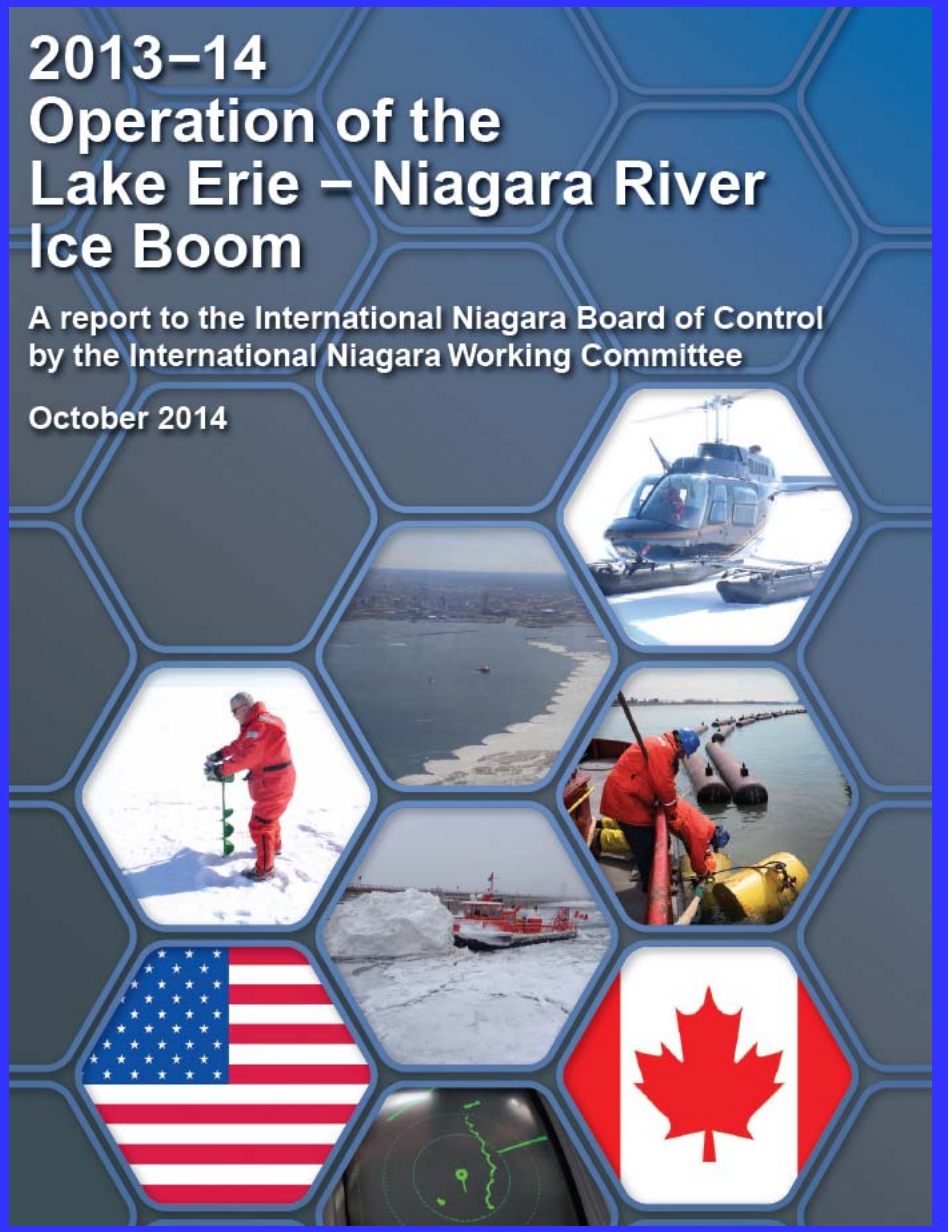
Further Ice Boom Information



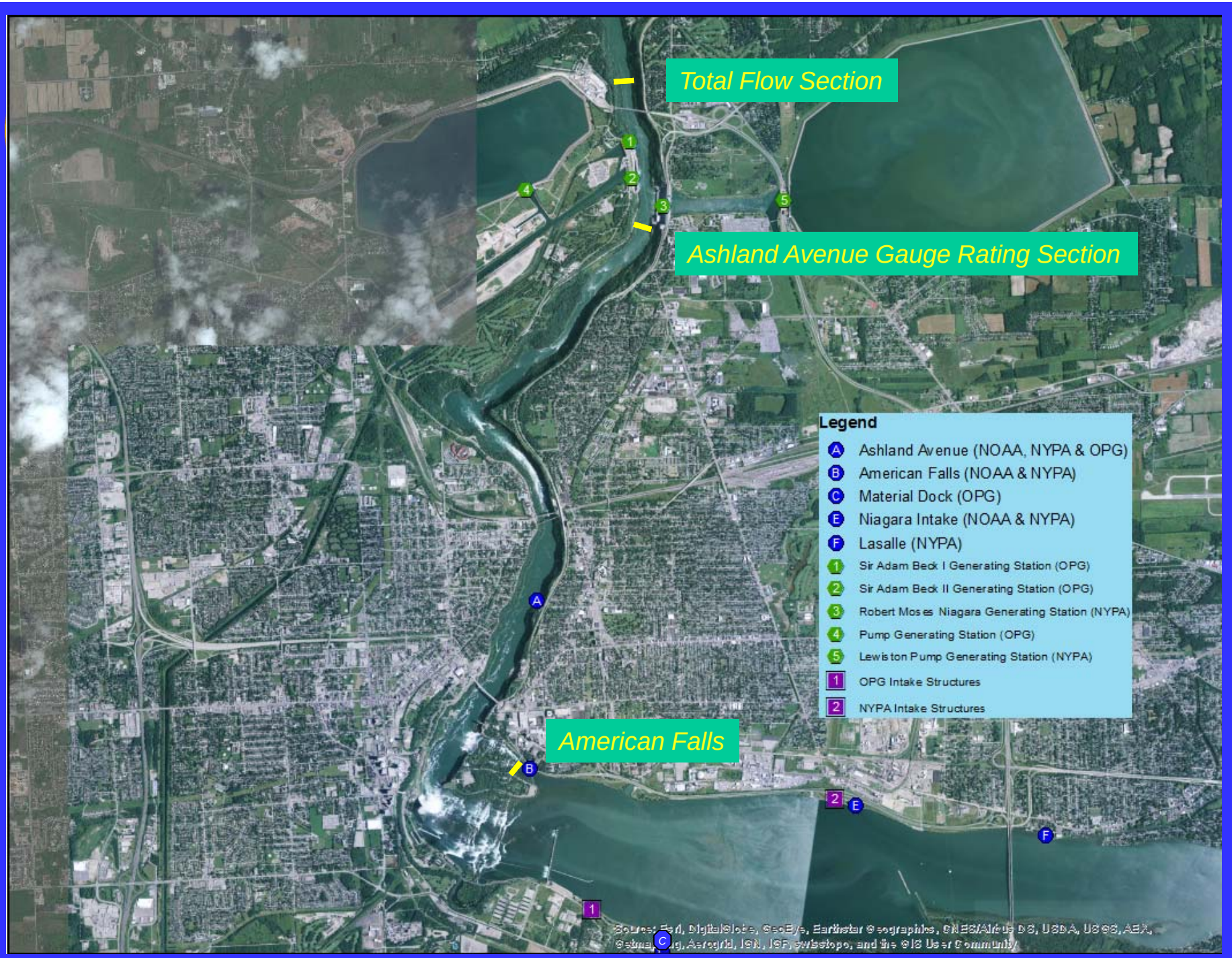
Web-site http://ijc.org/en_/inbc/ice_boom

Further Ice Boom Information

http://ijc.org/en_/inbc/reports



Water Level and Discharge Monitoring


Total Flow Section
Ashland Avenue Gauge Rating Section
American Falls
Legend
A Ashland Avenue (NOAA, NYPA & OPG)
B American Falls (NOAA & NYPA)
C Material Dock (OPG)
E Niagara Intake (NOAA & NYPA)
F Lasalle (NYPA)
1 Sir Adam Beck I Generating Station (OPG)
2 Sir Adam Beck II Generating Station (OPG)
3 Robert Moses Niagara Generating Station (NYPA)
4 Pump Generating Station (OPG)
5 Lewiston Pump Generating Station (NYPA)
1 OPG Intake Structures
2 NYPA Intake Structures

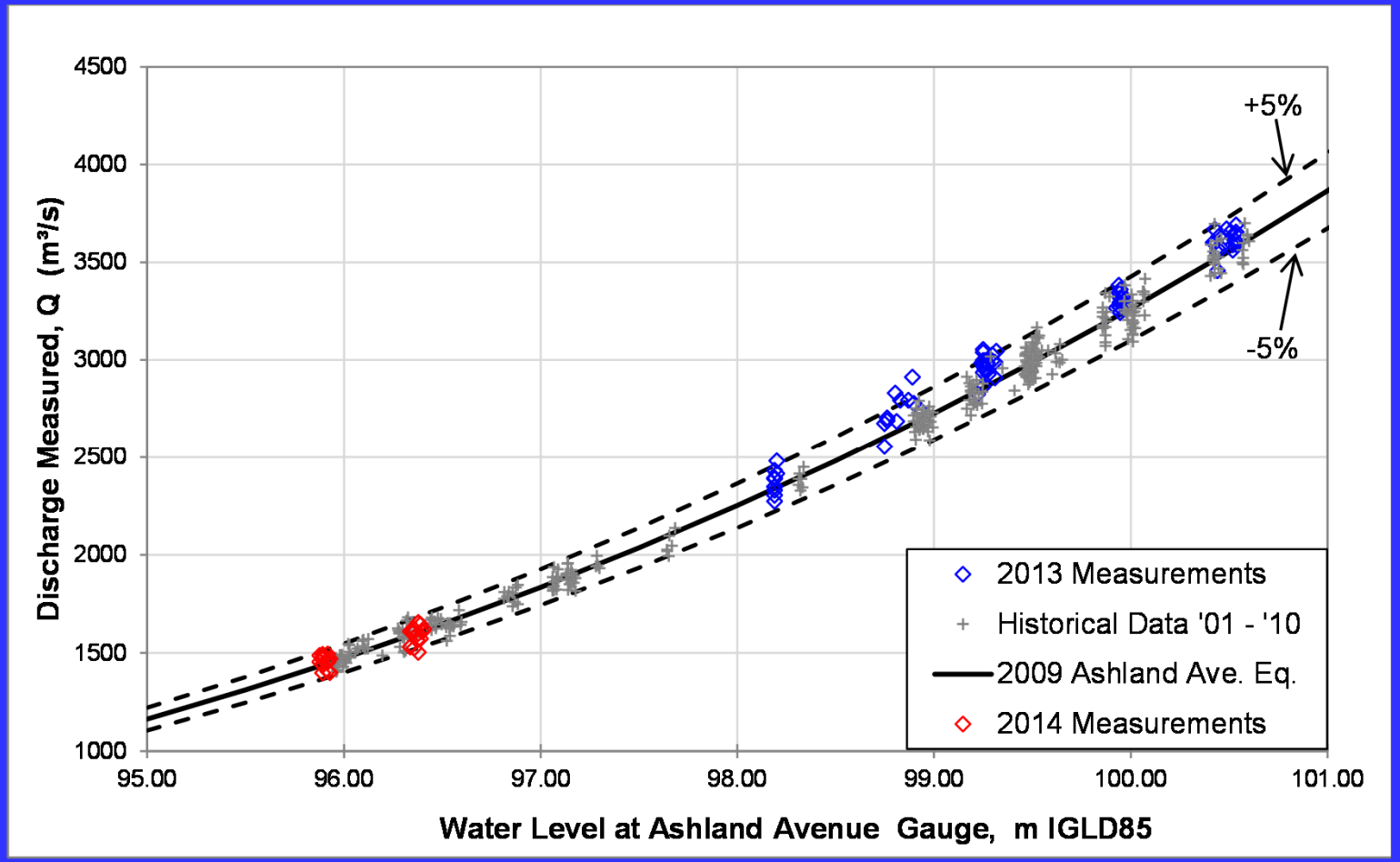
Ashland Avenue Water Level Gauging Station (NOAA station 9063007)

Station jointly operated by National Oceanic Atmospheric Administration, New York Power Authority and Ontario Power Generation

Lower Niagara River Discharge Measurements Locations

Niagara River Discharge Measurements

Stage vs Discharge Relationship for Niagara Falls



Horseshoe and American Falls Recession

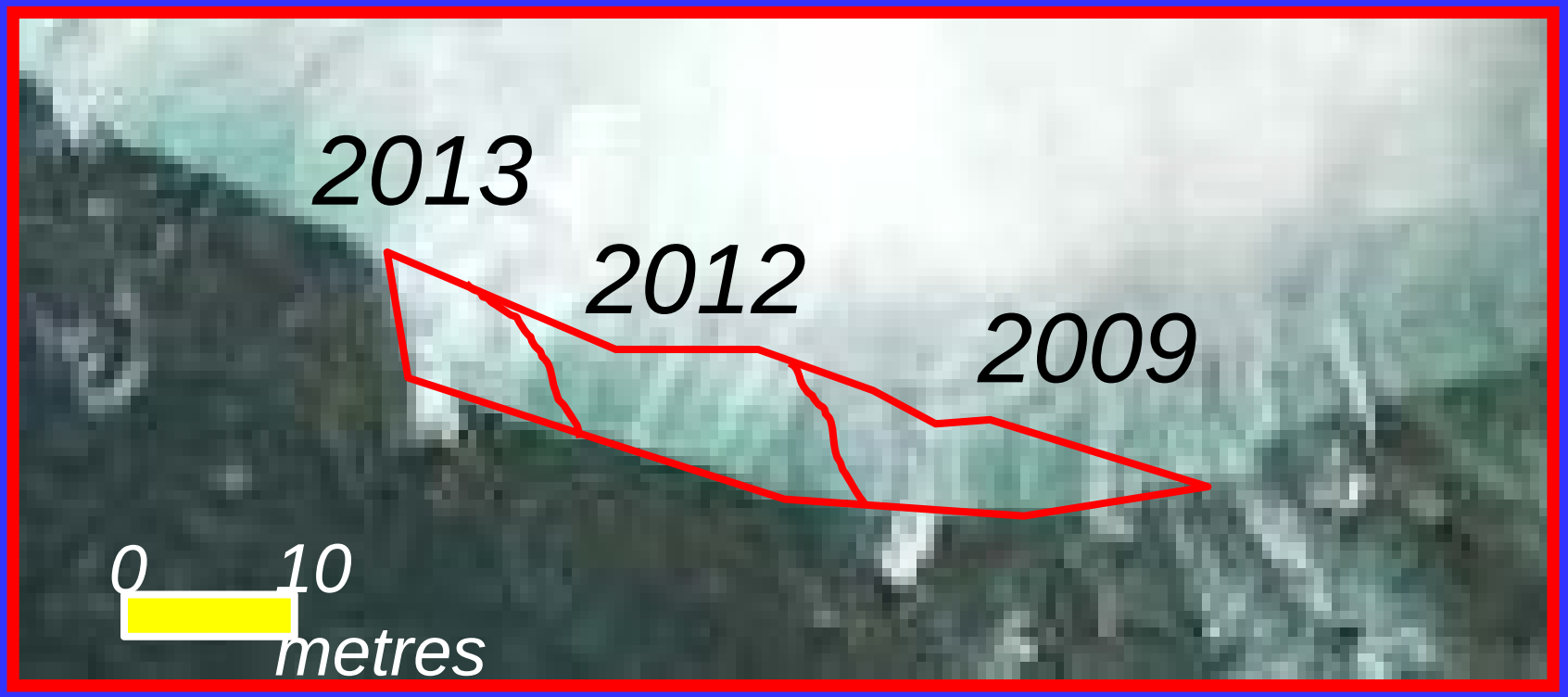
Niagara Board's 1953 Directive

- Clause 2B) of the directive reads:

The Board is to "Progressively, with the construction of the remedial works, to exercise control over the maintenance and operation thereof and more particularly the CGIP Control Structure in such a manner as fully to meet the scenic–beauty requirements of Article IV of the Niagara Treaty with the objectives of ensuring:

  - "2B)b) … A dependable and adequate flow over the Horseshoe Falls, including both flanks thereof, sufficient to provide an unbroken crest line, …"

Recent Horseshoe Falls Recession


2013
2012
2009
0
10
metres

Recent Horseshoe Falls Recession

- Even with the three relatively recent rockfalls on the crest of Horseshoe Falls, the evidence gathered at this point does not suggest any dramatic change in the recession rate of the crest of Horseshoe Falls.

Thank you

Additional information can be found at:

http://ijc.org/en_/inbc