International Management of the Great Lakes-St. Lawrence River Basin

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Colloque international sur la gestion de l’eau douce du bassin du fleuve Saint-Laurent et des Grands Lacs
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International Joint Commission
United States and Canada

OUTLINE

- **Boundary Waters Treaty and the International Joint Commission**
  - **Role and Authorities**
  - **Boards, Studies, and Task Forces**
  - **International Watershed Initiative**

- **International Great Lakes – St. Lawrence River Water Management**
  - **Quality**
  - **Quantity**
  - **The Lake Ontario – St. Lawrence River Study and Review of Regulation Orders**
  - **St. Lawrence River – “le Fleuve”**

Boundary Waters Treaty of 1909

- **Provided Principles and Mechanisms to Prevent and Resolve Disputes Concerning Water Quantity and Water Quality and Other Environmental Issues Along the U.S.-Canada Boundary**
- **Established the International Joint Commission (IJC)**

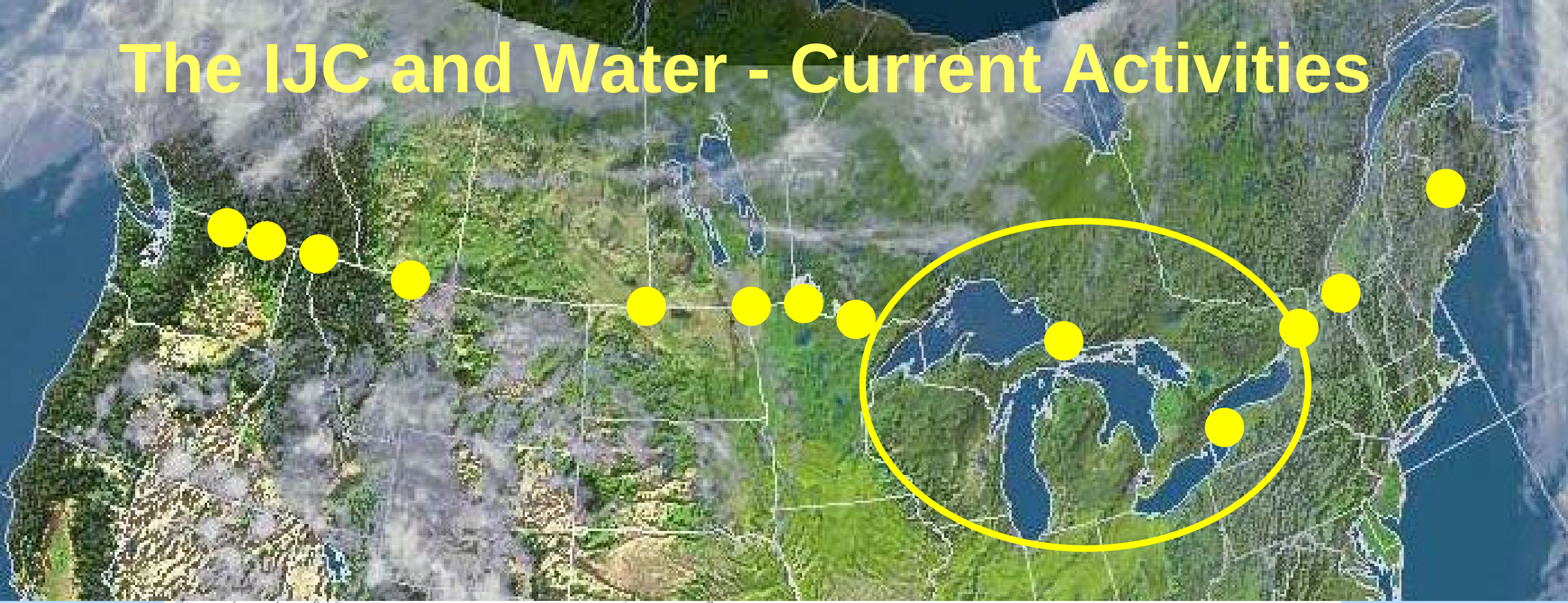
The IJC in Brief

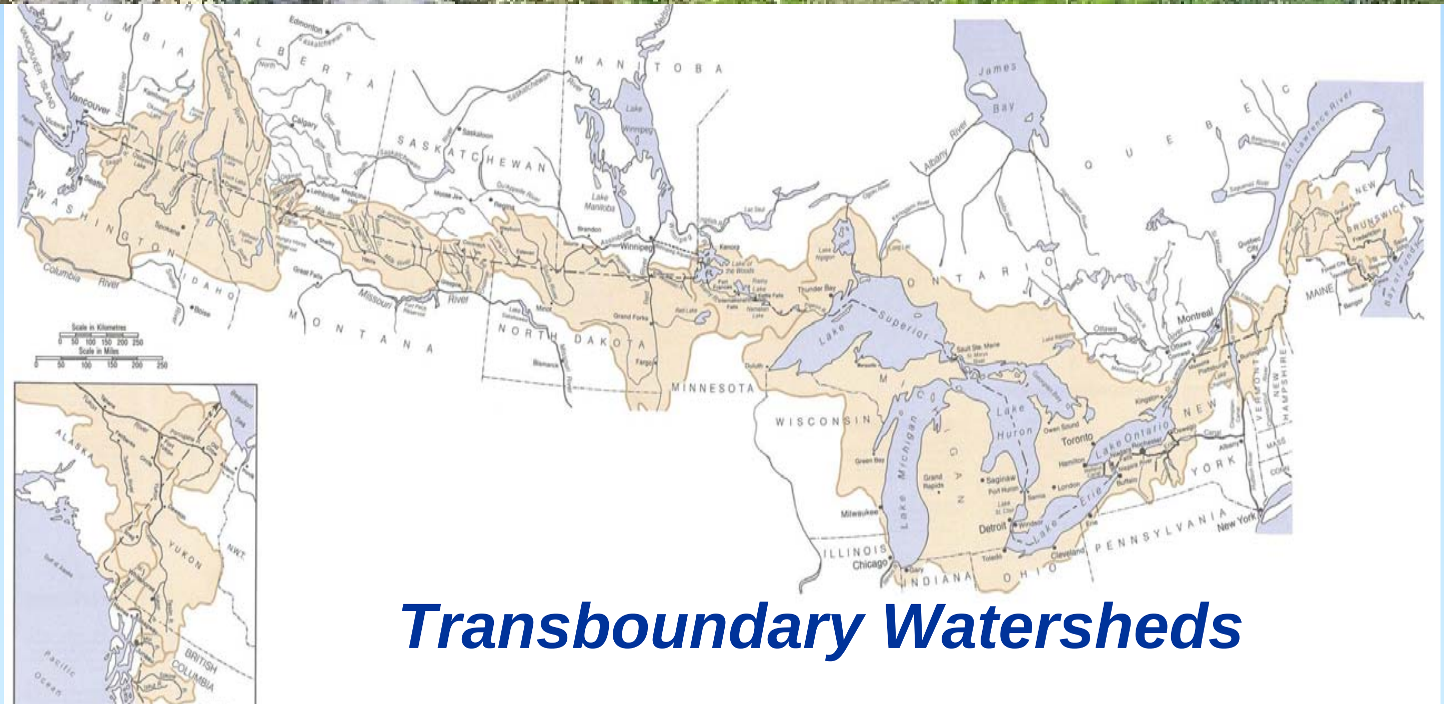
- Unitary independent treaty organization
- Six Commissioners – Canada 3, U.S. 3
- Decisions by Consensus
- Prevents and Resolves Disputes Over Shared Water and Air
- Watchdog of Great Lakes Restoration Efforts
- Conducts Studies for Governments
- Offices in Ottawa, Washington and Windsor

Other IJC Authorities

- Great Lakes Water Quality Agreement of 1978
- References from Governments
- Orders in Response to Applications
- Columbia River Treaty
- Rainy Convention
- Lake of Woods Convention

The IJC and Water - Current Activities





Transboundary Watersheds

Boards and Task Forces

INTERNATIONAL BOARDS of CONTROL/COMBINED BOARDS/POLLUTION BOARDS

- **St. Lawrence River Board of Control***
- **International Niagara River Board of Control**
- **Lake Superior Board of Control**
- **Osoyoos Lake Board of Control**
- **Rainy Lake Board of Control**
- **Rainy River Pollution Advisory Board**
- **Lake of the Woods Board of Control**
- **Lake Board of Control**
- **Columbia River Board of Control**
- **Air Quality Advisory Board**
- **Red River Board**
- **St. Croix River Watershed Board ****
- **Souris River Board**
- **St. Mary-Milk Rivers Accredited Officers**

GREAT LAKES WATER QUALITY

- **Great Lakes Water Quality Board**
- **Great Lakes Science Advisory Board**
- **Council of Great Lakes Research Managers**

INVESTIGATIVE BODIES

- **Health Professionals Task Force**
- **Lake Ontario-St. Lawrence Study Board**
- **Upper Lakes Study Board**
- **Missisquoi Bay Task Force**
- **St. Mary and Milk Rivers Administrative Measures Task Force**

Initiative des bassins hydrographiques

Establishment of First Watershed Board
- The St. Croix River Basin

International Joint Commission
United States and Canada

International Great Lakes – St. Lawrence River Water Management

- Quality
- Quantity
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Quantity – Diversions, Consumptive Uses

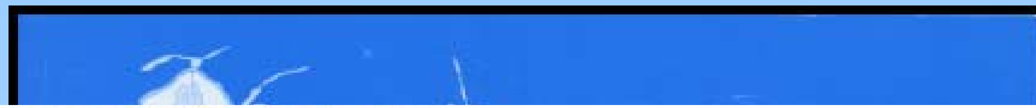
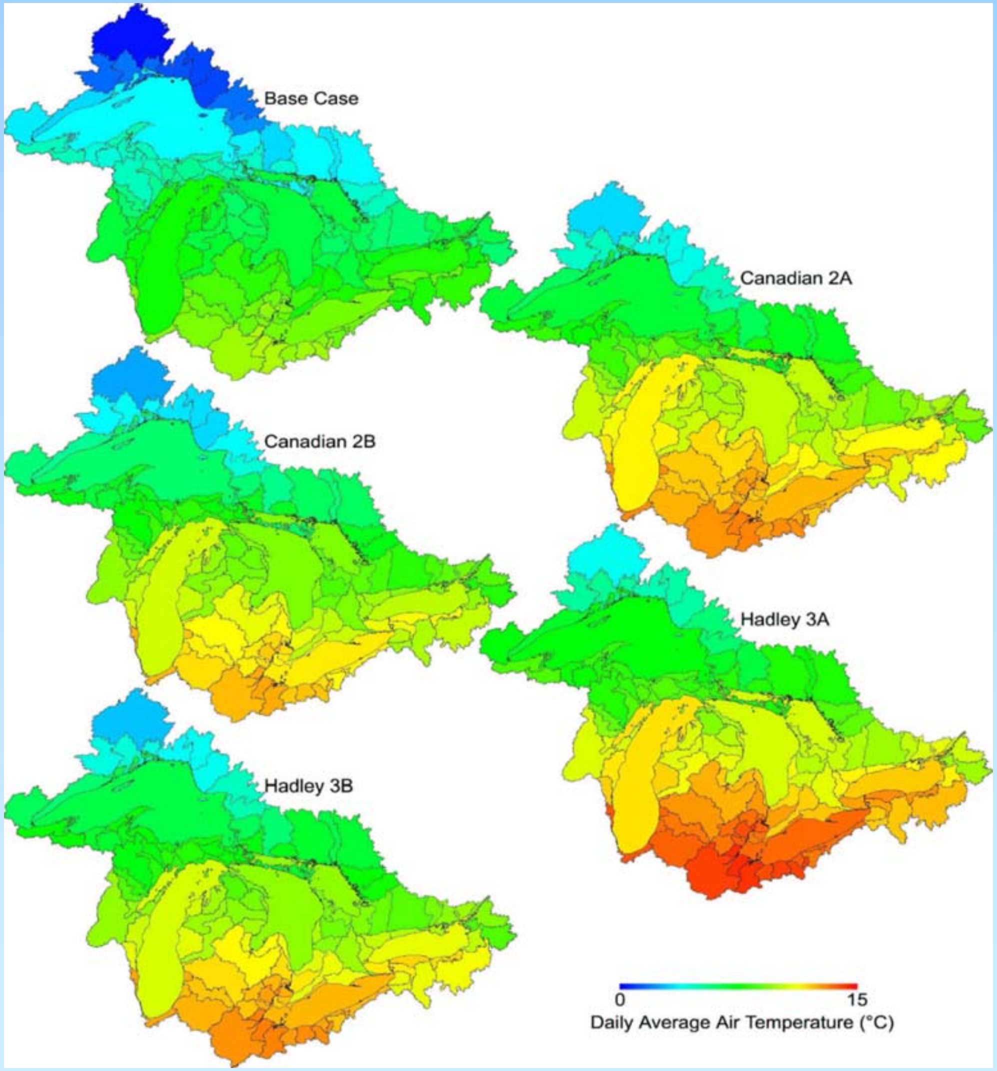


Figure 4: Existing Diversions in the Great Lakes Basin.

Great Lakes
Scenarios 2050s

Air Temp
Daily Average



Great Lakes Regulation
IJC Orders of Approval and Recent Studies

St. Marys River at Sault Ste. Marie

(Looking East or Downstream)

Chippawa Grass Island Pool Structure is located upstream of the Niagara Falls to control daily and seasonal shares of water between the power plants and Falls

Moses-Saunders Dam

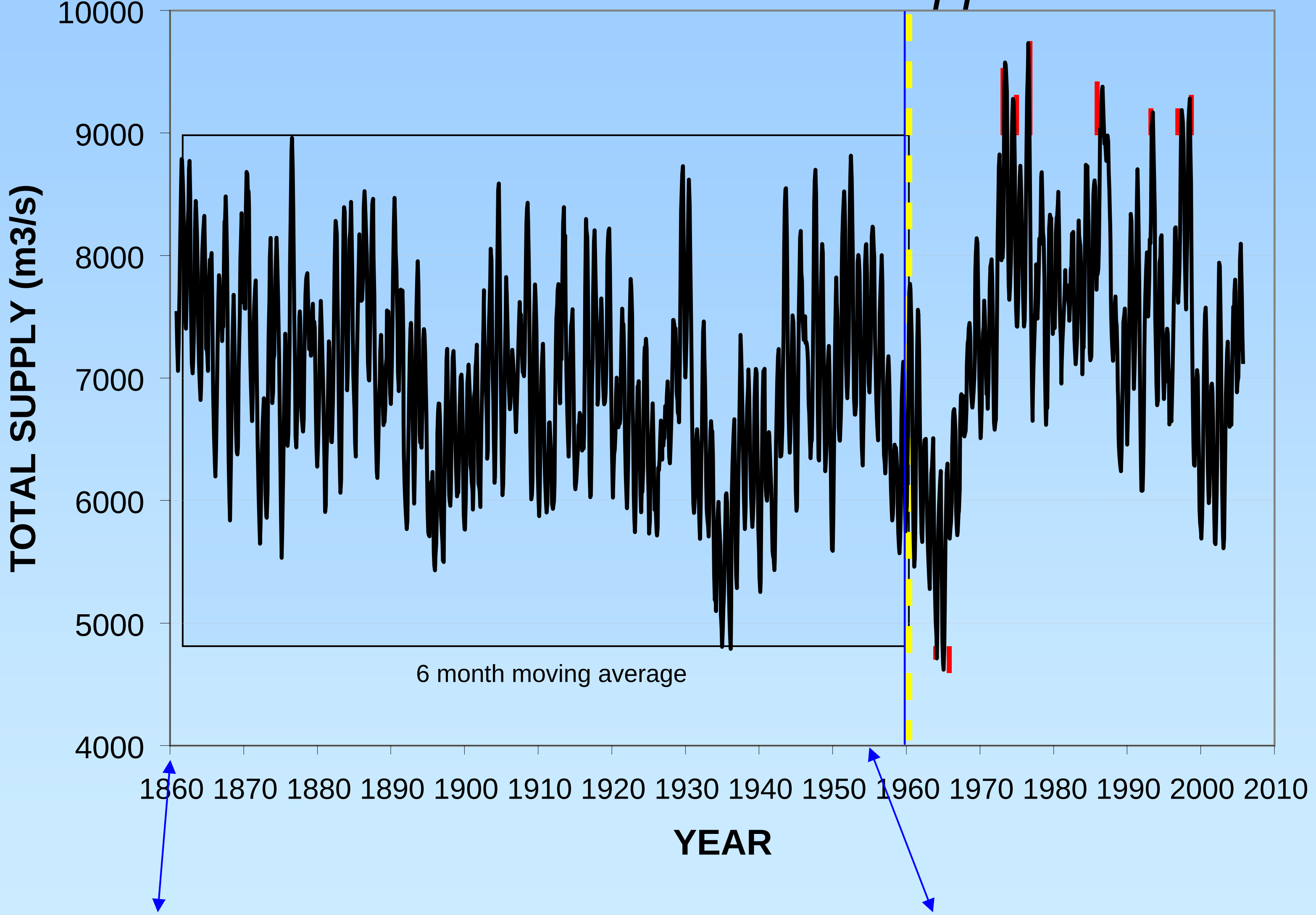
- operated according to IJC Orders of 1952&1956
- overseen by Int. St. Lawrence River Board of Control

The Lake Ontario – St. Lawrence River Study and Review of Regulation Orders

St. Lawrence River – “le Fleuve”

Need for a New Order

Shift in Lake Ontario Total Supplies



Supplies used for 56 Orders criteria & Plan1958D

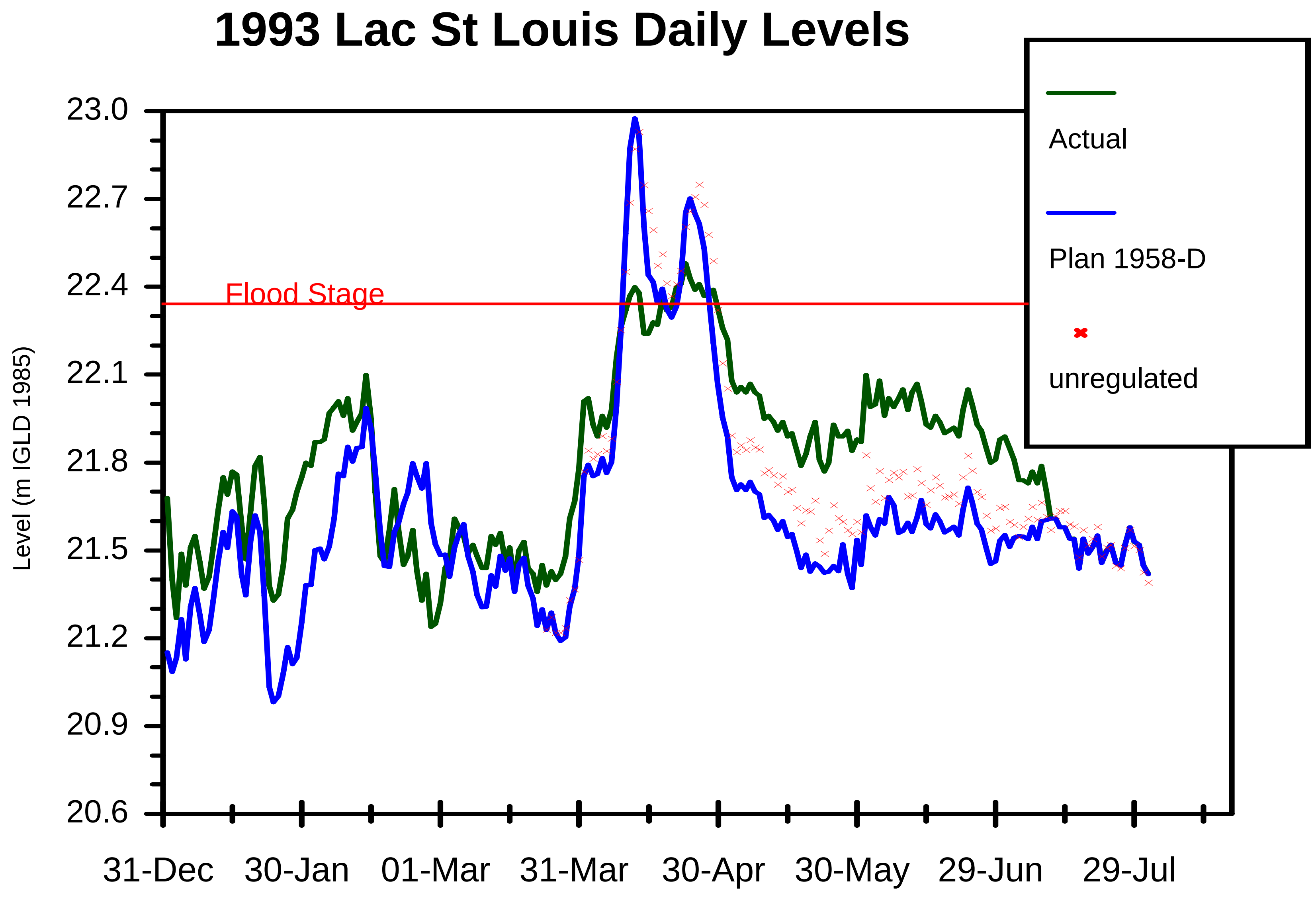

1993 Lac St Louis Daily Levels
Level (m IGLD 1985)
23.0
22.7
22.4
22.1
21.8
21.5
21.2
20.9
20.6
Flood Stage
31-Dec
30-Jan
01-Mar
31-Mar
30-Apr
30-May
29-Jun
29-Jul
Actual
Plan 1958-D
unregulated

IMAGE SATELLITE LANDSAT
11 AOÛT 2001, 20.65 m

Hauts niveaux

(seulement 1 % sont supérieurs)

Tous les plans : écart inférieur à 4 po par rapport au plan actuel

B+ 4 pouces plus haut

A+ 4 pouces plus bas

Niveaux moyens

B+ varient moins durant l'année

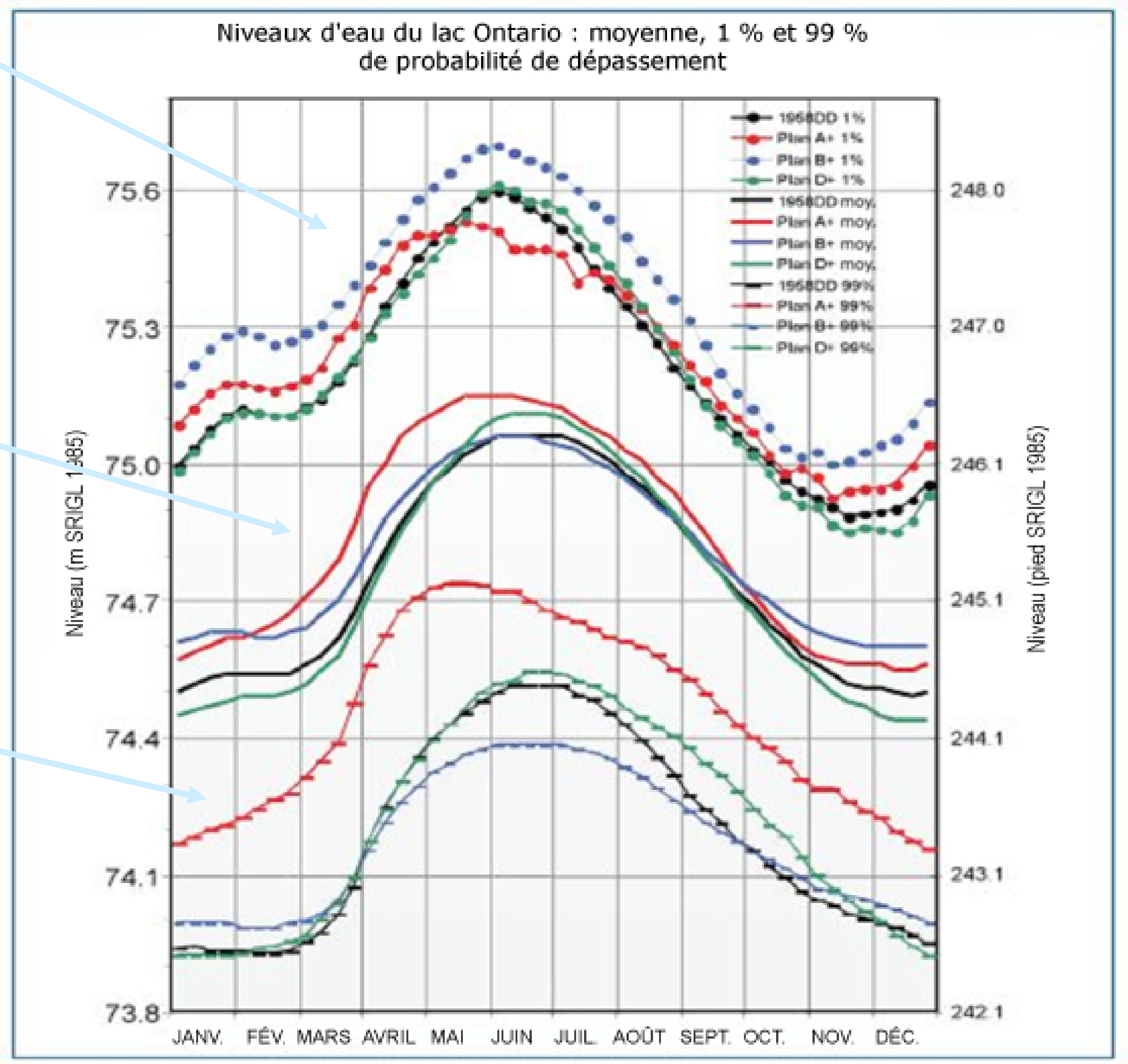
D+ varient plus

Bas niveaux

(seulement 1 % sont inférieurs)

A+ niveaux plus élevés

B+ niveaux estivaux plus bas



Hauts niveaux

(seulement 1 % sont supérieurs)

A+ niveaux de pointe plus élevés

Niveaux moyens

A+ cycles de niveaux d'eau différents

B+ varient davantage et plus bas niveaux d'automne

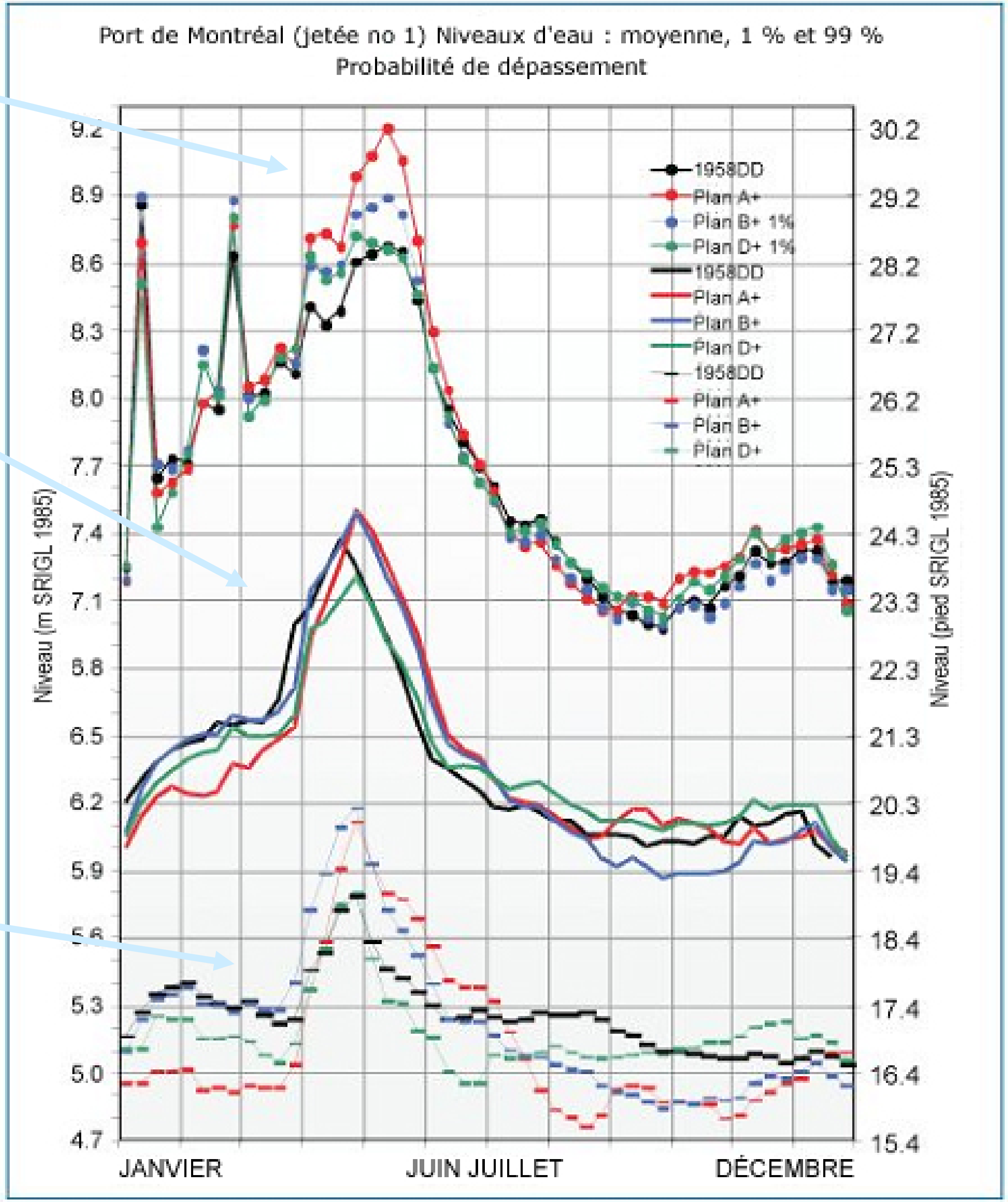
D+ plus bas niveaux de pointe et niveaux d'automne plus hauts

Bas niveaux

(seulement 1 % sont inférieurs)

A+ plus bas en automne et en hiver

B+ plus bas en automne



Diversions
- dates and flows

Existing Diversions in the Great Lakes Basin	Operational Date (original project)	Average Annual Flow (cms)	Average Annual Flow (cfs)
1. Interbasin			
Long Lac (into Lake Superior basin)	1939	45	1,590
Ogoki (into Lake Superior basin)	1943	113	3,990
Chicago (out of Lake Michigan basin)	(1848)1900	91	3,200
Forestport (out of Lake Ontario basin)	1825	1.4	50
Portage Canal (into Lake Michigan basin)	1860	1	40
Ohio & Erie Canal (into Lake Erie basin)	1847	0.3	12
Pleasant Prairie (out of Lake Michigan basin)	1990	0.1	5
Akron (out of and into Lake Erie basin)	1998	0.01	0.5
2. Intrabasin			
Welland Canal	(1829)1932	260	9,200
NY State Barge Canal (Erie Canal)	(1825)1918	20	700
Detroit	1975	4	145
London	1967	3	110
Raisin River	1968	0.7	25
Haldimand	1997	0.1	2

Impacts of diversions, consumptive use, and outlet channel modifications on Great Lakes levels

Table 3: Impacts of diversions, consumptive use, and outlet channel modifications on water levels in the Great Lakes.

On Lake Levels in Centimeters

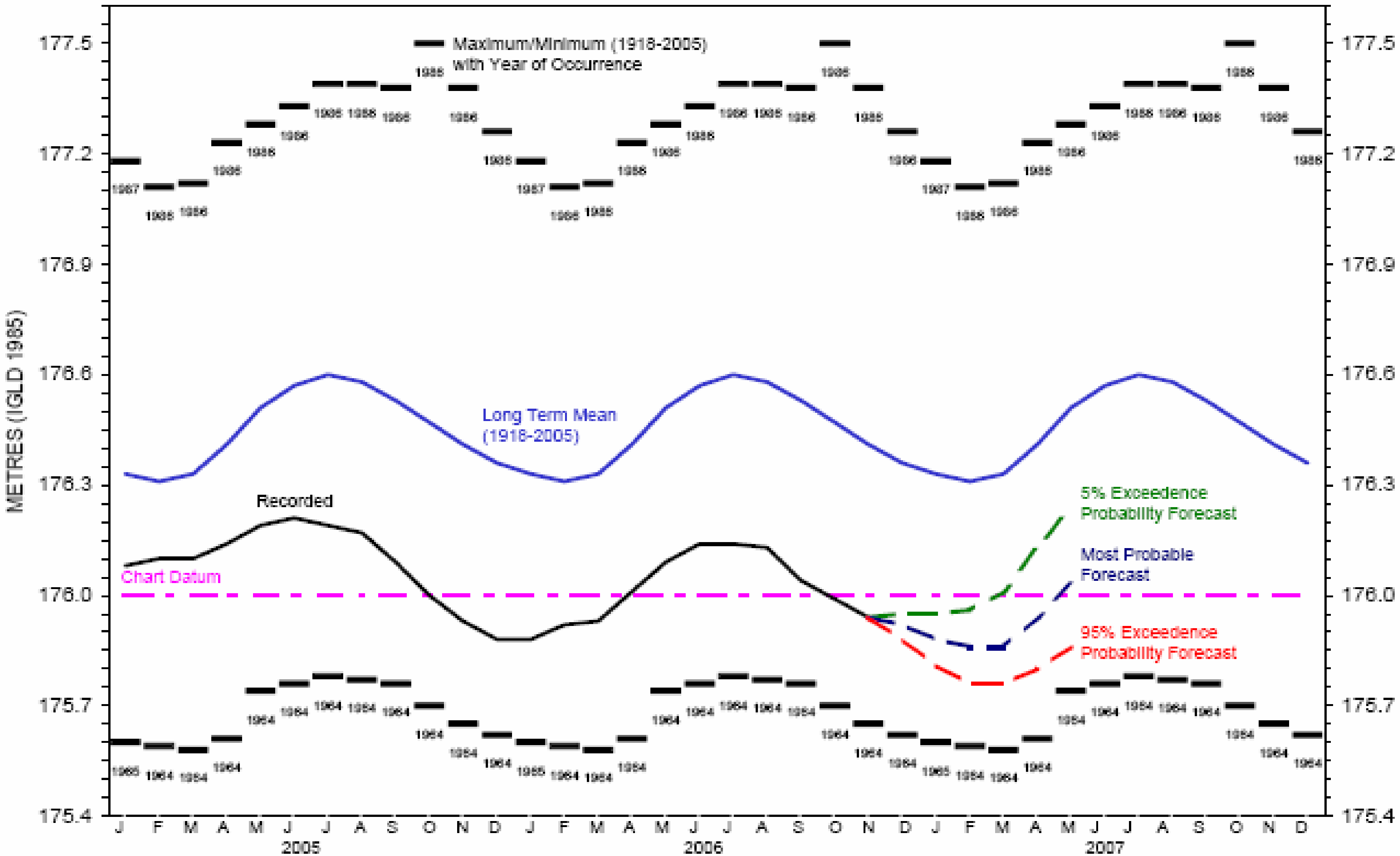
	Superior	Michigan - Huron	St. Clair	Erie	Ontario
	Mean	Mean	Mean	Mean	Mean
Recorded Levels 1918-1997 (meters)	183.43	176.49	175.02	174.15	74.75
Long Lac-Ogoki (160 cms) (inflows)	6	11	N/A	8	7
Chicago (90 cms) (outflows)	-2	-6	N/A	-4	-3
Welland Canal (260 cms)	-2	-6	N/A	-13	0
Detroit / St.-Clair modifications	0	-40	N/A	0	0
Niagara River outlet	0	3	N/A	12	
Existing consumptive uses (1993)	-1	-5	-5	-4	-6
Impacts (cm):	1	-43	N/A	-1	-2

On Flows in Connecting Channels (in cubic meters per second)

	St. Mary's R.	St. Clair R.	Detroit R.	Niagara R.	St. Lawrence R.
	Mean	Mean	Mean	Mean	Mean
Recorded flows 1918-1997 (cms)	2150	5200	5350	5940	6980
Long Lac-Ogoki (160 cms) (inflows)	160	160	160	160	160
Chicago (90 cms) (outflows)	0	-90	-90	-90	-90
Welland Canal (260 cms)	0	0	0	-260	0
Existing Consumptive Uses (1993)	-10	-50	-50	-90	-110
Total Impacts (cms):	150	20	20	-280	-40

Notes: N/A is Not Available
St. Lawrence River flows measured at Cornwall

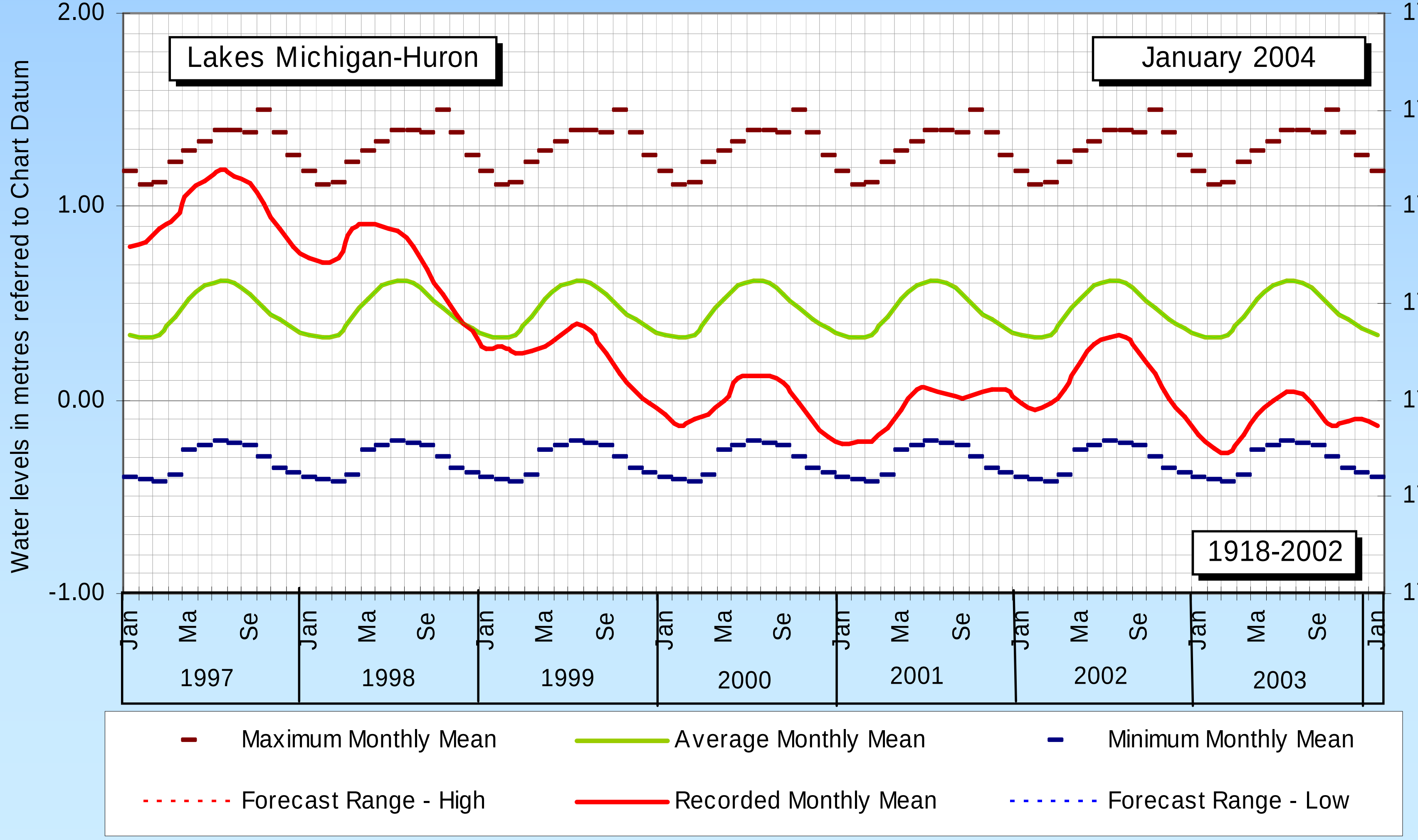
LAKES MICHIGAN-HURON MONTHLY MEAN LEVELS



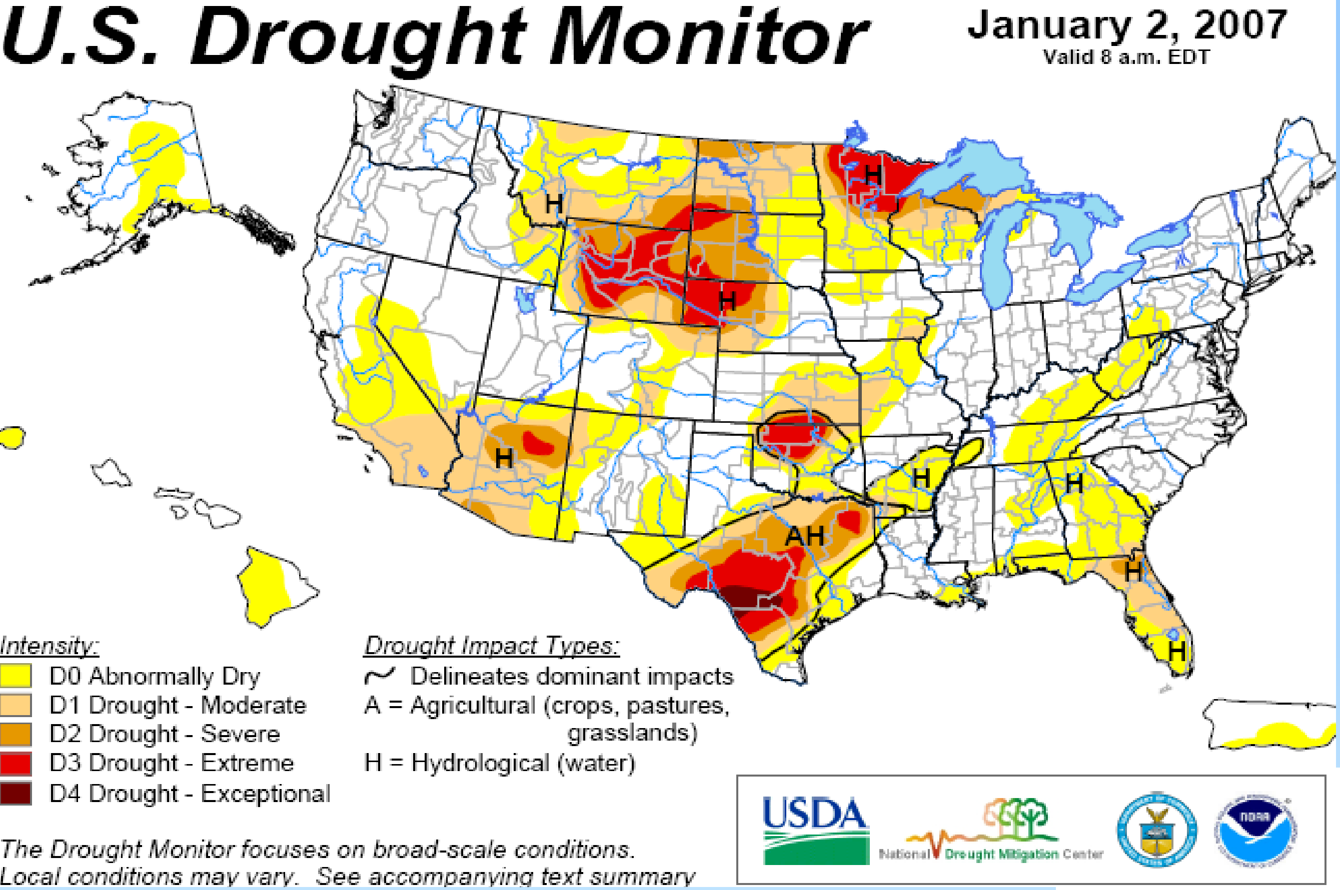
Questions?

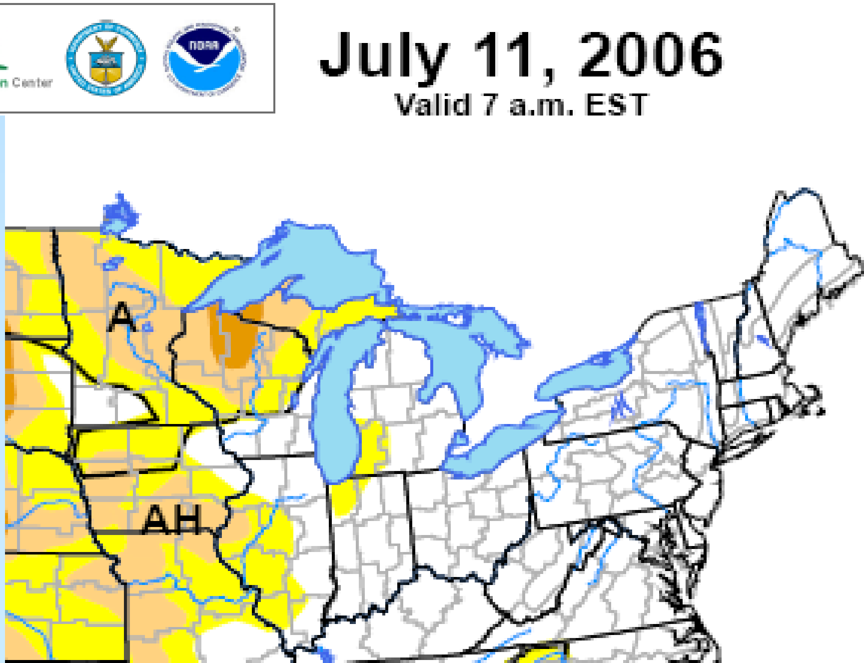
ijc.org

International Joint Commission
United States and Canada



Lakes Michigan-Huron
January 2004
1918-2002
Water levels in metres referred to Chart Datum
Water levels in metres referred to IGLD 1985
2.00
1.00
0.00
-1.00
178.0
177.5
177.0
176.5
176.0
175.5
175.0
Jan
Ma
Se
1997
1998
1999
2000
2001
2002
2003
Maximum Monthly Mean
Average Monthly Mean
Minimum Monthly Mean
Forecast Range - High
Recorded Monthly Mean
Forecast Range - Low





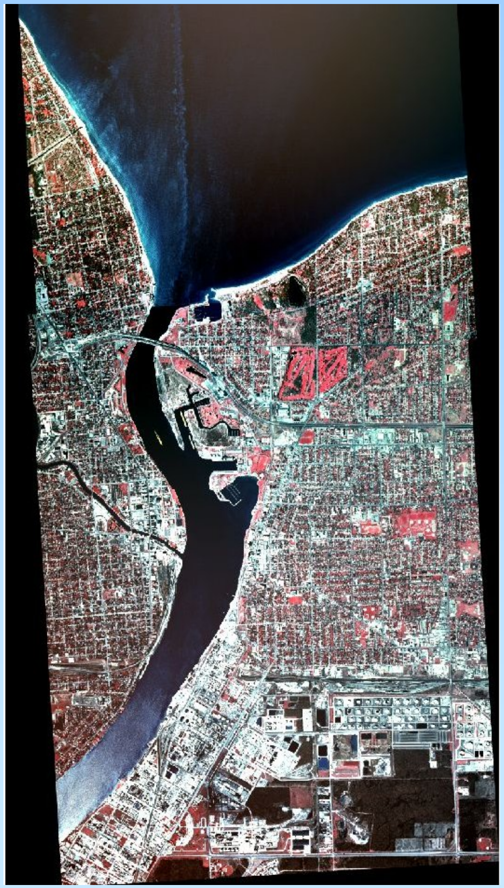
Reduced supplies to upper Great Lakes

Channel Alterations – St. Clair River

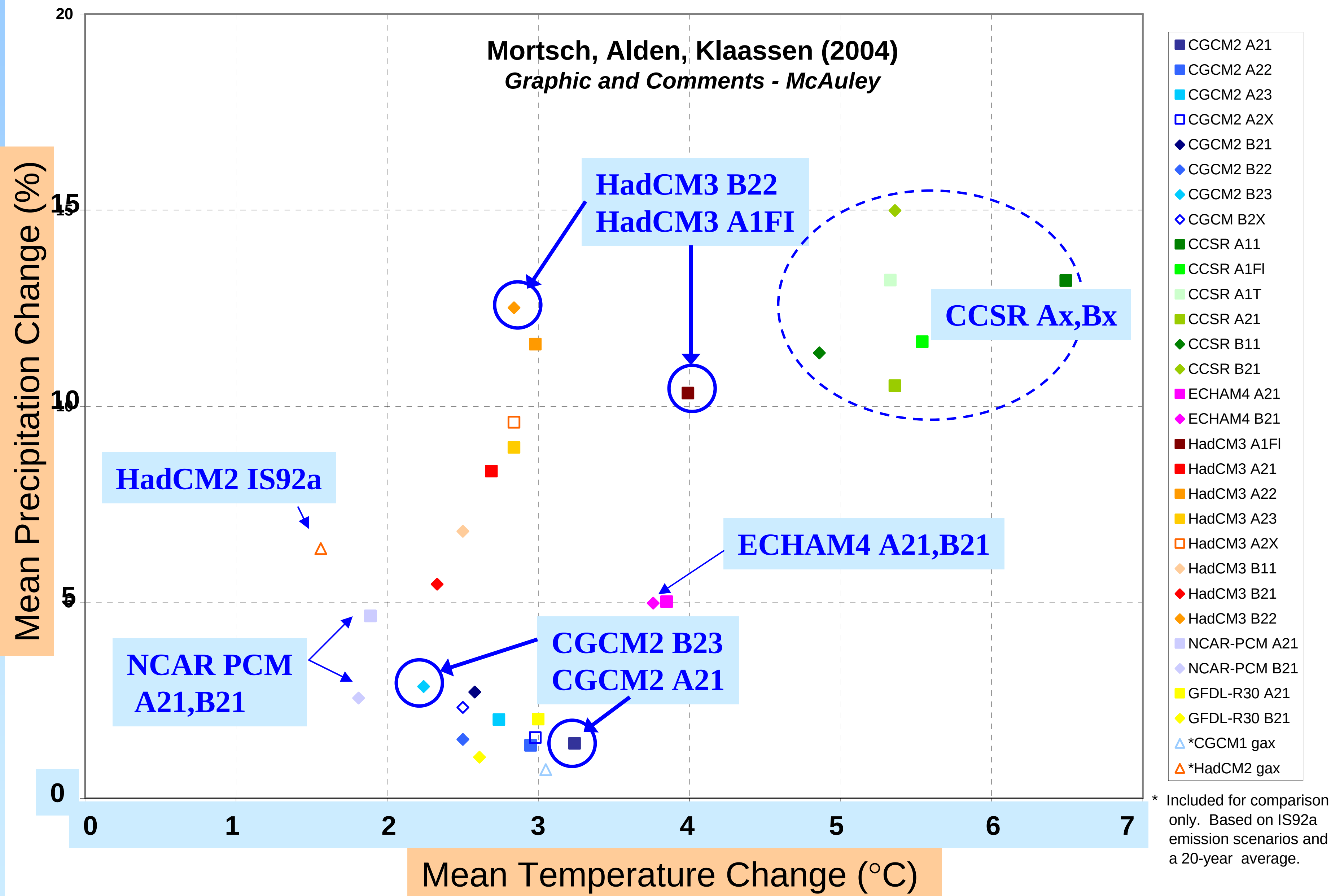
- Recent low M-H levels may not be entirely due to hydrology, but possibly ongoing physical changes in the St. Clair River

- Decline in water level difference between Lakes Michigan-Huron and Lake Erie since 1970 implies ongoing St. Clair River erosion.

- IUGL Study includes a thorough investigation of the St. Clair River



Scatter Plot of Great Lakes Basin Areal Averaged Changes in Temperatures & Precipitation in 2050s



* Included for comparison only. Based on IS92a emission scenarios and a 20-year average.

Great Lakes are in the interplay of three major air masses