

# St-Lawrence Seaway Management Corporation

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Benoit Nolet

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*Senior Manager, Trade  
Relations & Compliance  
October 2021*



The St. Lawrence  
Seaway Management  
Corporation

Corporation de Gestion  
de la Voie Maritime  
du Saint-Laurent

# AGENDA

- Orientation
- Navigation Season Review
- High Water Levels and High Flows
  - Lessons learned from 2017 & 2019
  - Safety Mitigation Measures
    - Tools deployed
    - Models developed

# An Overview: The Great Lakes / Seaway System

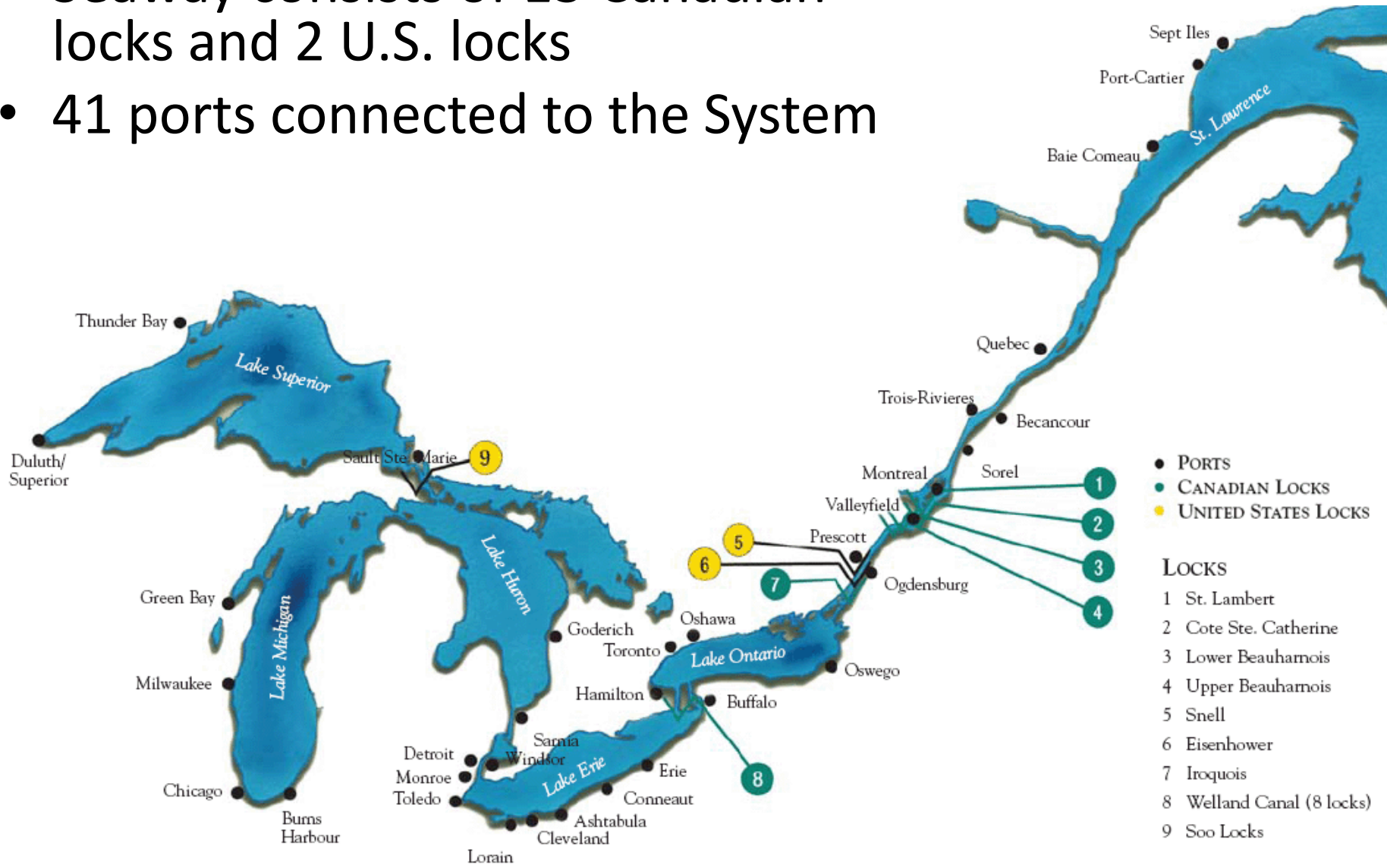
- Your gateway to the heartland of North America
- 3,700 km marine highway
- 41 ports connected to the System
- serves a region that is:
  - home to 100 million people
  - 26% of US industry
  - 60% of Canadian industry



**We like to call it.....Hwy H<sub>2</sub>O**

# Great Lakes St. Lawrence Seaway

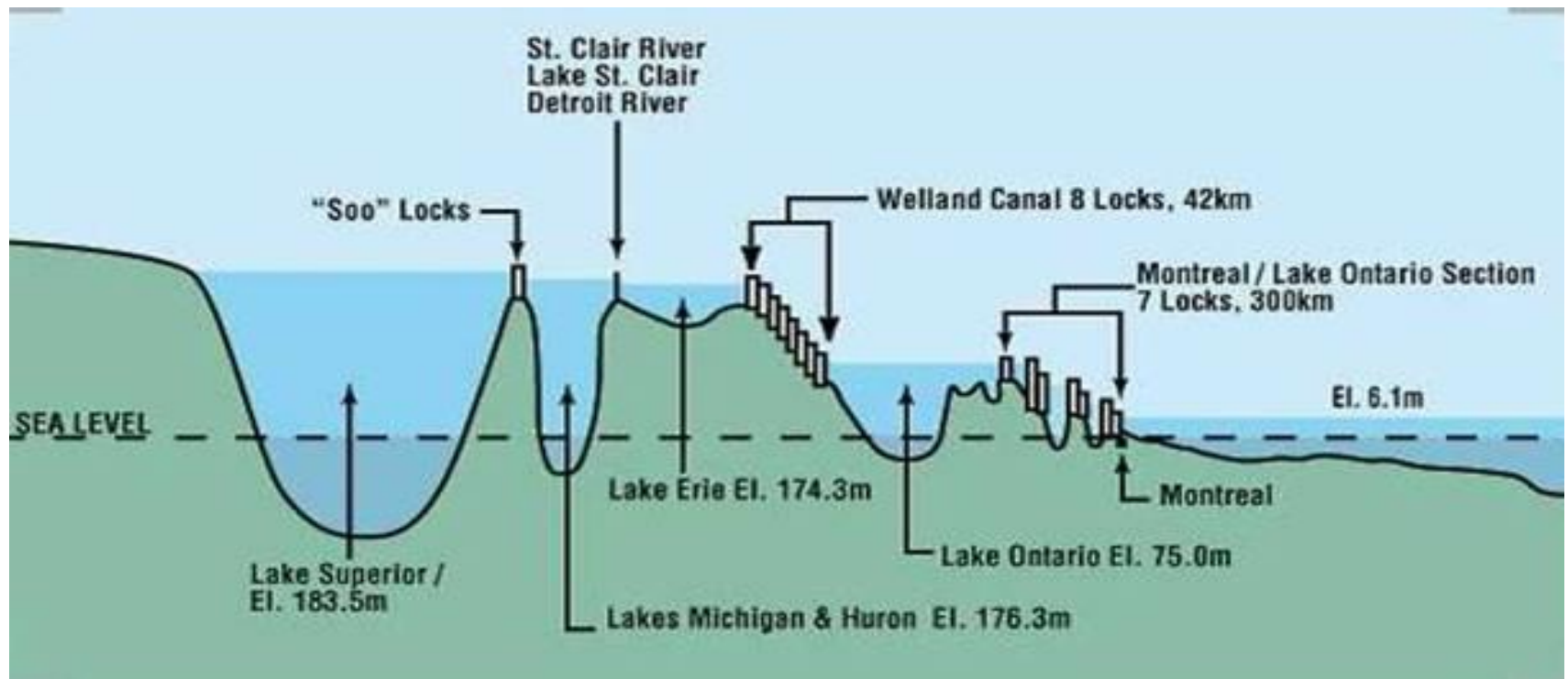
- 3,700 km marine highway
- Seaway consists of 13 Canadian locks and 2 U.S. locks
- 41 ports connected to the System





# The St. Lawrence Seaway

- The St. Lawrence Seaway includes 13 Canadian and 2 U.S. locks.

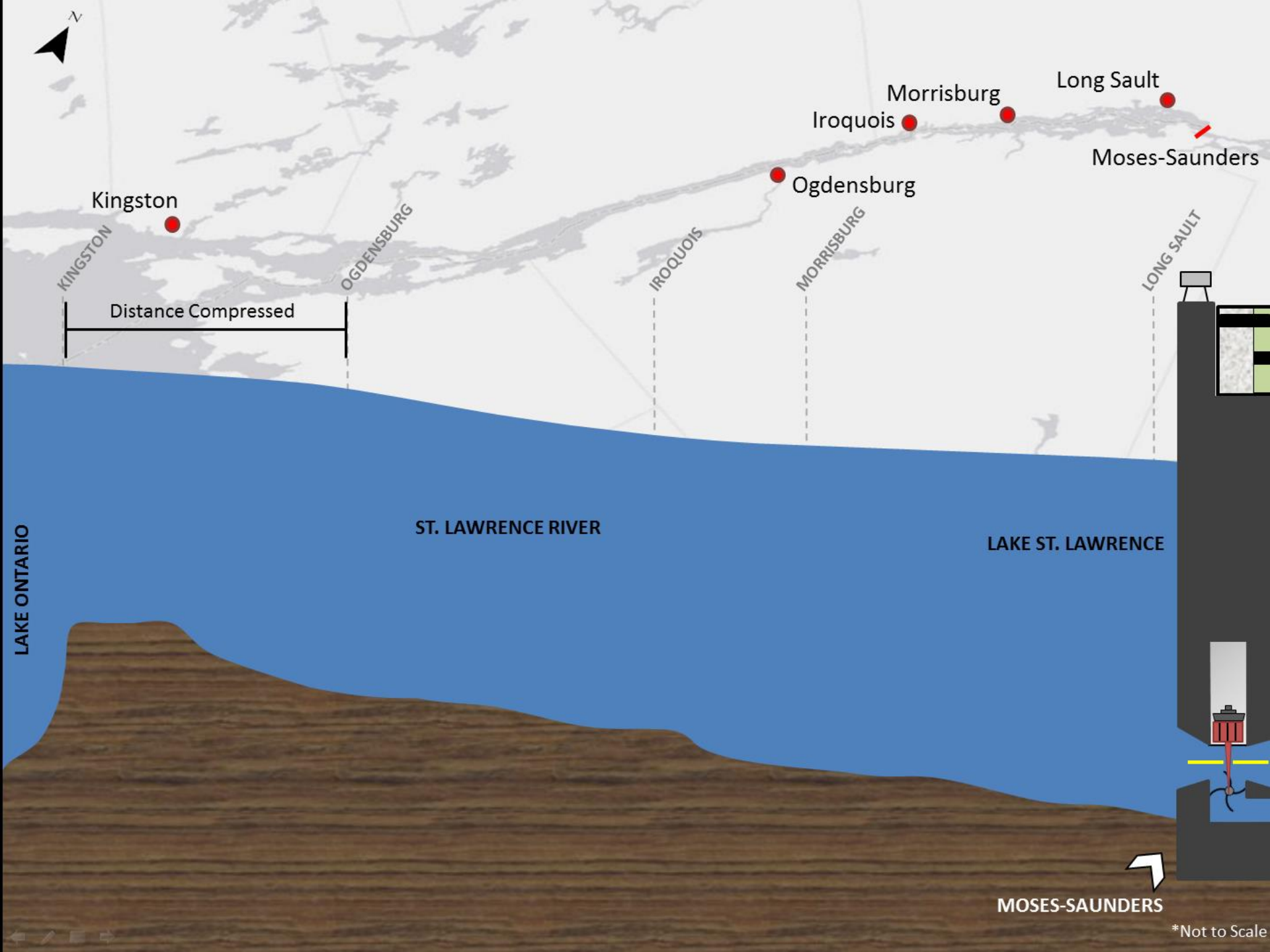




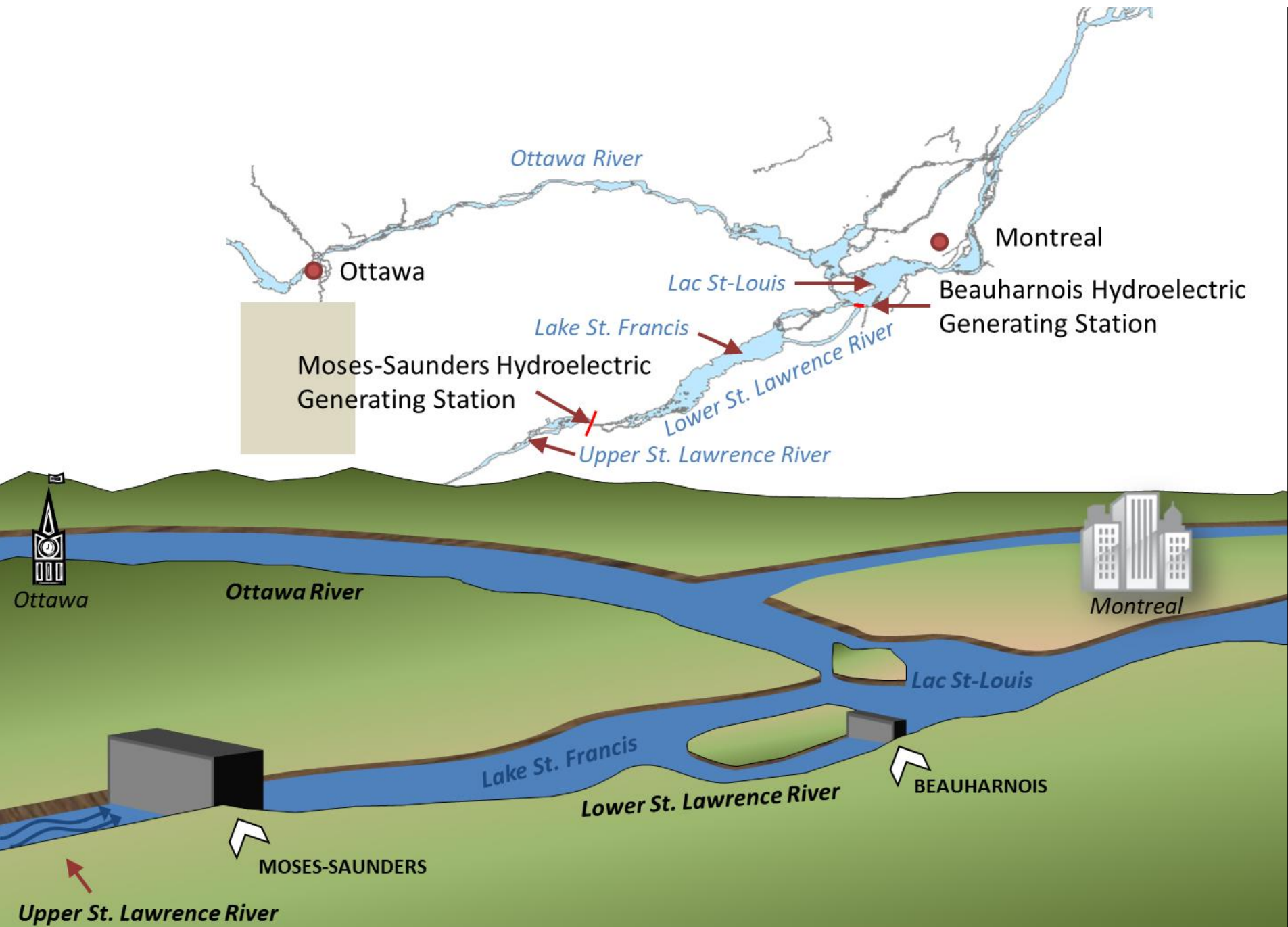
# **HIGH WATER LEVELS & FLOWS**

## A lot of water in the upper lakes

	SUPERIOR	MICH-HURON	ST. CLAIR	ERIE	ONTARIO
Forecasted Water Level for Jan 22, 2021 (feet)	602.07	580.97	575.95	573.06	244.75
Chart Datum (feet)	601.10	577.50	572.30	569.20	243.30
Difference from chart datum (inches)	+12	+42	+44	+46	+17
Difference from average water level for Dec 22, 2020 (inches*)	-4	-2	-2	+1	0
Difference from average water level for Jan 22, 2020 (inches*)	-7	-8	-10	-7	-19



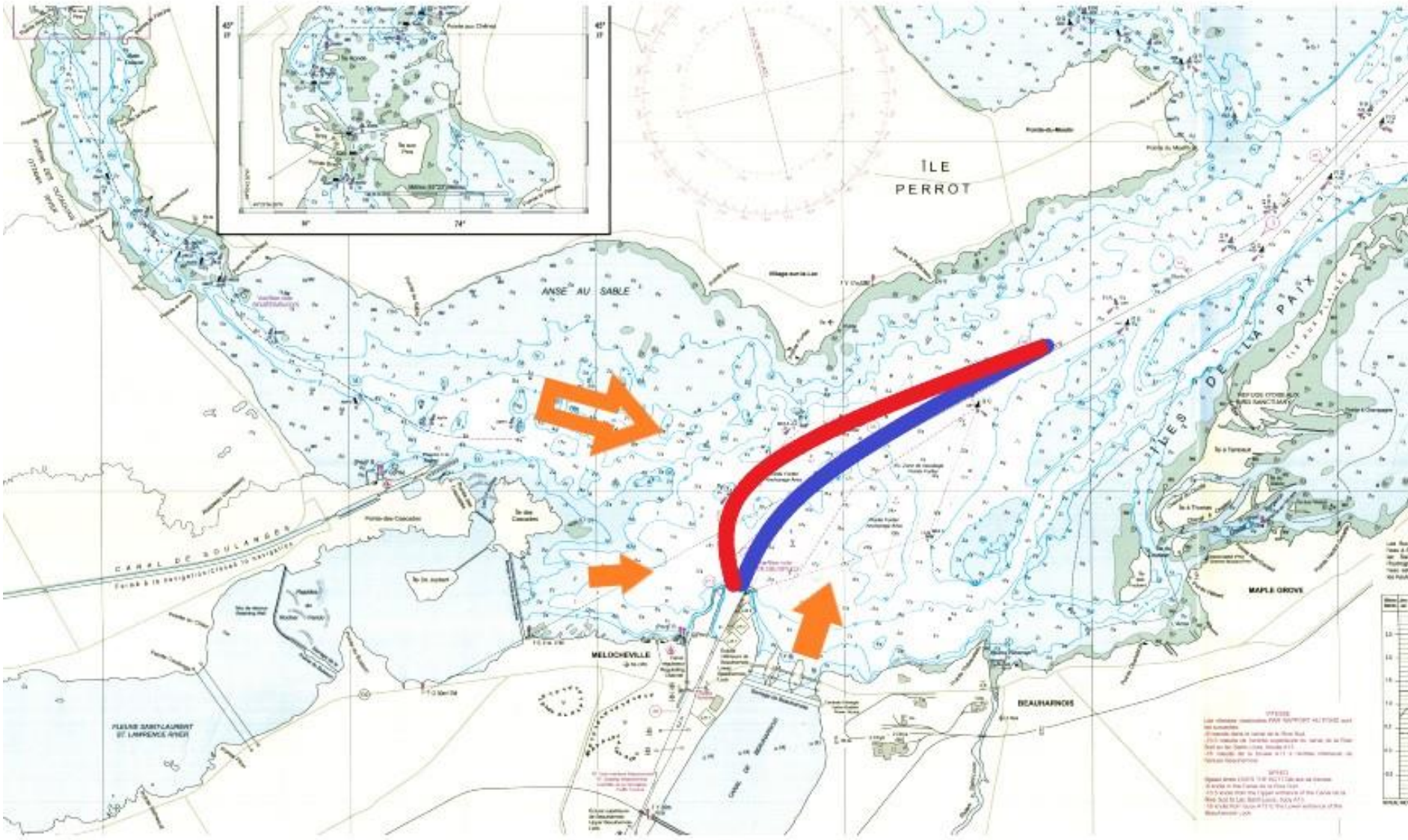




NOT TO SCALE

# Navigation in 2020

- (Winter/spring 2020) Mariners identified 5 high risk areas for navigating in high flows
- (Spring 2020) CHS provided Hydrographic models for the 5 high risk areas, under likeliest flow conditions
- Models were placed on Seaway website for mariner access, as well as critical gradients



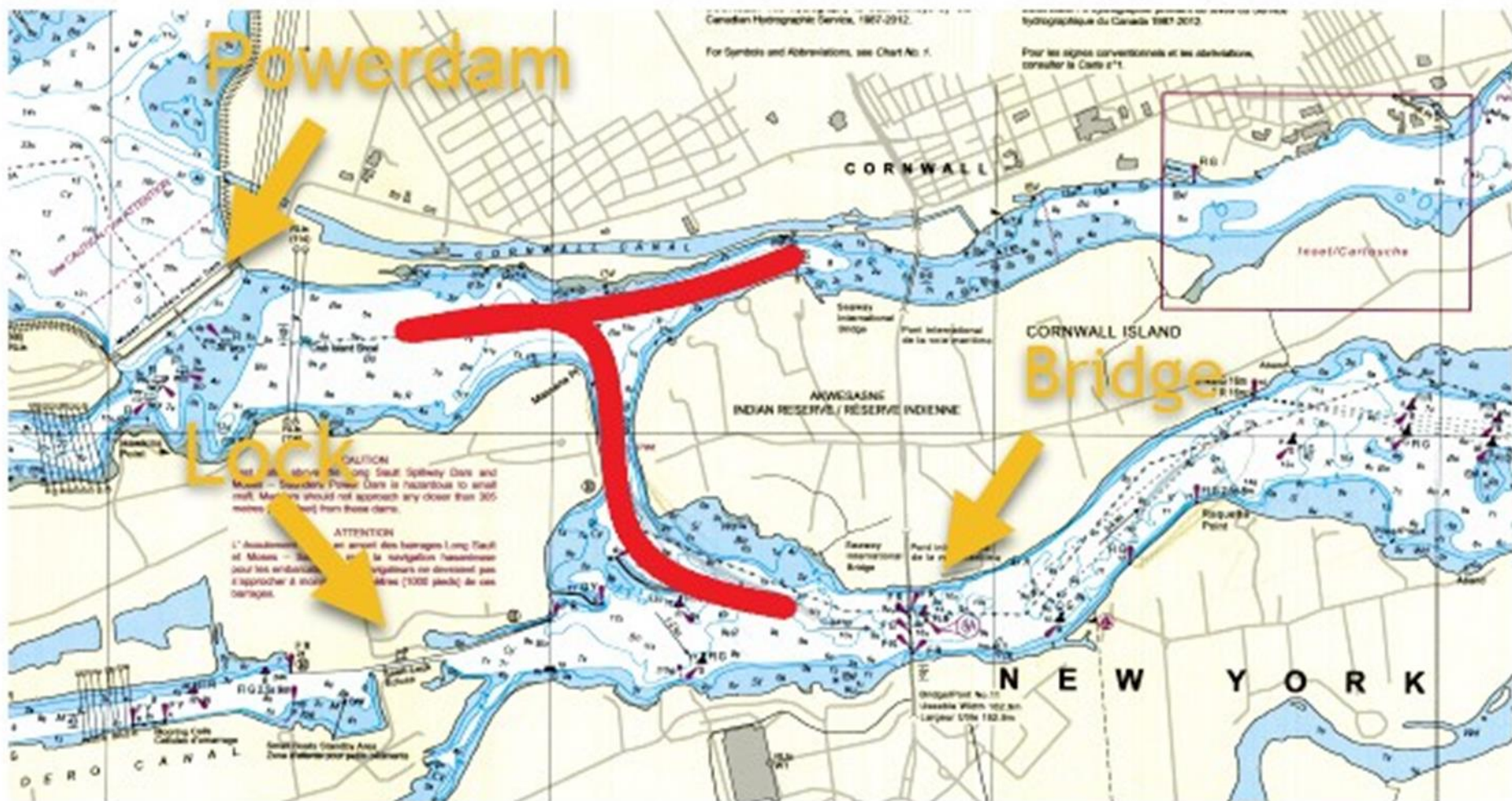
**NOTES**  
 1. Low water minimum FOR TOWERS 41 FT and  
 2. 40 FT  
 3. 35 FT  
 4. 30 FT  
 5. 25 FT  
 6. 20 FT  
 7. 15 FT  
 8. 10 FT  
 9. 5 FT  
 10. 0 FT  
 11. 5 FT  
 12. 10 FT  
 13. 15 FT  
 14. 20 FT  
 15. 25 FT  
 16. 30 FT  
 17. 35 FT  
 18. 40 FT  
 19. 45 FT  
 20. 50 FT  
 21. 55 FT  
 22. 60 FT  
 23. 65 FT  
 24. 70 FT  
 25. 75 FT  
 26. 80 FT  
 27. 85 FT  
 28. 90 FT  
 29. 95 FT  
 30. 100 FT  
 31. 105 FT  
 32. 110 FT  
 33. 115 FT  
 34. 120 FT  
 35. 125 FT  
 36. 130 FT  
 37. 135 FT  
 38. 140 FT  
 39. 145 FT  
 40. 150 FT  
 41. 155 FT  
 42. 160 FT  
 43. 165 FT  
 44. 170 FT  
 45. 175 FT  
 46. 180 FT  
 47. 185 FT  
 48. 190 FT  
 49. 195 FT  
 50. 200 FT



Powerdam

Lock

Bridge



# <https://greatlakes-seaway.com/en/>



GREAT LAKES  
ST. LAWRENCE  
SEAWAY SYSTEM



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NAVIGATING THE SEAWAY

SEAWAY MAP

NAUTICAL CHARTS

AIDS TO NAVIGATION

WATER LEVELS AND  
ENVIRONMENTAL DATA

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## Environment Information

Water Levels (MLO)

Gradients (MLO)

Water Levels (Welland)

Water Temperatures

Flow / Currents (MLO)

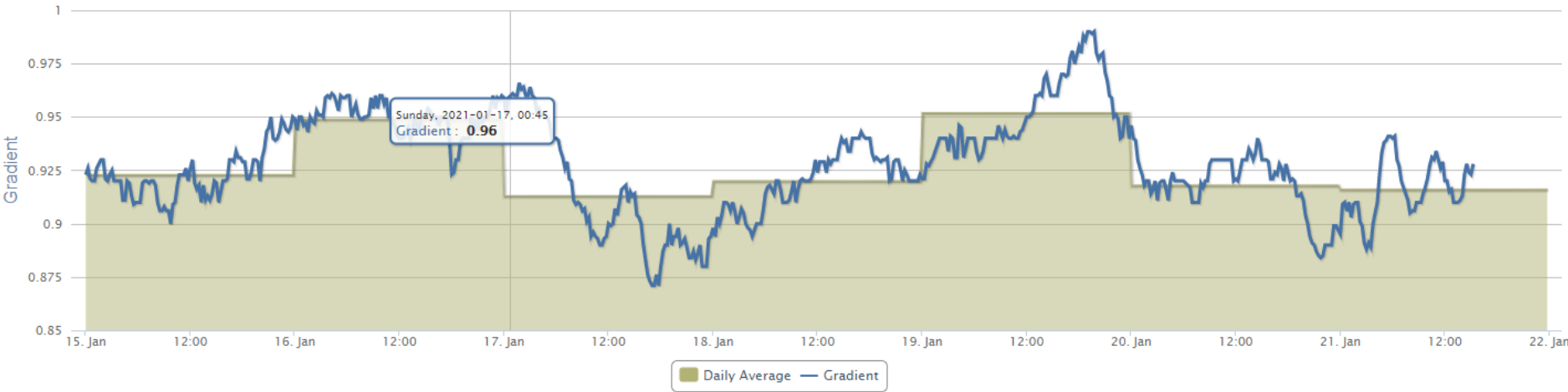
Wind Information

## Water Levels - Montreal-Lake Ontario

Gauge	Location	Date/Time	(m)	7-day Trend
SLBL	ST. LAMBERT LOCK LOWER WALL	01/21 15:18	9.58	<a href="#">View Details</a>
SLBU	ST. LAMBERT LOCK UPPER WALL	01/21 15:18	9.54	<a href="#">View Details</a>
CSCL	COTE STE. CATHERINE LOCK LOWER WALL	01/21 15:18	9.64	<a href="#">View Details</a>
CSCU	COTE STE. CATHERINE LOCK UPPER WALL	01/21 15:18	21.76	<a href="#">View Details</a>
W-SSC	WATER LEVEL ABOVE CPR BRIDGE	01/21 15:18	21.7	<a href="#">View Details</a>
BO3L	LOCK 3 BEAUHARNOIS LOWER WALL	01/21 15:18	21.89	<a href="#">View Details</a>
W-BOH	BOH POOL LEVEL	01/21 12:34	33.2	<a href="#">View Details</a>
BO4U	LOCK 4 BEAUHARNOIS UPPER WALL	01/21 15:18	45.69	<a href="#">View Details</a>
W-SLU	WATER LEVEL ST. LOUIS BRIDGE	01/21 15:18	45.9	<a href="#">View Details</a>
W-VAL	VALLEYFIELD LEVEL	01/21 15:18	46.14	<a href="#">View Details</a>
CTL	CÔTEAU LANDING	01/21 15:18	46.39	<a href="#">View Details</a>
SMT	SUMMERSTOWN	01/21 15:18	46.67	<a href="#">View Details</a>
SNLL	SNELL LOCK LOWER WALL	01/21 13:46	46.87	<a href="#">View Details</a>
W-SNLU	UPPER SNELL LEVEL	01/05 12:02	60.83	<a href="#">View Details</a>
IKEU	EISENHOWER LOCK UPPER WALL	01/21 15:18	71.89	<a href="#">View Details</a>
W-MOR	MORRISBURG LEVEL	01/21 15:18	72.33	<a href="#">View Details</a>
IROL	IROQUOIS LOCK LOWER WALL	01/21 15:18	72.82	<a href="#">View Details</a>
IROU	IROQUOIS LOCK UPPER WALL	01/21 15:18	73.02	<a href="#">View Details</a>
W-CAR	CARDINAL LEVEL	01/21 15:18	73.47	<a href="#">View Details</a>
OGD	OGDENSBURG N.Y.	01/21 15:18	74.18	<a href="#">View Details</a>
KGN	KINGSTON	01/21 15:18	74.61	<a href="#">View Details</a>

Note: Highlighted water levels are estimated.

Last 7-Day Gradient Trend: OGD-CAR



## Environment Information

Water Levels (MLO)

Gradients (MLO)

Water Levels (Welland)

Water Temperatures

**Flow / Currents (MLO)**

Wind Information

### Flow / Currents (MLO)

#### Area 1 - Below Beauharnois 3

F-CARI:1817.0 Updated:2021-01-21 14:45:00

F-CASC:1722.0 Updated:2021-01-21 14:45:00

F-BOHP:7530.0 Updated:2021-01-21 14:45:00

F-BOHP (m <sup>3</sup> /s) / F-CASC (m <sup>3</sup> /s)	500	1000	1500	2000	2500	3000	3500	4000	4500
7000									
7500				<a href="#">Image</a>		<a href="#">Image</a>			<a href="#">Image</a>
8000									
8500									

Beauharnois Flow (m3/s) / Pointe Des Cascades flow (m3/s)

#### Area 2 - Below Snell, Polly's Gut

F-MS: 9172.0 Updated: 2021-01-21 11:00:00

F-MS (m <sup>3</sup> /s)	
7000	
7500	
8000	
8500	
9000	<a href="#">Image</a>
9500	
10000	
10500	<a href="#">Image</a>
12000	<a href="#">Image</a>

Moses-Saunders Flow (m3/s)

#### Area 3 - Above Eisenhower, Copeland Cut

KGN: 74.63 Updated: 2021-01-21 15:22:00



# Strong Cross Current below Beauharnois 3

High Risk Area #1 - Scenario 12  
Below Boh 3

H2D2 Hydrodynamic Model

Model Parameters (m<sup>3</sup>/sec)

Ottawa river: 6000  
Cornwall: 9000  
Beauharnois: 7500  
Pointe-des-Cascades: 1500  
Vaudreuil channel: 1562

Legend



HOW TO INTERPRET THE IMAGE

Surface Current Direction: The direction toward which a CURRENT is flowing.

Surface Current Speed: Arrow size and Color are function of Speed.

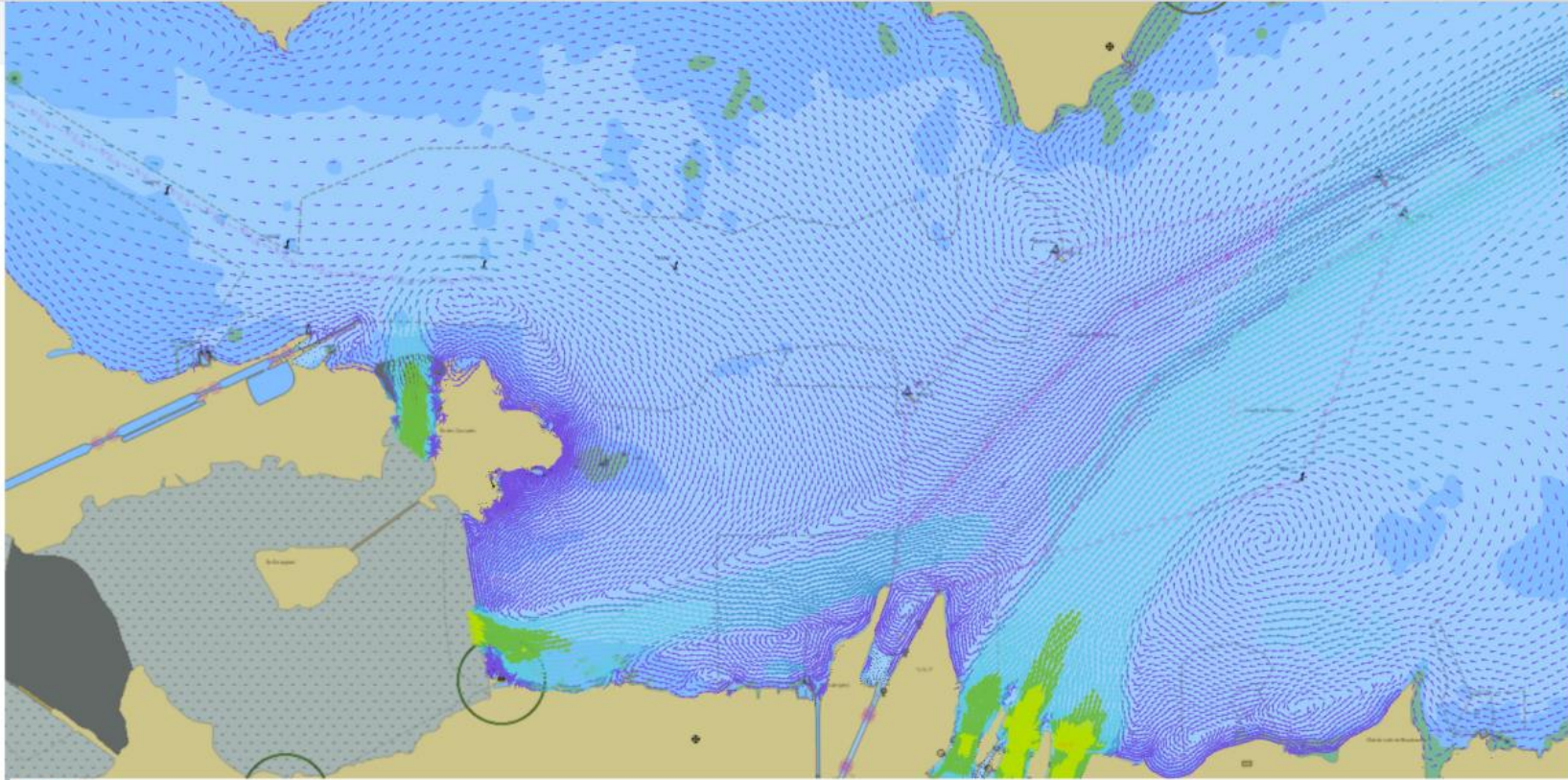
Density of arrows represent the spatial resolution of the model.

COMMENT INTERPRÉTER L'IMAGE

Direction du courant de surface: Direction vers laquelle un COURANT s'écoule.

Vitesse du courant: La taille de la flèche et la couleur sont fonction de la vitesse.

La densité des flèches représente la résolution spatiale du modèle.



\*\*\* WARNING \*\*\*

These maps were jointly developed by the Canadian Hydrographic Service (CHS) of the Department of Fisheries and Oceans, and by the National Hydrological Service (NHS) of Environment and Climate Change Canada (ECCC). They provide to the St. Lawrence Seaway Management Corporation provisional information with regard to currents in the St. Lawrence Seaway in the purpose of ensuring safe navigation. Portrayal of the information is compliant with S-111 International Hydrographic Organisation (IHO) specifications for surface currents. <https://iho.int/en/standards-and-specifications> These maps were developed urgently to inform mariners about unusual hydrodynamic conditions in the St. Lawrence Seaway resulting from high water levels in the Great Lakes and in the St. Lawrence River. There is no guarantee that they are complete and accurate. They are based on the information available to the Government of Canada as of March 2020. These maps shall not be used out of this context. Using them out of context could cause accidents. For further information please contact the Canadian Hydrographic Service at [chinfo@fho-mipo.gc.ca](mailto:chinfo@fho-mipo.gc.ca).

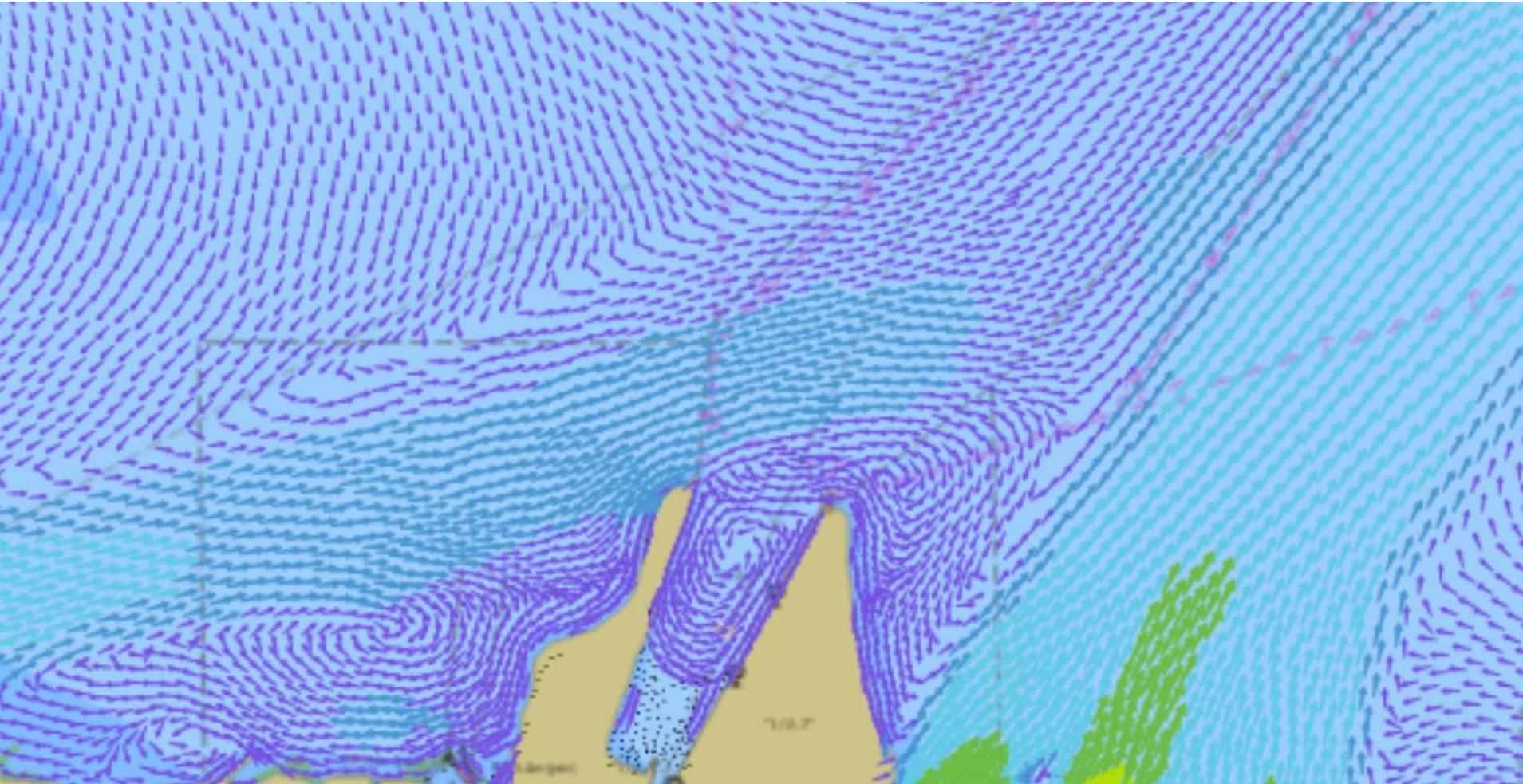
\*\*\* ATTENTION \*\*\*

Ces cartes ont été développées conjointement par le Service hydrographique du Canada (SHC) du Ministère des Pêches et des Océans, et le service hydrologique national (SHN) d'Environnement et changement climatique Canada (ECCC). Elles donnent de l'information provisoire à la Corporation de gestion de la Voie maritime du Saint-Laurent au sujet des courants dans la Voie maritime du Saint-Laurent dans un objectif de sécurité de la navigation. L'affichage de l'information respecte la norme S-111 de l'Organisation internationale hydrographique pour les courants de surface(OH). <https://iho.int/fr/normes-et-specifications> Ces cartes ont été développées d'urgence en raison d'informer les marins de conditions hydrodynamiques inhabituelles dans la Voie maritime du Saint-Laurent résultants

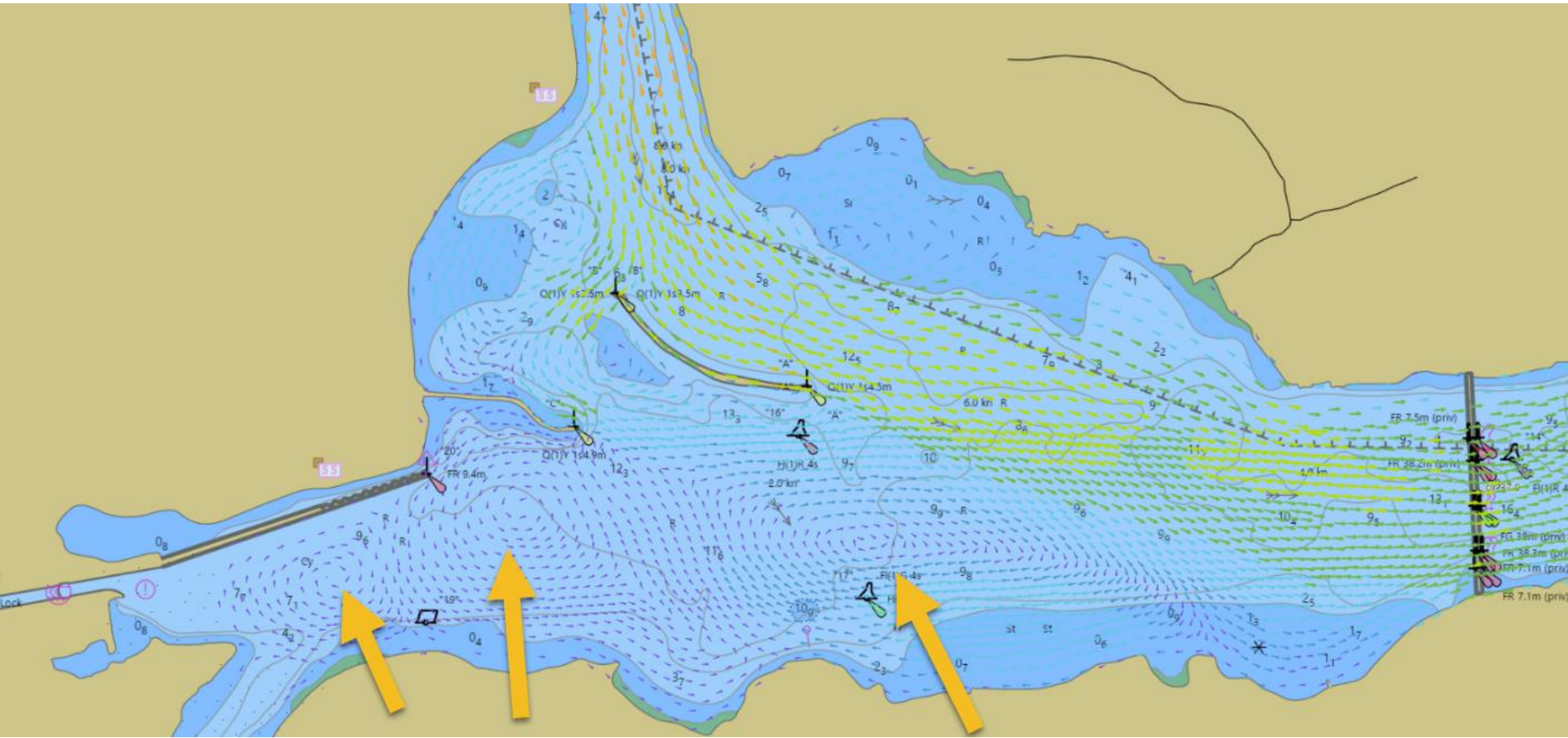




# Strong Cross Current below Beauharnois 3



# Eddy's and strong currents, below Snell Lock





# Next Steps: In Situ real time readings



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## Conclusion:

- Continue to refine the models and assess the needs for onsite instrumentation (current meters)
- Push information to the ECDIS / PPU



Questions?

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