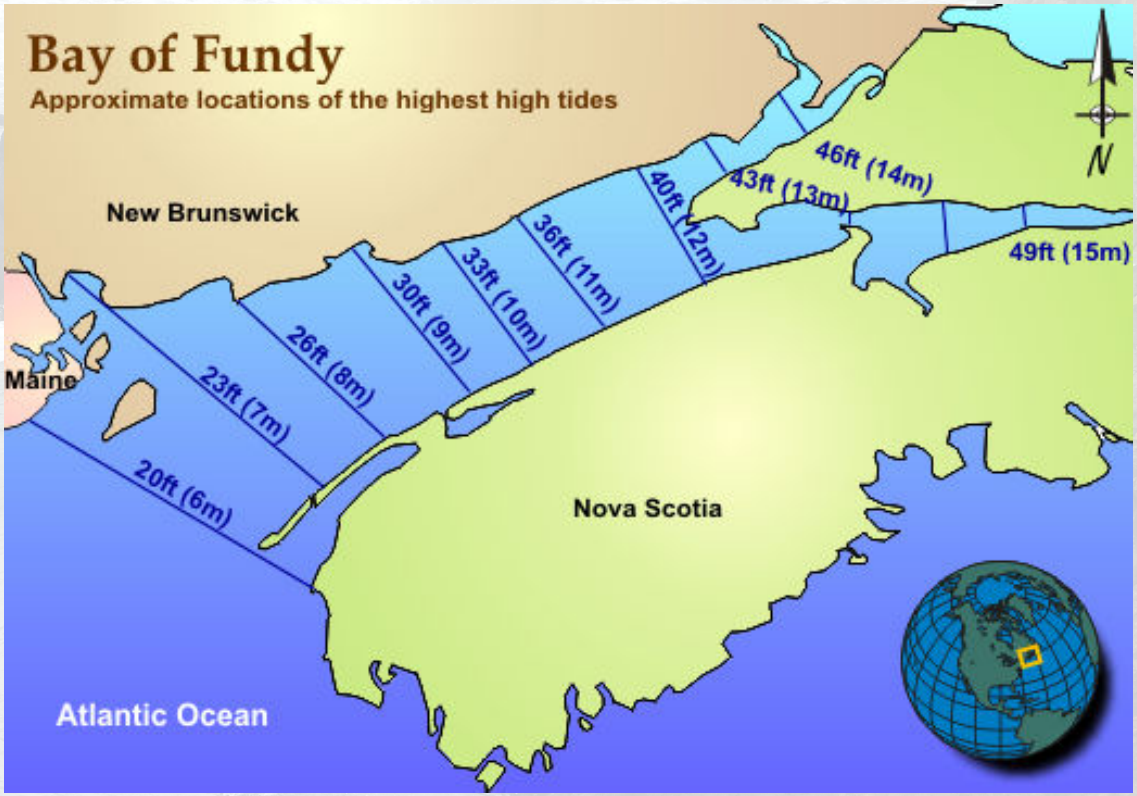
Hydrodynamics of the Bay of Fundy.

Richard Karsten

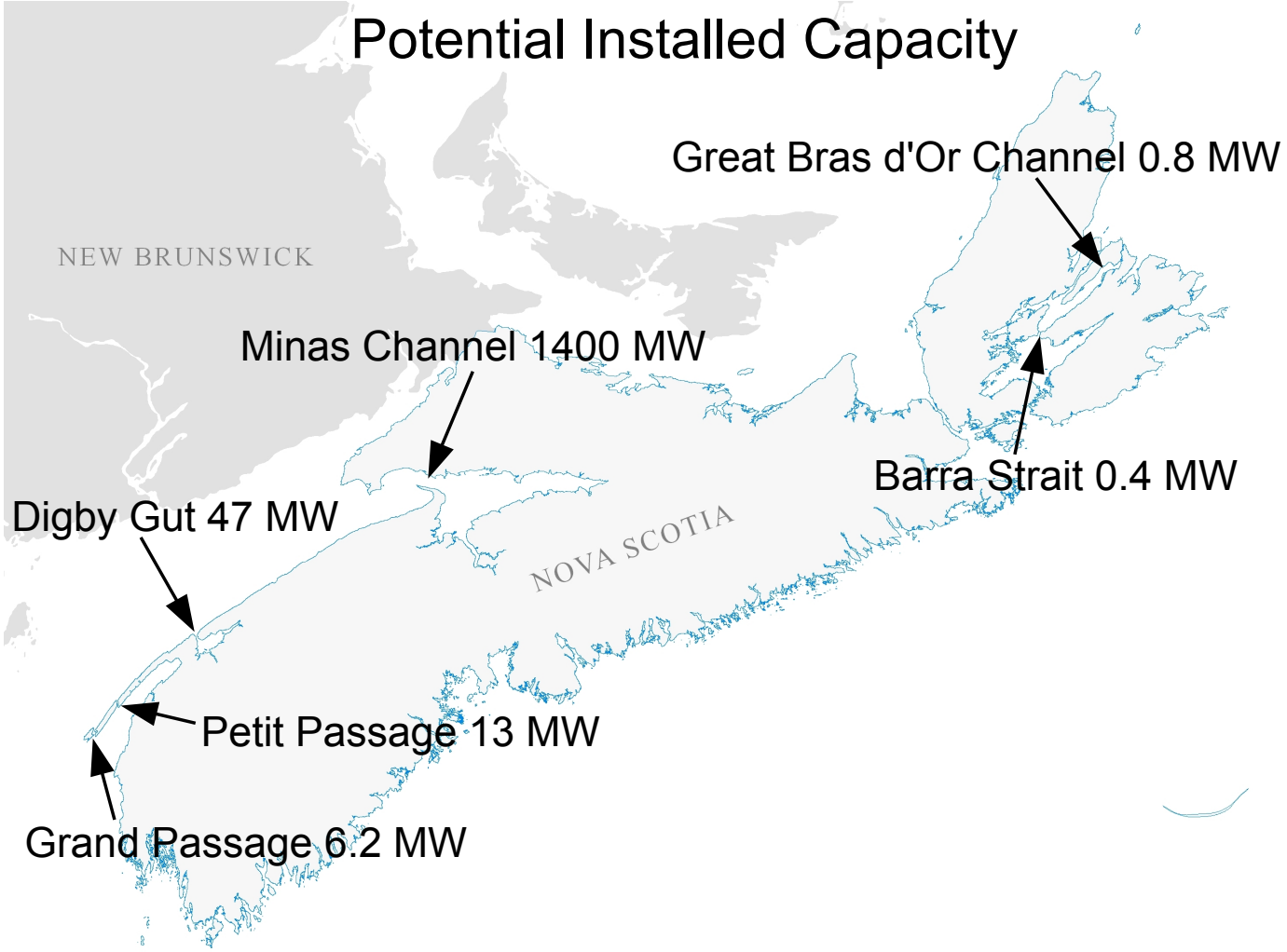
ACADIA
Tidal Energy
INSTITUTE
Research. Education. Outreach.

Bay of FundyTides

- Resonant, M_2 system
- tidal range up to 17 m
- 120 –160 Billion tons of water

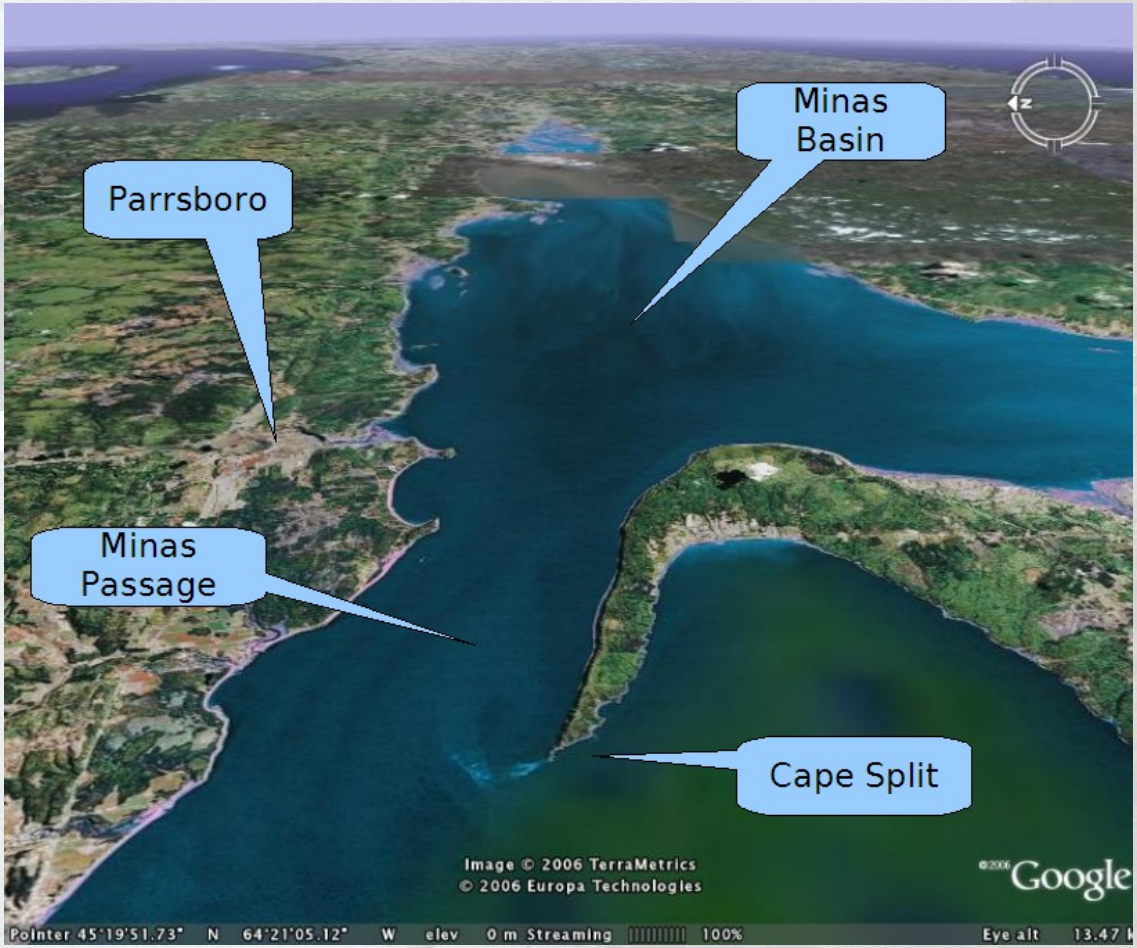


Nova Scotia Tidal Power: Potential Power



Minas Passage

- 5 km wide
- 15 km long
- water speeds > 5m/s
- asymmetric tides
- turbulent flow



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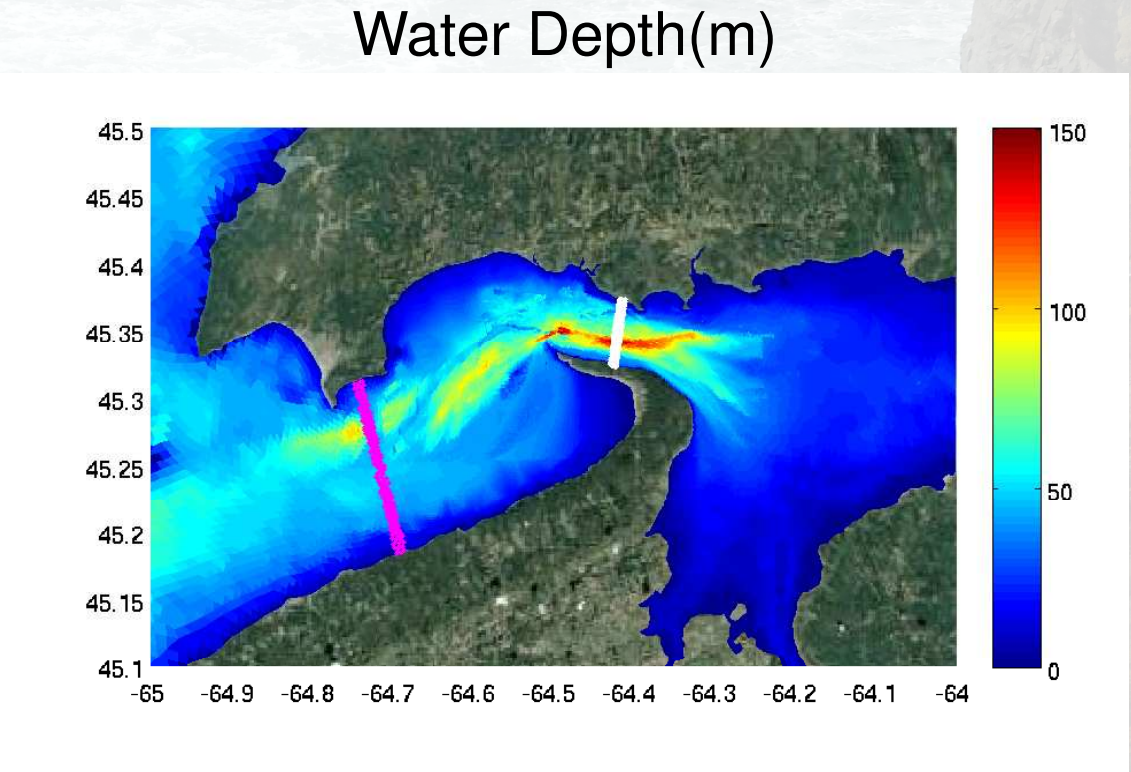

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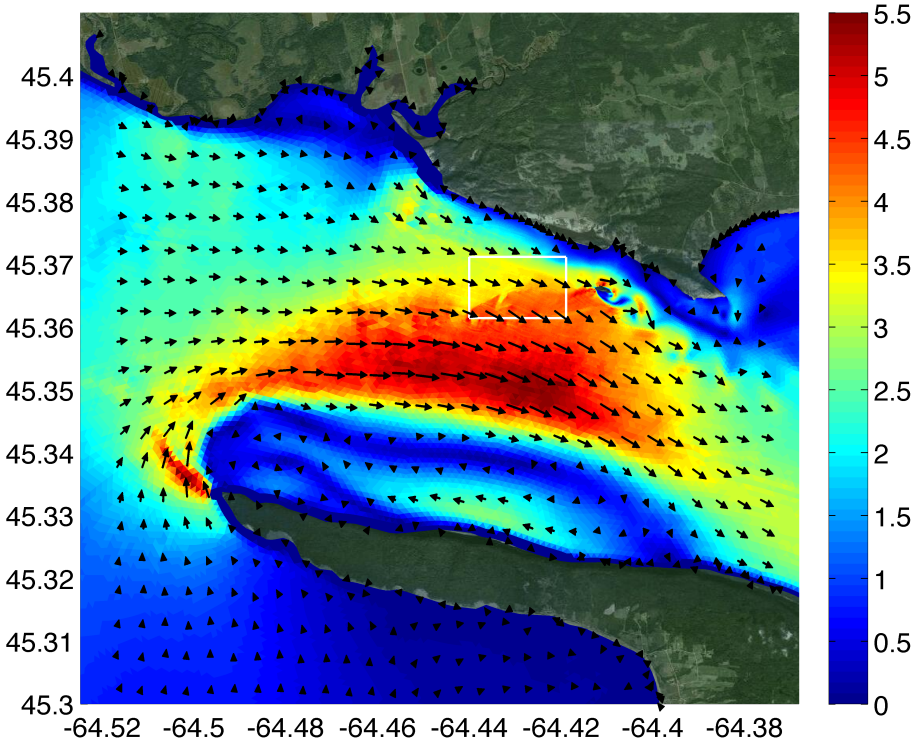
Flood tide



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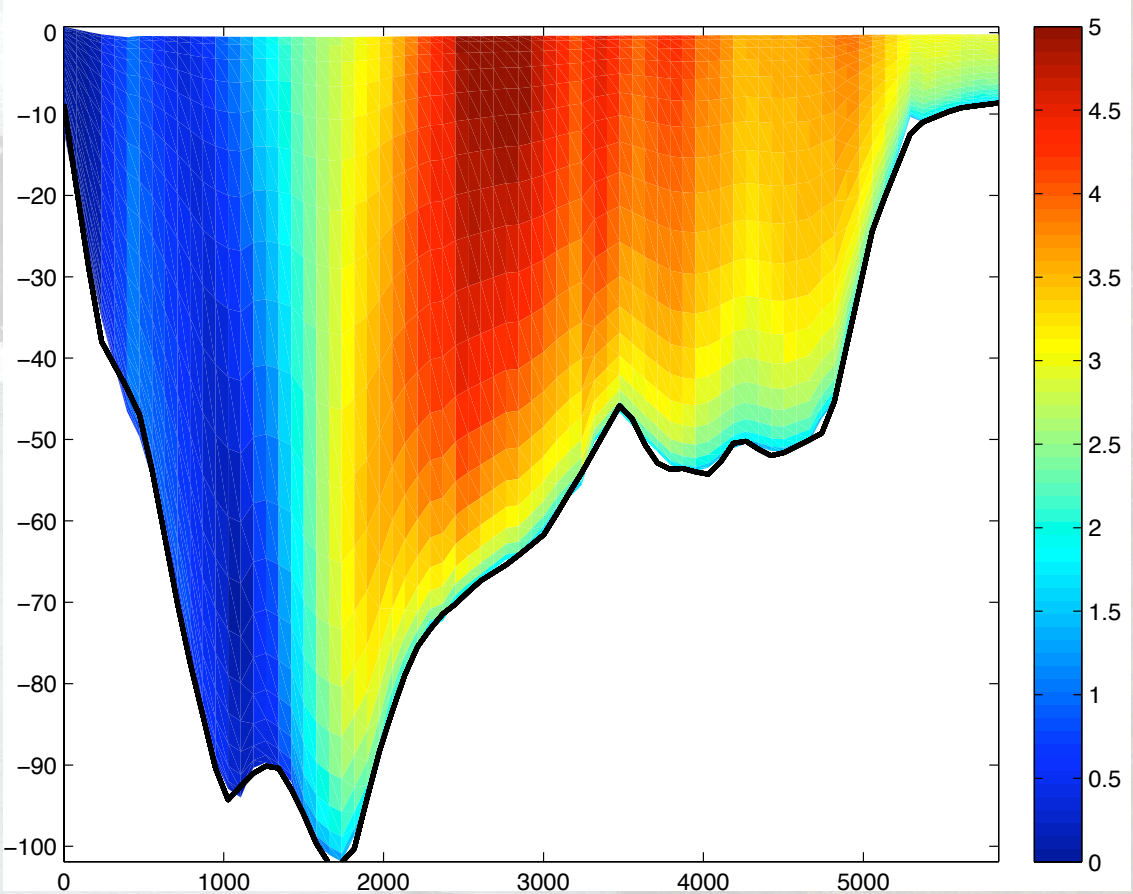

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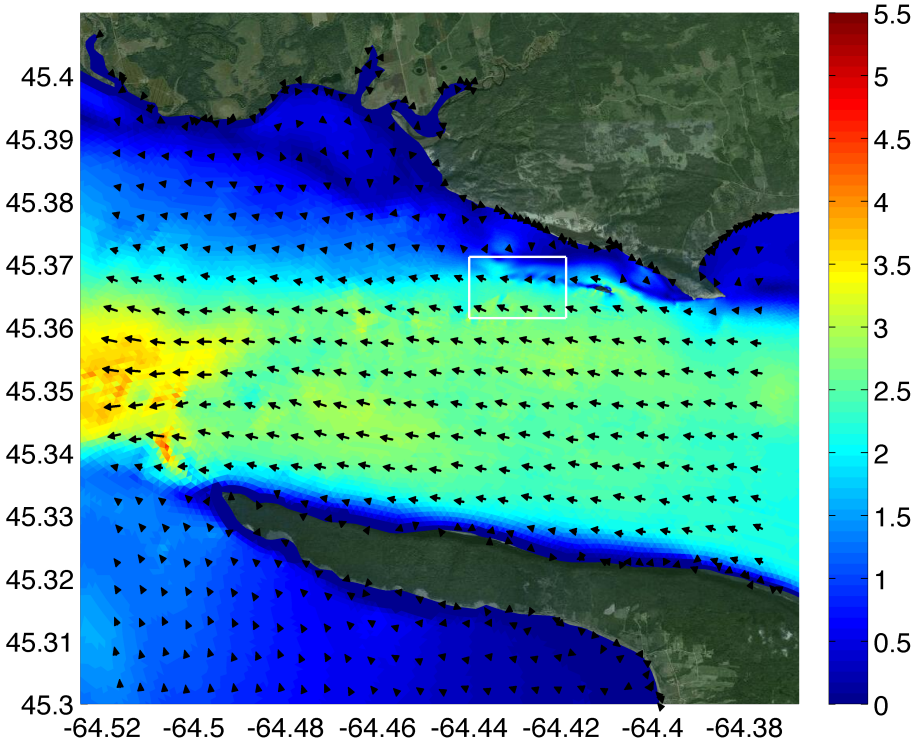
Ebb tide



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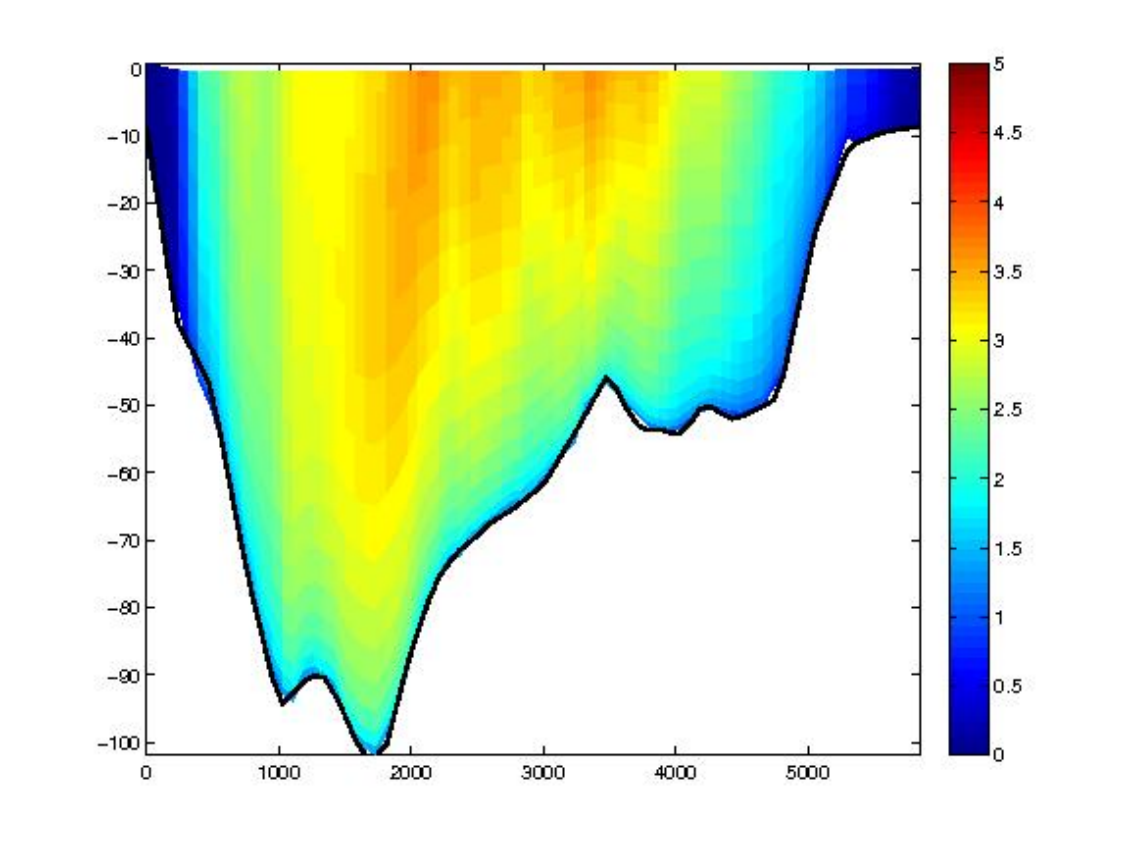

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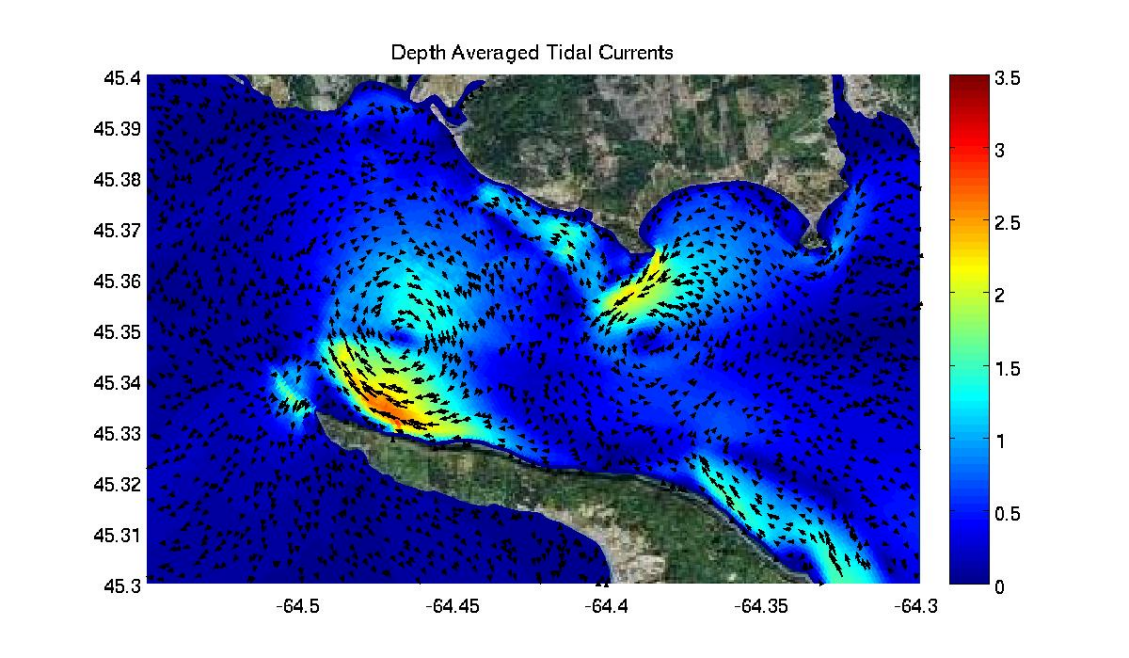
Slack Tide



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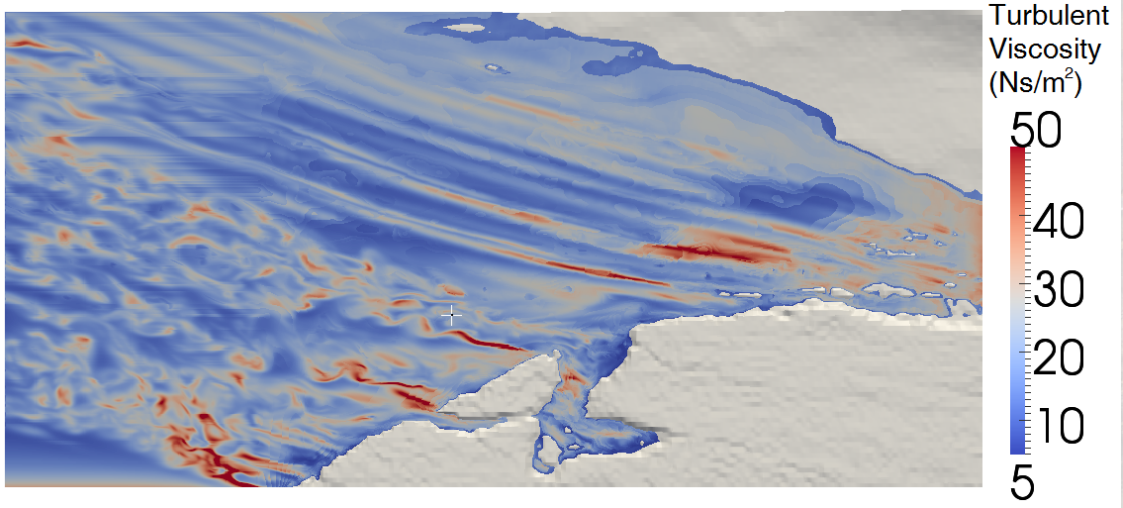
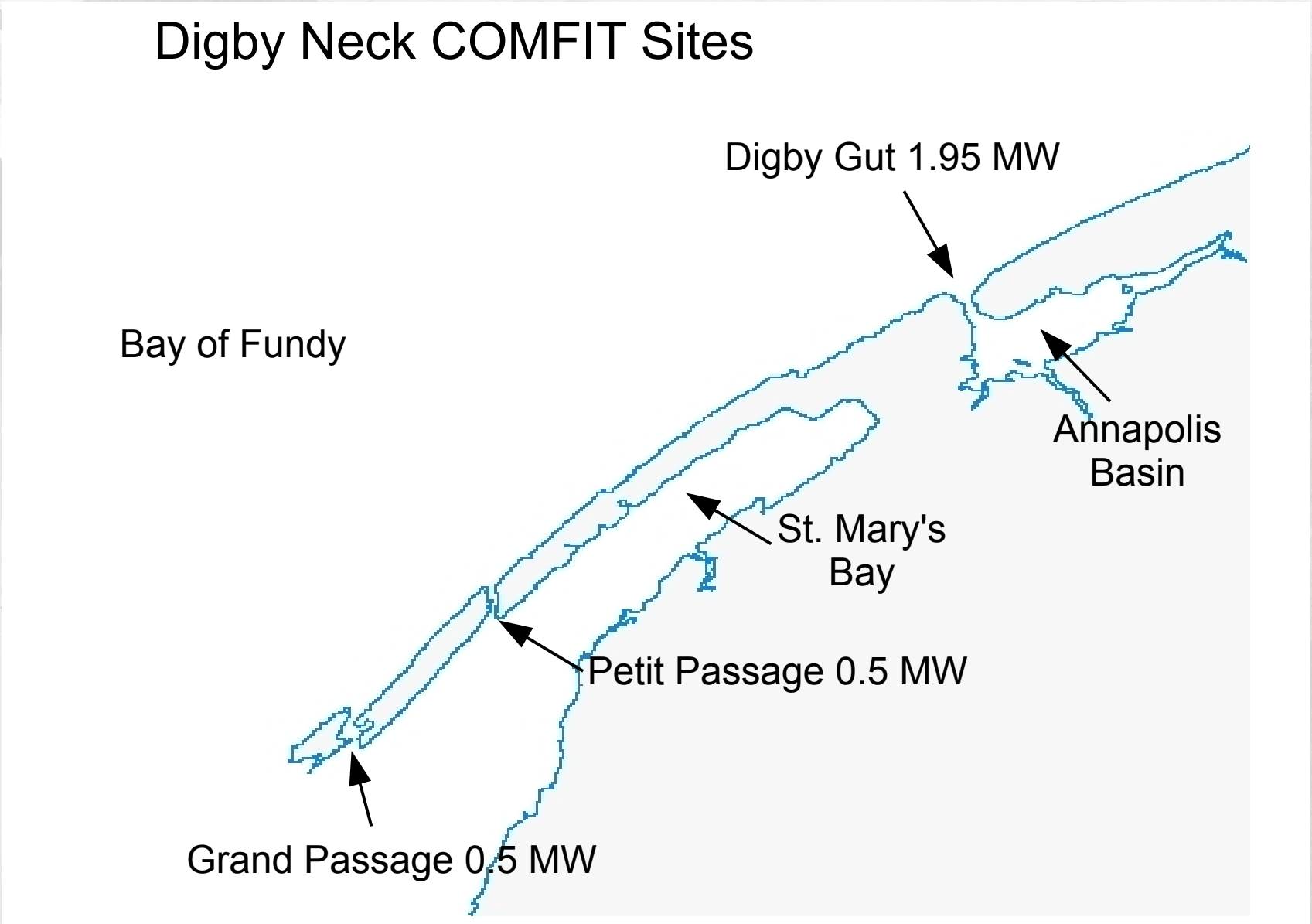


Modelling Turbulence with CFD
UNB

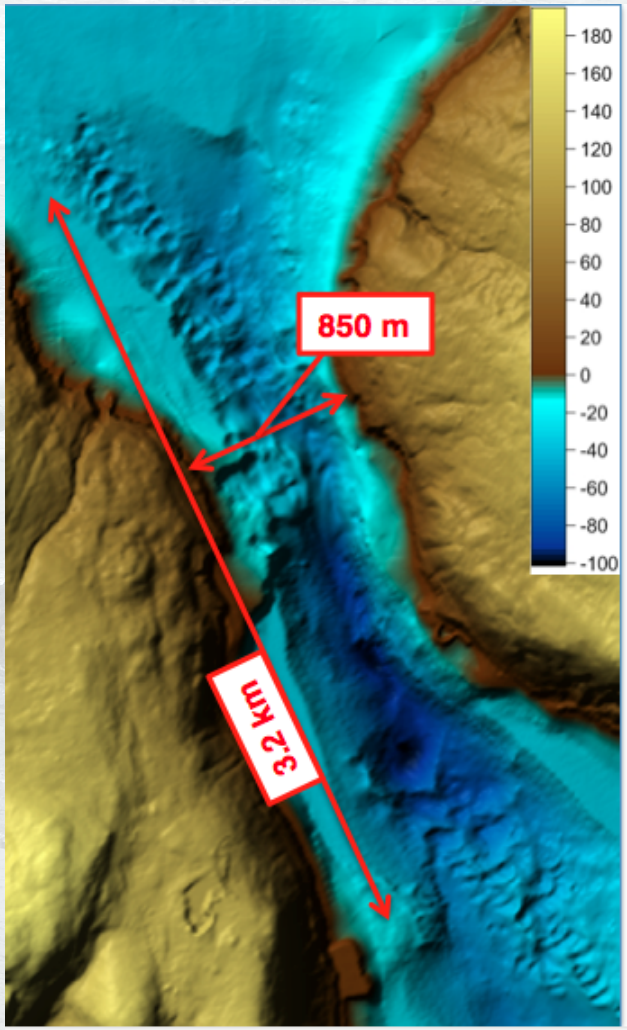
Community Feed In Tariff - 65.2¢ per kW/h



Digby Gut

- 850 m wide
- 3.2 km long
- Deep channel with shallow shelf
- Connects Annapolis Basin to Bay of Fundy
- water speeds > 3m/s

Bathymetry



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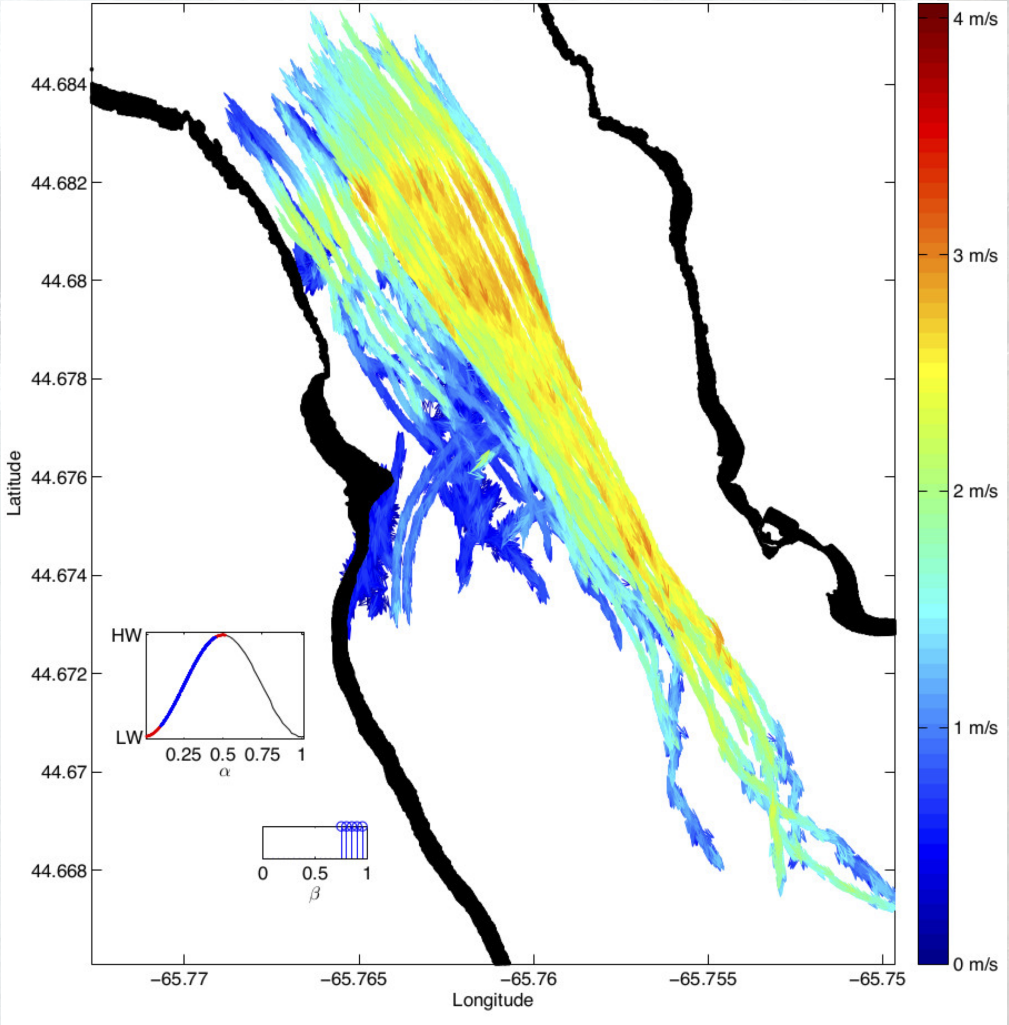

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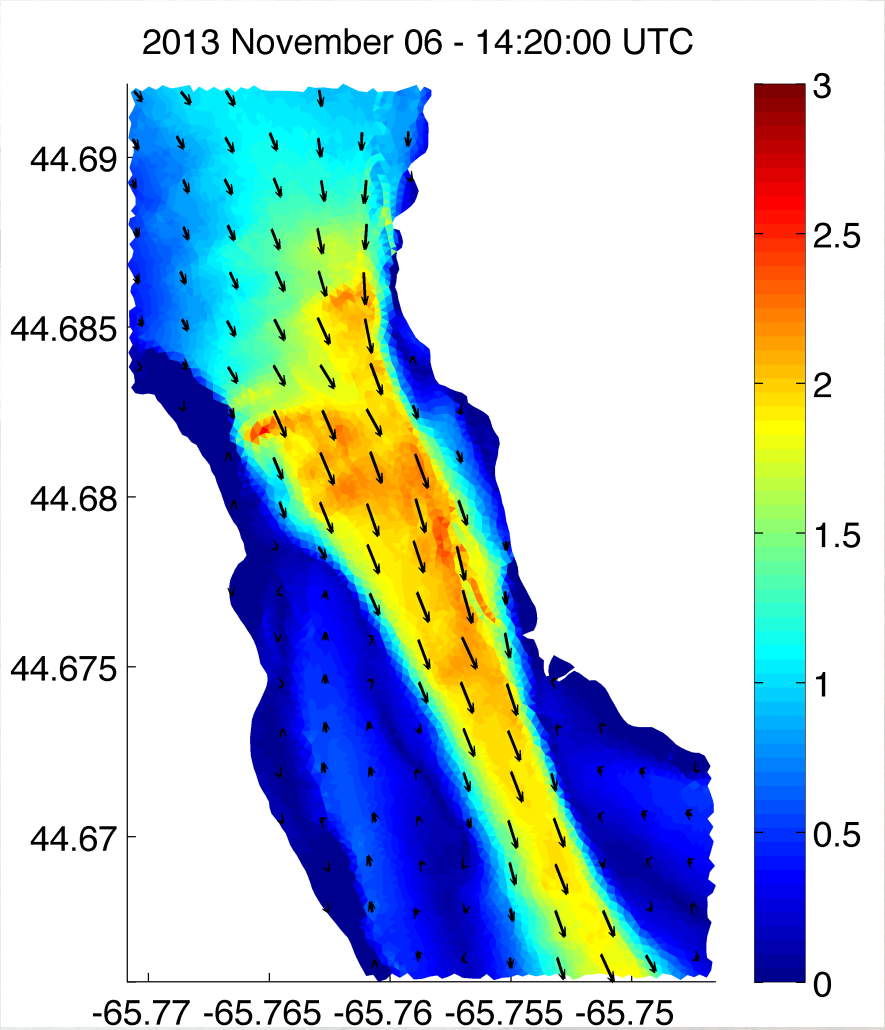

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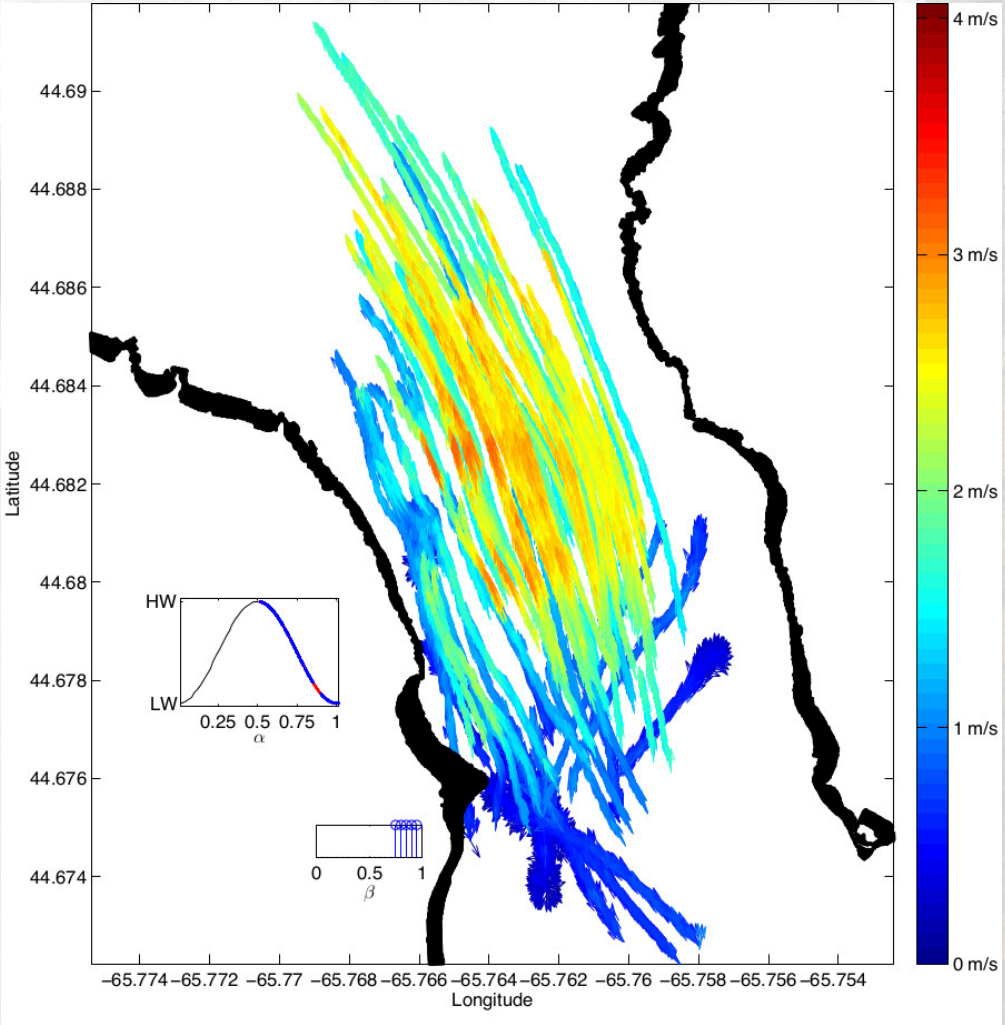

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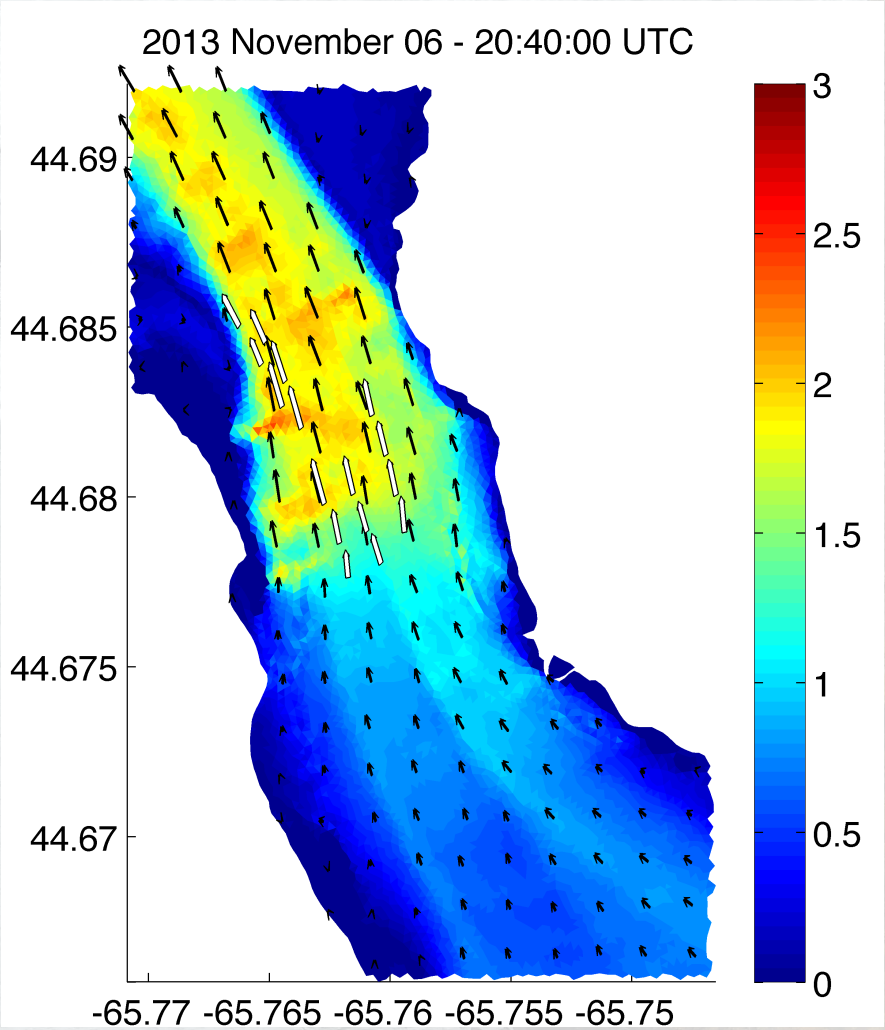

Petit Passage

- 400 m wide
- 3.3 km long
- medium depths
- Between St. Mary's Bay and Bay of Fundy
- water speeds > 4.5m/s

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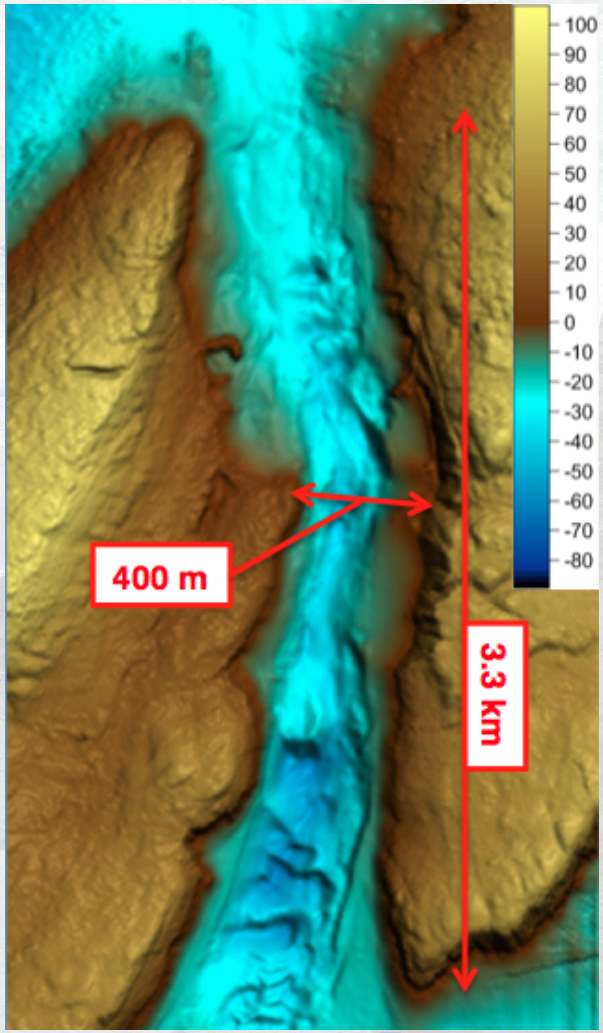

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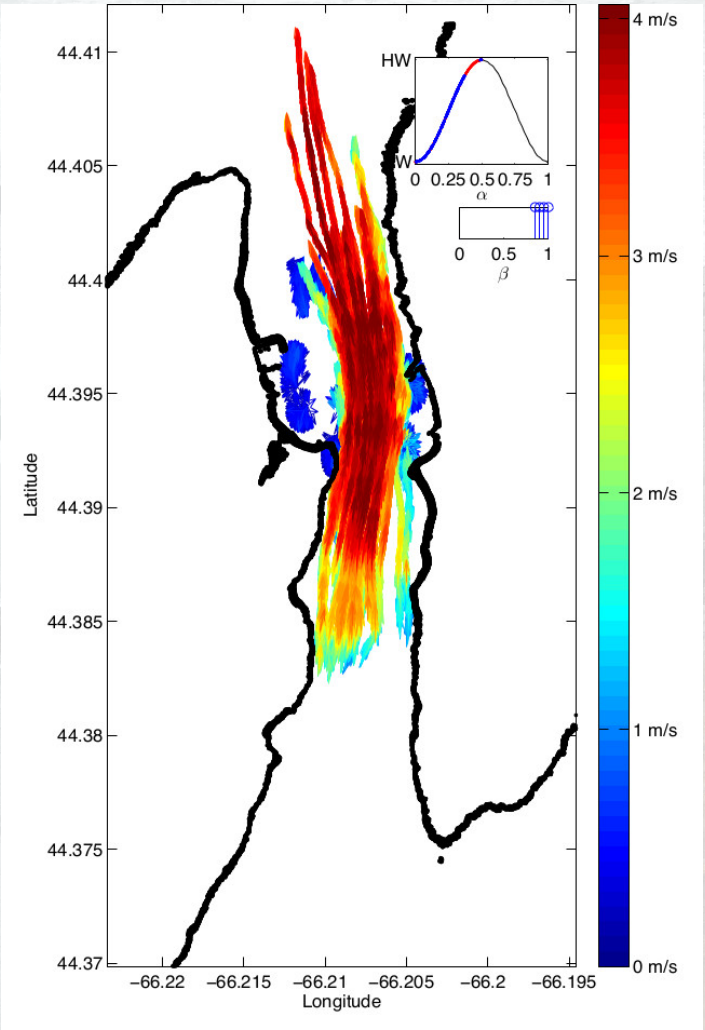

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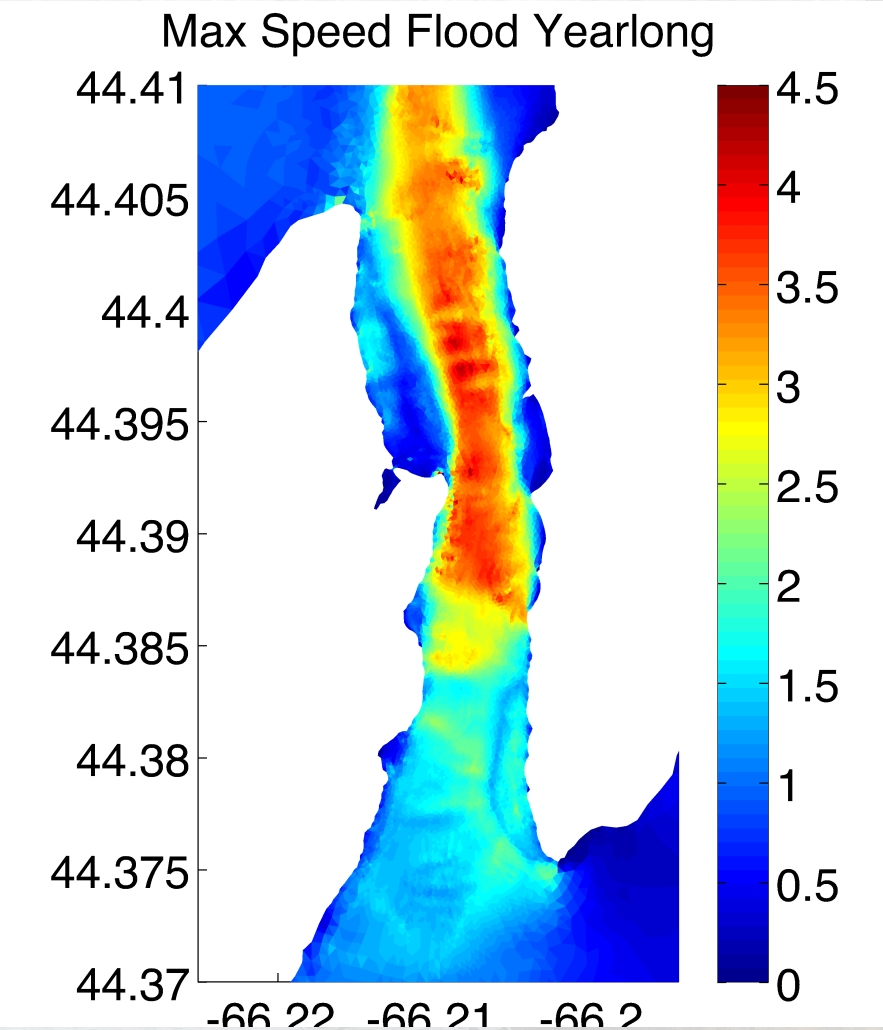

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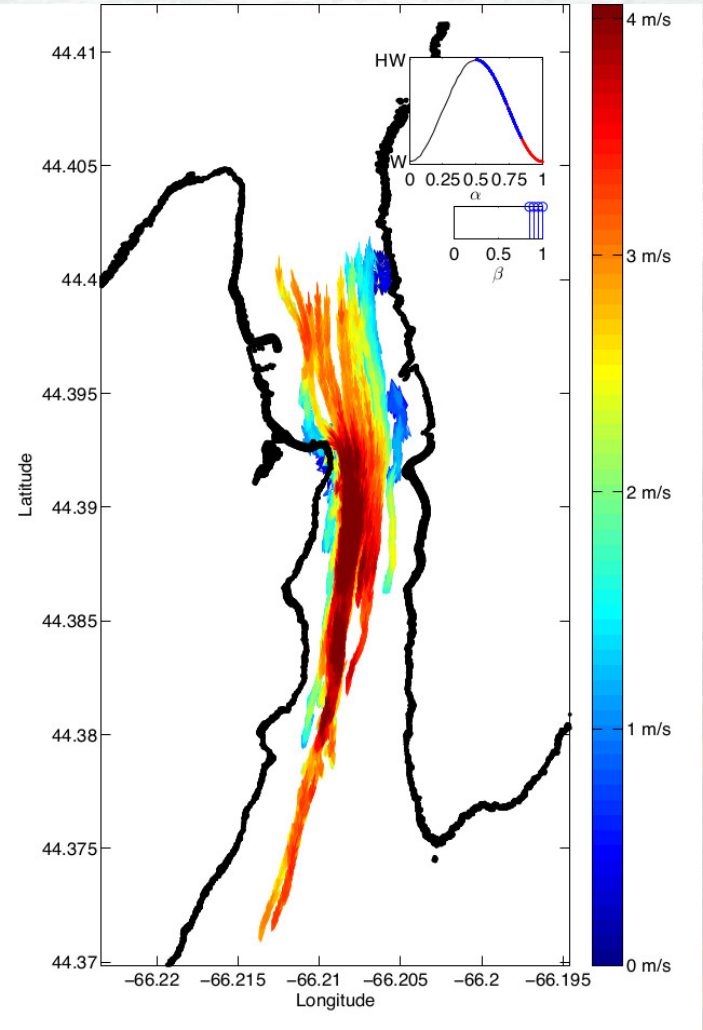

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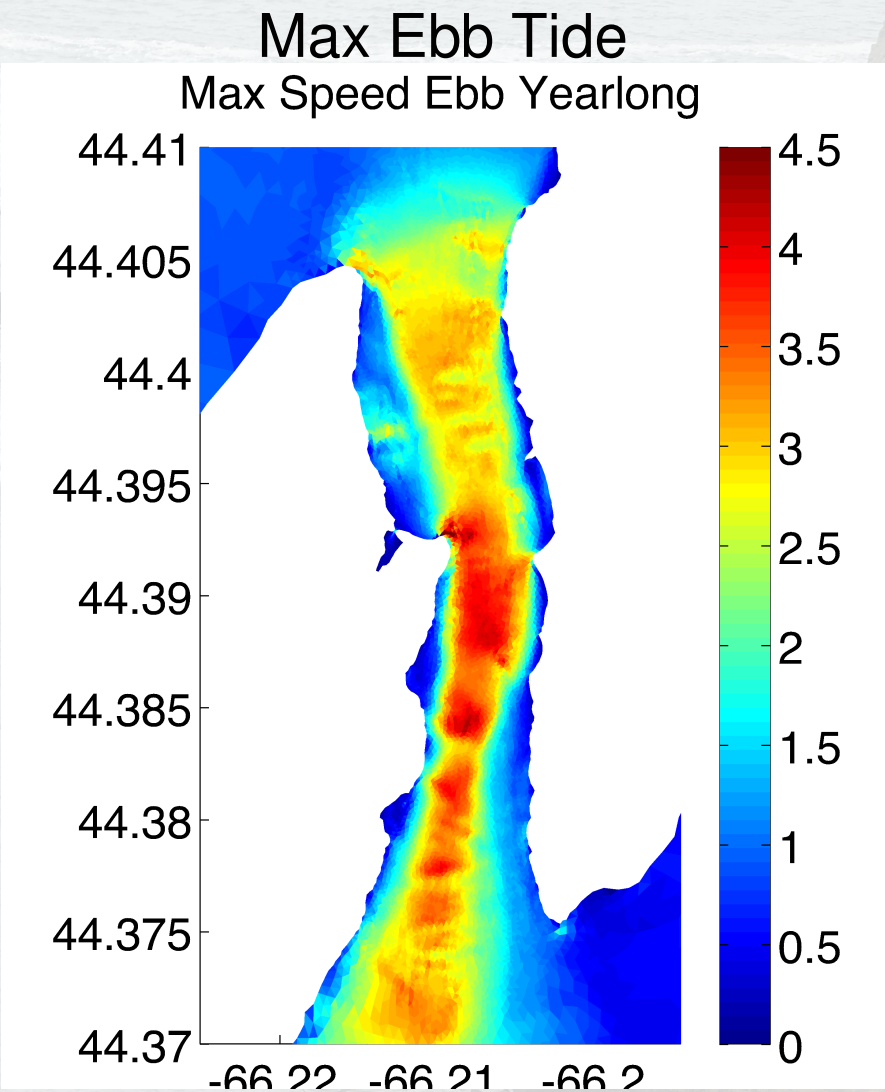
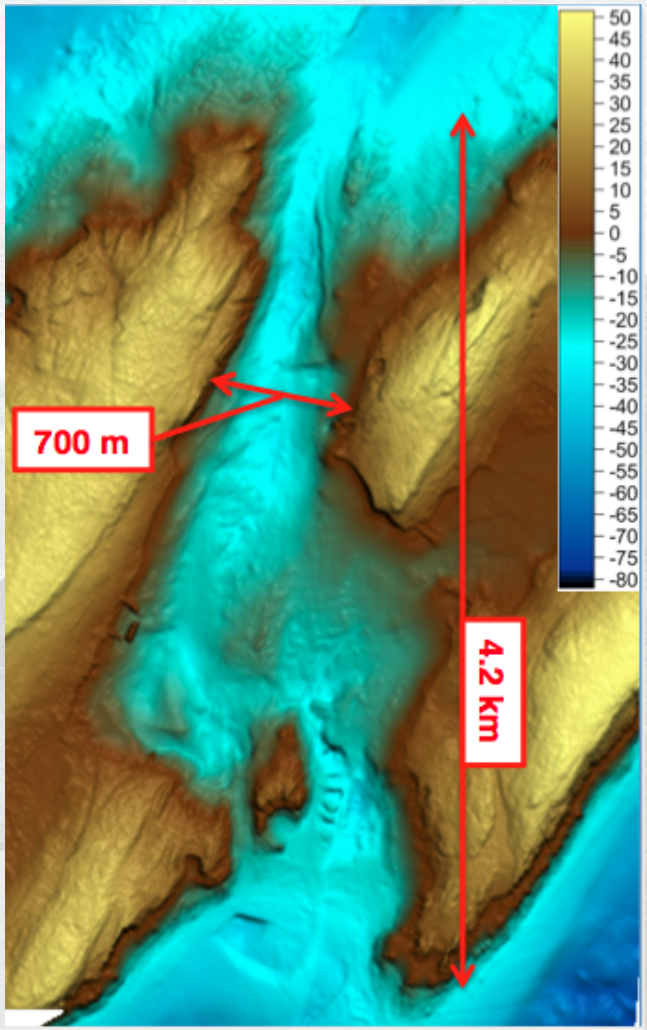


Grand Passage

- 700 m wide
- 4 km long
- Between St. Mary's Bay and Bay of Fundy
- water speeds > 3 m/s
- Interesting flows around bathymetry

Bathymetry



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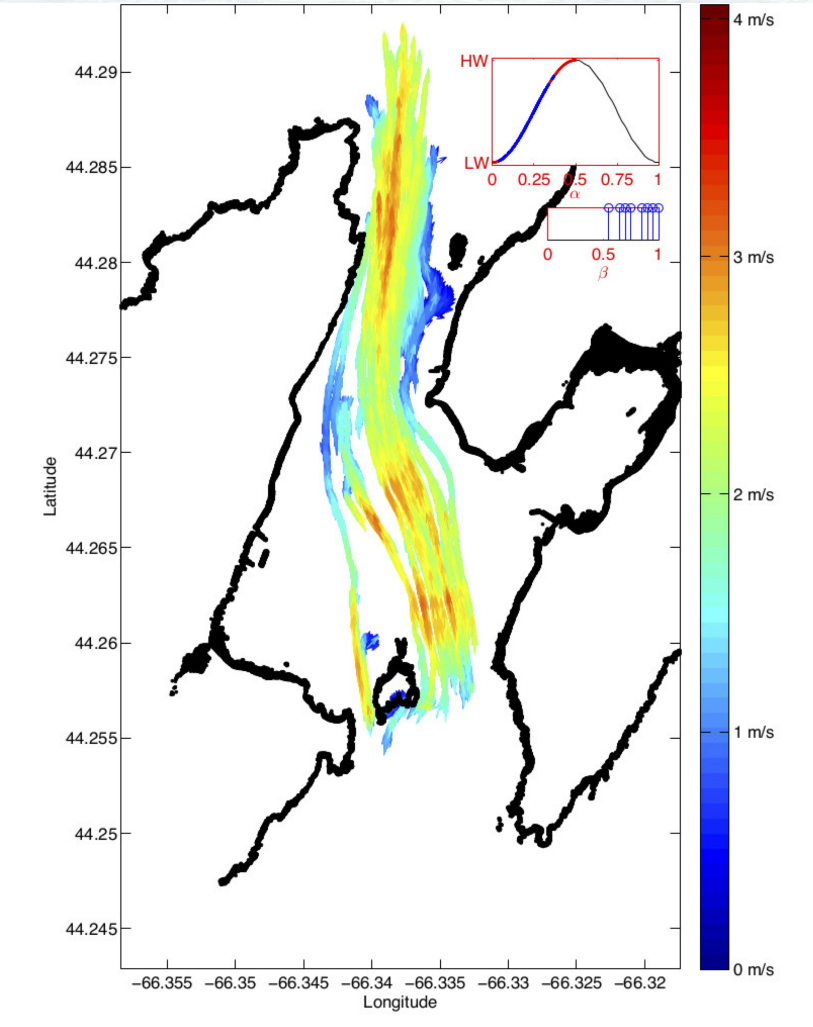

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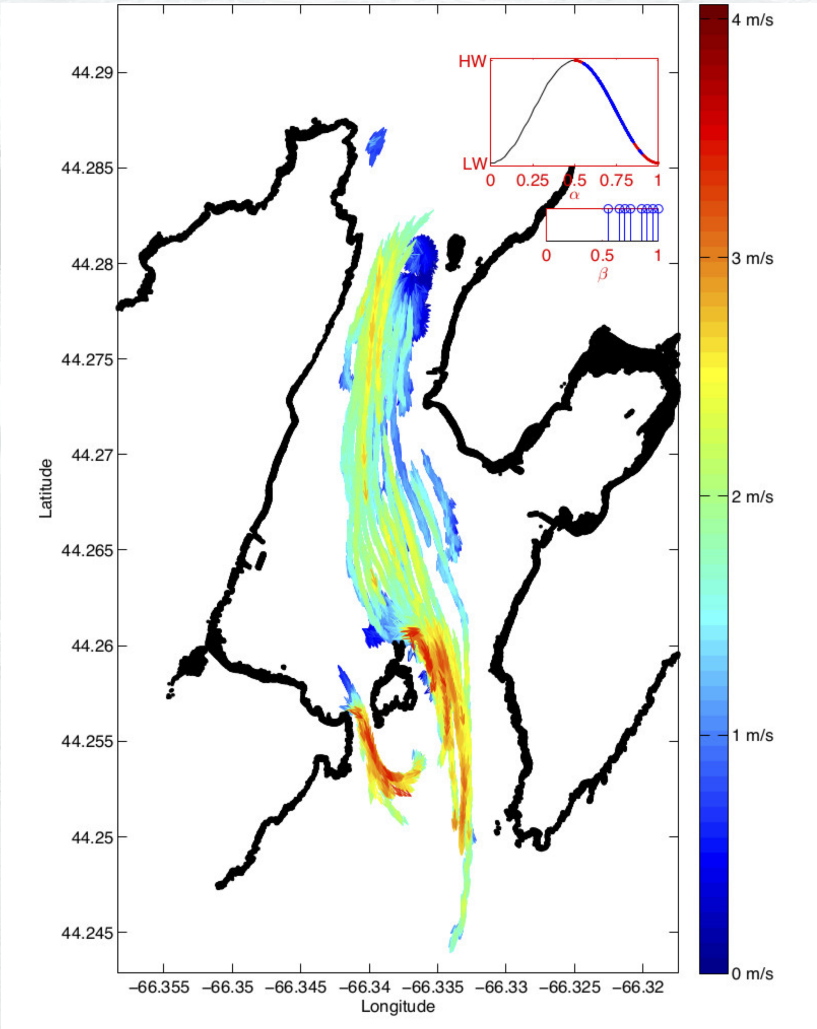
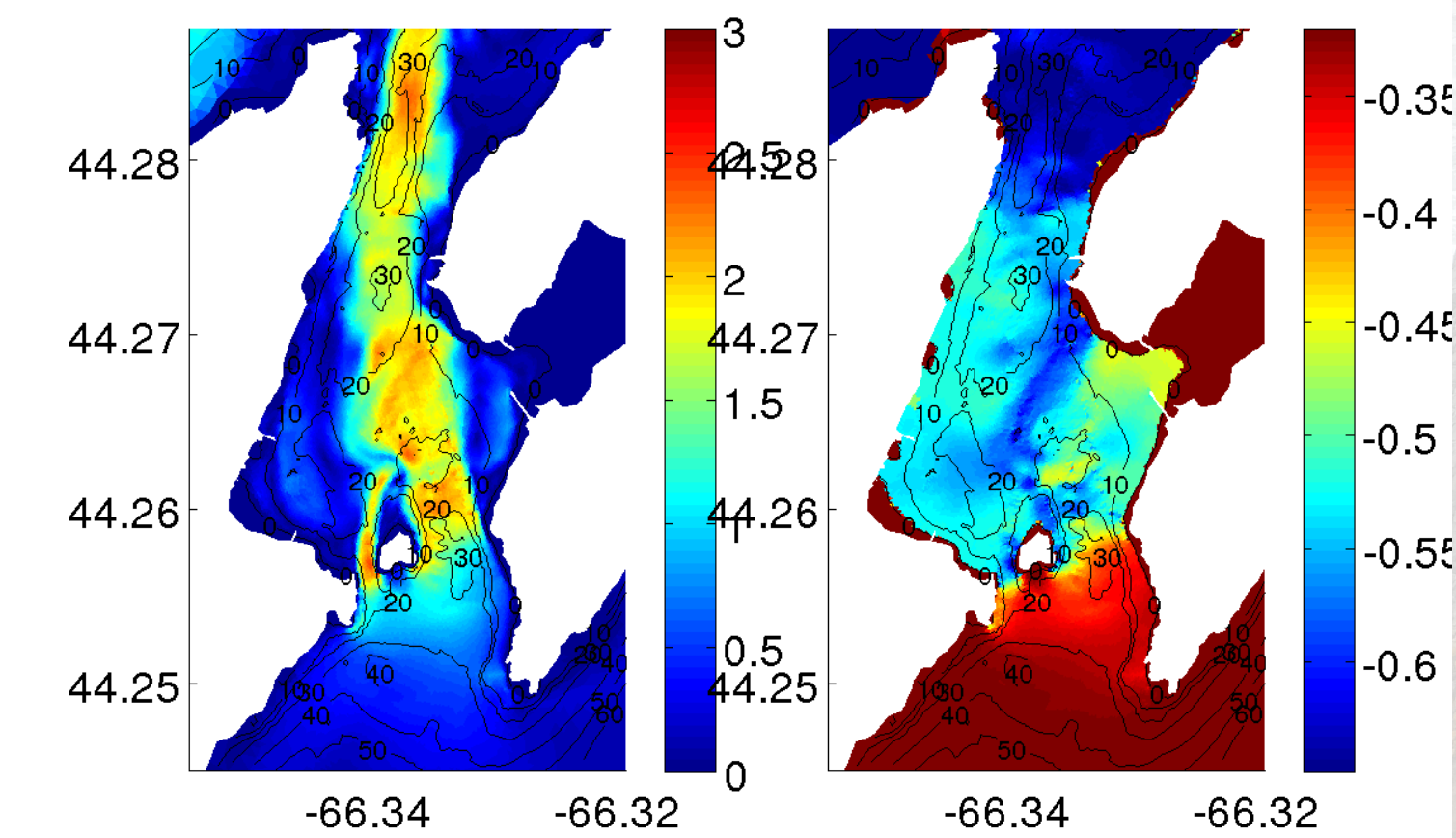


Grand Passage Flood Tide

Bay of Fundy

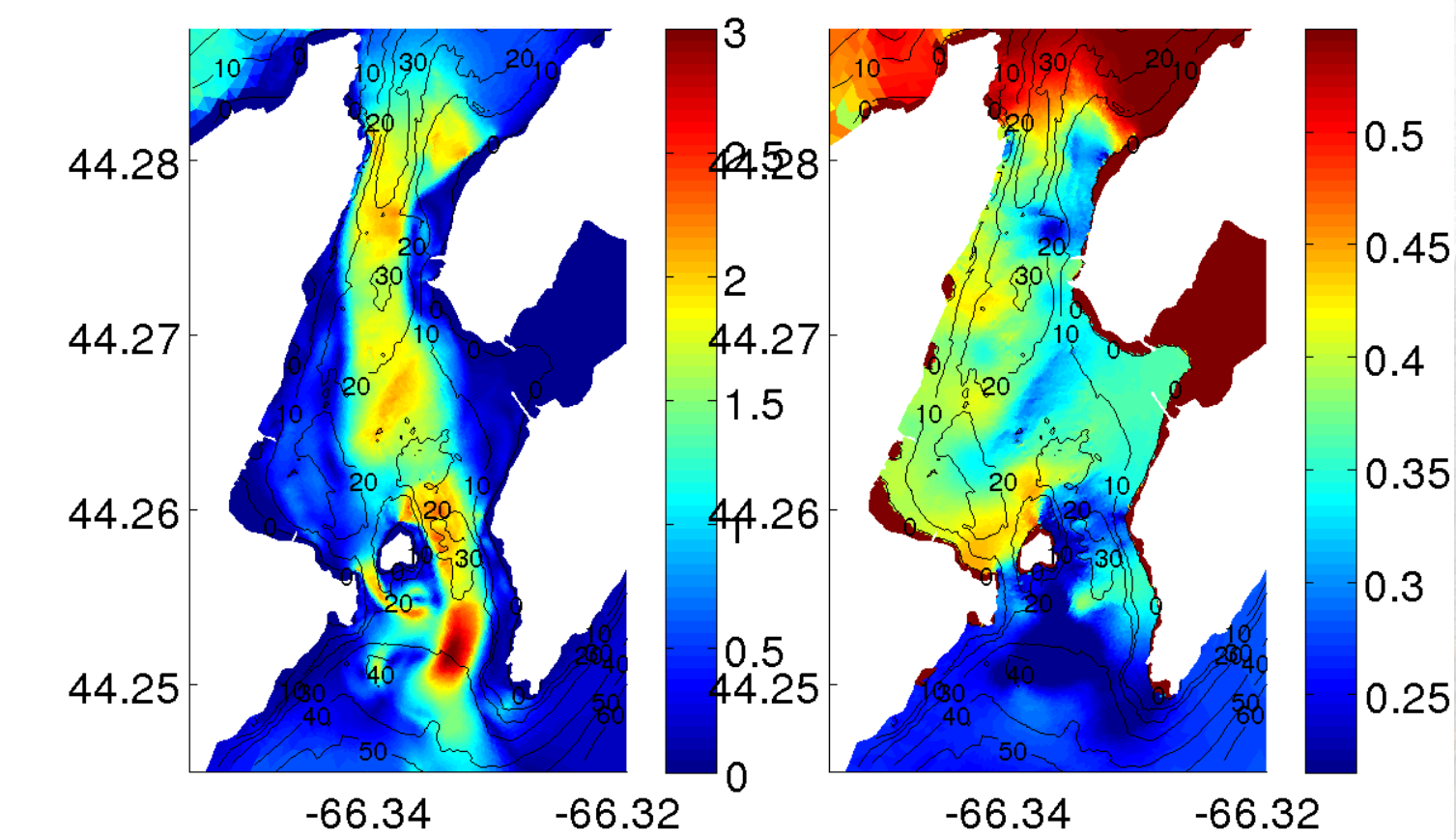


Water Speed (m/s) Elevation (m)

St Mary's Bay

Grand Passage Ebb Tide

Bay of Fundy



Water Speed (m/s) Elevation (m)

St Mary's Bay

Reducing the cost of in-stream tidal energy generation through comprehensive hydrodynamic site assessment.

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