

**wood.**

# Lower Churchill River Physical Ecosystem: General Overview

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[woodplc.com](http://woodplc.com)

# Physical Ecosystem Summary

## Brief Physical Ecosystem Summary:

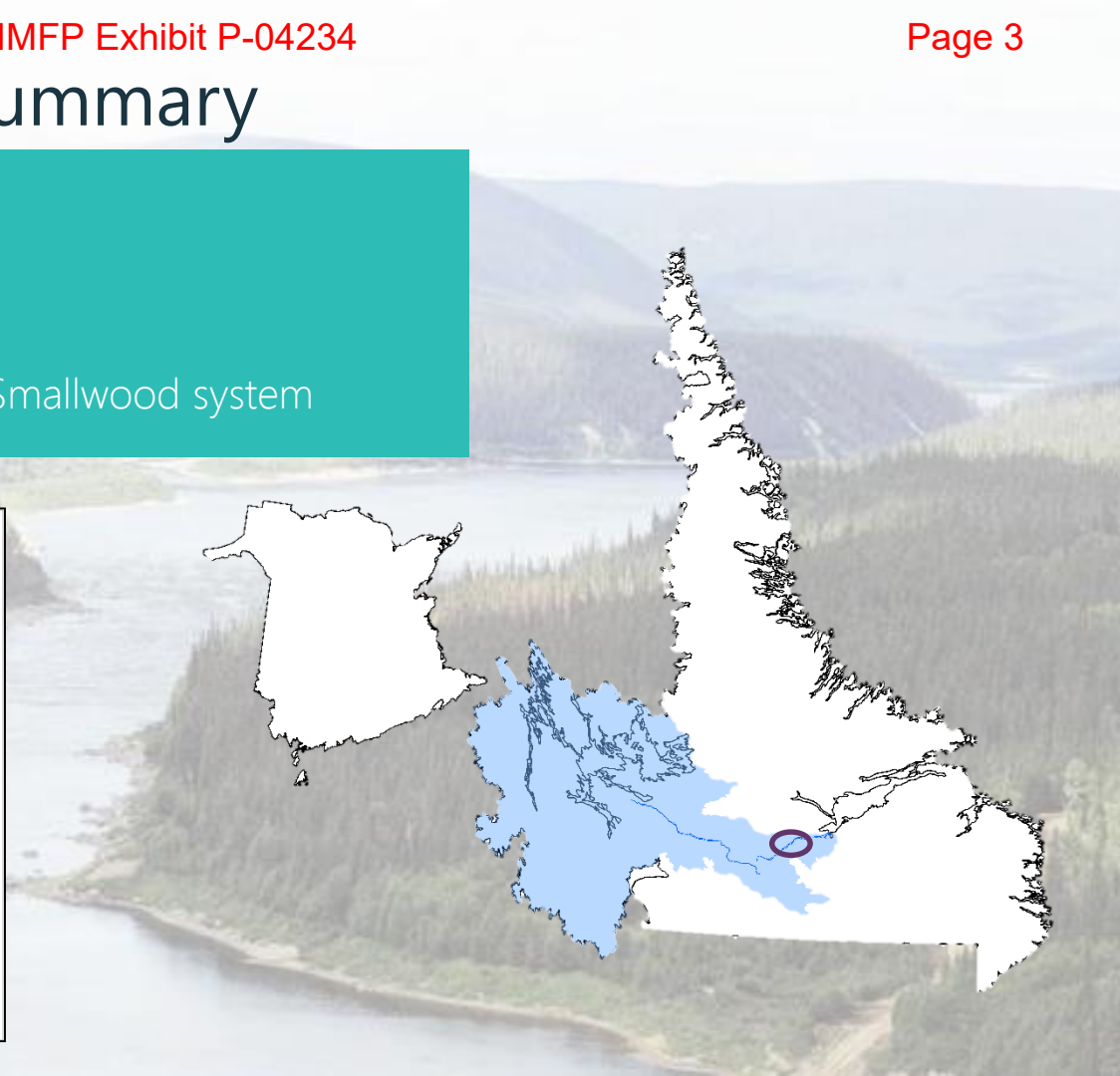
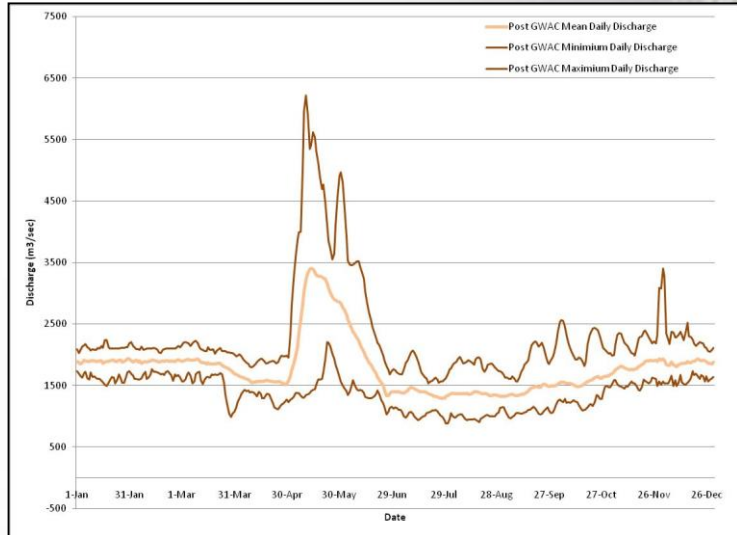
- River, Goose Bay, Lake Melville
- As it relates to MeHg
- Why it's important



# Physical Ecosystem Summary

## Churchill River Watershed

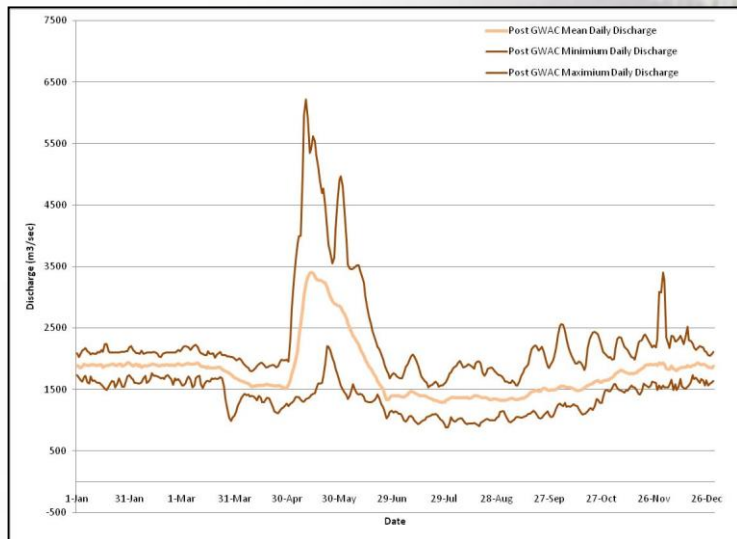
- Overall Watershed area 92,415km<sup>2</sup>
- MAF: ~1,780m<sup>3</sup>/s at Muskrat Falls
  - 75% from Upper Churchill and Smallwood system



# Physical Ecosystem Summary

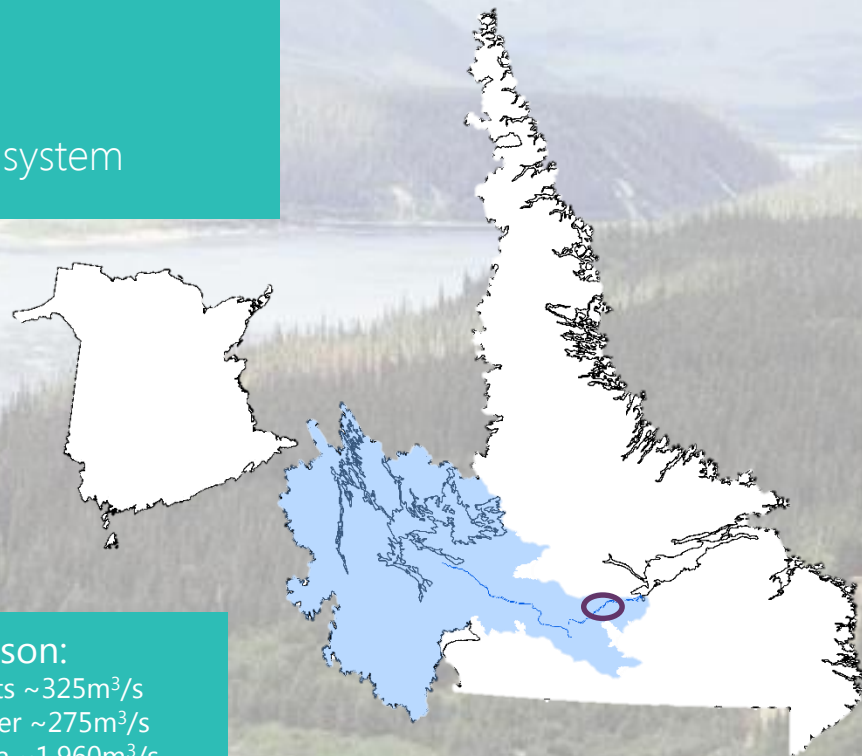
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### Comparison:

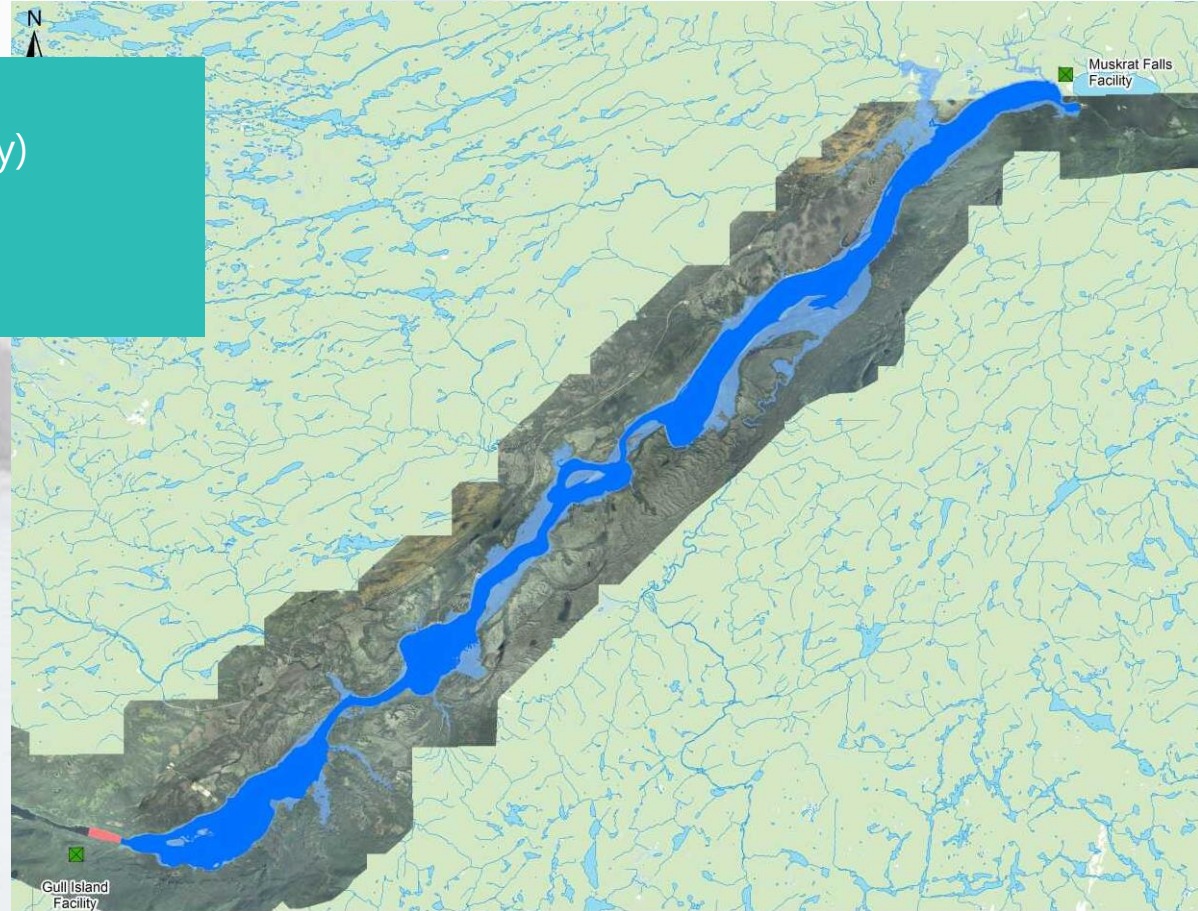
- Exploits ~325m<sup>3</sup>/s
- Humber ~275m<sup>3</sup>/s
- Ottawa ~1,960m<sup>3</sup>/s
- Thames ~70m<sup>3</sup>/s



# Physical Ecosystem Summary

## Muskrat Falls Reservoir:

- 43 km from estuary (Goose Bay)
- 101 km<sup>2</sup> total
  - 41 km<sup>2</sup> of flooding
- 39m fsl – 38.5m lsl



# Physical Ecosystem Summary

## Goose Bay:

- ~225km<sup>2</sup> total area
  - 25km long, 2.5km wide, 55m deep
- Churchill River, Otter Creek, Kenamu River
- Freshwater/Saltwater Transition Zone at 10-25m
- 11 day freshwater retention time
- Outflow - Lake Melville via Goose Bay Narrows



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## Comparison:

- Bay d'Espoir ~230km<sup>2</sup>
- Red Indian Lake ~184km<sup>2</sup>
- Gander Lake ~115km<sup>2</sup>
- Deer Lake ~70km<sup>2</sup>



# Physical Ecosystem Summary

## Lake Melville:

- ~2,700 km<sup>2</sup> total area
  - 130km long, 30km wide, 100m deep
- Goose Bay Narrows inflow, Northwest R, + others
- Freshwater/Saltwater Transition Zone at 7-20m
- 125 day freshwater retention time
- Outflow – Hamilton Inlet via The Narrows

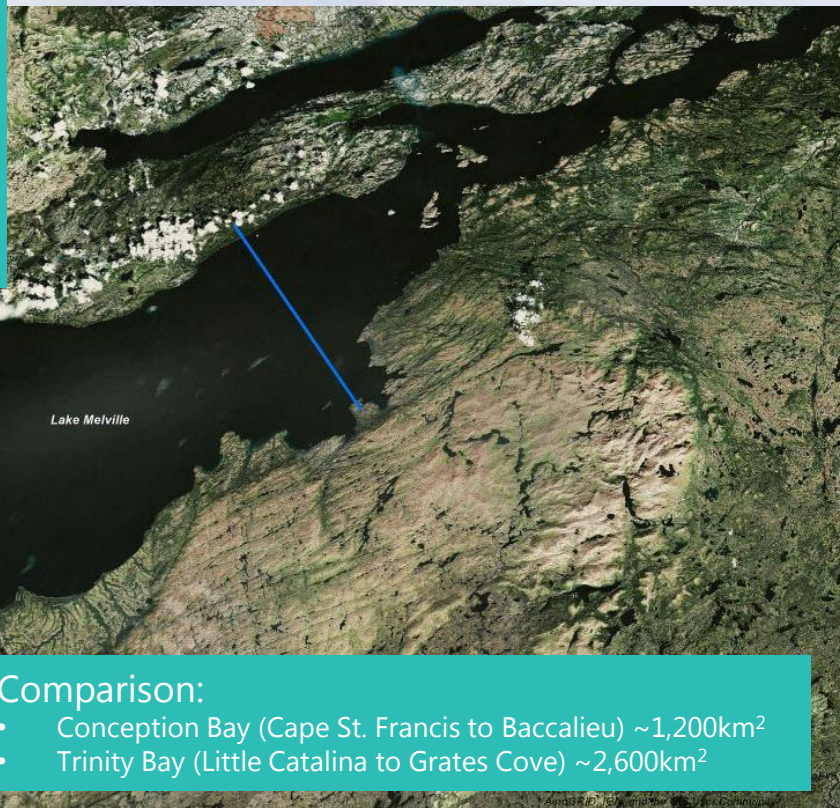




# Physical Ecosystem Summary

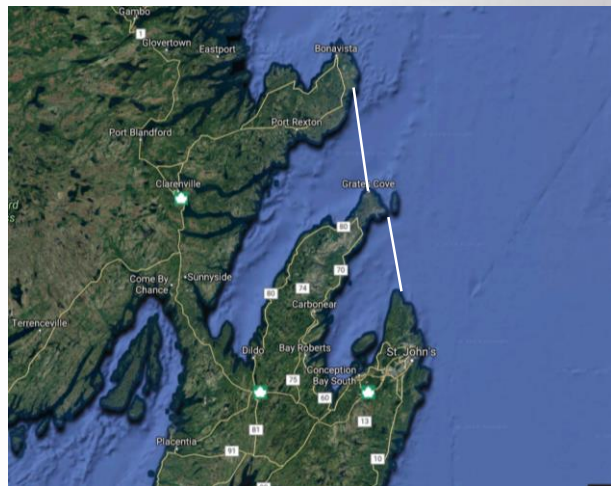
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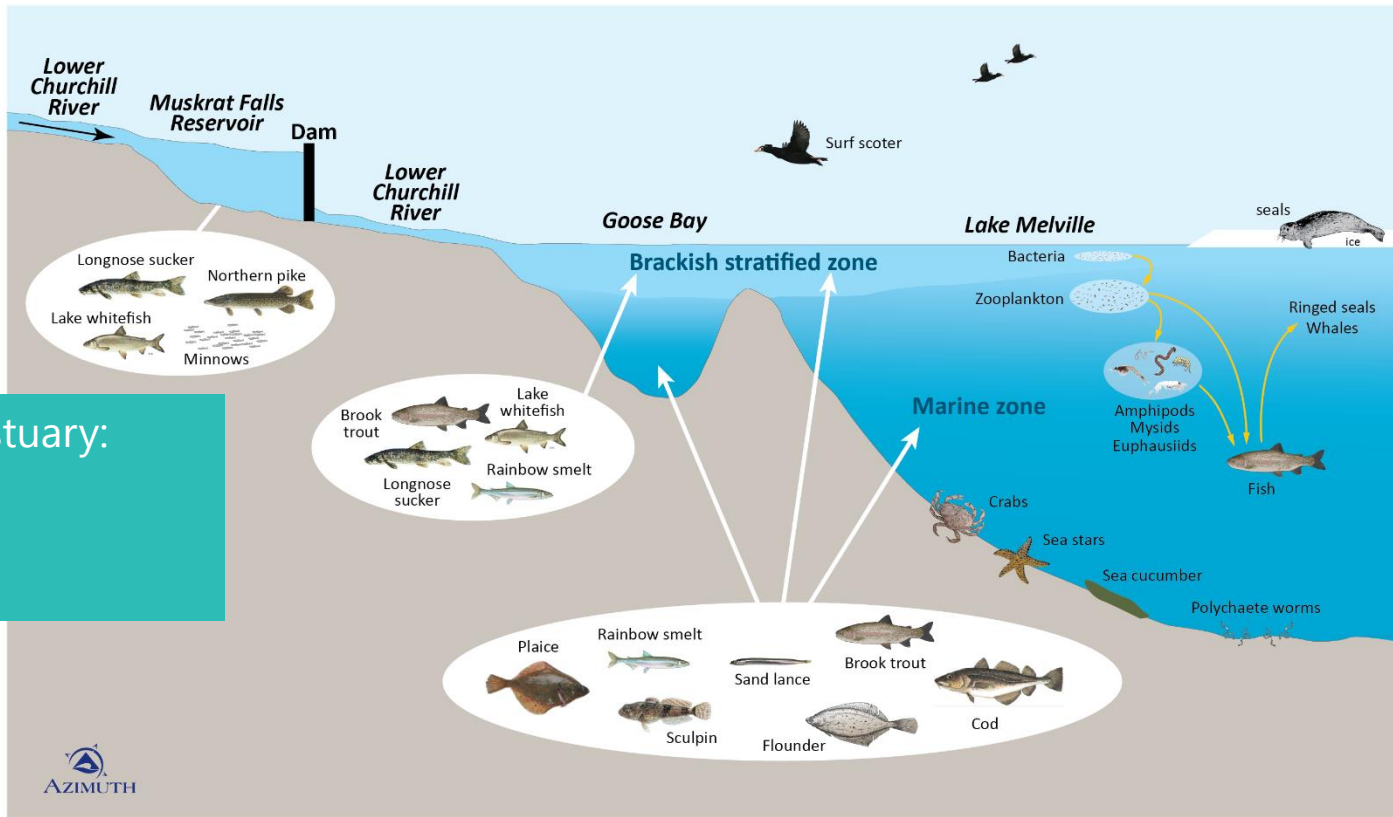


## Comparison:

- Conception Bay (Cape St. Francis to Baccalieu) ~1,200km<sup>2</sup>
- Trinity Bay (Little Catalina to Grates Cove) ~2,600km<sup>2</sup>



# Physical Ecosystem Summary



Freshwater Inflow to estuary:

- Surface Transport
- 7-20m Depth
- Diffuses outward



# Physical Ecosystem Applicability and Importance

- Understanding Ecosystem Connectivity
- Real Measurements for Model Inputs
- Model Validation(s)
  
- “Reality Check”
- Biological Components to follow

