



Methylmercury Risk Analysis at Muskrat Falls

Discussion about scenarios requested on 2/20

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Independent Expert Advisory Committee, Newfoundland and Labrador

Agenda

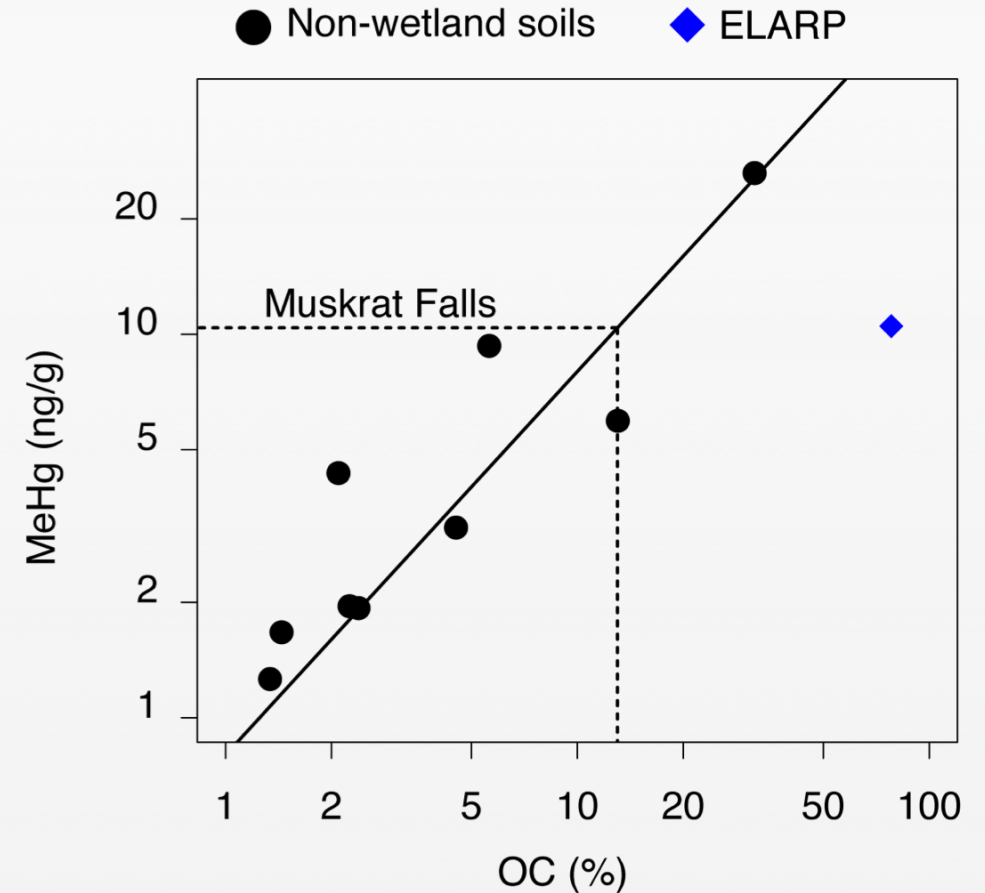
- Approach to modeling effects of capping wetlands (Scenario “A”)
- Effect of soil removal (Scenario “B”)
- New fish and seal Hg data
- Possible alternative assumptions for species habitats
- Q&A about submissions to date

Scenario A: capping wetlands

- 2/13 memo considered 0.356 km² (0.9% of total)
- 2/20 request: 0.8 km² (1.9% of total)
- Calder et al. 2016 made no special consideration for wetlands
 - Small fraction of overall area at Muskrat Falls but precise coverage data unavailable at the time
 - Limited data available to forecast effect of flooding (ELARP only?)

Scenario A: capping wetlands

- Wetlands are important contributors to MeHg budgets relative to uplands in pristine ecosystems (St. Louis 1994, 1996; Rudd 1995)
- Question: effect of flooding?
- Available data: pulse of MeHg but < proportional to carbon
 - Why? Maybe sulfate-limited (evidence from boreal wetlands)

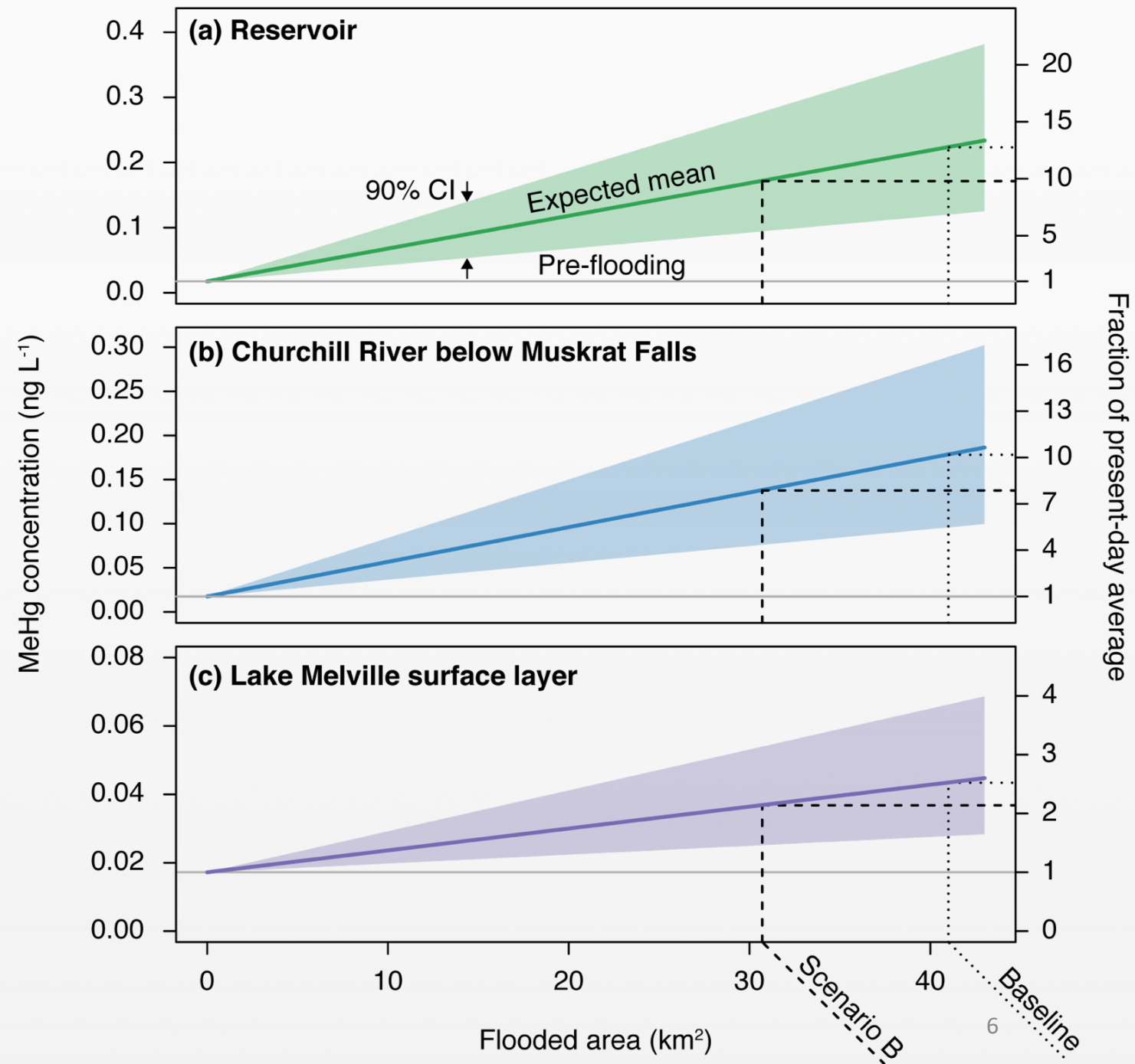


Scenario A: capping wetlands

- Based on available data, peak MeHg production in flooded wetlands appears to max out at roughly the level forecasted for Muskrat Falls
- Reasonable assumption: capping wetlands → reduction in MeHg production proportional to area (2% based on revised GIS data)

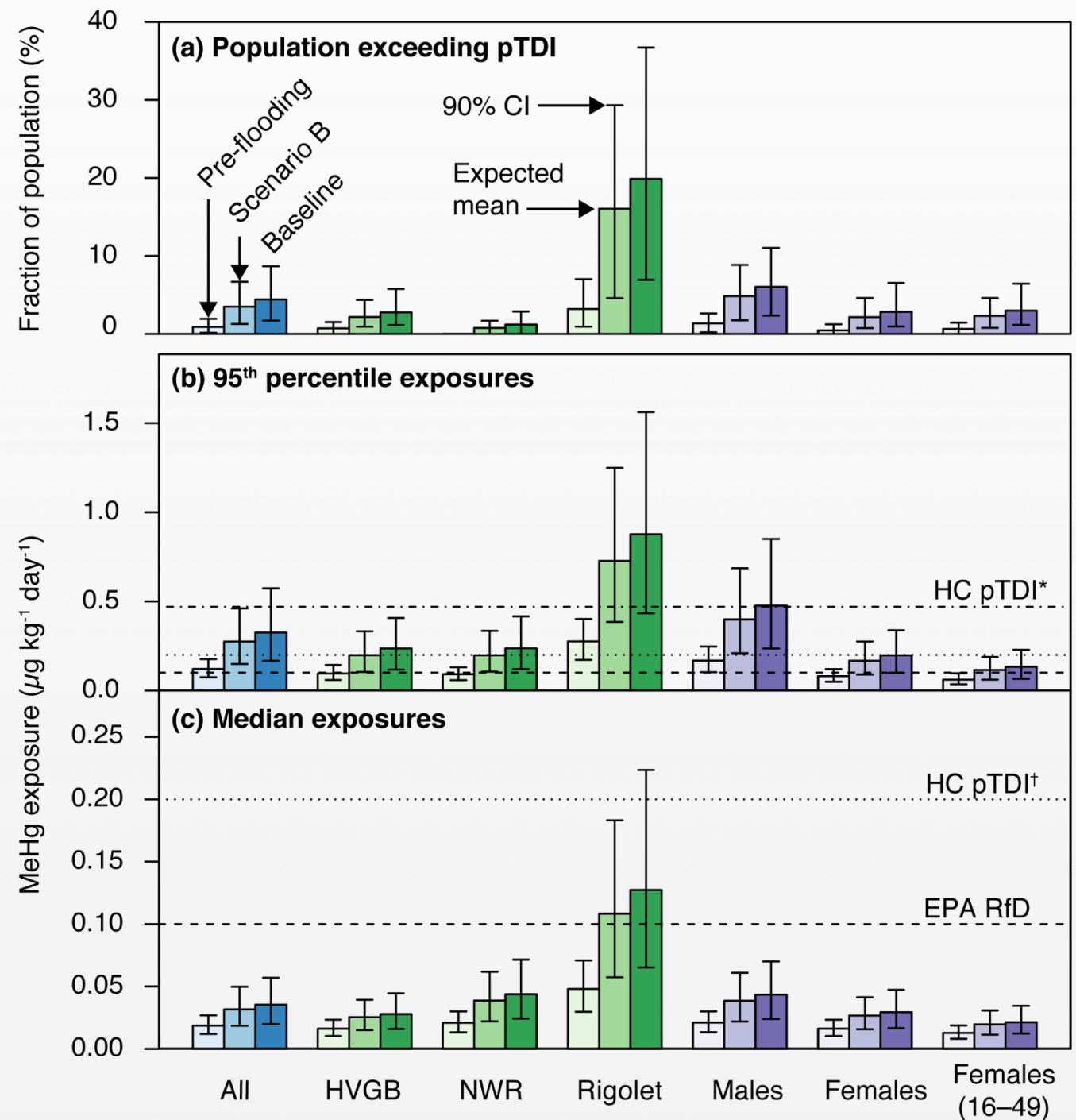
Scenario B: soil removal

- Peak MeHg increase mitigation proportional to area removal ($\sim \frac{1}{4}$)
- Removed 10.3 km² from flooded area considered in Calder et al. (2016) (41 km²)



Scenario B: soil removal

- Exposure increases are somewhat mitigated
- Pushes fraction of women of childbearing age > pTDI from >5% to ~5%
- Costs/benefits must be evaluated



Updated fish/seal Hg data

- Salmon and seal muscle (age-weighted) are almost unchanged
- No new seal liver MeHg?
 - Looks roughly the same if THg \sim 30% MeHg
- Updated trout and smelt data are lower
 - Significance of brook trout to exposures may decrease
 - Lake trout and smelt relatively less important
- Unlikely to result in major changes to exposure forecasts but can sub in new data for completeness

Alternate species habitat fractions

Isotope data available for

Atlantic cod*, Atlantic salmon*,
brook trout, char, capelin, flatfish,
mussel, salmon, sculpin, seal,
smelt, flatfish

* Modeled probabilistically given importance for
diet

- Advantage: corrects for uneven foraging at different life stages

Traditional knowledge supplied and no isotope data

Lake trout, ouananiche, rock cod

- Can simulate effect of using traditional knowledge values
- Not major contributors to overall exposures so probably small effect

Other
questions?

