3. Results

The estimated cumulative mass of MeHg contained within the biota of Lake Melville is 272 tonnes/km^2 for the baseline and post-flood scenarios is shown in **Table 1**. A sample calculation for mass of MeHg in Lake Melville, using seals in the baseline scenario as an example, is as follows:

- Convert seal biomass to kg: 0.21 t/km^2 = 210 kg/km^2
- Convert seal [MeHg] from mg/kg to g/kg = 0.28/1000 = 0.00028 g/kg
- Multiply seal biomass x [MeHg] = 0.0588 g MeHg/km^2
- Expand to Lake Melville surface area = 0.0588 g MeHg/km^2 * 3100 km^2 = 182.3 g MeHg
- Convert to moles (215.6 g/mol for MeHg) = 182.3g or MeHg/215.6 g/mol = 0.85 mol

The MeHg mass in the biotic component of the Lake Melville ecosystem is **19.8 kg** (91.7 mol). Assuming the changes in biota MeHg concentrations predicted by Calder et al. (2016) using their BAF approach, the mass of MeHg in Lake Melville biota must increase to **50.8 kg** (236 mol) post-flood, to satisfy their predictions. The difference between the two scenarios is **31.1 kg** (144 mol), which is the mass of additional MeHg that would have to be accumulated over time in order to change pre-flood biota concentrations to match the predictions of Calder et al. As stated in the Overview, 31.1 kg of MeHg only represents the mass of "new" MeHg from MFR in the biota. *Actual* MeHg production from the MFR would need to be *considerably higher* given that it will take on the order of a decade of sustained production to reach the higher steady state in biota. Furthermore, as we noted in the main document, a substantial amount of the MeHg produced by the MFR will not end up in biota (e.g., much will be buried in sediment or leave Lake Melville through tidal exchange).

4. Uncertainty Assessment

Biomass estimates are an acknowledged source of uncertainty. For example, we did not include whales in our biomass estimate. Although we know they are present, they are migratory and will not always be present Thus, we conducted a sensitivity analysis to explore the implications of changing biomass estimates. Essentially, any reduction or increase in total biomass will directly affect the estimate of the baseline mass, or the mass of "new" MeHg needed to match the Calder et al. (2016) predictions. Thus, halving or doubling the biomass estimates will do the same to the estimates of the mass of "new" MeHg needed to match the Calder et al. (2016) predictions (i.e., 15.5 kg MeHg and 62.2 kg MeHg for the halving and doubling sensitivity analyses, respectively).

We conducted a literature search to provide context and bound the Bundy et al. (2000) biomass estimate of 276 kg/km^2. We identified 16 other studies that quantified ecosystem biomass in temperate and Arctic marine environments using EcoBase (http://sirs.agrocampusouest.fr/EcoBase/#discoverytools), an online repository of published Ecopath models (**Table 2**, **Figure 1**). The "ecosystem type" field was reported in EcoBase. While biomass estimates ranged from 57 t/km^2 (Hudson Bay) to 3786 t/km^2 (Iceland), the majority of values fell between 200 and 400 t/km^2, similar to our estimate. Interestingly, with the exception of Hudson Bay, the other three bay/fjord ecosystems were considerably higher in biomass than other regional shelf or open ocean ecosystems. In Alaska, Prince William Sound (1078 t/km^2) was nearly 5-fold higher than Southeast Alaska (215 t/km^2) and the Western and Central Aleutian Islands (208 t/km^2). In British Columbia, Western Vancouver Island (236 t/km^2) was approximately 2-fold higher than Haida Gwaii (122 t/km^2) and the Northern BC Coast (129 t/km^2). Finally, Chesapeake Bay biomass (665 t/km^2) was more than double that of the Southern Gulf of St. Lawrence (291 t/km^2) or Newfoundland-Labrador Shelf (273 t/km^2). These results indicate that the use of the Bundy et al. (2000) biomass estimate for Lake Melville is likely conservative and that the actual biomass could be 2-fold to 5-fold higher.