Arctic-Subarctic Ocean Fluxes: Learned from an extension of the CORE-II exercise
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Figure 1: Anomaly of ocean volume transport through Arctic gateways. Note the recovery of A1O1 variability by summing up those of A1O0 and A0O1.

Figure 2: Anomaly of ocean volume transport through Barents Sea Opening: inflow and outflow.

Figure 3: Anomaly of liquid freshwater transport through Arctic gateways.

Figure 4: Anomaly of ocean heat transport through BSO.

Figure 5: Correlation coefficients between SLP and ocean volume transport.

Figure 6: Correlation coefficients between SSH and ocean volume transport.

Figure 7: Atlantic meridional overturning circulation maximum at 45°N.

Figure 8: Anomaly of the Arctic liquid and solid freshwater contents (FWC). The observed liquid FWC (Polyakov et al. 2008) and the solid FWC based on PIOMAS (Schweiger et al. 2011) are shown.

Summary
- In the past CORE model intercomparison project the normal year forcing (NYF) and interannually varying forcing (IAV) are used separately in two CORE phases. Different ocean basins are assessed individually. Here we combine the two forcing sets and try to understand the model behavior focused on Arctic-Subarctic fluxes.
- Three simulations: A1O1 (IAV forcing everywhere), A1O0 (Arctic with IAV, outside with NYF) and A0O1 (Arctic with NYF, outside with IAV). A global configuration with FESOM (Wang et al. 2014).
- The interannual variability of ocean volume, freshwater and heat transport in A1O1 is recovered by summing up those obtained from A1O0 and A0O1.
- We identify the driving mechanisms of the gateways flux variability, from both the Arctic side and subarctic regions.

• AMOC is not impacted by changes in (both liquid and solid) freshwater export from Arctic. And the Arctic freshwater content is mainly determined by forcing over the Arctic, while the Arctic Atlantic Water layer sees signals from the North Atlantic (not shown).