Supplement of

Arctic Ocean Simulations in the CMIP6 Ocean Model Intercomparison Project (OMIP)

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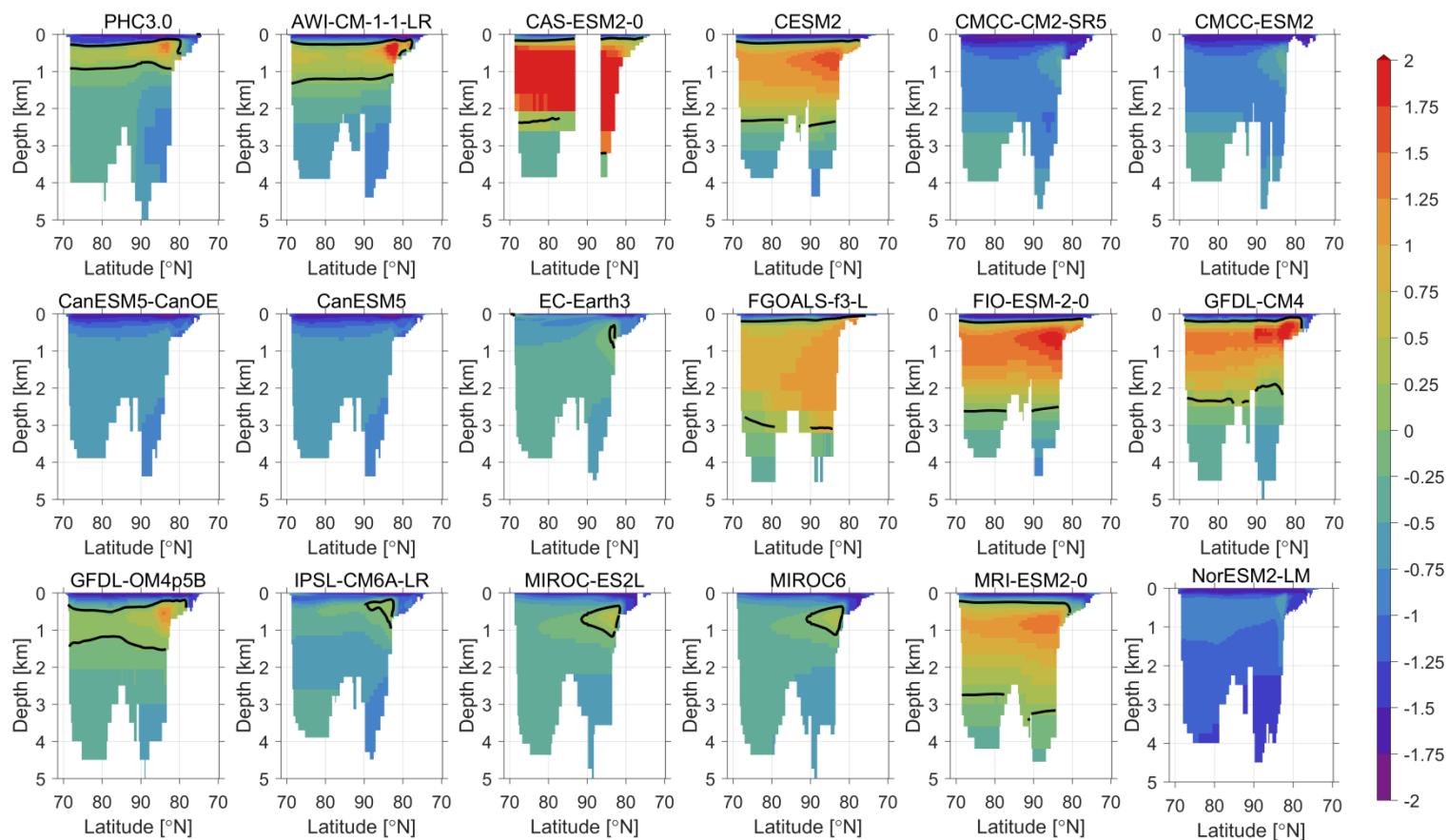


Figure S1. Potential temperature (unit: ℃) along section S (Fig. 1) from the PHC3.0 climatology and OMIP-1 models averaged from 1971 to 2000. Black line is the 0 ℃ isotherm.

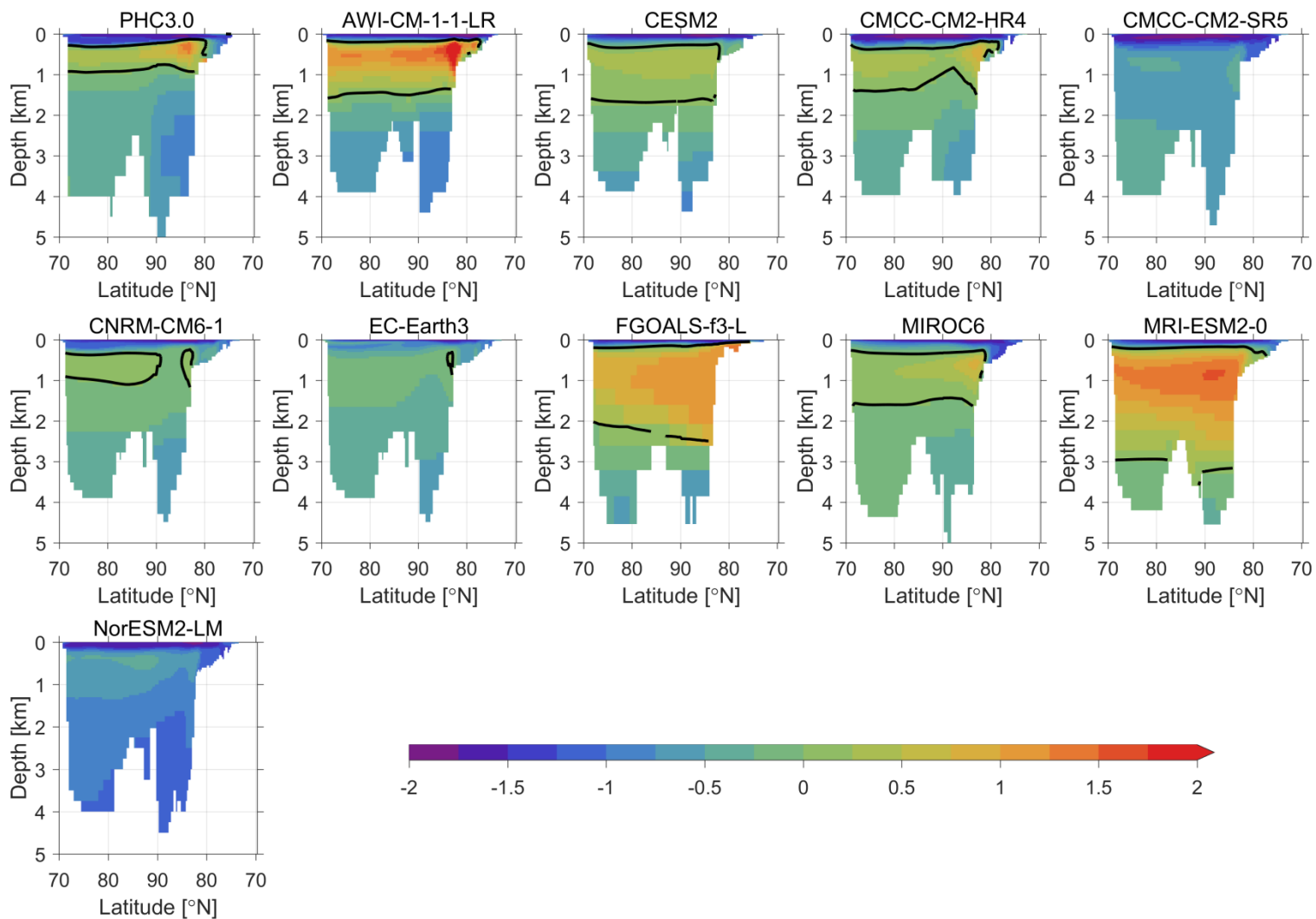



Figure S2. Potential temperature (unit: ℃) along section S (Fig. 1) from the PHC3.0 climatology and OMIP-2 models averaged from 1971 to 2000. Black line is the 0 ℃ isotherm.

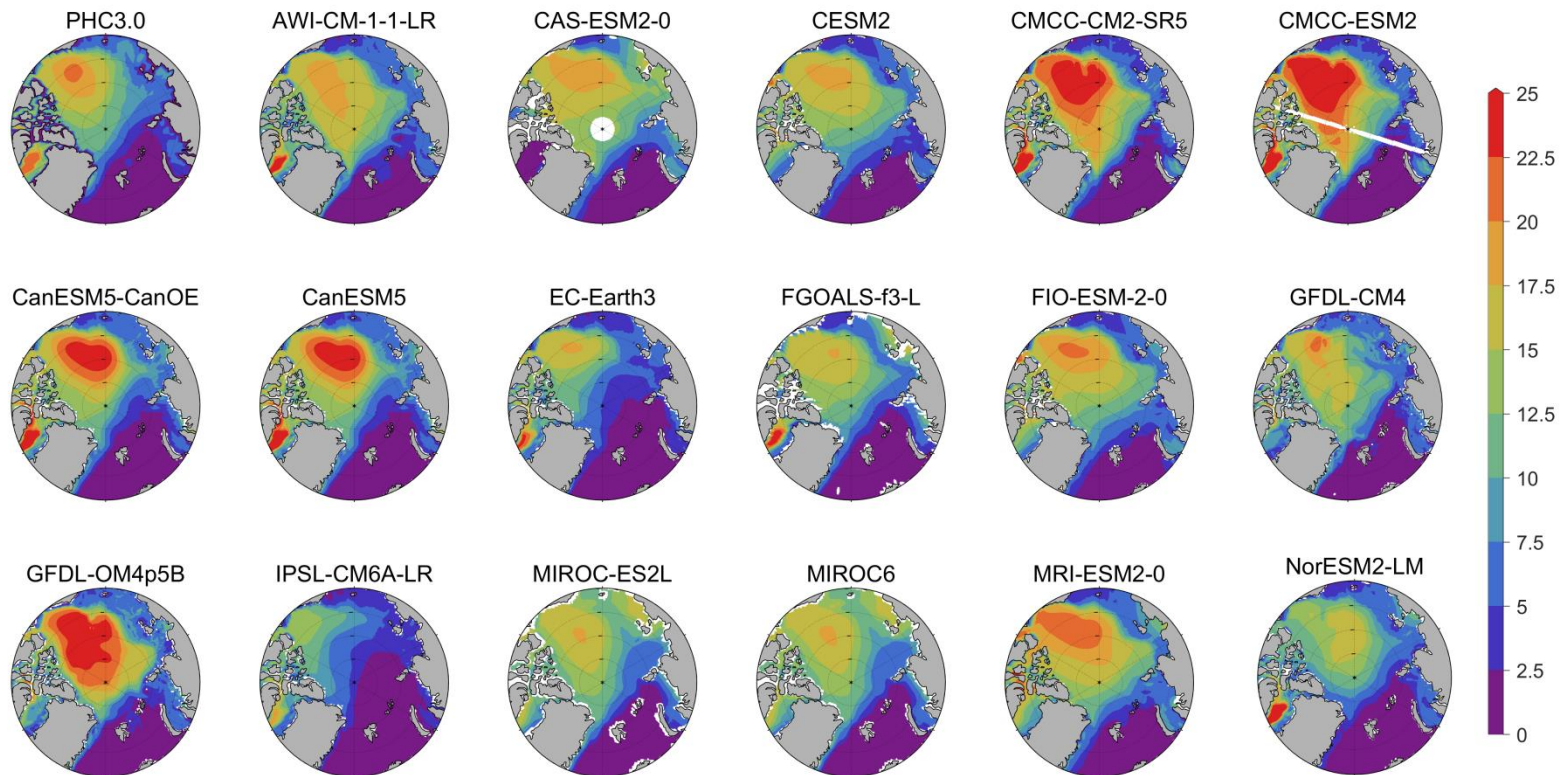



Figure S3. Liquid freshwater column (unit: m) from PHC3.0 climatology and OMIP-1 models averaged over 1971 to 2000.

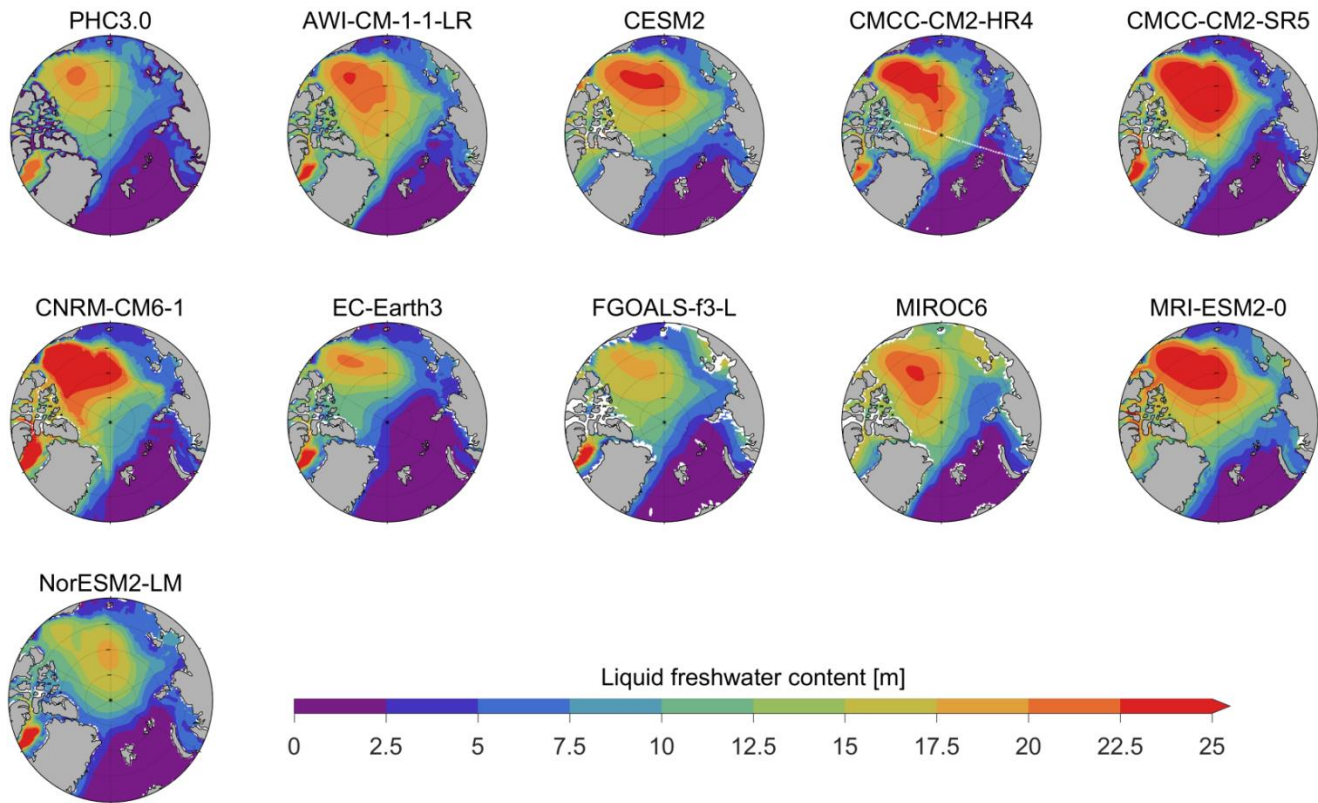



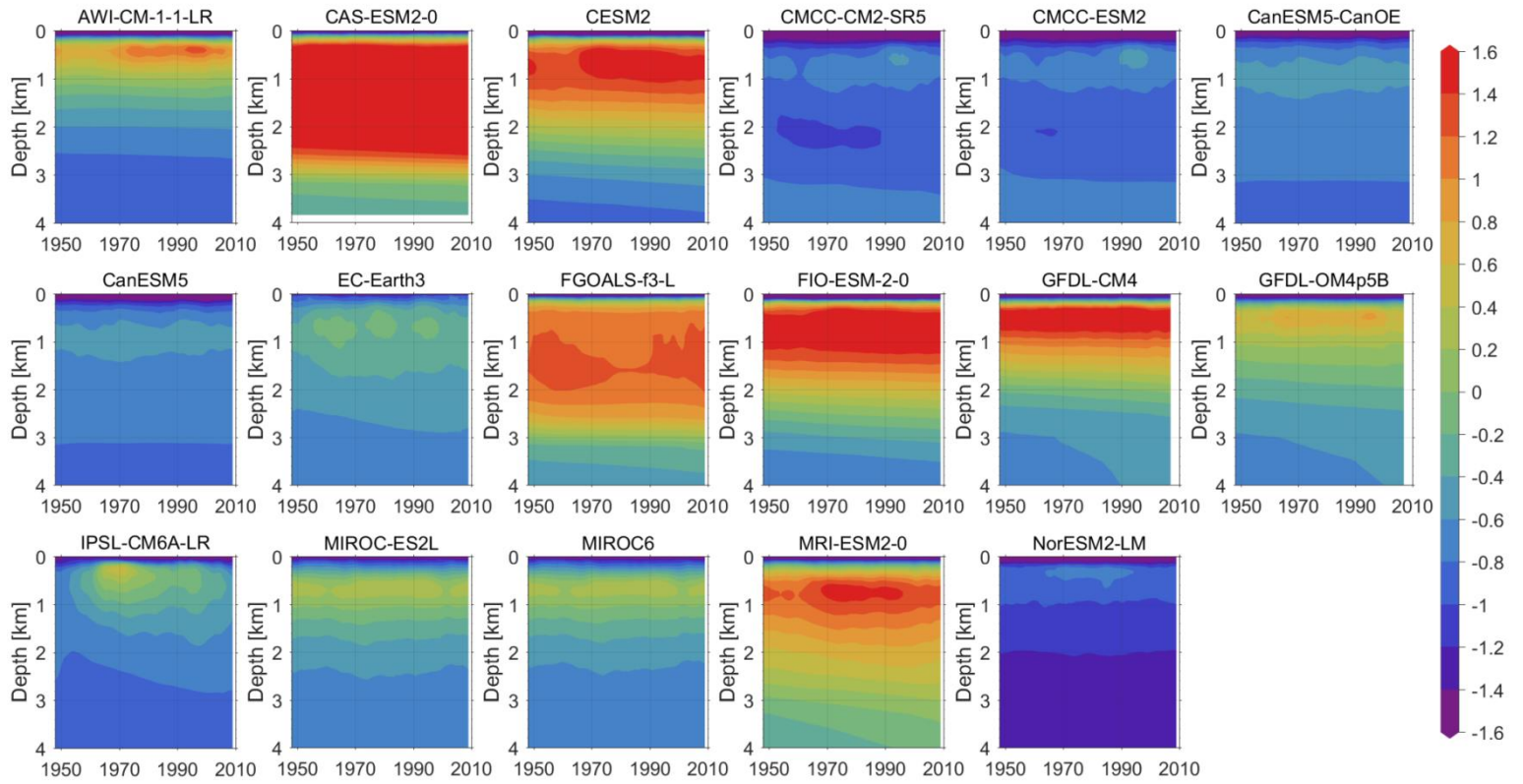
Figure S4. Liquid freshwater column (unit: m) from PHC3.0 climatology and OMIP-2 models averaged over 1971 to 2000.

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Figure S5. Hovmöller diagram of basin-mean potential temperature (unit: °C) for the Eurasian Basin from OMIP-1 models.

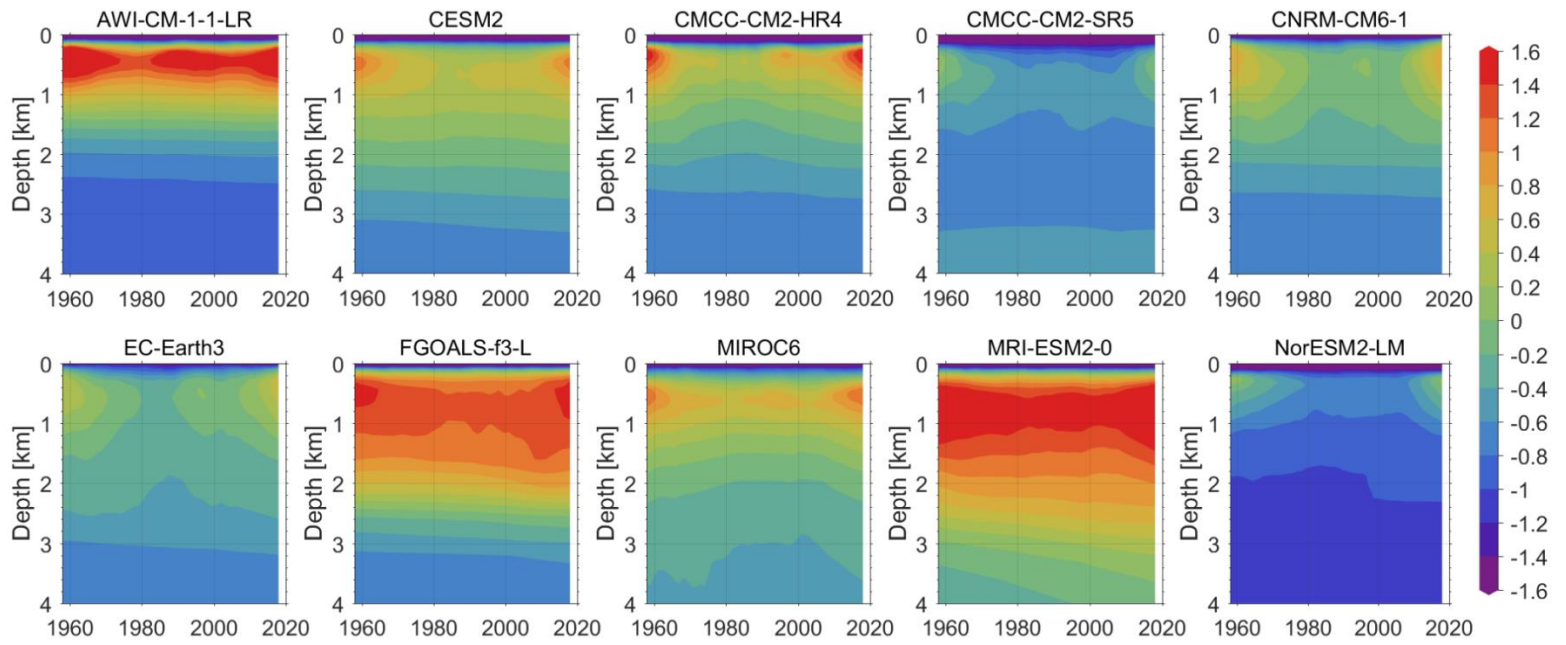
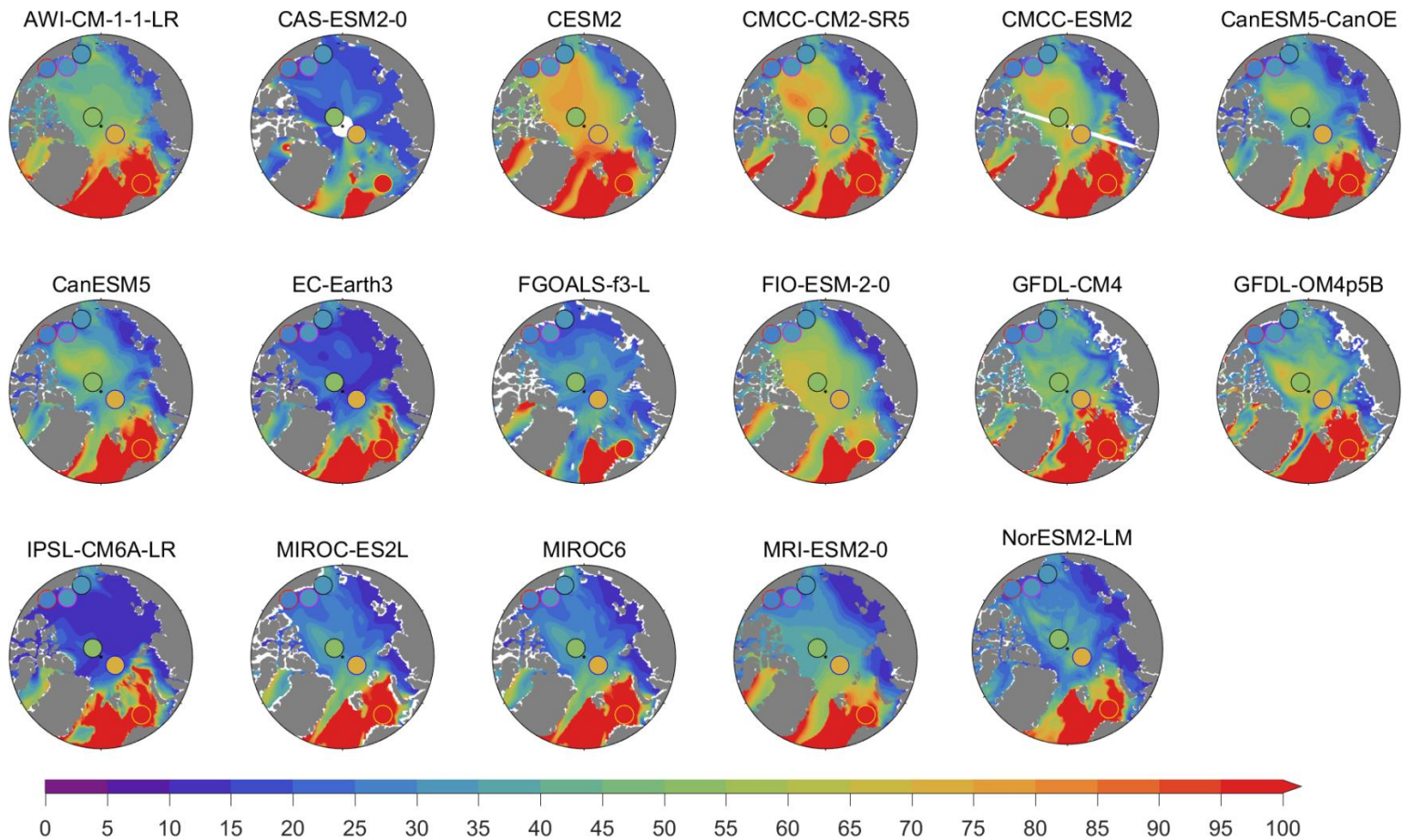



Figure S6. Hovmöller diagram of basin-mean potential temperature (unit: ℃) for the Eurasian Basin from OMIP-2 models.

35   **Figure S7. Cold season (November-May) mixed layer depth (unit: m) from OMIP-1 and observations (dots). The average period for OMIP-1 is from 1979 to 2009 and the observations are based on the period of 1979 to 2012.**

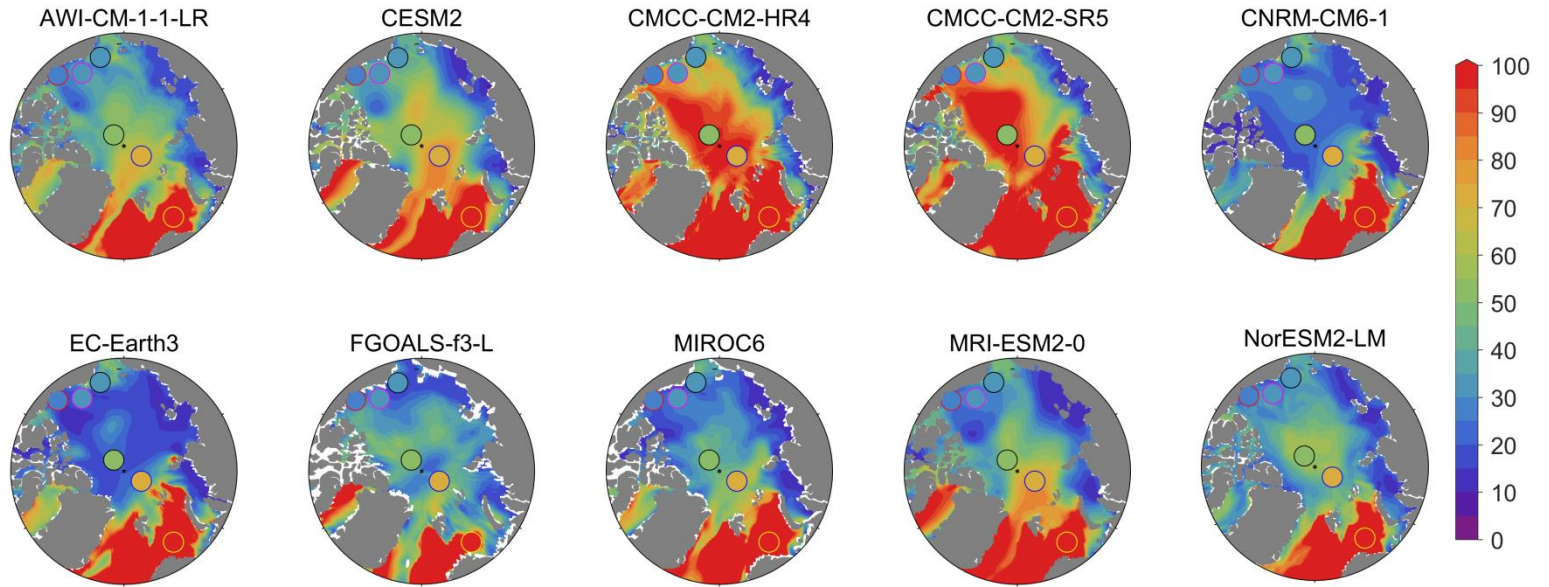



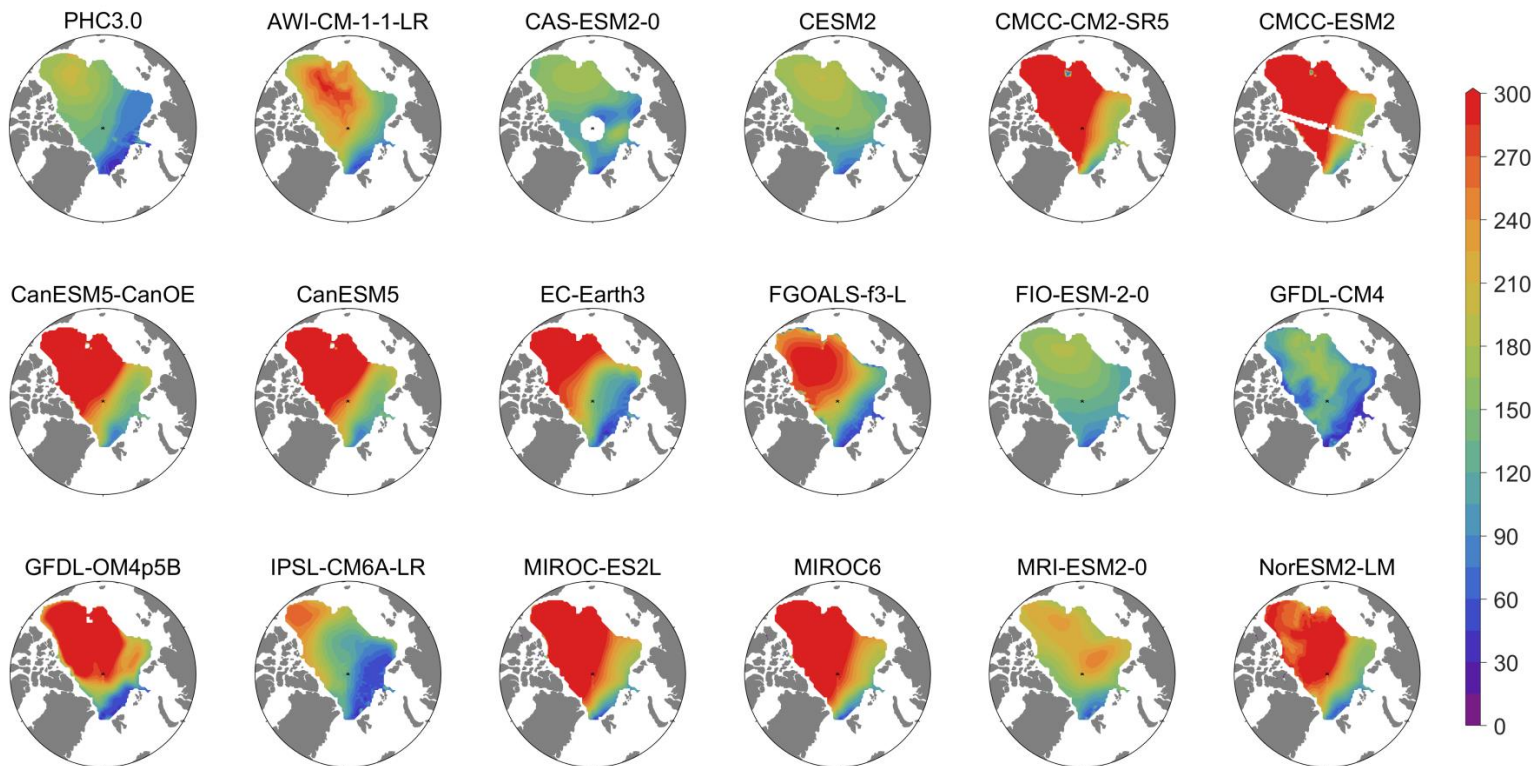
Figure S8. Cold season (November-May) mixed layer depth (unit: m) from OMIP-2 and observations (dots). The average period for OMIP-2 is from 1979 to 2012 and the observations are based on the period of 1979 to 2012.

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Figure S9. Cold halocline base depth (unit: m) from PHC3.0 climatology and OMIP-1 models average over 1971 to 2000.

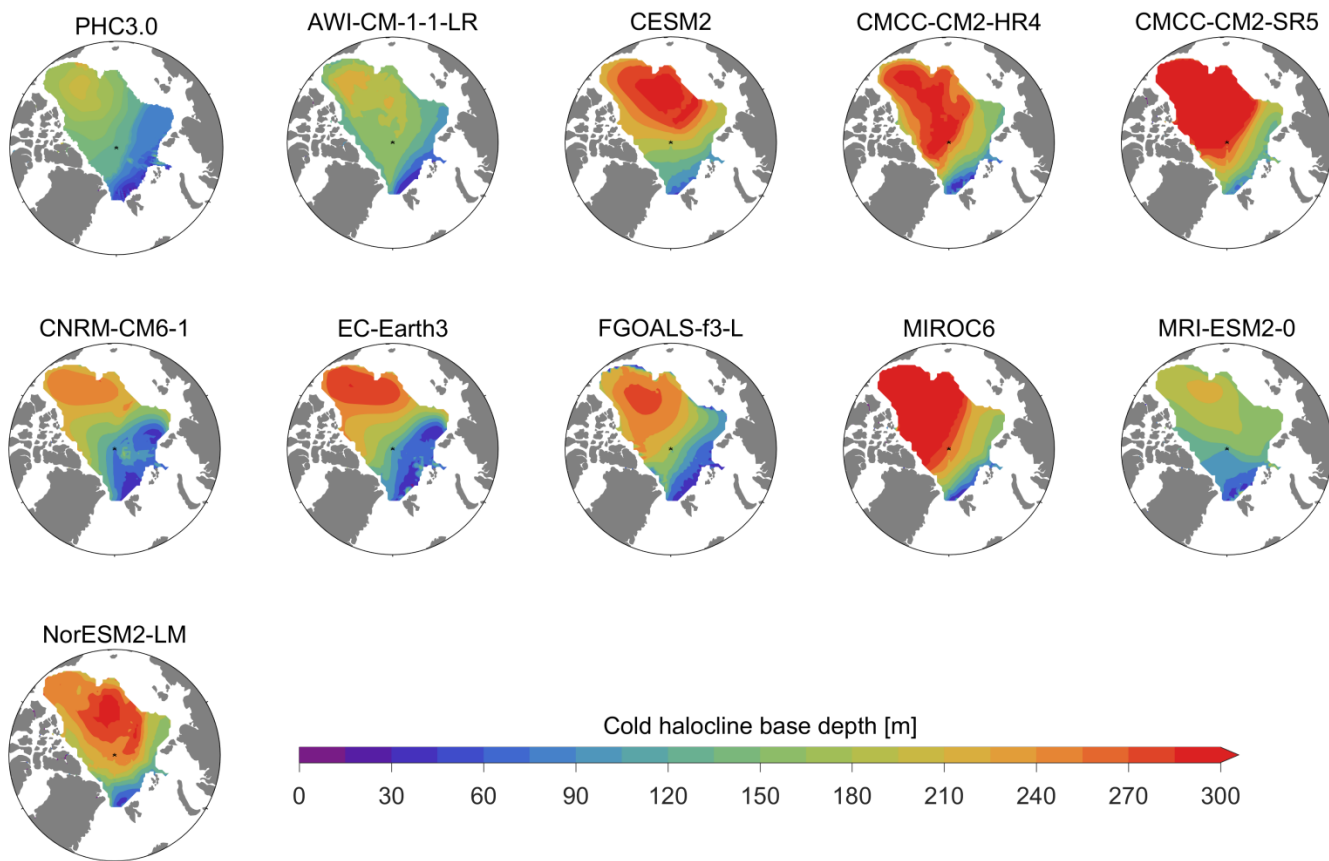
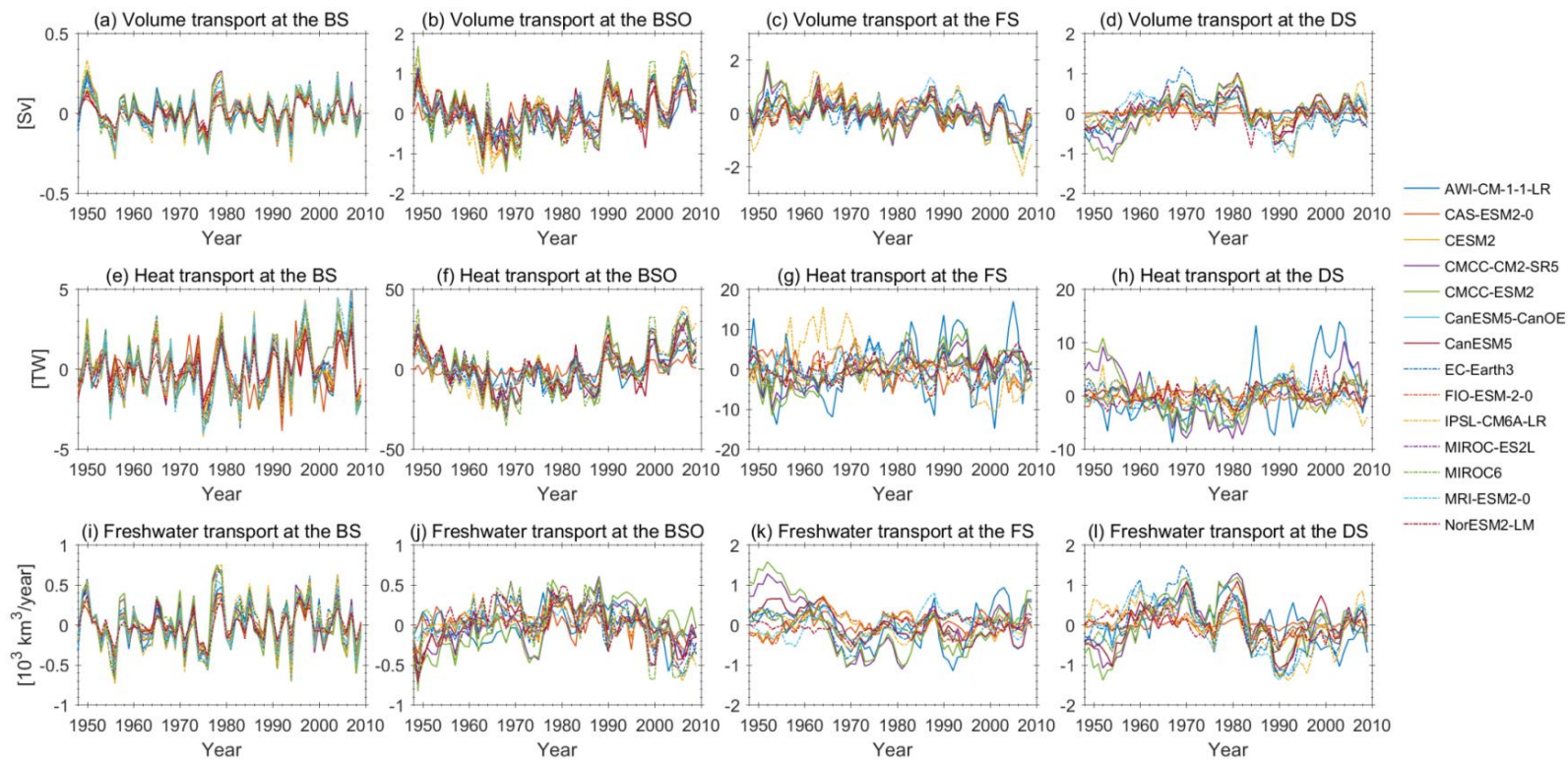



Figure S10. Cold halocline base depth (unit: m) from PHC3.0 climatology and OMIP-2 models average over 1971 to 2000.

45 **Figure S11. Ocean volume, heat, and liquid freshwater transport anomalies through the Bering Strait (BS), Barents Sea Opening (BSO), Fram Strait (FS), and Davis Strait (DS) in OMIP-1.**

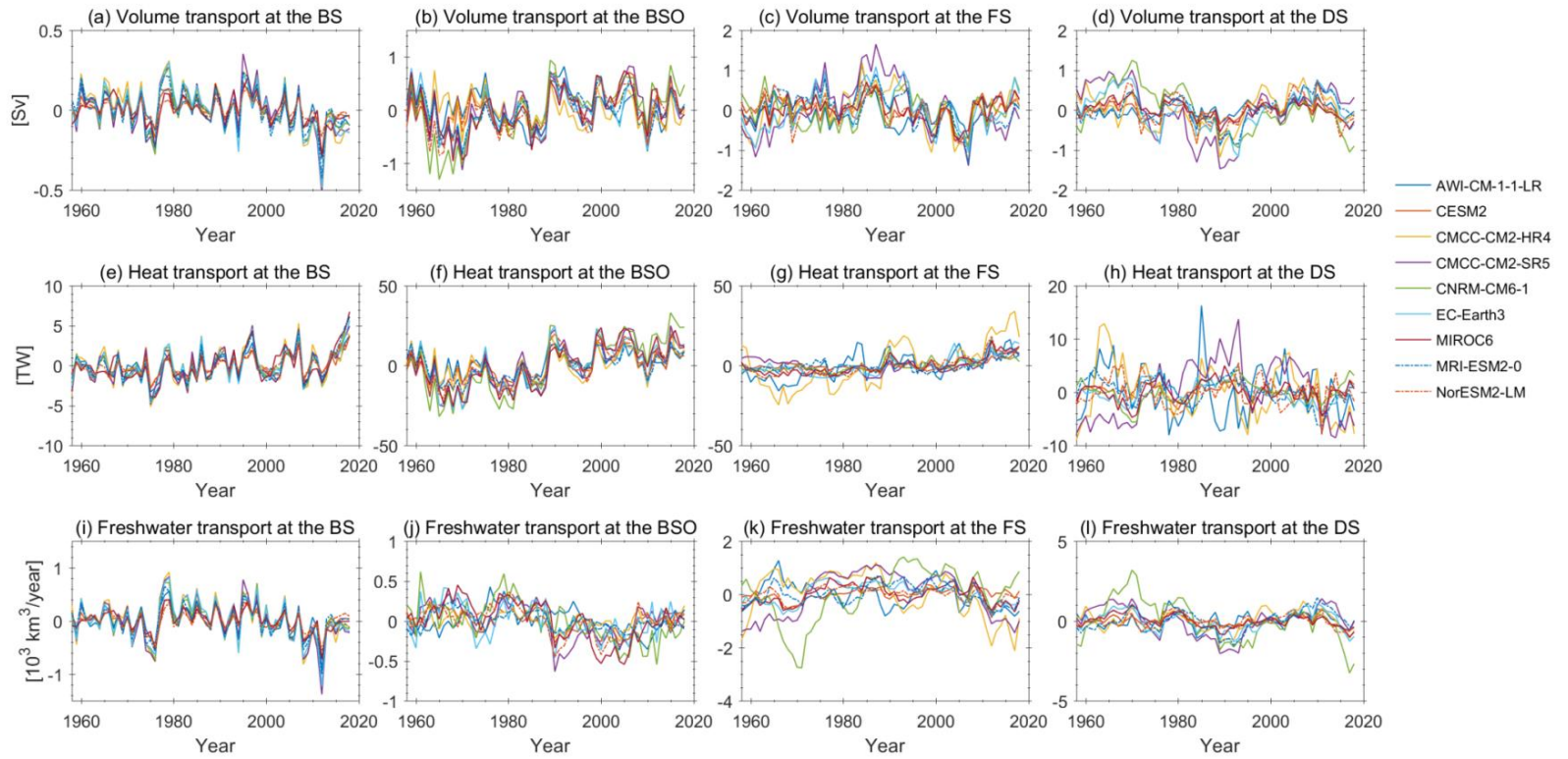



Figure S12. Ocean volume, heat, and liquid freshwater transport anomalies through the Bering Strait (BS), Barents Sea Opening (BSO), Fram Strait (FS), and Davis Strait (DS) in OMIP-2.