

## Revisit of the formation and distribution of mesothermal and dichothermal structures (temperature inversions) in the North Pacific using an eddy OGCM

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The formation and distribution of the mesothermal and dichothermal structures (temperature inversions) in the North Pacific are investigated using an eddy (1/10 x 1/10) Pacific OGCM. The distribution of the modeled inversions are closely related to the strong currents in the northern North Pacific, indicating that lateral advection is essential for its distribution and temporal variability. The modeled mesothermal structures are found more than 90% of the year in the Subarctic gyre west of the dateline and along the Subarctic Current (SAC). Its southern boundary is quite distinct between the dateline and the Gulf of Alaska. Its northern and eastern boundary is somewhat unclear partly due to the presence of strong mesoscale rings in the Gulf of Alaska and along the Alaskan Stream. In winter and spring, they are found along the current associated with the Subarctic Boundary (SAB-C) and Alaskan Stream. The distribution of the modeled dichothermal structure is similar to that of the mesothermal structure, but the region where the dichothermal structure is found more than 90% is only limited along the SAC and shows a large inter-annual variability. In these areas the dichothermal structures are created upstream and advected downstream below the seasonal thermocline. These findings in the model is consistent with that found in the WOA13.

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