
# Trench Aleutian anticyclonic eddies: generation and evolution

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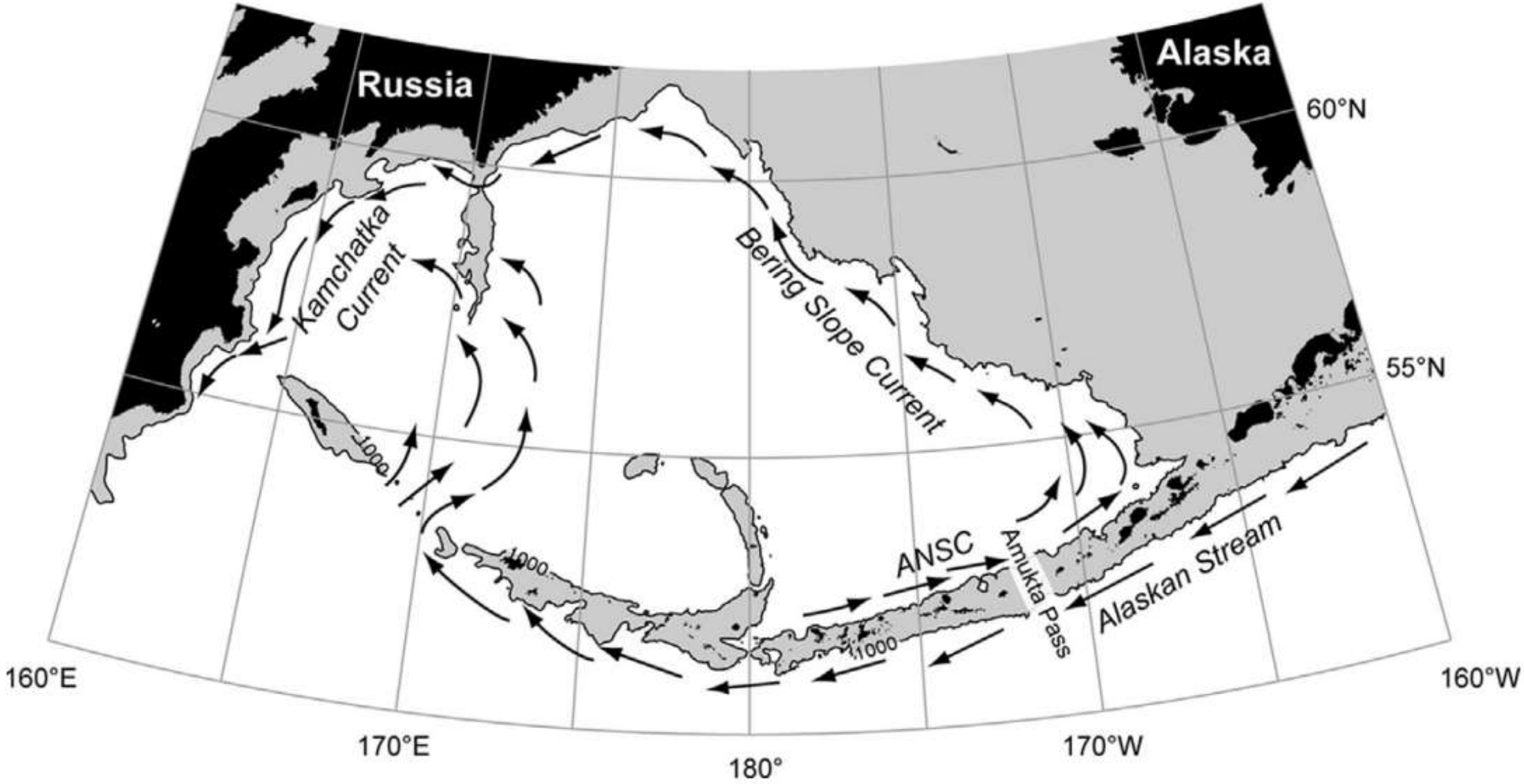


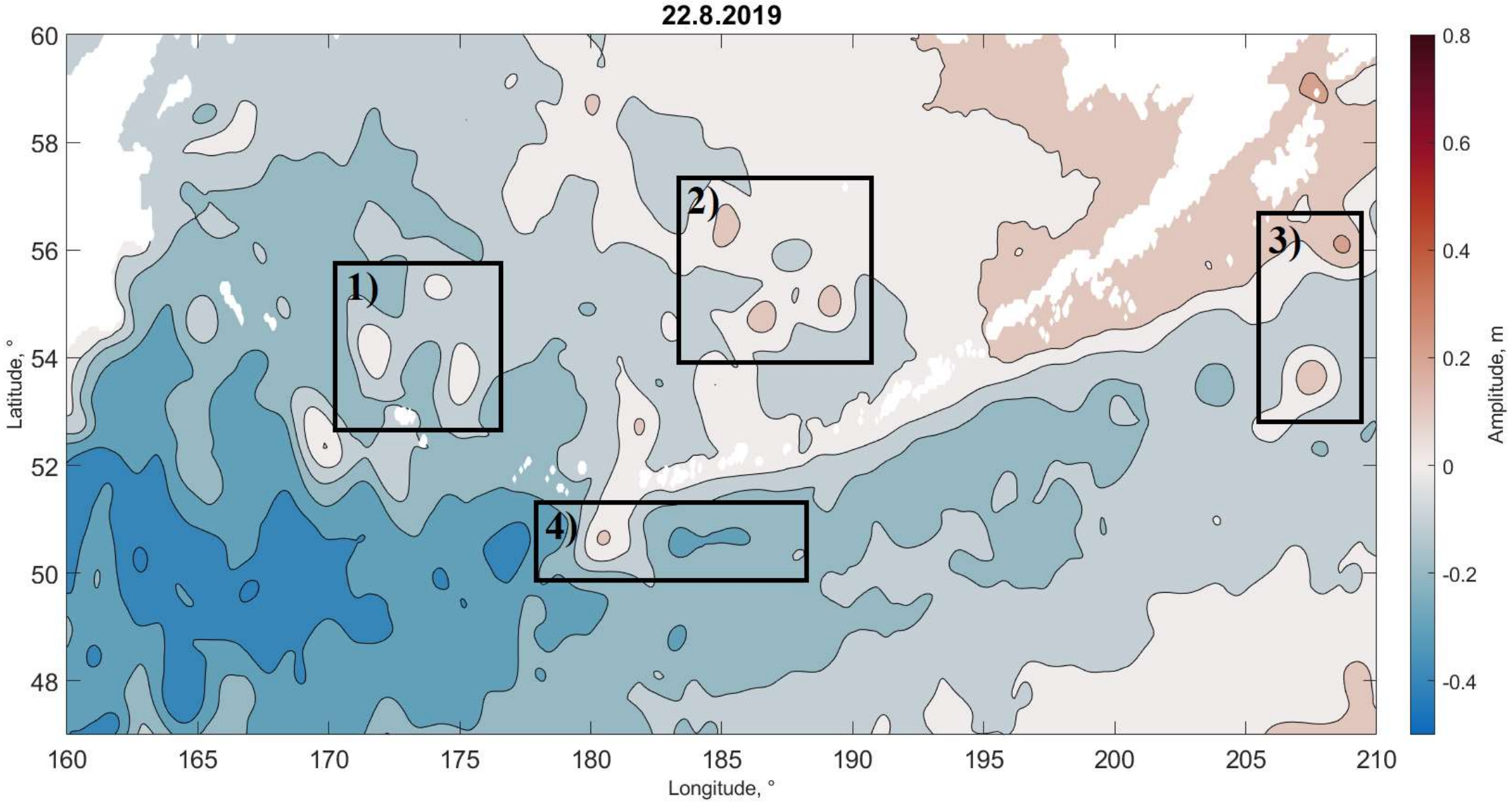

*Schematic of Bering Sea currents. Gray shading denotes regions with depth o1000 m.*

*ANSC - Aleutian North Slope Current (Ladd, 2014)*

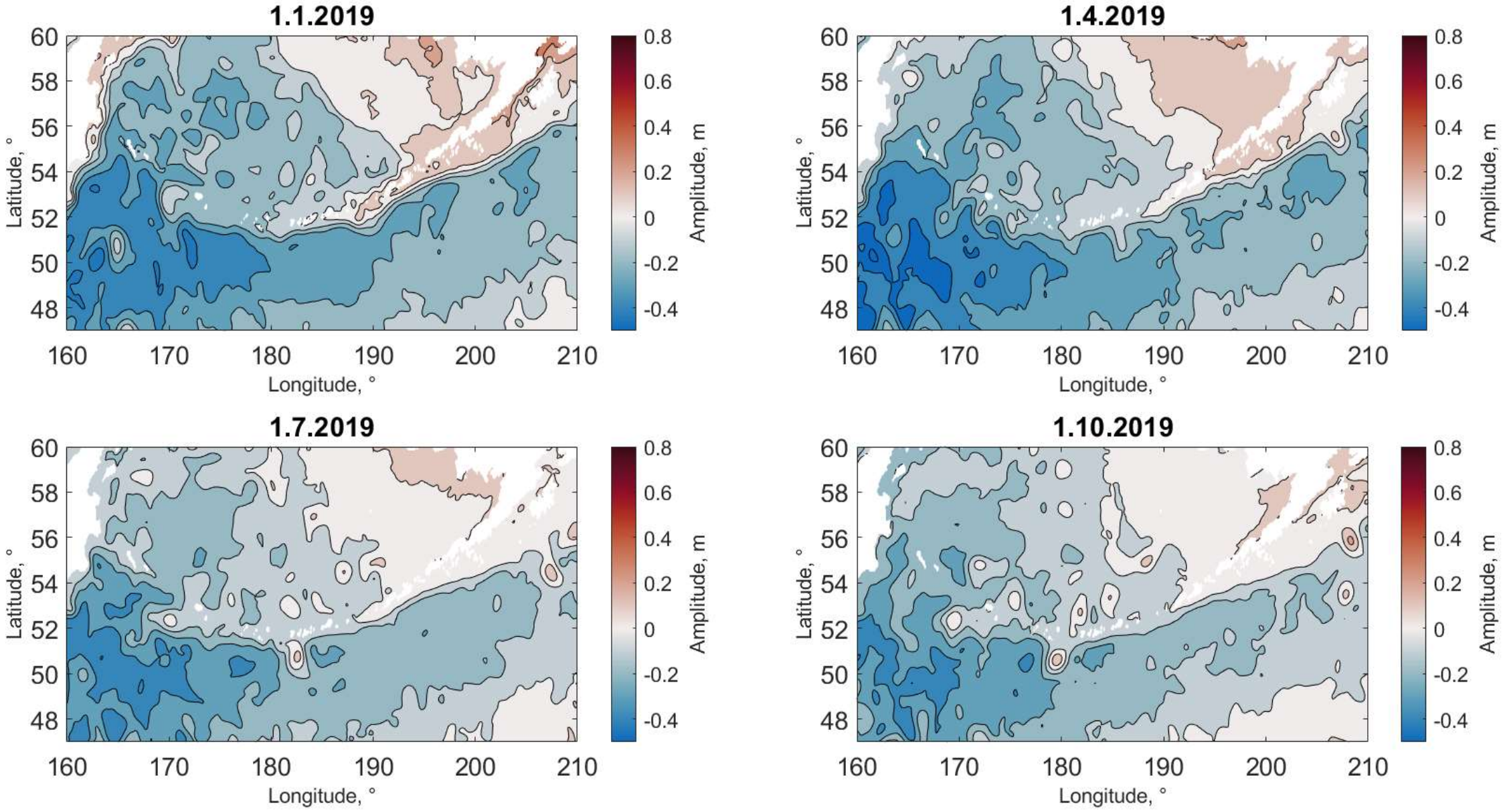
# Data

Global reanalysis (GLORYS12V1)

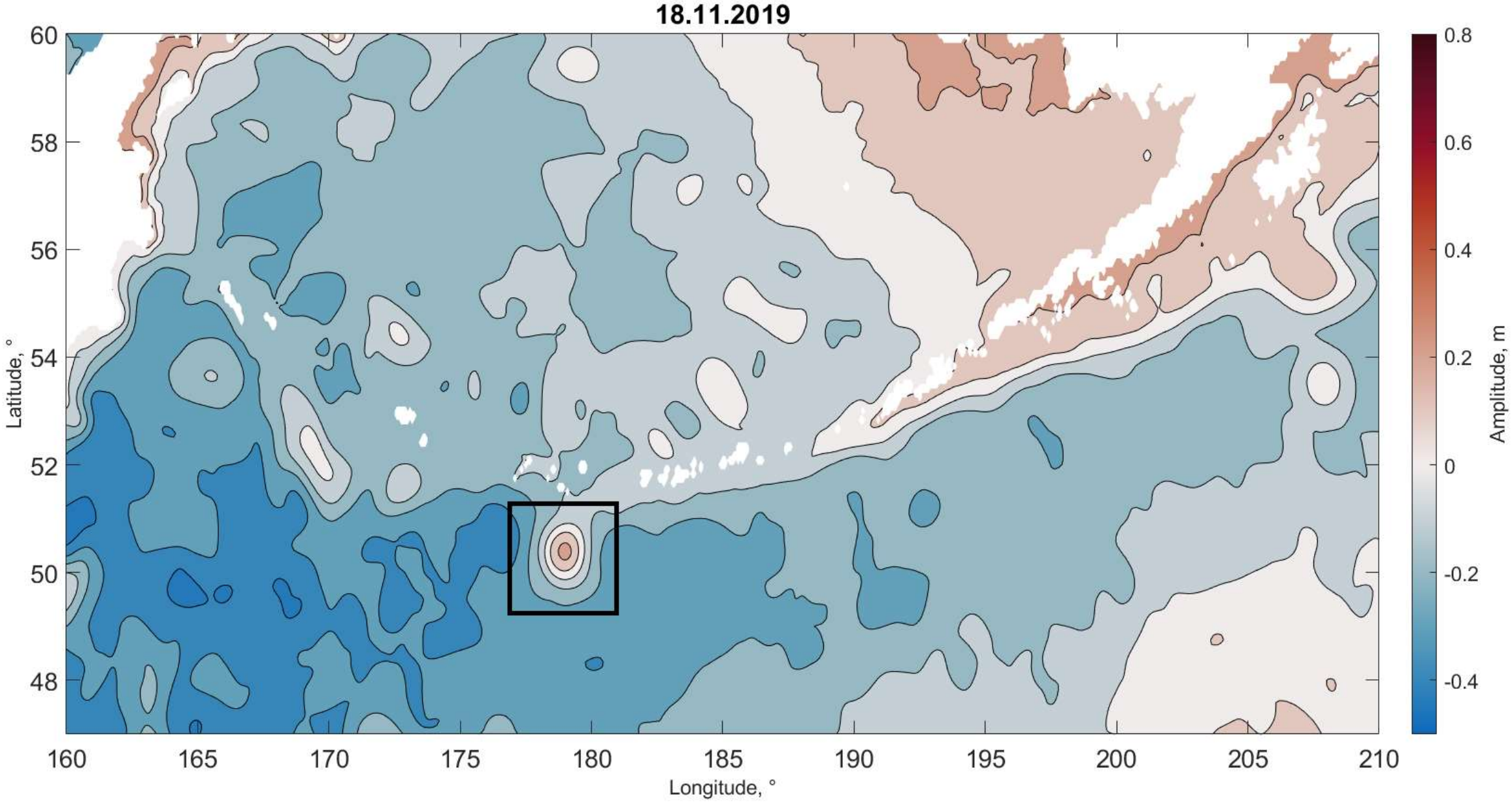

- Spatial resolution 1/12°
- 50 standard levels (from -5500 to 0 m)
- Daily data for 2019
- Sea surface height above geoid (SSH), temperature, salinity, geostrophic velocities - zonal and meridional components, mixed layer depth



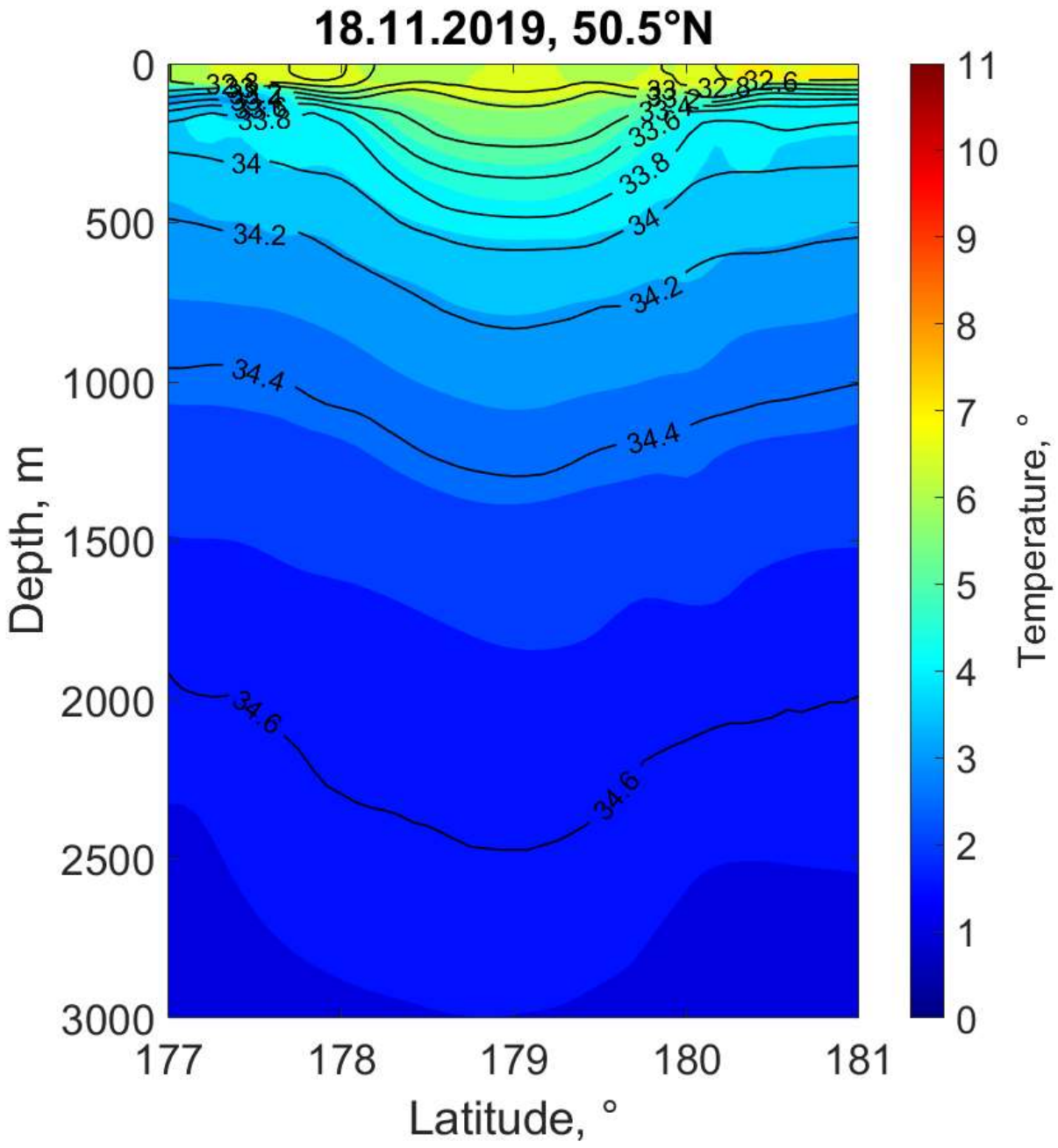

*Eddy generation areas based on Global reanalysis data (SSH)*




*Sea surface height (SSH) for January, April, July and October*




*A single long-lived eddy*

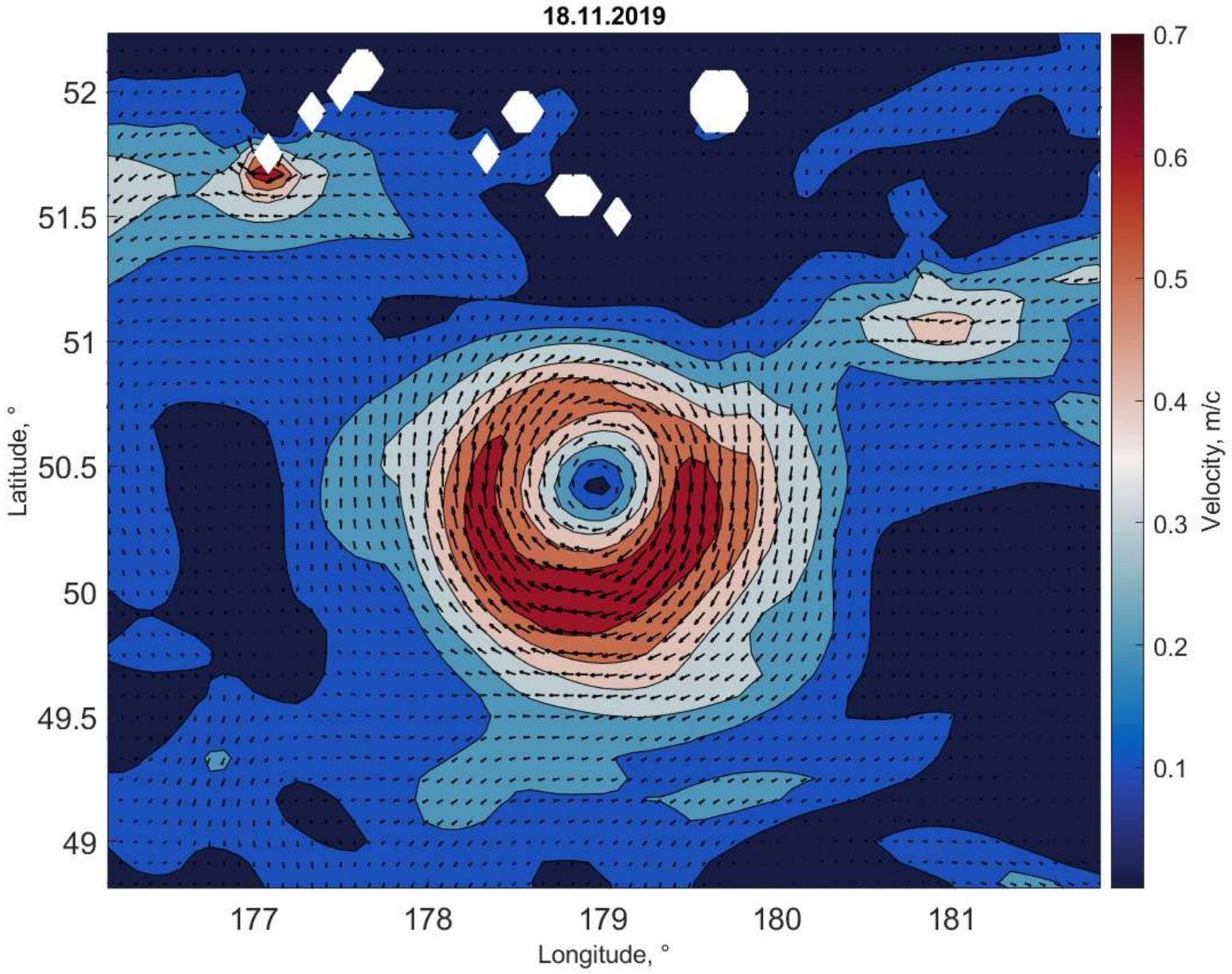



*Vertical profile of temperature and salinity*

The eddy center is characterized by warmer and saltier water than that located on the periphery.

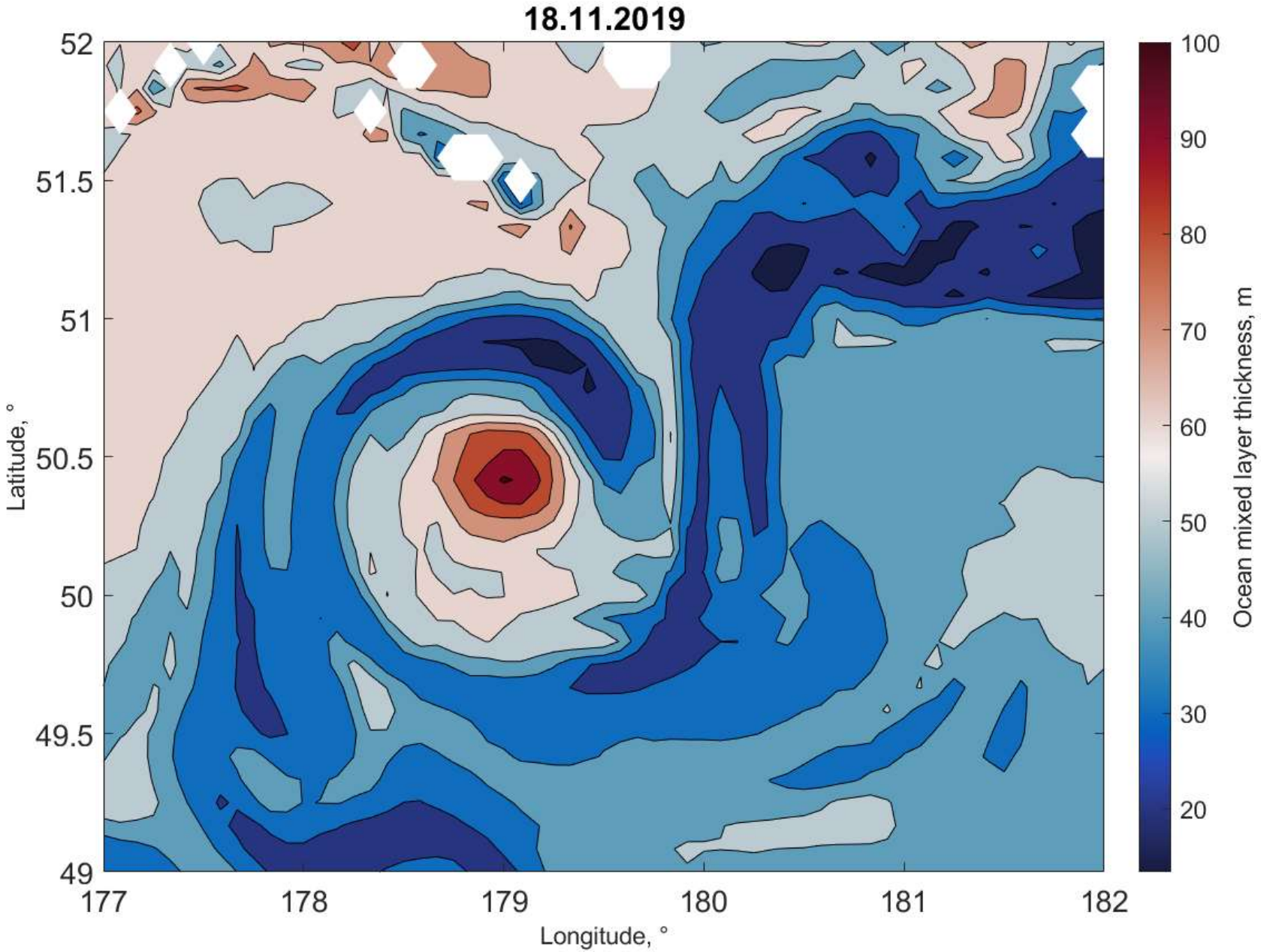
The largest vertical gradients of temperature and salinity of the eddy can be traced up to 3000 meters.

On the surface of the eddy the water temperature is about 7°C and a salinity of 32.6-32.8 psu. Down to a depth of 1000 meters, the characteristics change rapidly and reach the following values at the periphery: the salinity rises to 34.4 psu, and the temperature drops to 3°C.




*Surface orbital velocity*

The maximum orbital velocities (65-70 cm/s) are located 22 km south of the eddy center.




*Mixed layer depth*

The maximum depth of the mixed layer (100 meters) is reached in the center of the eddy and the minimum (about 20 meters) is at the northern boundary of the eddy in the region of 51°N, 179°E.

# Conclusions

During the analysis period, 1 long-lived eddie was observed.

The eddie formed along the Alaskan Stream south of the Aleutian Islands and propagate southwestward, carrying warm and salty water.

The largest vertical gradients of temperature and salinity of the eddy can be traced up to 3000 m. On the surface of the eddy the water temperature is about 7°C and the salinity is 32.6-32.8 psu. At a depth of 1000 m, the characteristics change rapidly and reach the following values at the periphery: the salinity rises to 34.4 psu, and the temperature drops to 3°C.

The maximum velocities are observed in winter (3.1 cm/s) and spring (3.3 cm/s), while the minimum ones are observed in summer (2.3 cm/s) and autumn (1.8 cm/s).

During the year, the eddy covered a distance of approximately 837 km, and its average velocity was 2.6 cm/s.

The highest orbital velocities (65-70 cm/s) are located 22 km south of the eddy center.