

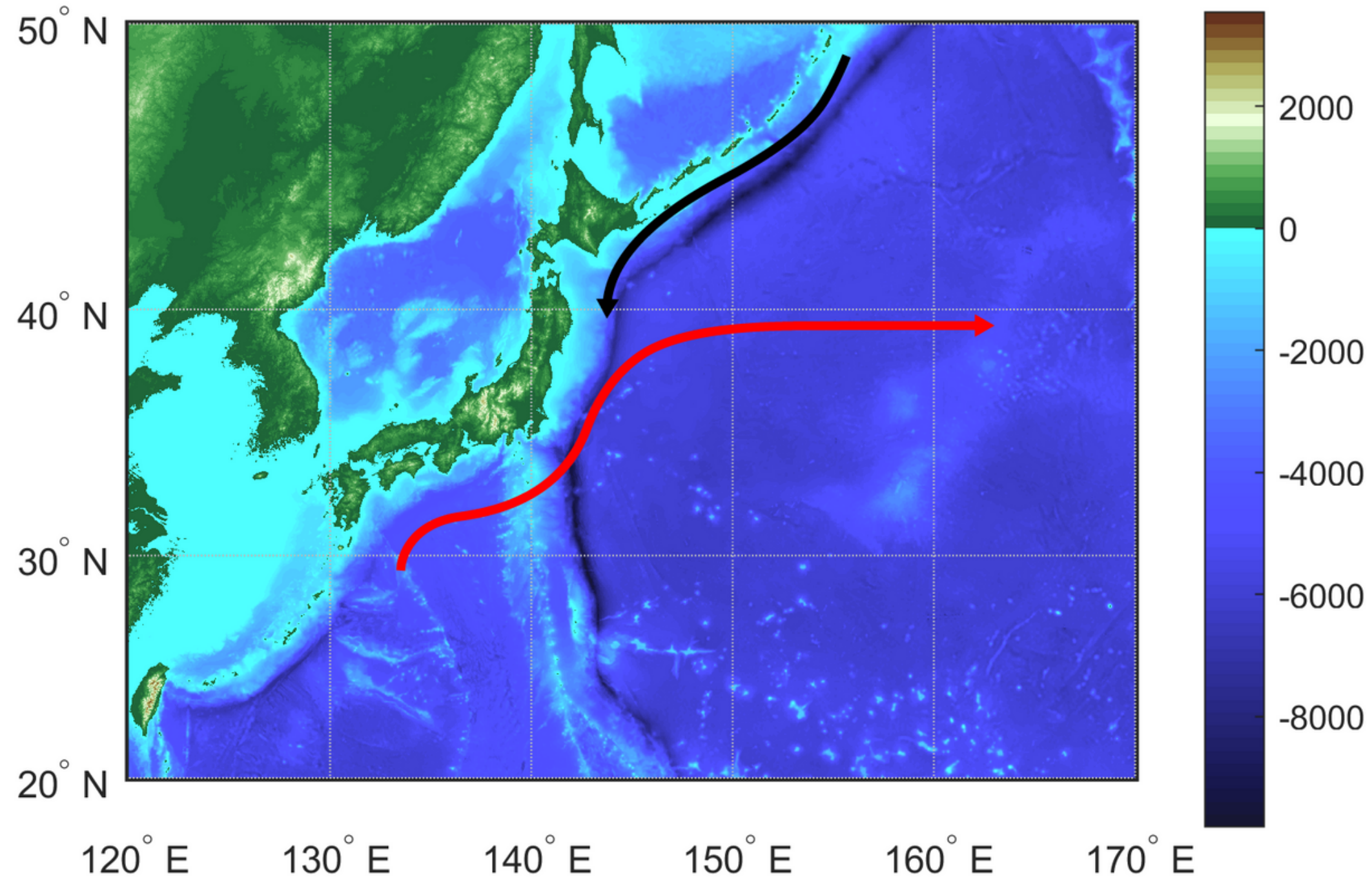
Thermohaline structure and dynamic parameters of a mesoscale eddie of South Kuril region

based on reanalysis product GLORYS12V1

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Introduction



Western North Pacific (WNP) is a region of Pacific saury fishing.



WNP is a region with interesting dynamics, here merge the waters of two currents. As a result of collision of currents, mesoscale eddies are formed.

Ocean current pattern. A red arrow — the Kuroshio, a black arrow — the Oyashio

Aim and objectives

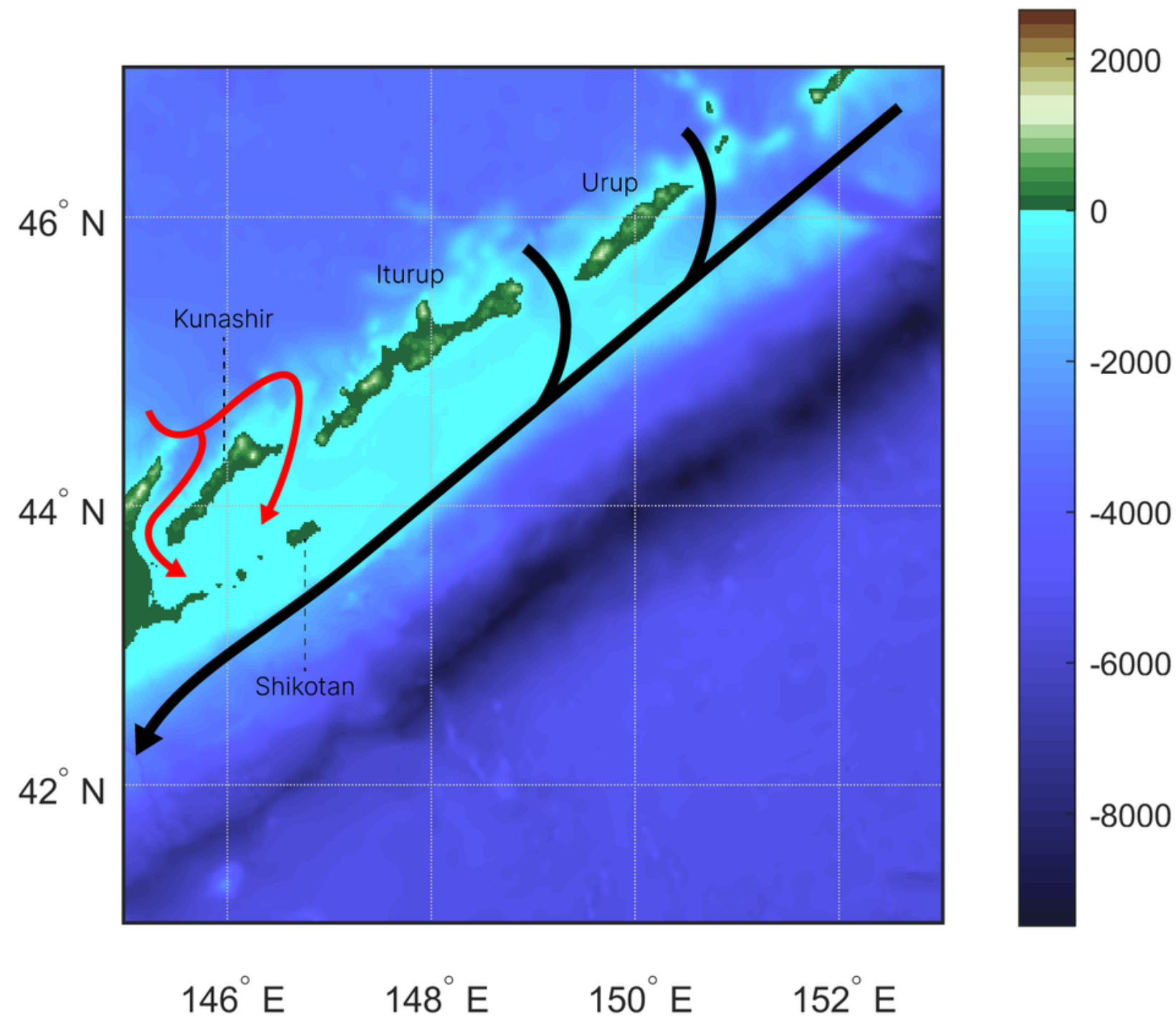
The aim

of the work is to analyze the thermohaline structure and dynamic parameters of a mesoscale anticyclone located in the South Kuril region, using satellite and model data.

Objectives

- 1 make a physical and geographical description of the area
- 2 describe the data used in the work
- 3 examine the parameters of the mesoscale eddie
- 4 analyze the thermohaline structure of the eddie

Geographical description of the area



The region of interest in this work is an area of the Southern Kuril Islands.

The Kuril Kamchatka Trench:
length 2170 km
depth 9717 m
average width 59 km

Topographic map of the Southern Kuril region

Data used

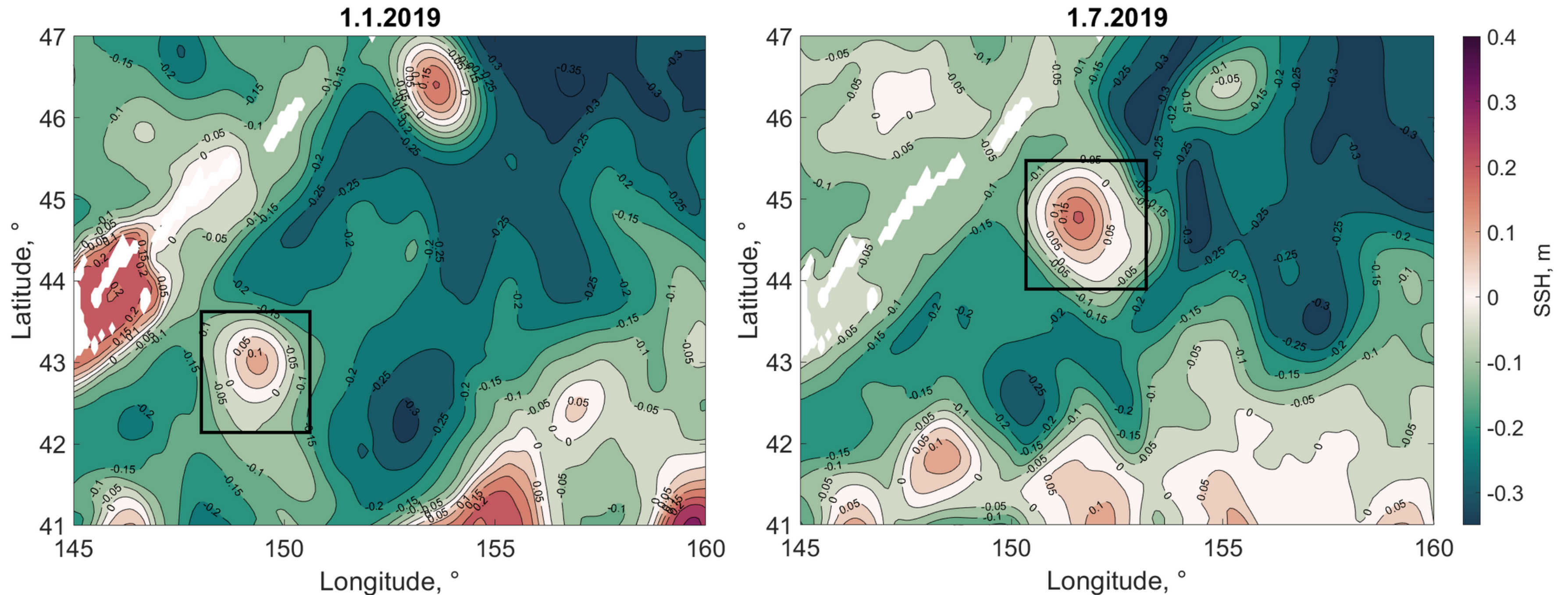
The GLORYS12V1 product is the CMEMS global ocean eddy-resolving (1/12° horizontal resolution, 50 vertical levels) reanalysis covering the altimetry from 1993 to 2019.

Along track altimeter data (Sea Level Anomaly), Satellite Sea Surface Temperature, Sea Ice Concentration and In situ Temperature and Salinity vertical profiles are jointly assimilated.

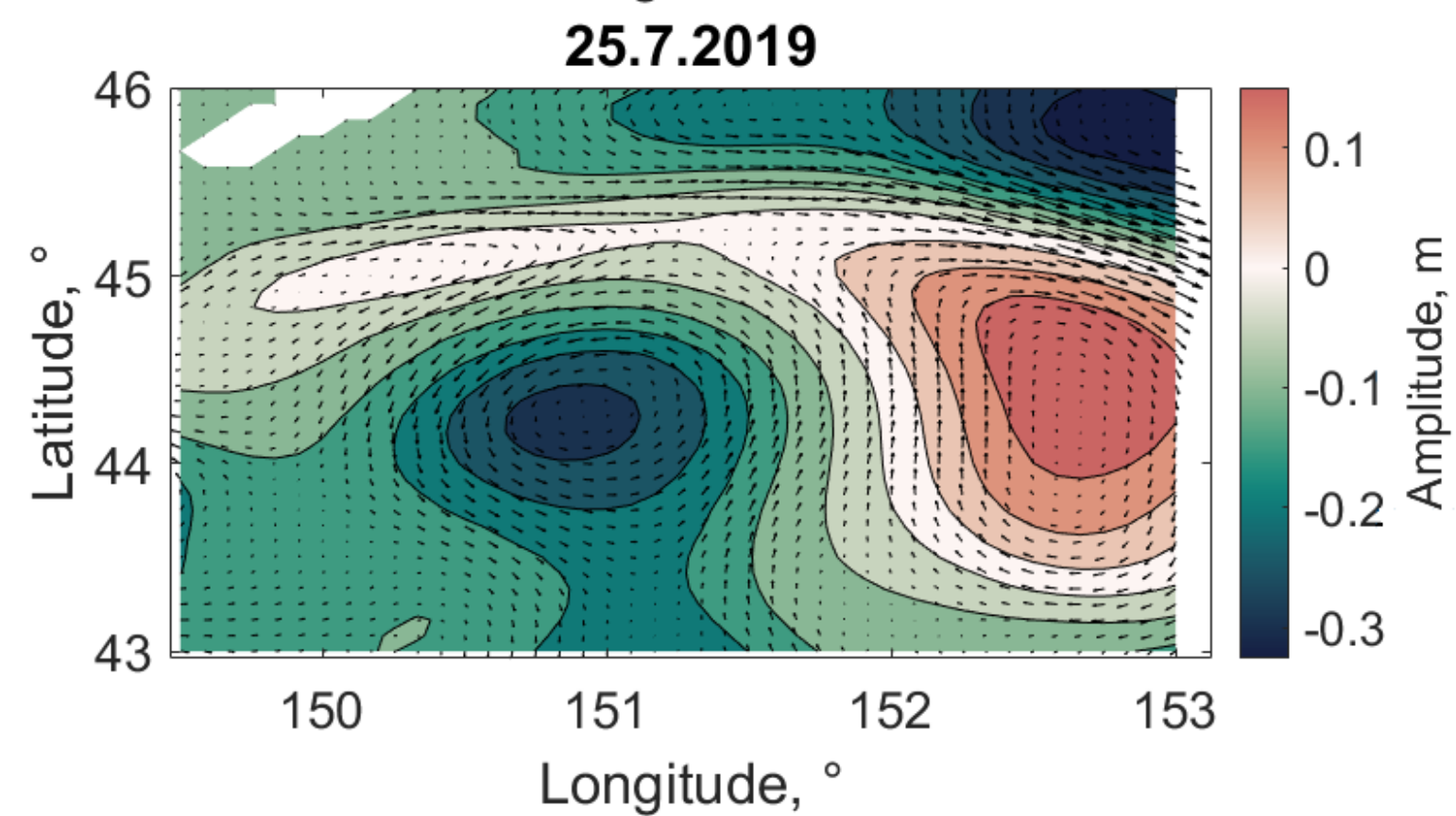
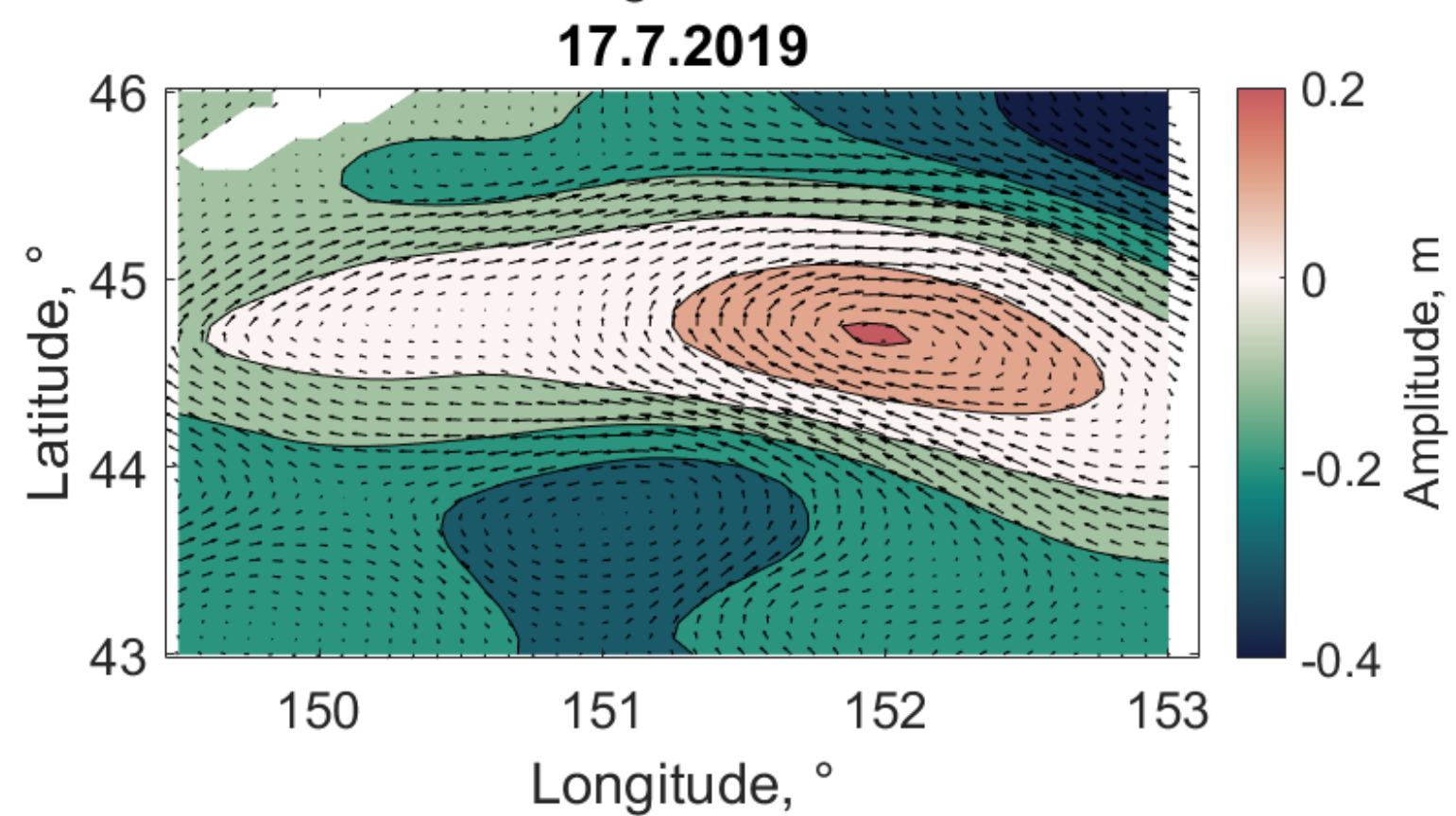
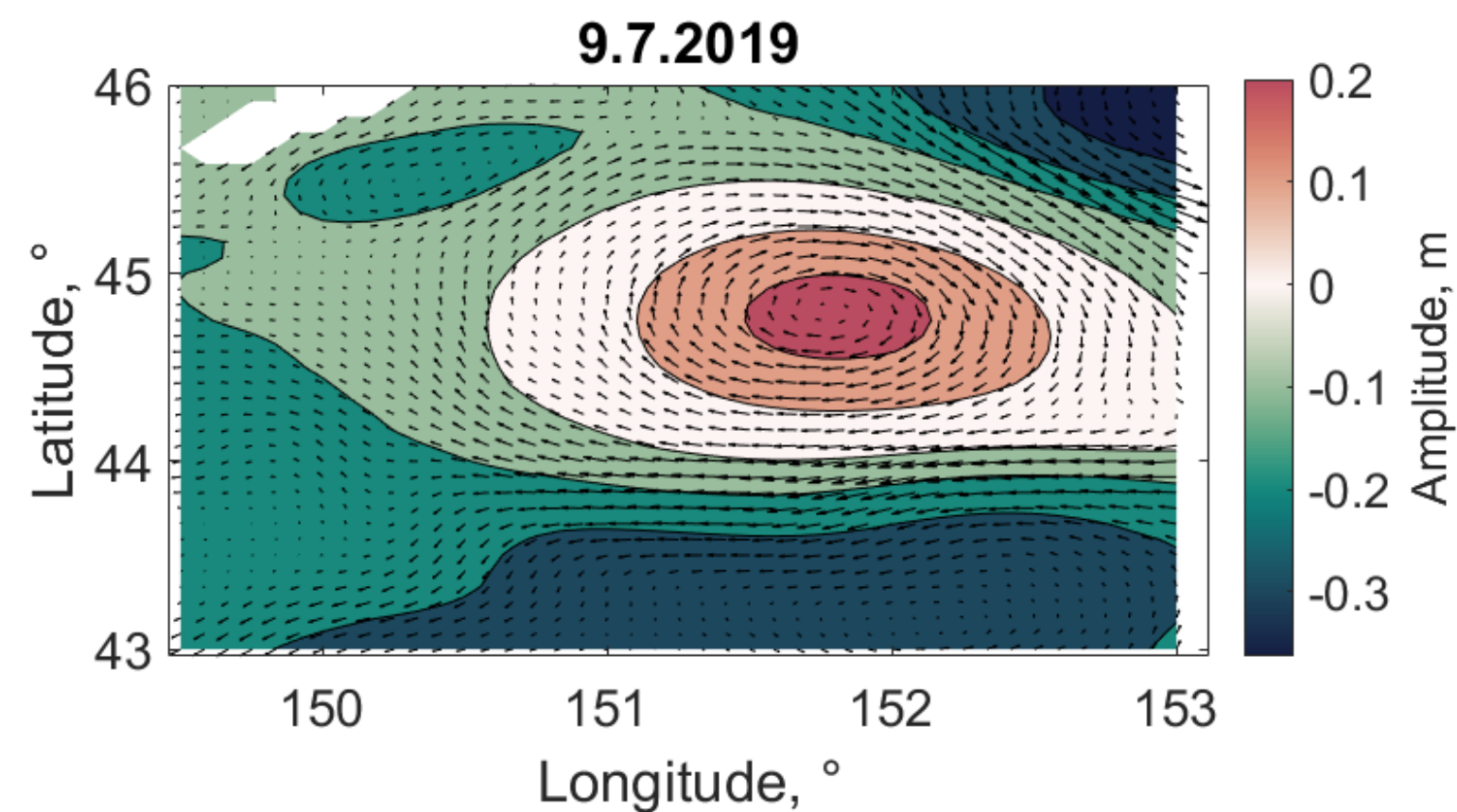
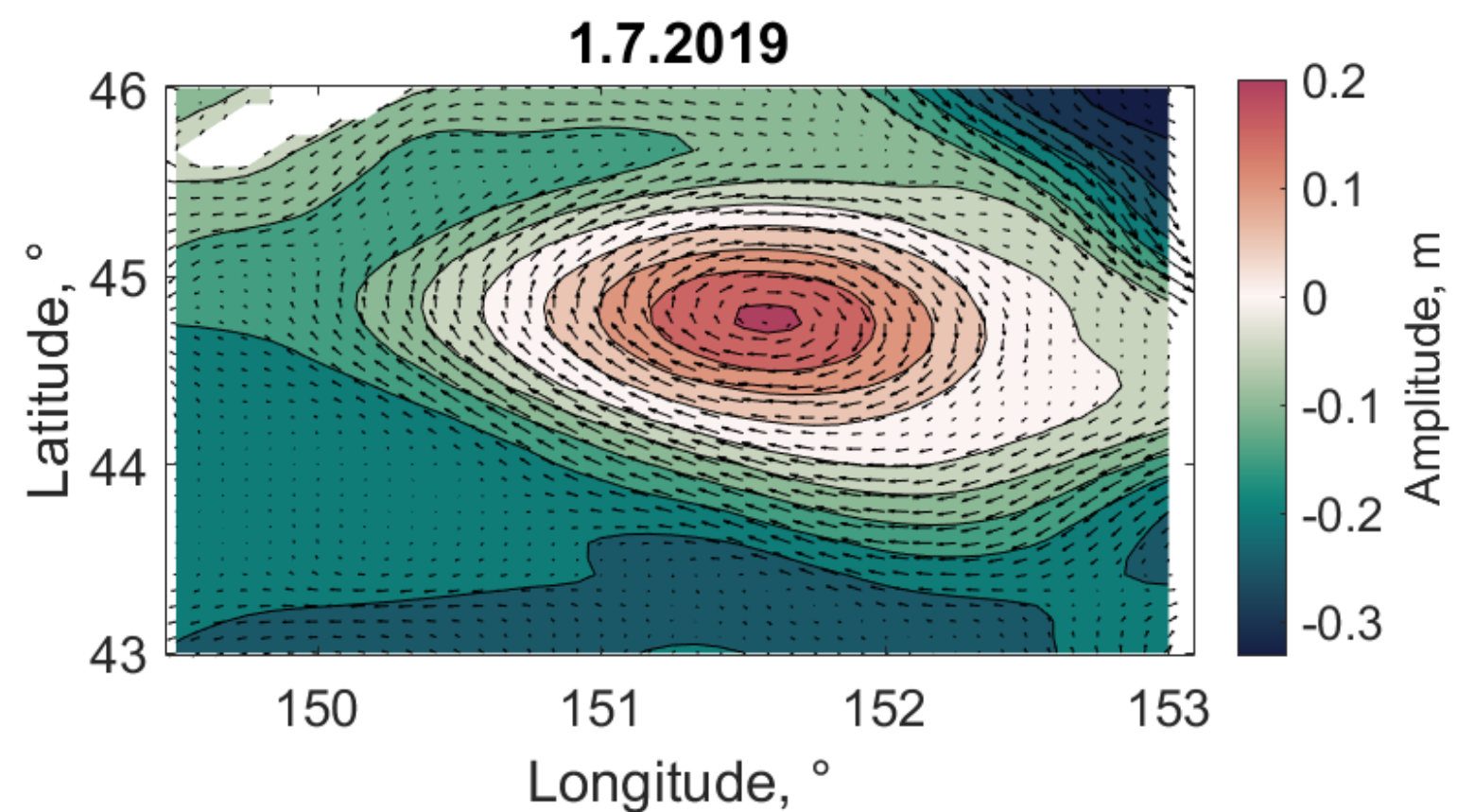
SSH, temperature and salinity data are used in the work.

The coordinates of the studied area: 41-47° N, 145-153° E.

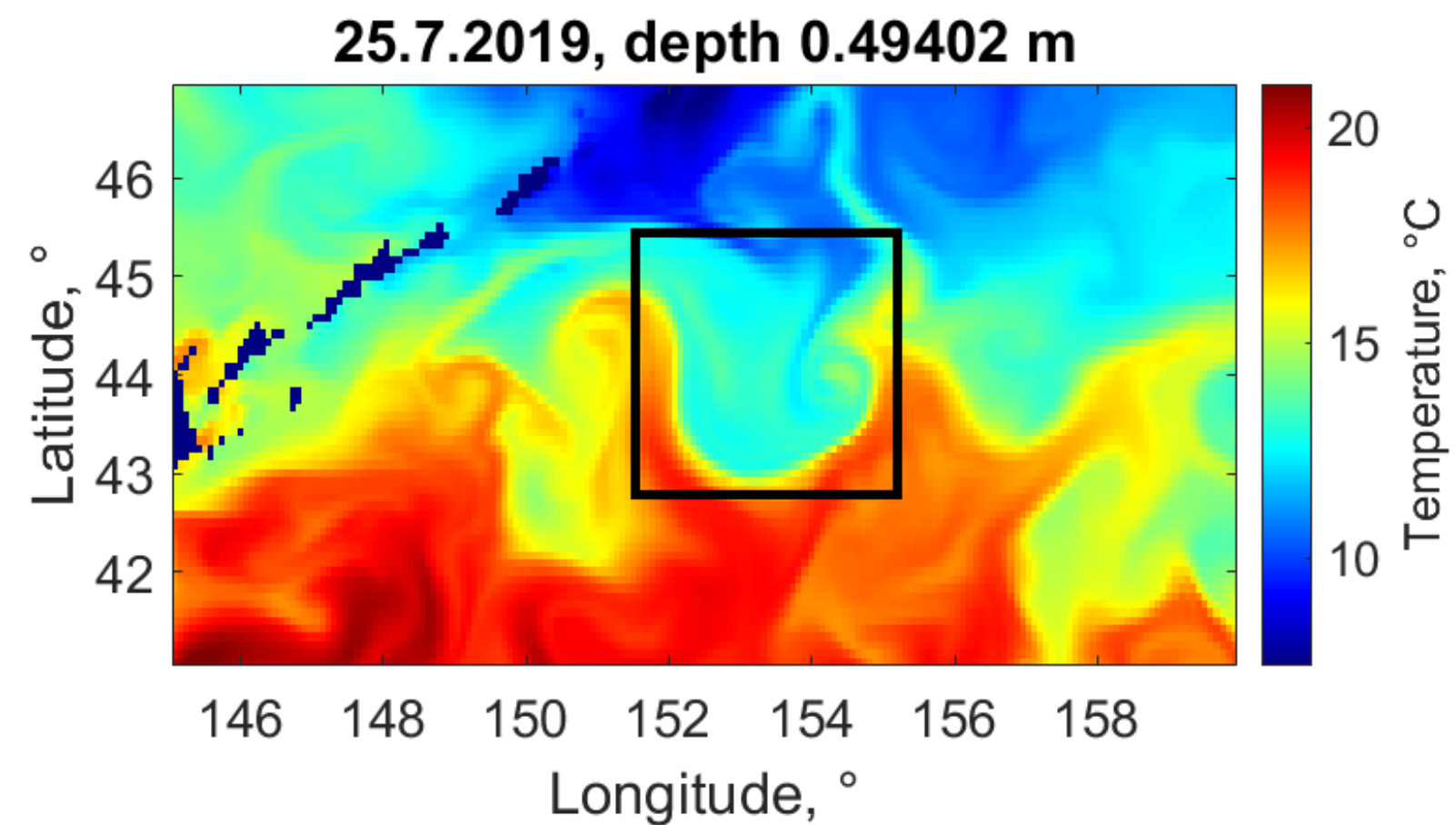
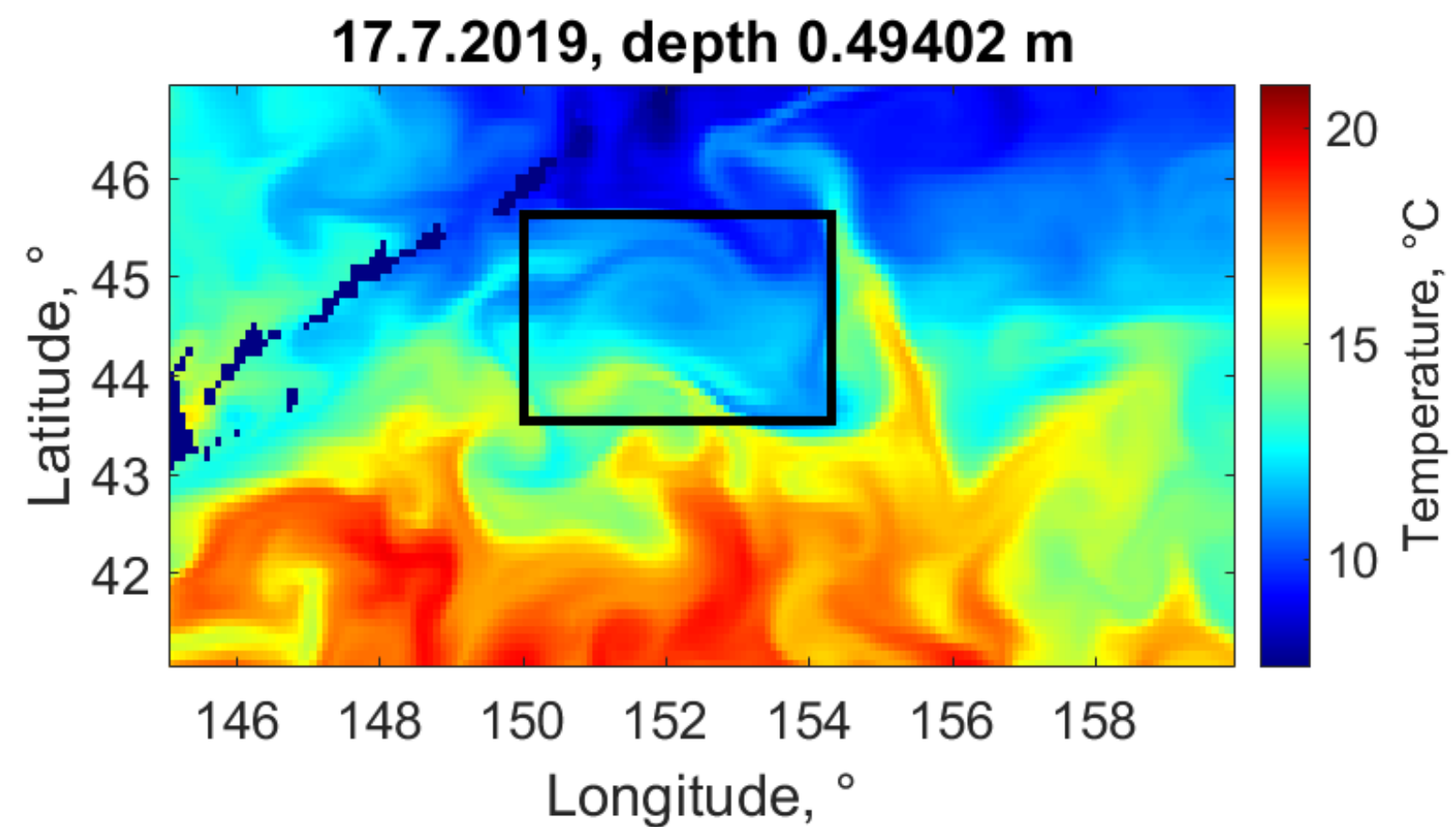
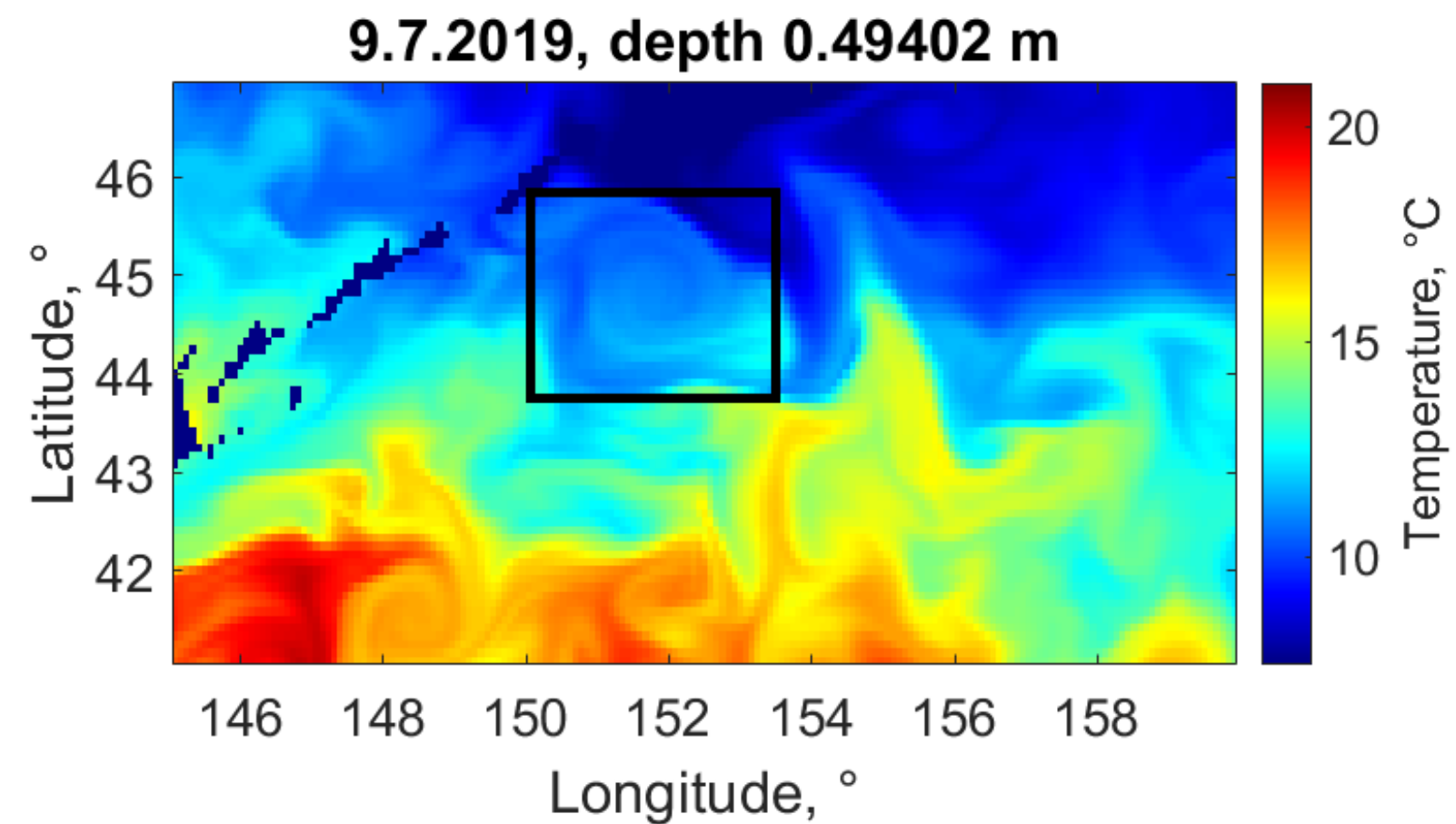
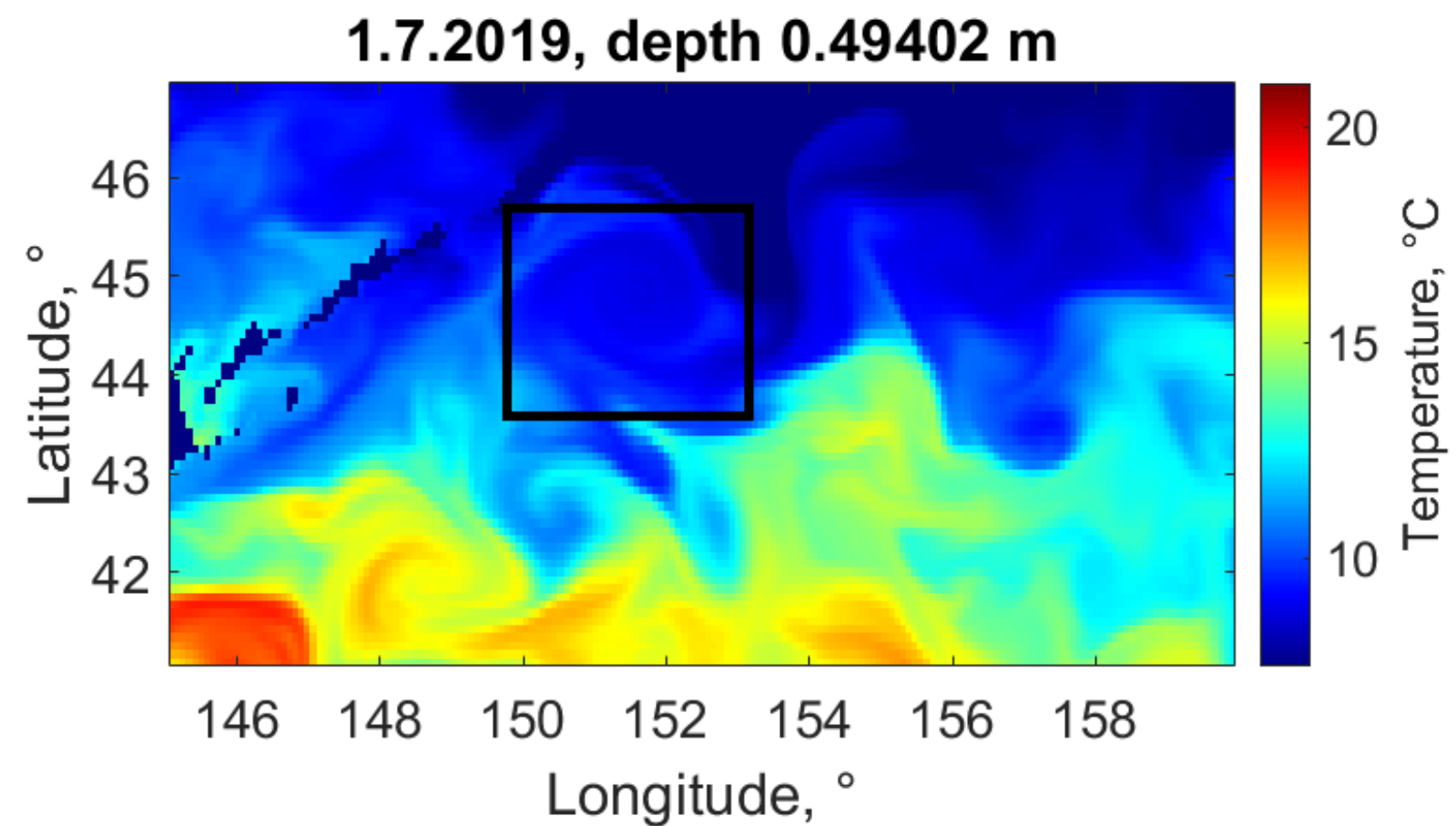
Characteristics of a studied anticyclonic eddie



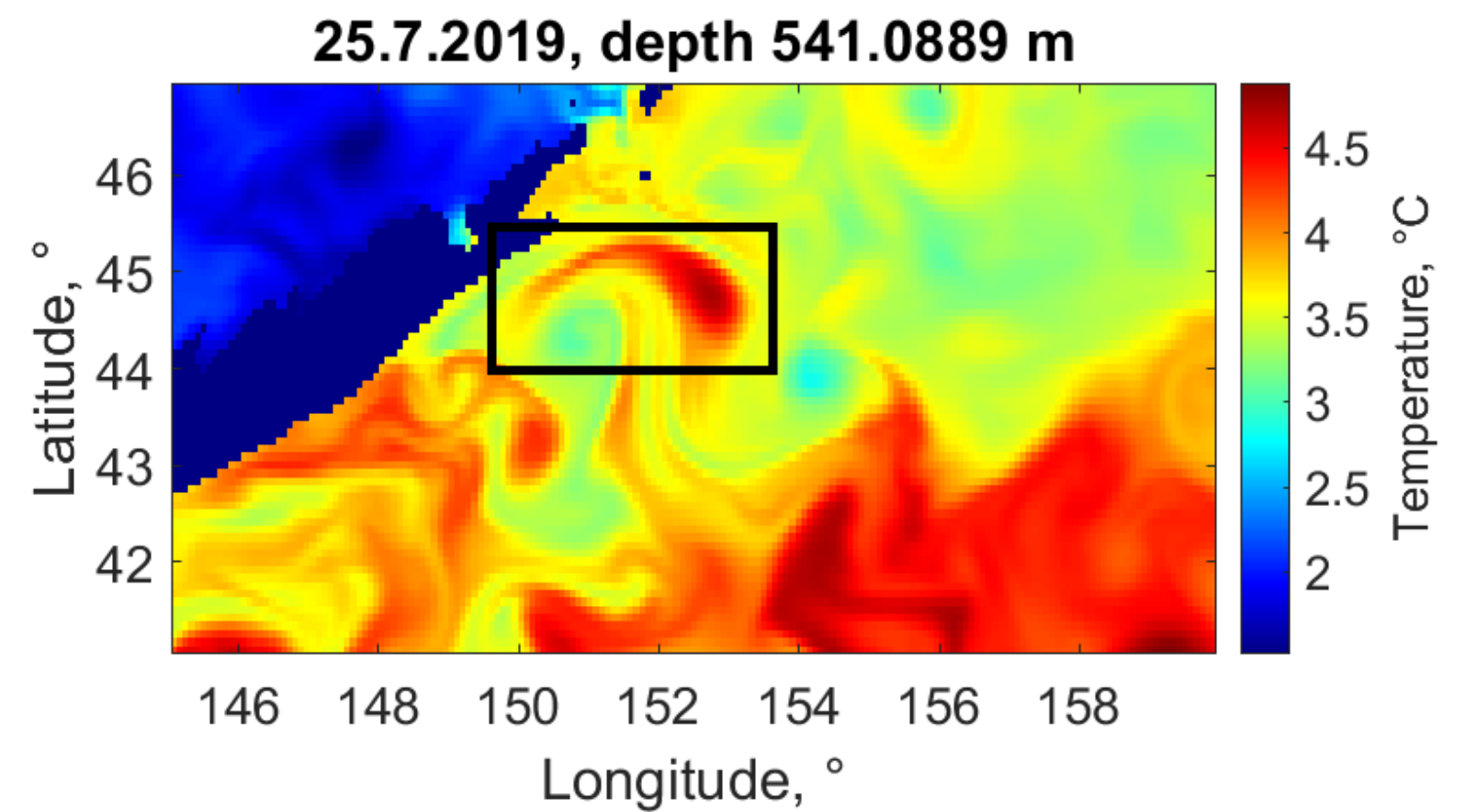
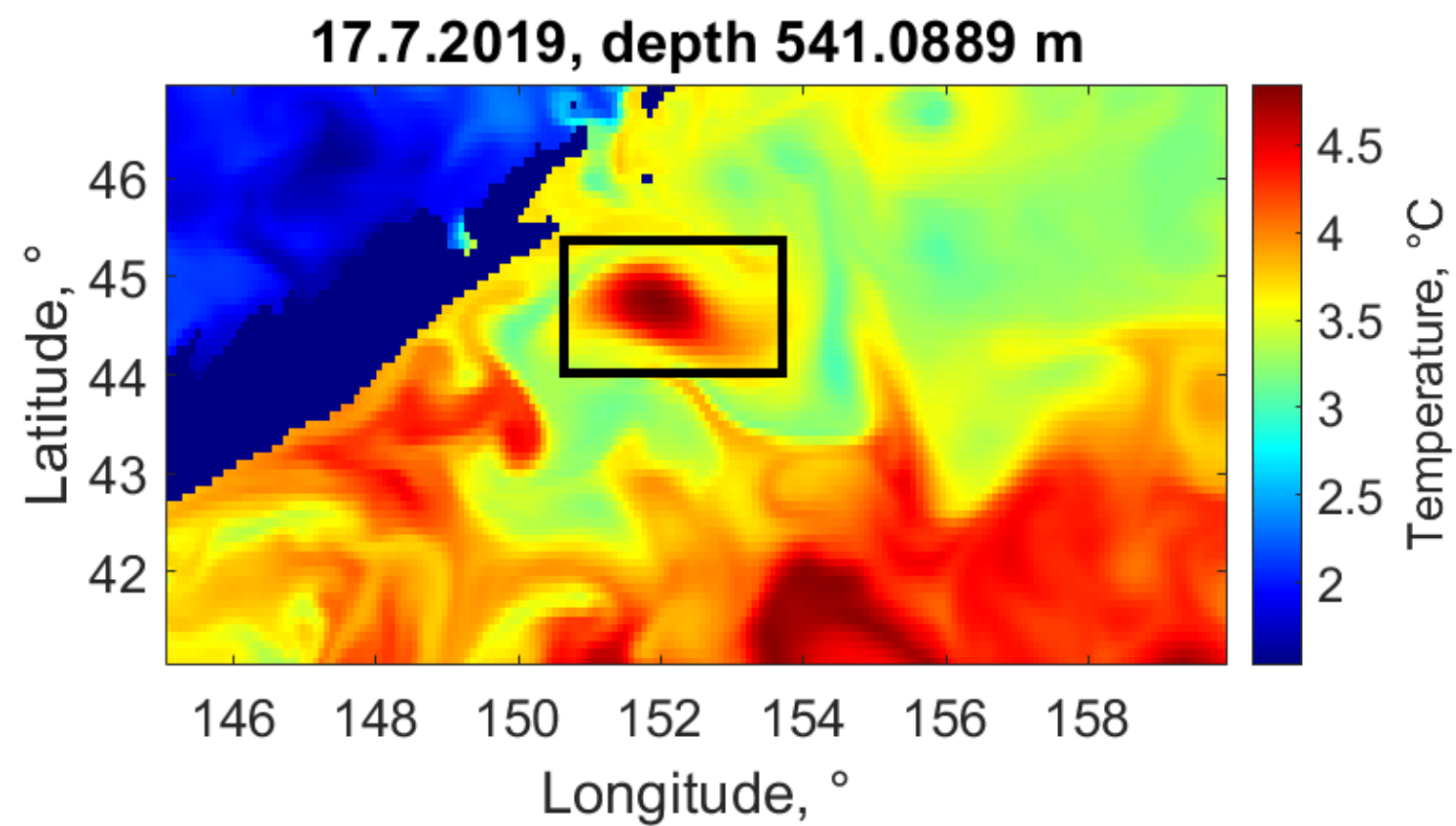
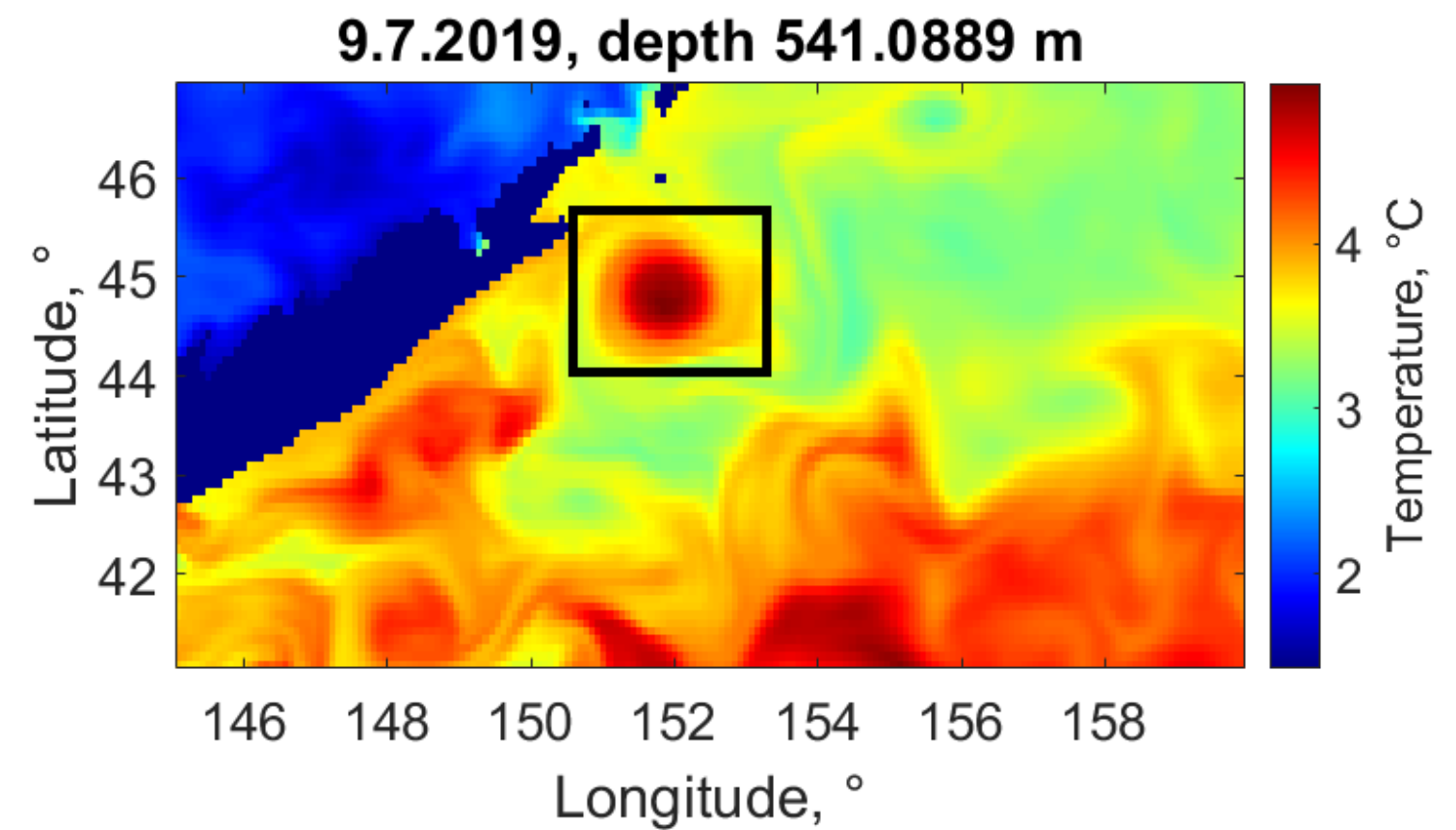
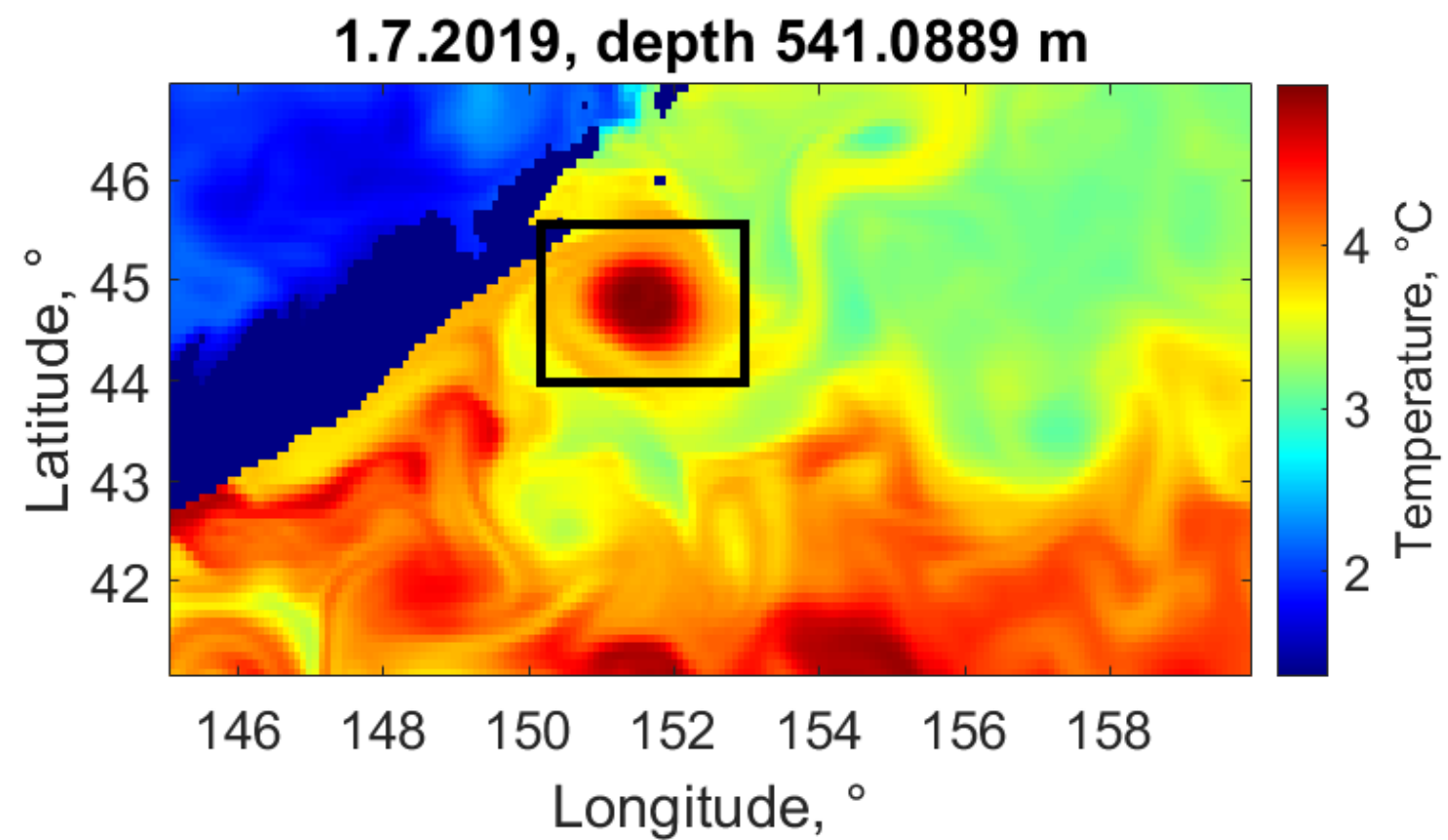
The location change of the eddie from 1.01.2019 to 1.07.2019 according to sea level anomaly (SLA)



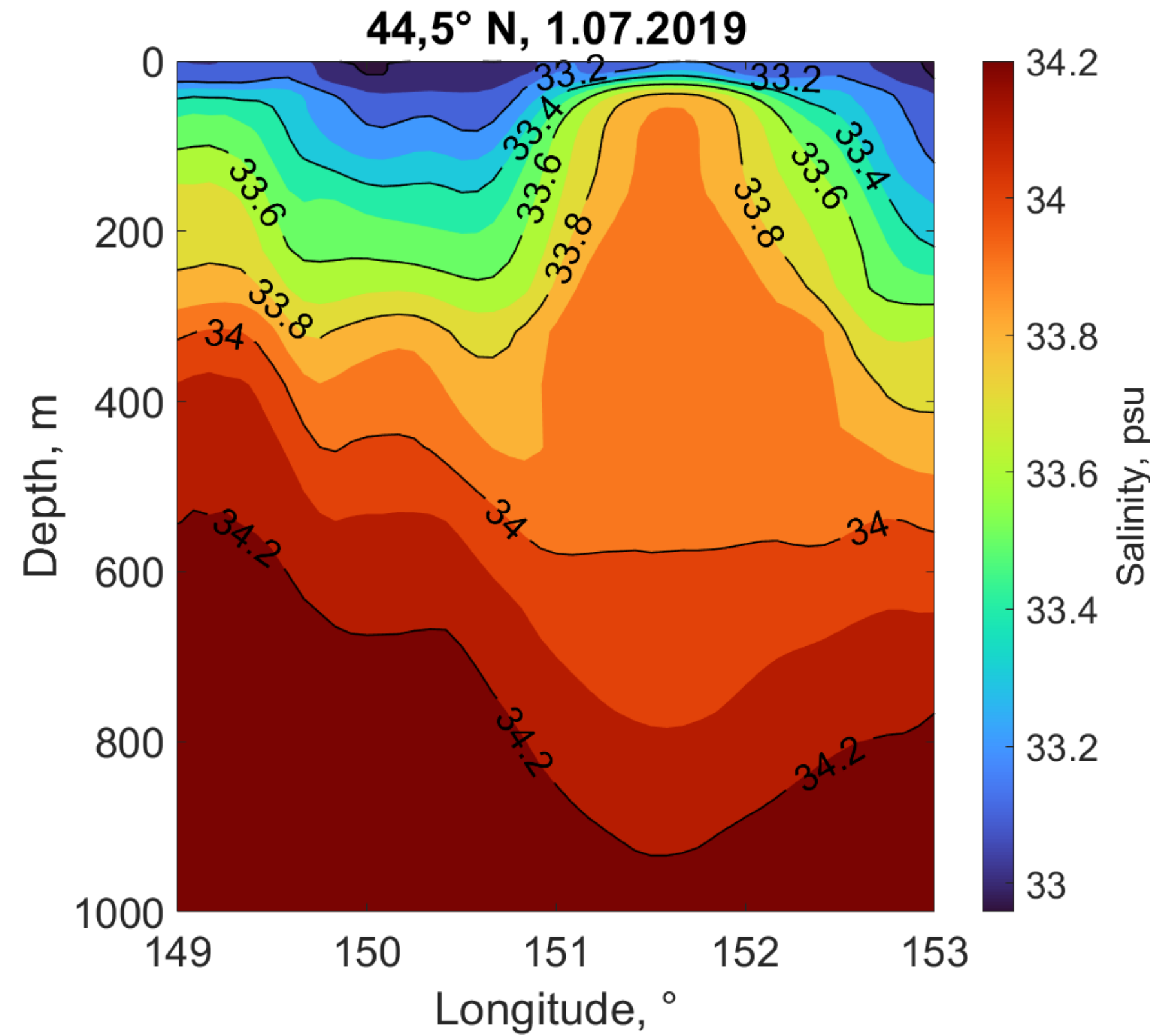
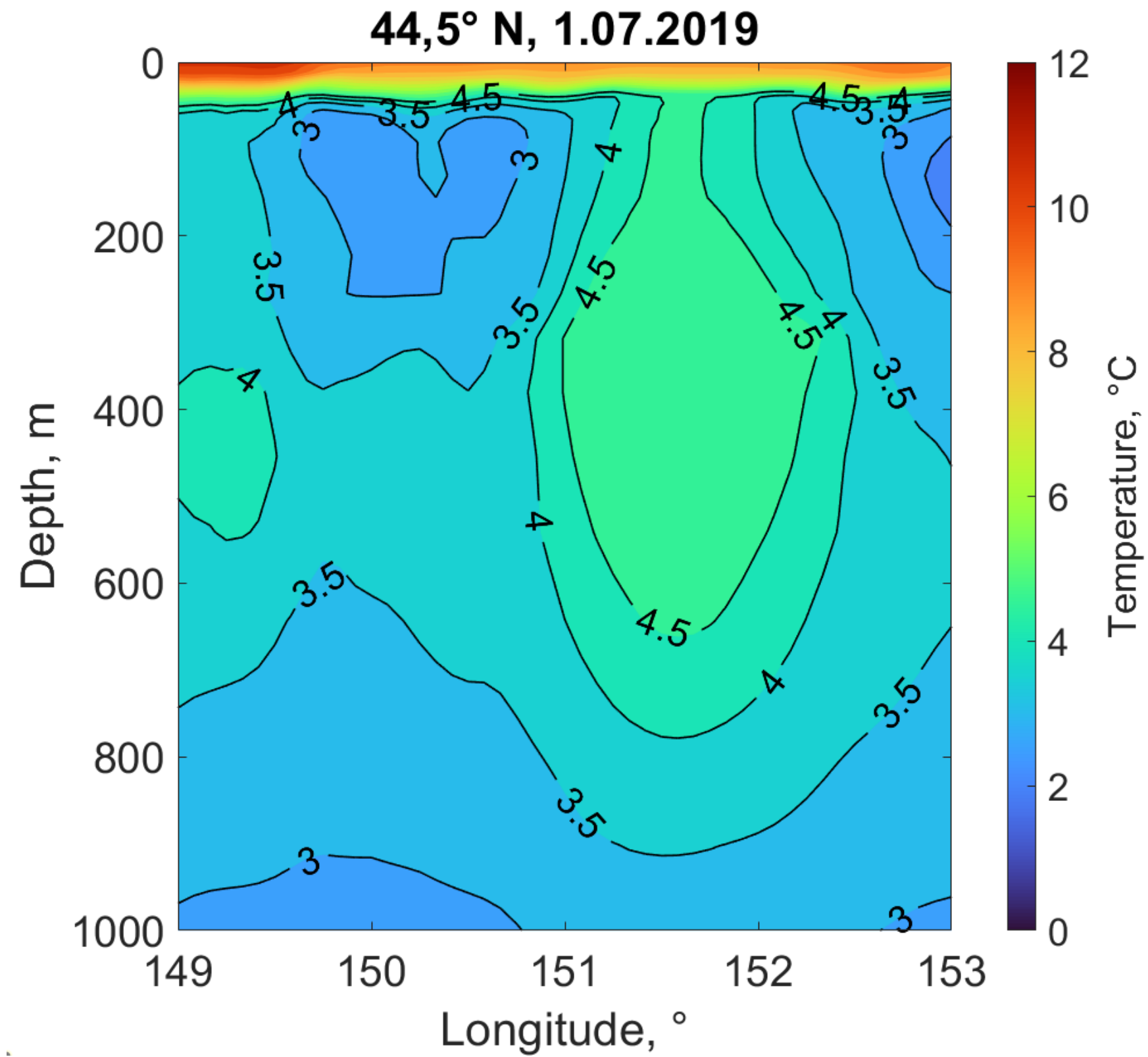
The velocity vectors in the near-surface layer in the eddie



Ocean surface temperature



Temperature in the layer at a depth of 541 m



Vertical temperature and salinity profiles along 44,5 N in July 2019

Conclusions

- 1 The considered anticyclone had a diameter of about 125 km, its average travel speed is 1.69 cm/s, orbital speed is 40 cm/s.
- 2 The vortex had the shape of a lens, its core consisted of warmer and saltier waters (relative to the surrounding waters) and spread to a depth of 1000 m
- 3 The spread of eddies affects the saury fishery in the Western North Pacific, so it is necessary to study the structure of cyclonic and anticyclonic formations

Thank you for your attention!