



MIDDLE EAST TECHNICAL UNIVERSITY  
INSTITUTE OF MARINE SCIENCES

# Mesoscale eddies and cold water dynamics obtained from profiling floats

Anıl Akpınar\*, Bettina Fach, Temel Oğuz, Barış Salihoğlu

Contact: [anil@ims.metu.edu.tr](mailto:anil@ims.metu.edu.tr)

# Introduction

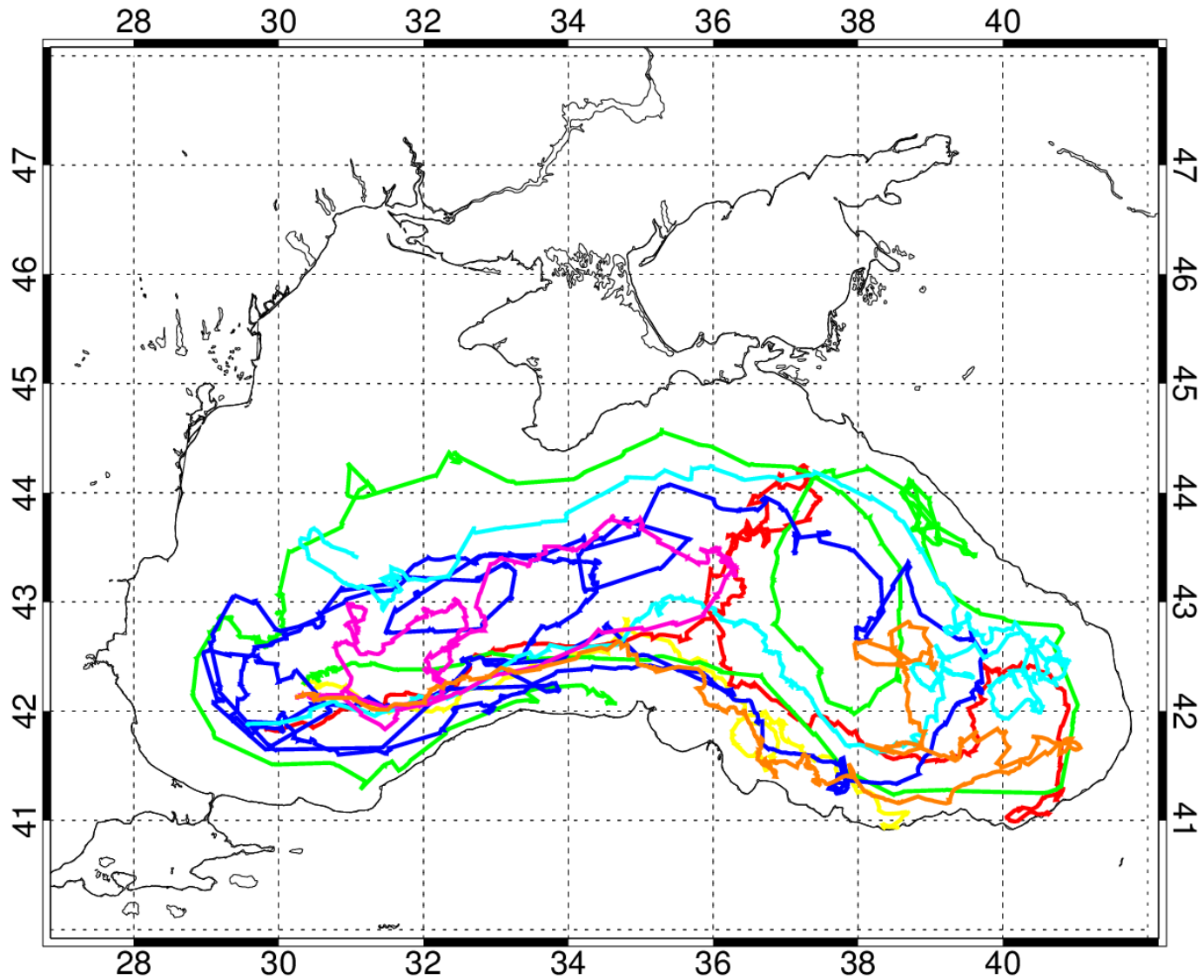


- The idea of this study is to get an overview of the vertical level of mixing in the Black Sea and to investigate the distribution of Cold Intermediate Layer (CIL) in the water column throughout the Black Sea.
- Another point of interest is the cold water formation (February-March) and the favorable conditions for CIL formation.

# Material and Methods

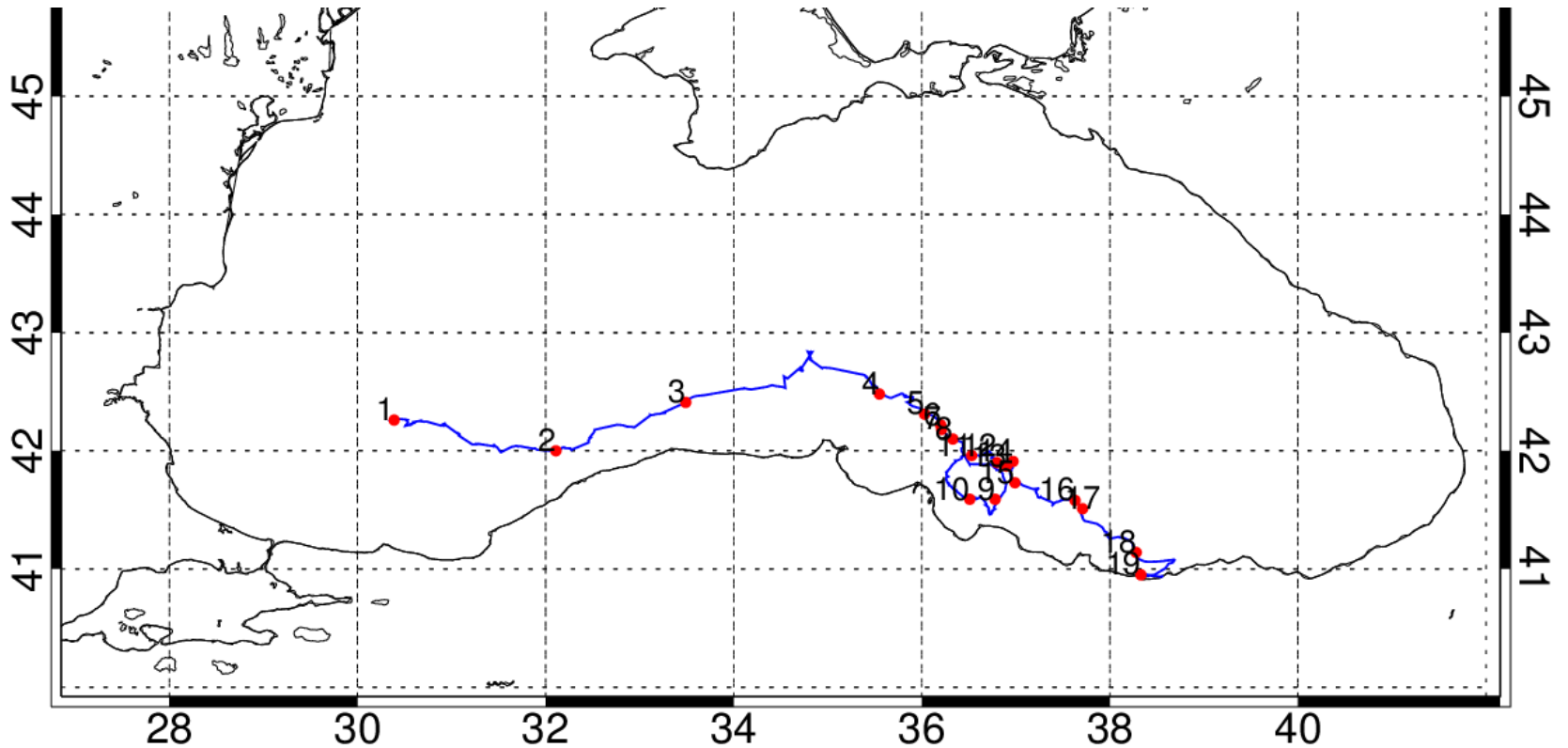
- Data from 7 profiling floats have been used (2002-2009)
- Merged Sea Surface Height Anomaly data distributed by AVISO is used, and interpolated to 0.1x0.625 degree grid-daily.

# Total area covered by the floats



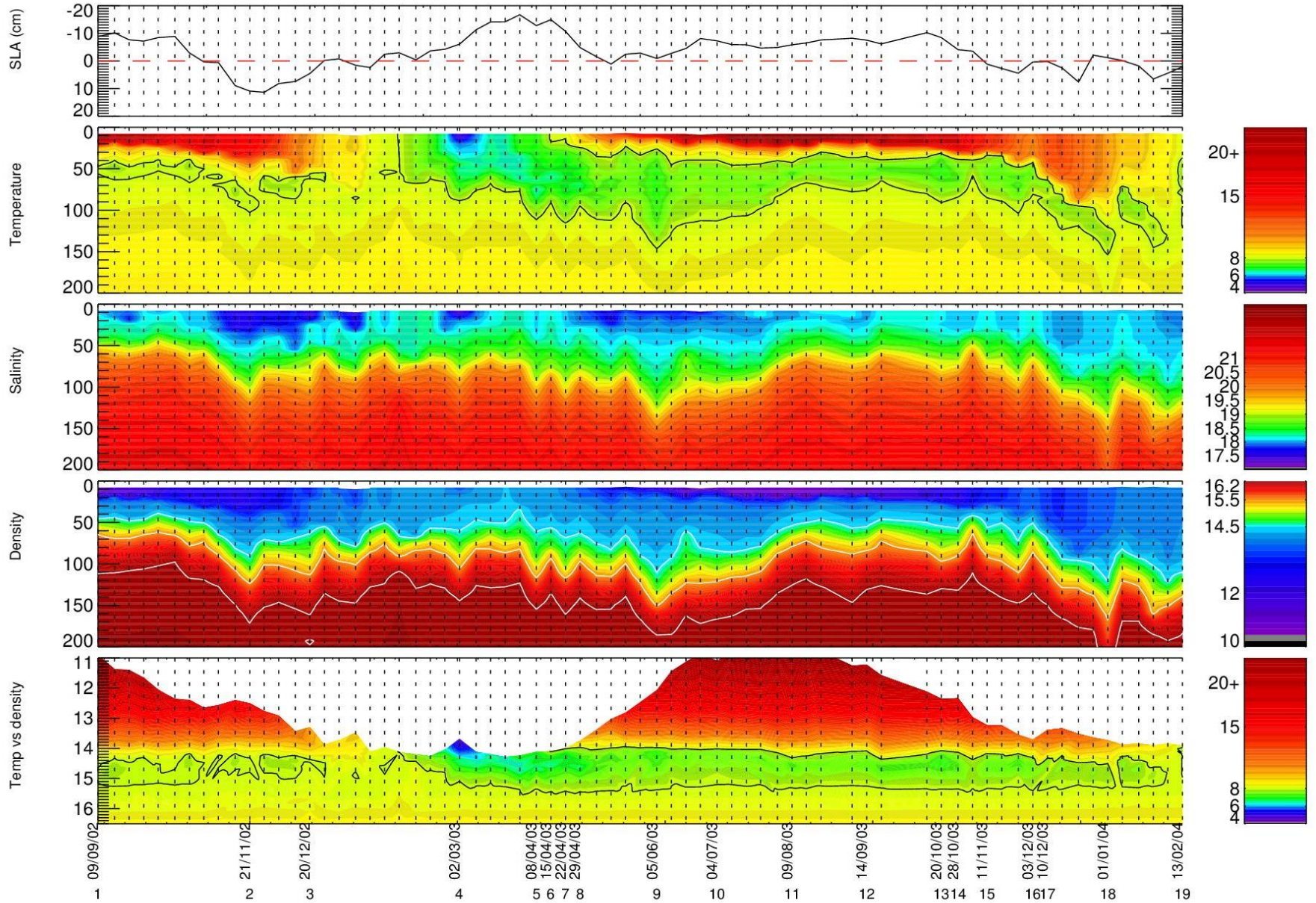
# RESULTS

## Trajectory of BS0587

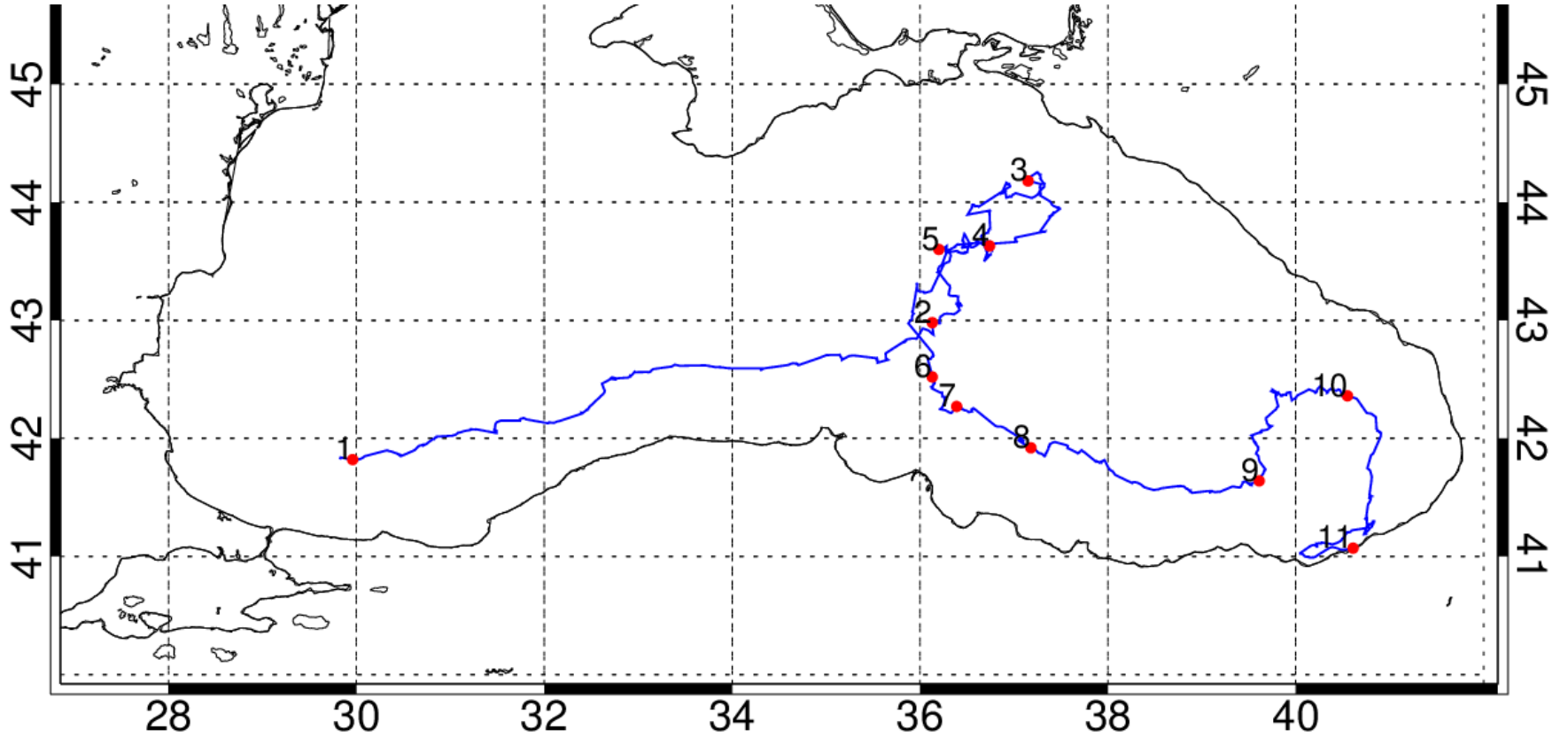




# BS0587

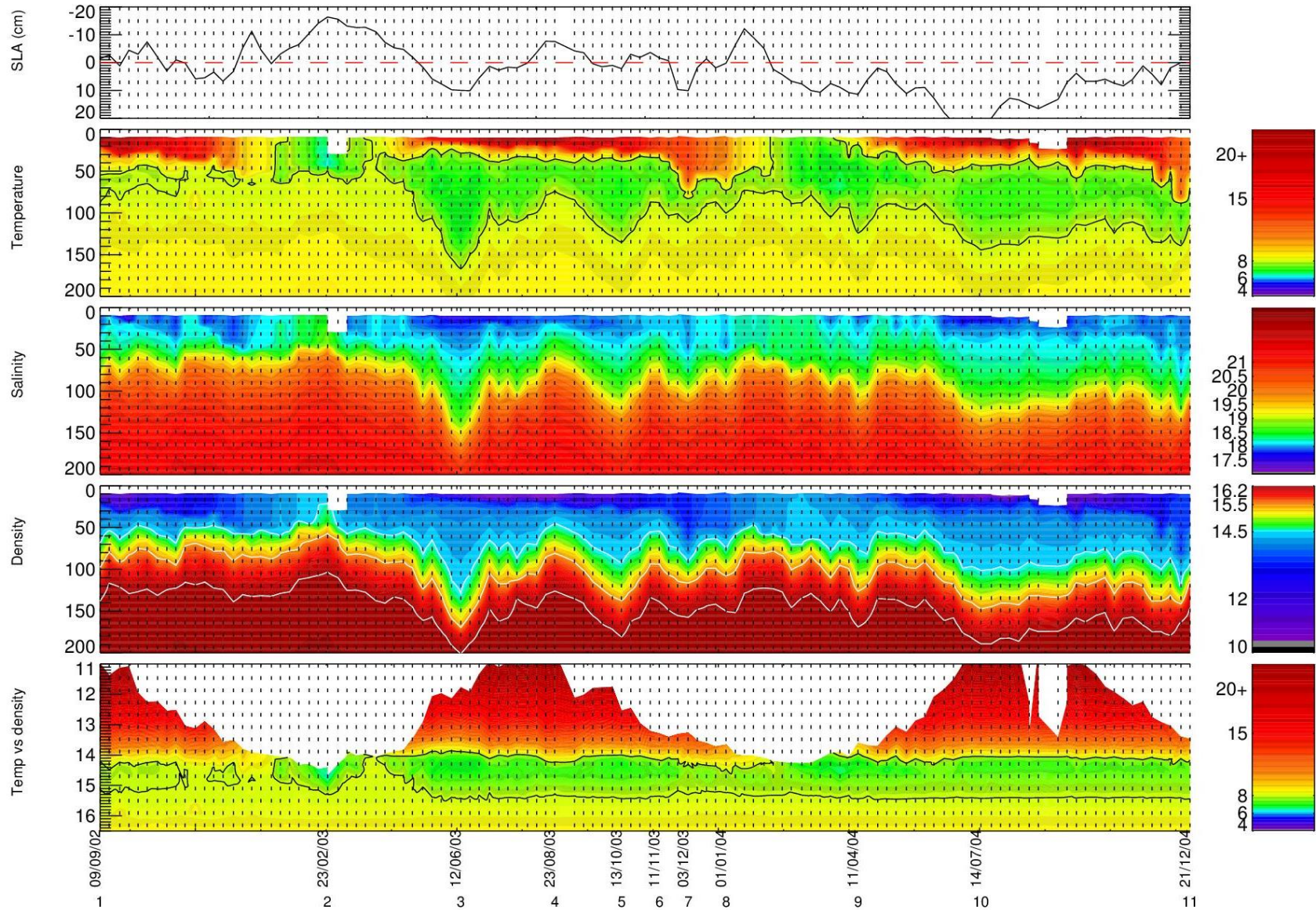


# Trajectory of BS0631

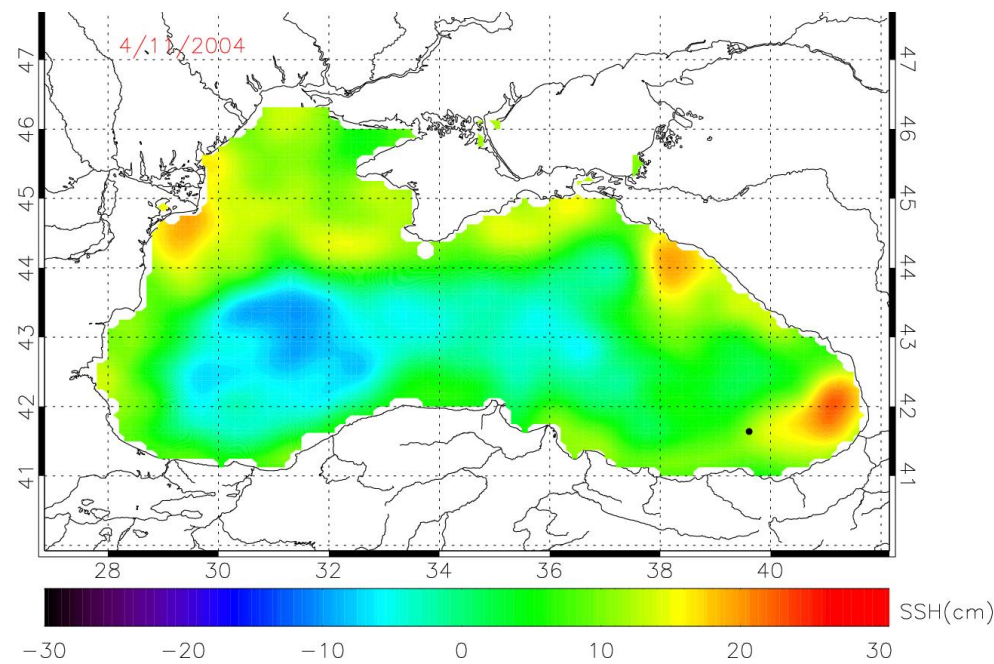
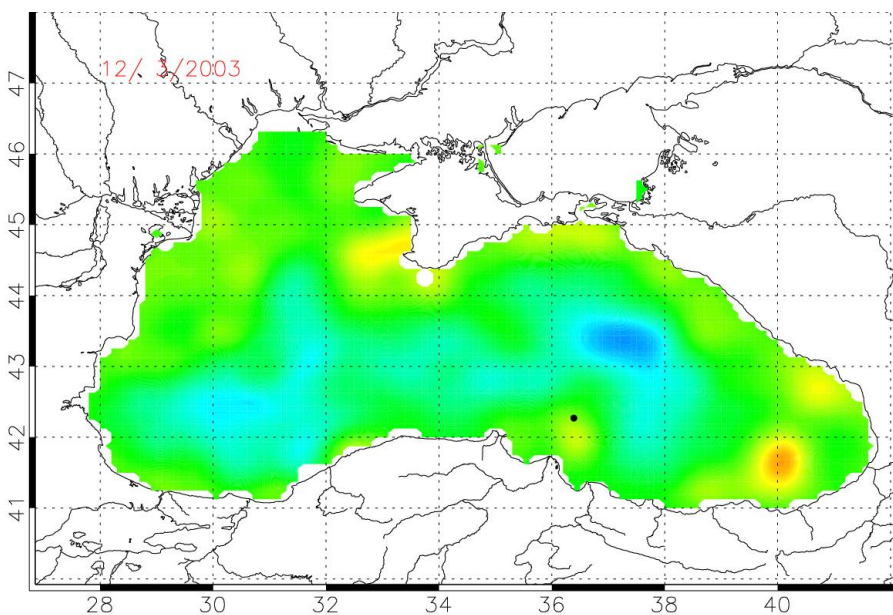
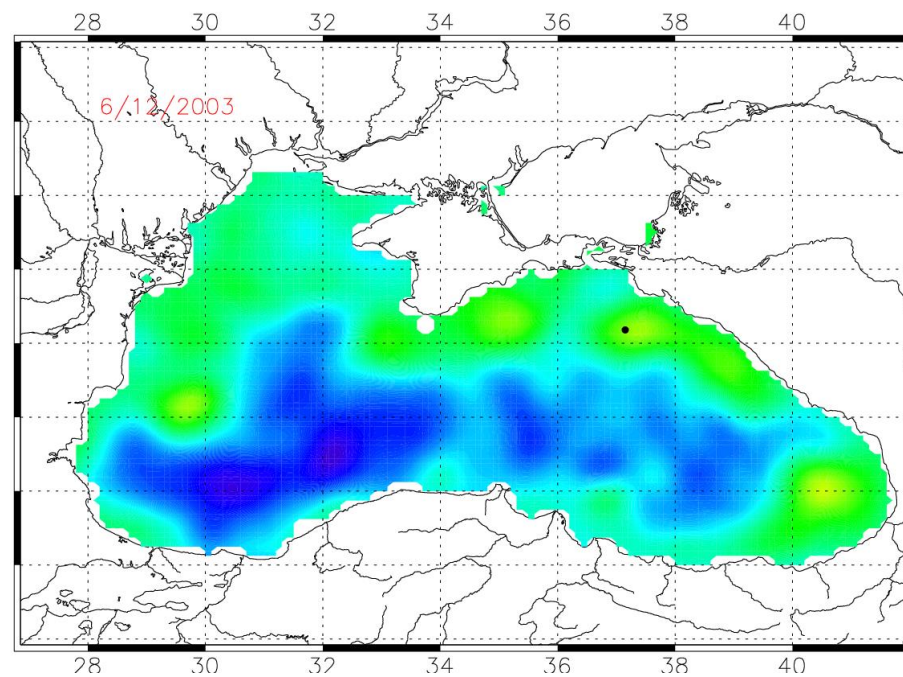
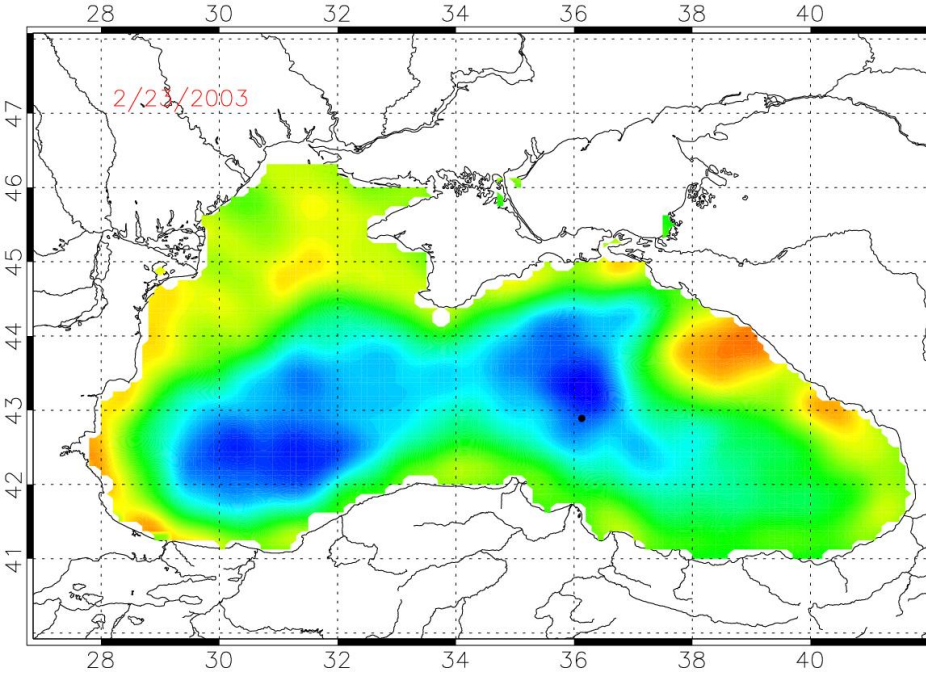




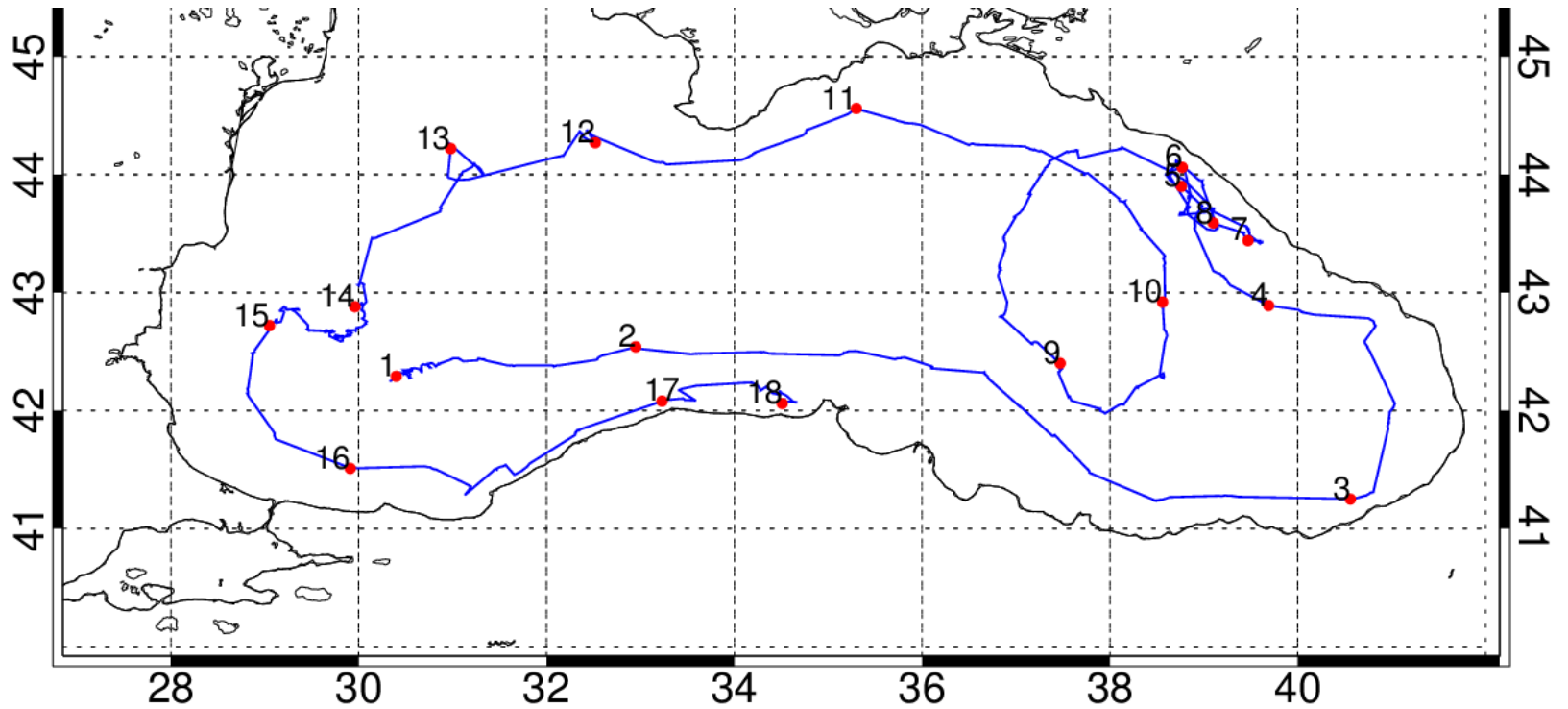
# BS0631





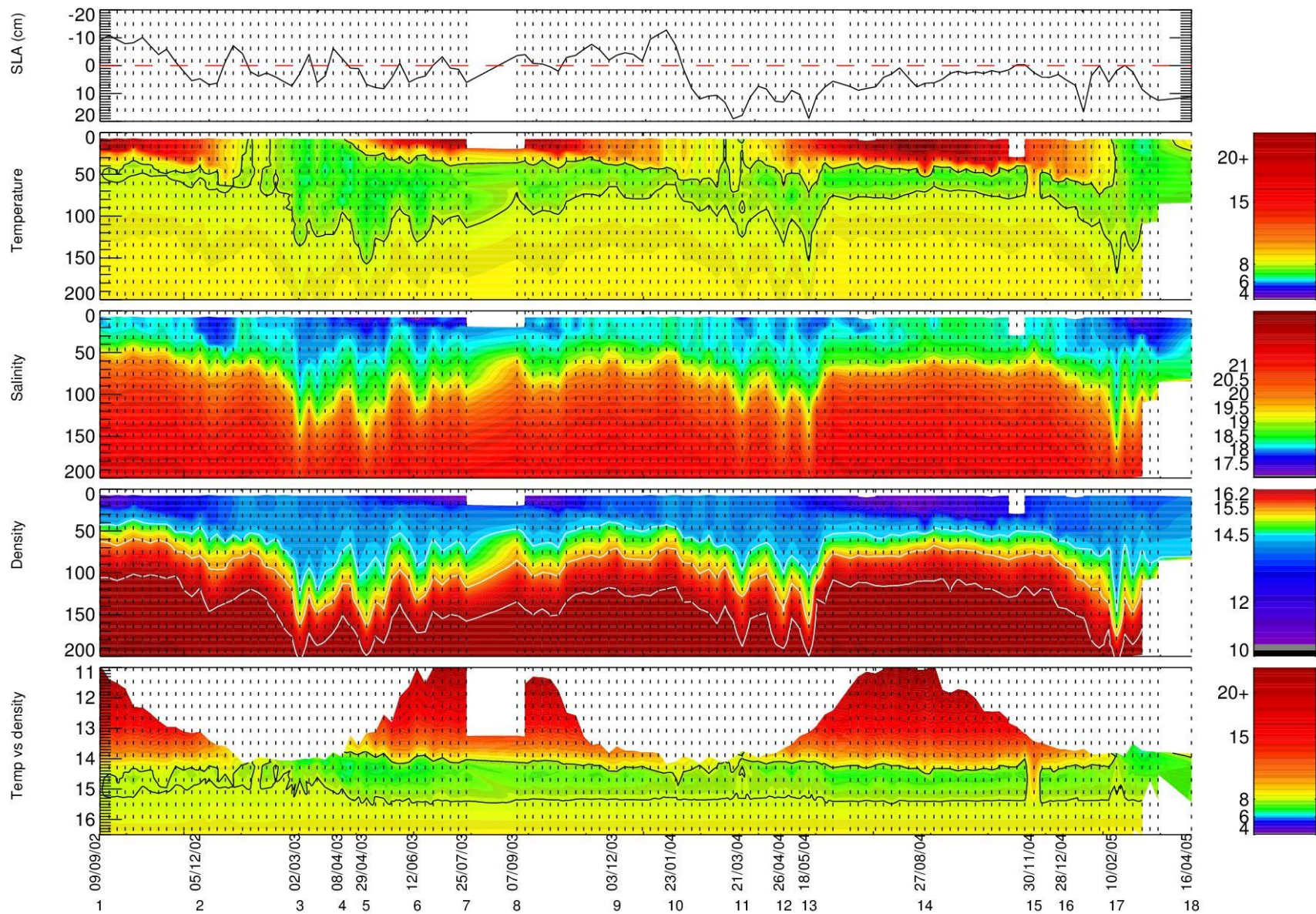


# Trajectory of BS0634

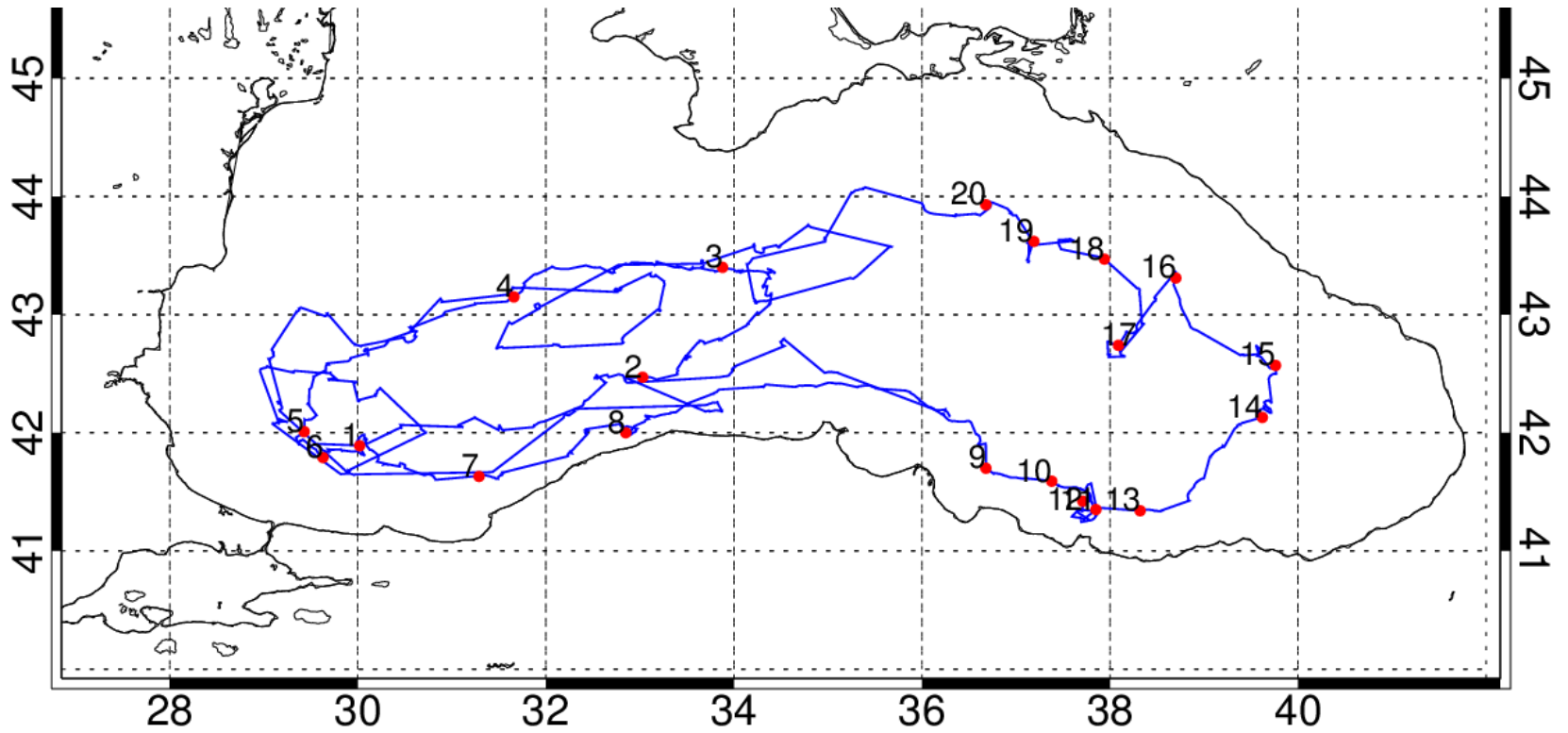




# BS0634

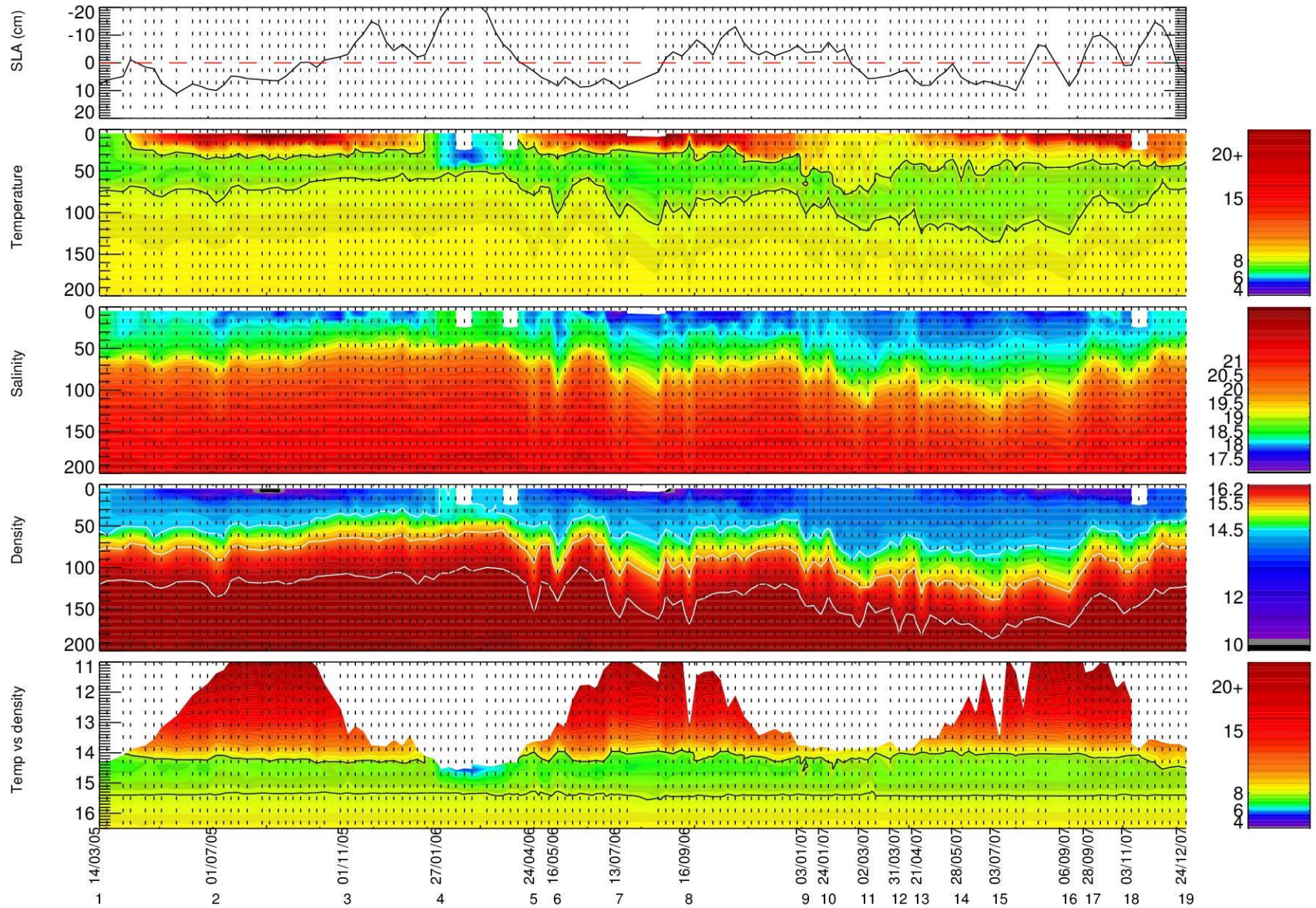


# Trajectory of BS1325



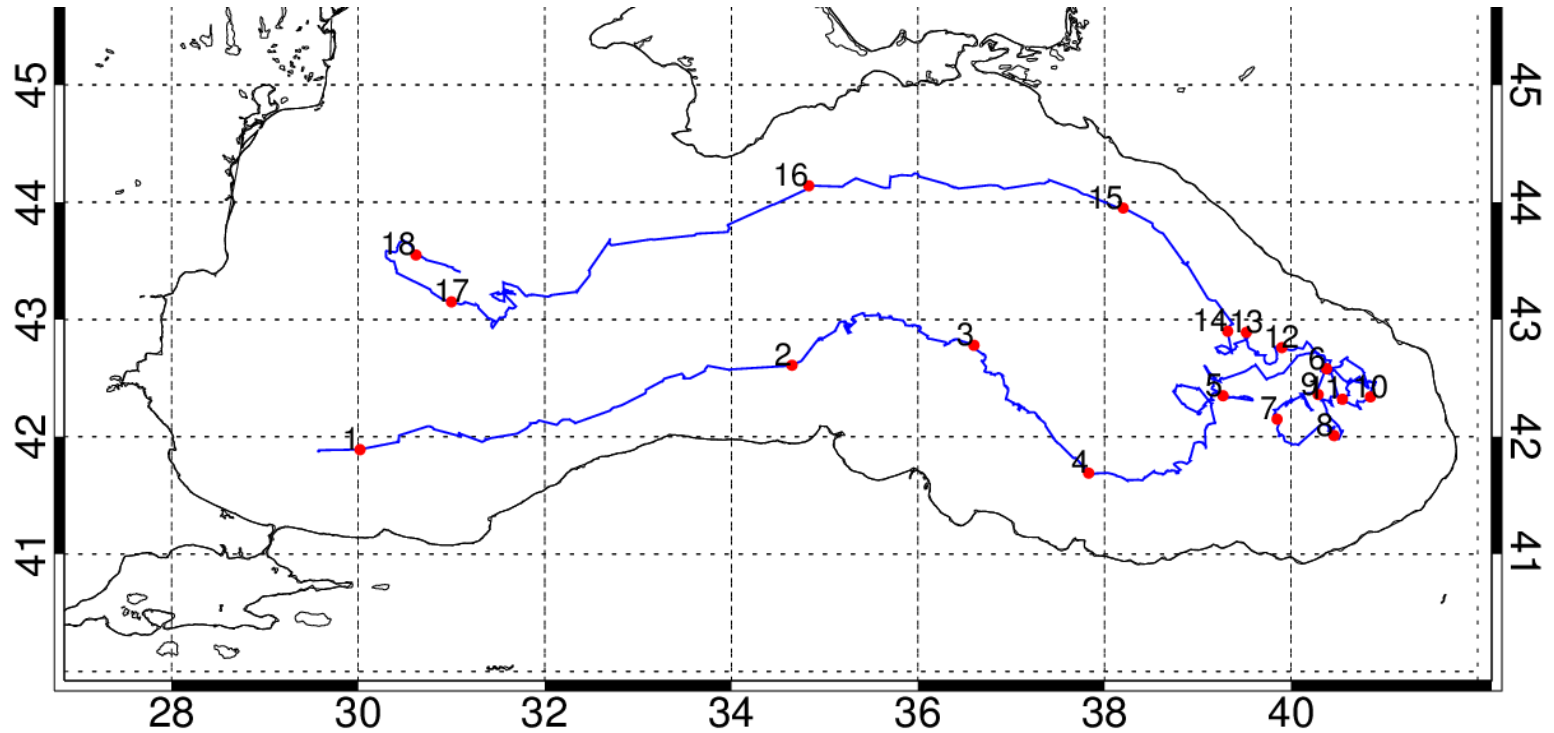


# BS1325

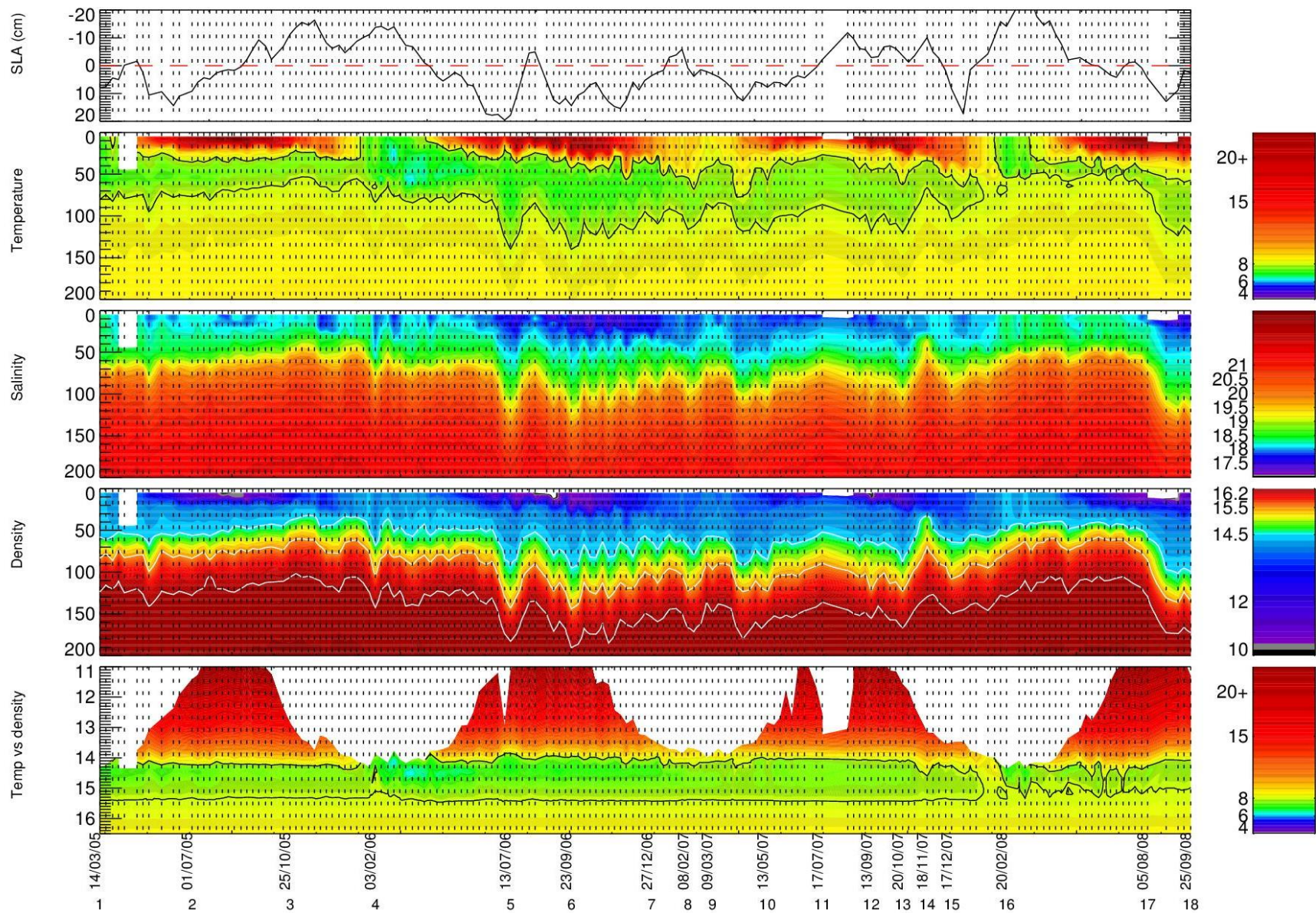




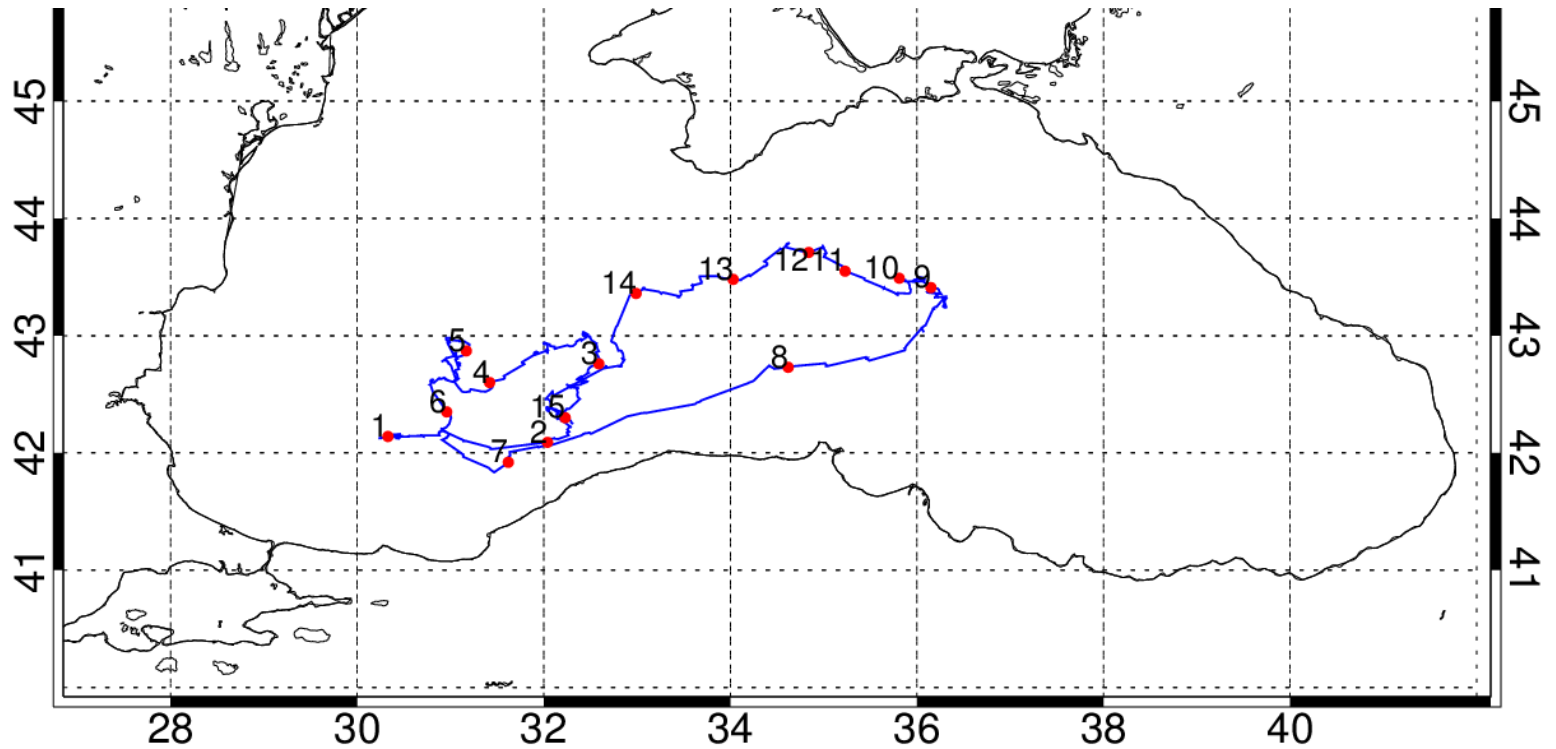
# Trajectory of BS1550



# BS1550

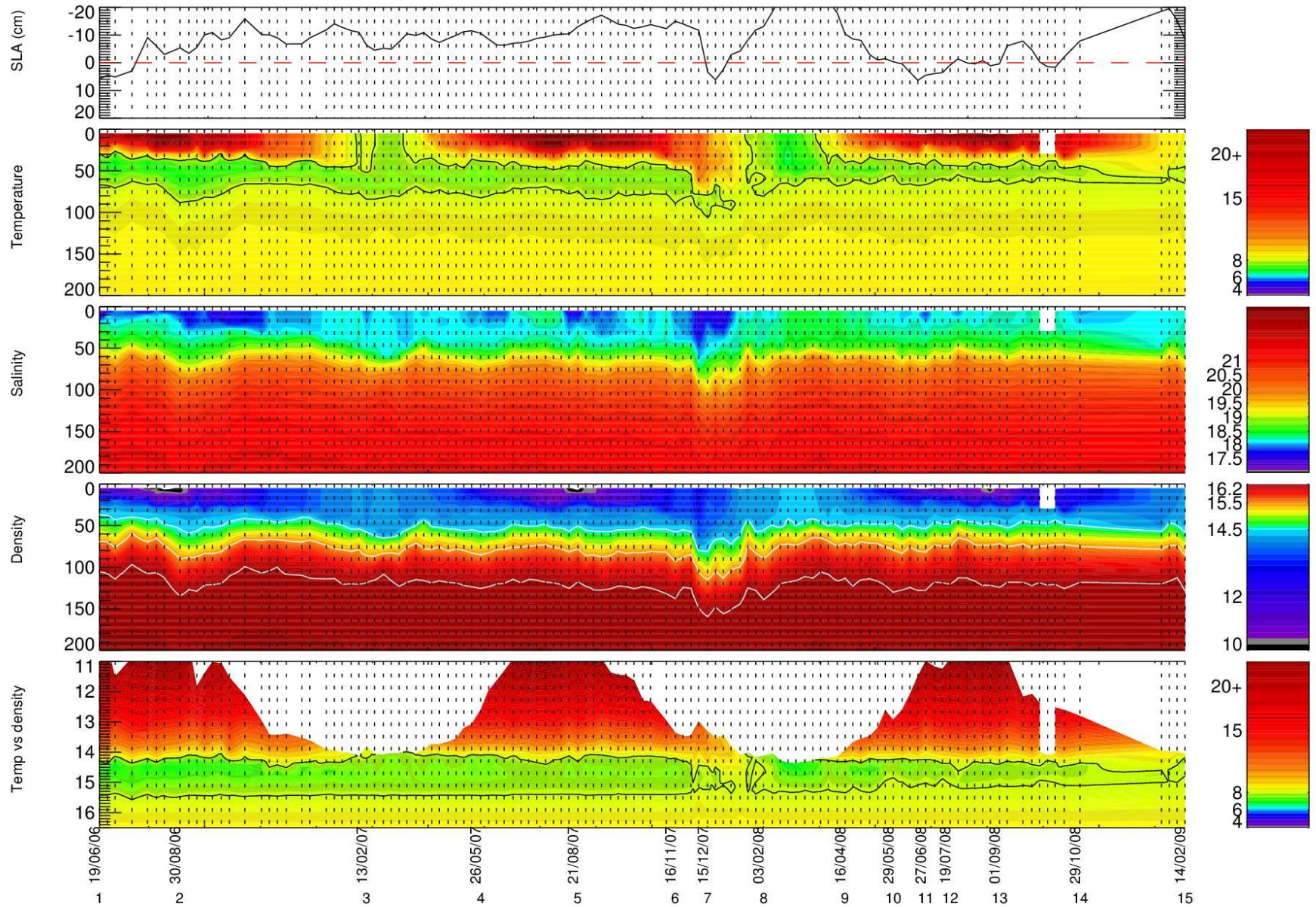


# Trajectory of BS2206

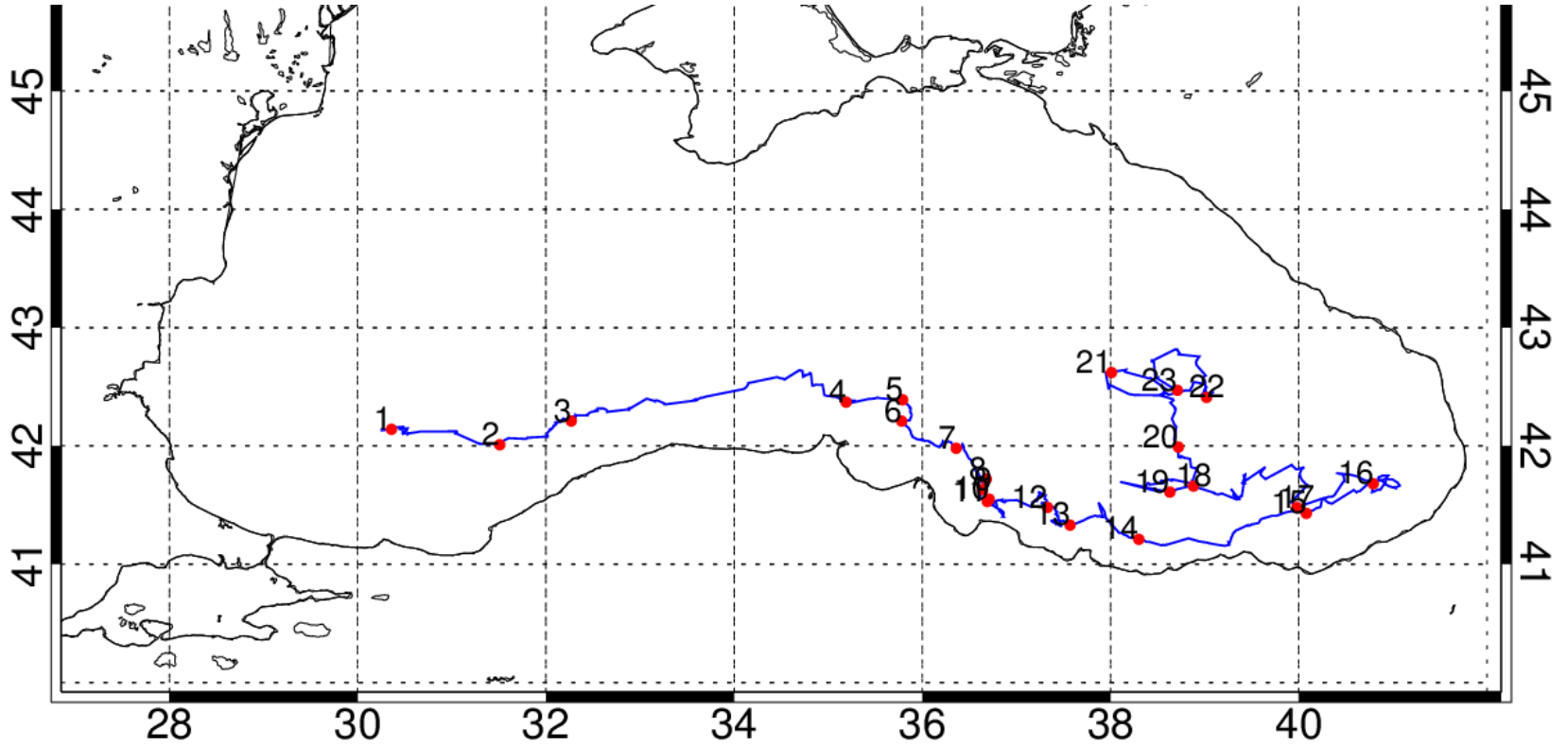




# BS2206

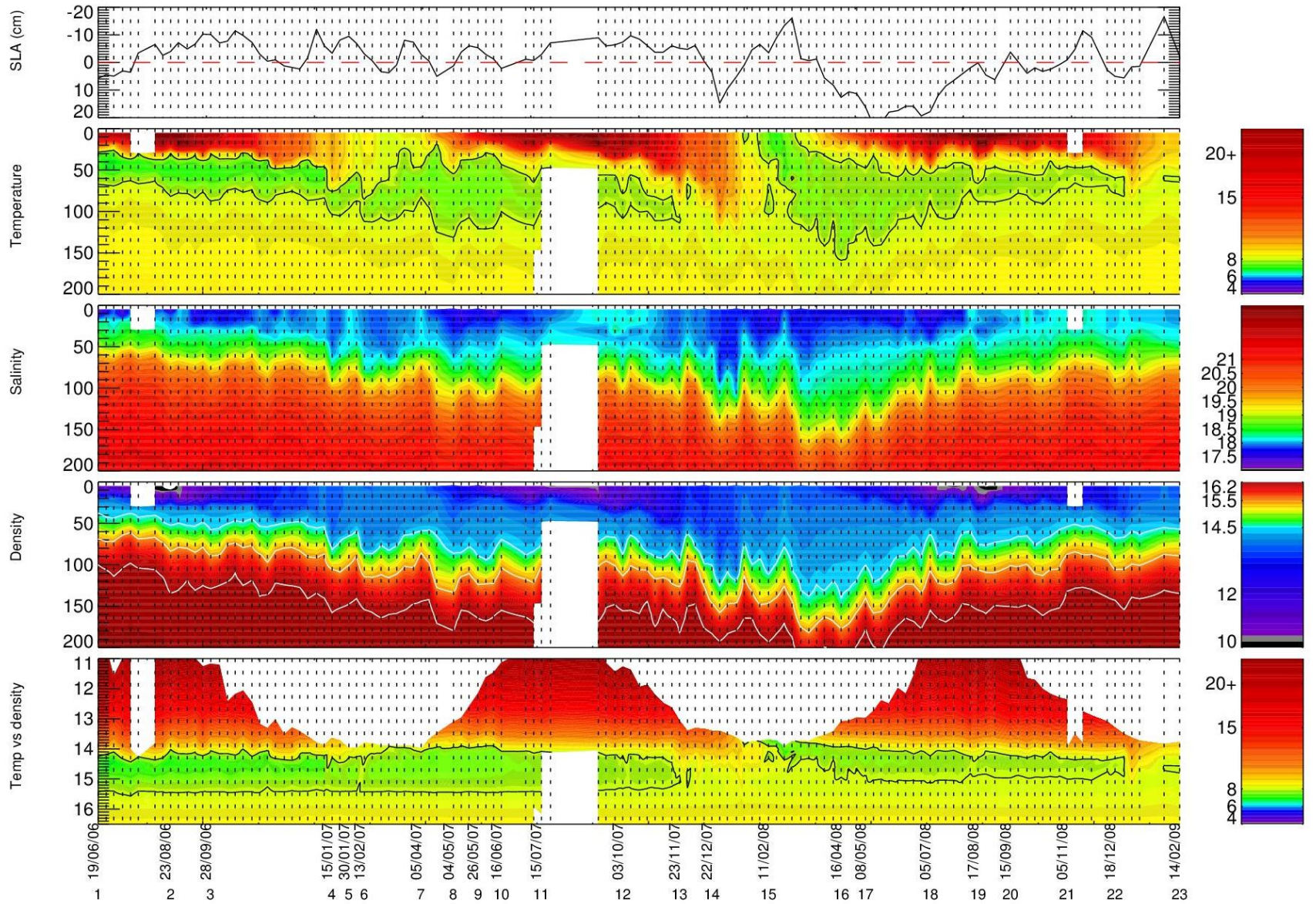


# Trajectory of BS2619





# BS2619





- Some observations within cyclonic gyres show shallow and thin CIL's and also shallow mixing, suggesting the suppression of convective mixing by divergence/upwelling.
- A good example for this is the average CIL depth and CIL thickness from float BS2206, which travelled inside the western gyre. The observations by this float has an average CIL depth that is shallower and also thinner than other floats' observations.

- Overall average temperature of CIL was found as 7.54°C, salinity was 18.7 psu , and density was estimated as 14.55 kg/m<sup>3</sup> .
- Overall average CIL thickness was estimated as 44 meters.
- There is cold water forming at the surface in each winter (February-March).
- Except 2007 winter, when there are 4 active floats but only one of the floats show cold water formation at the surface, which is the one located inside the cyclonic western gyre, supporting the well-known theory suggesting CIL formation in the centers of cyclones.

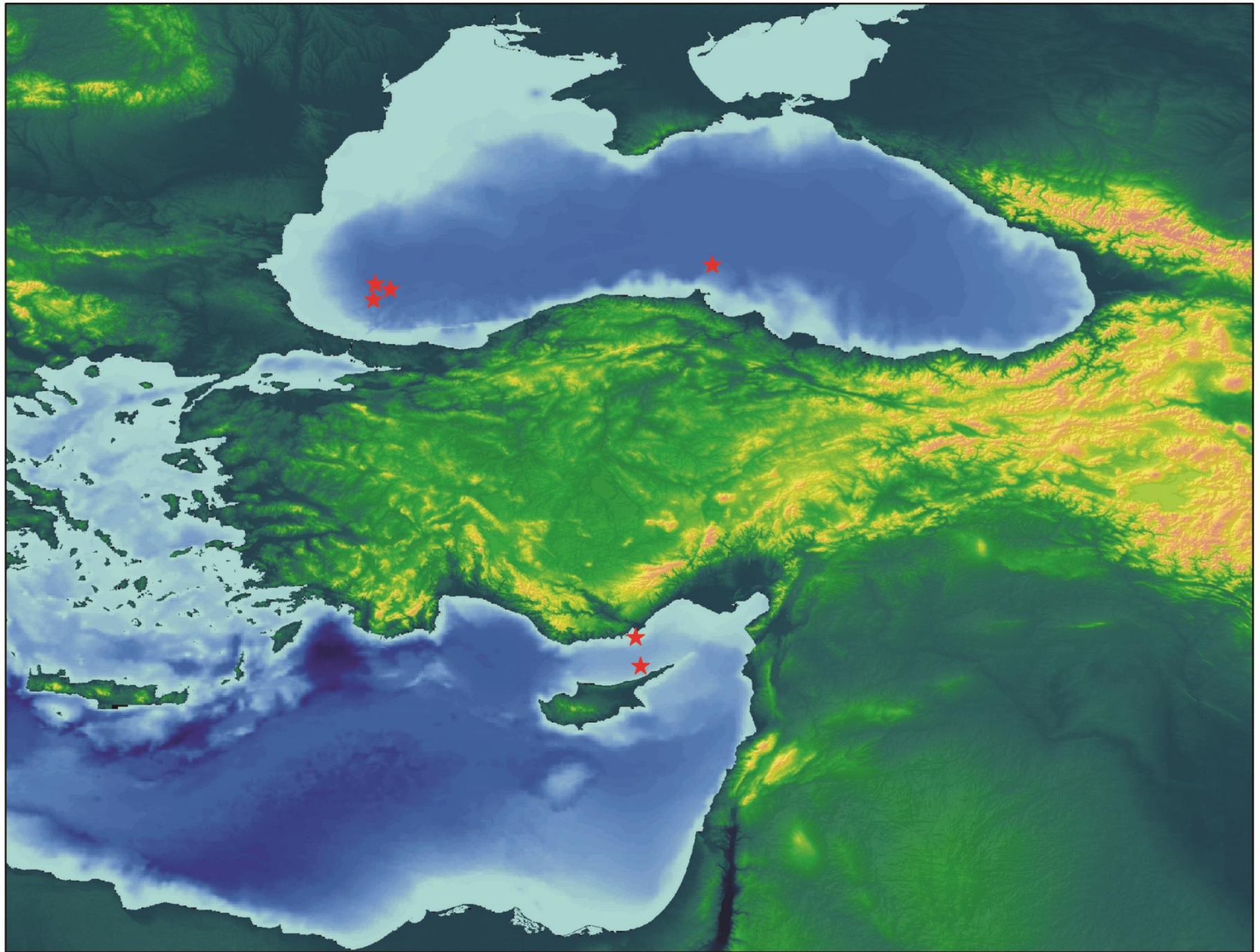
# Current float activities

2 floats ,WMO ID's : **6901895** and **6901896**



# Near-future float activities

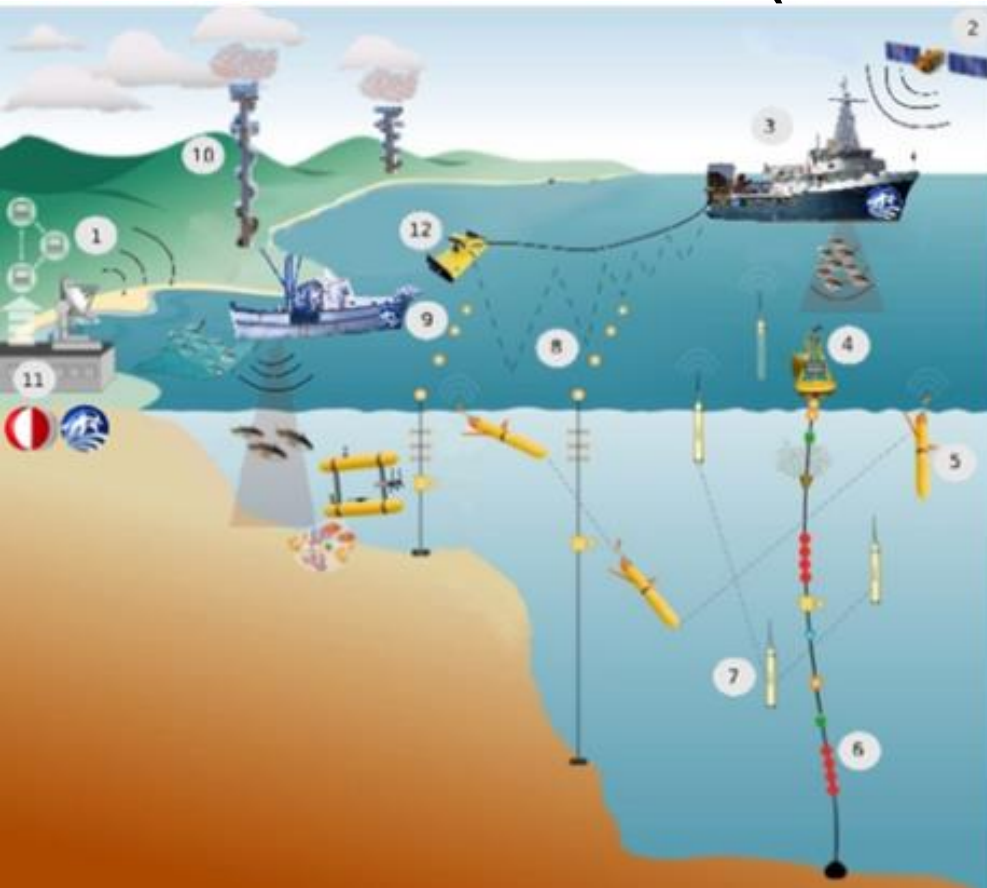
- 2 Floats (Iridium) will be deployed in the Black Sea
- 2 Floats (Argos) will be deployed in the Mediterranean







## Center for Marine Ecosystems and Climate Research (DEKOSİM)



Monitoring systems



Marine Sciences Laboratory



# THANK YOU

