Suspended sediments and water masses in the Madeira shelf

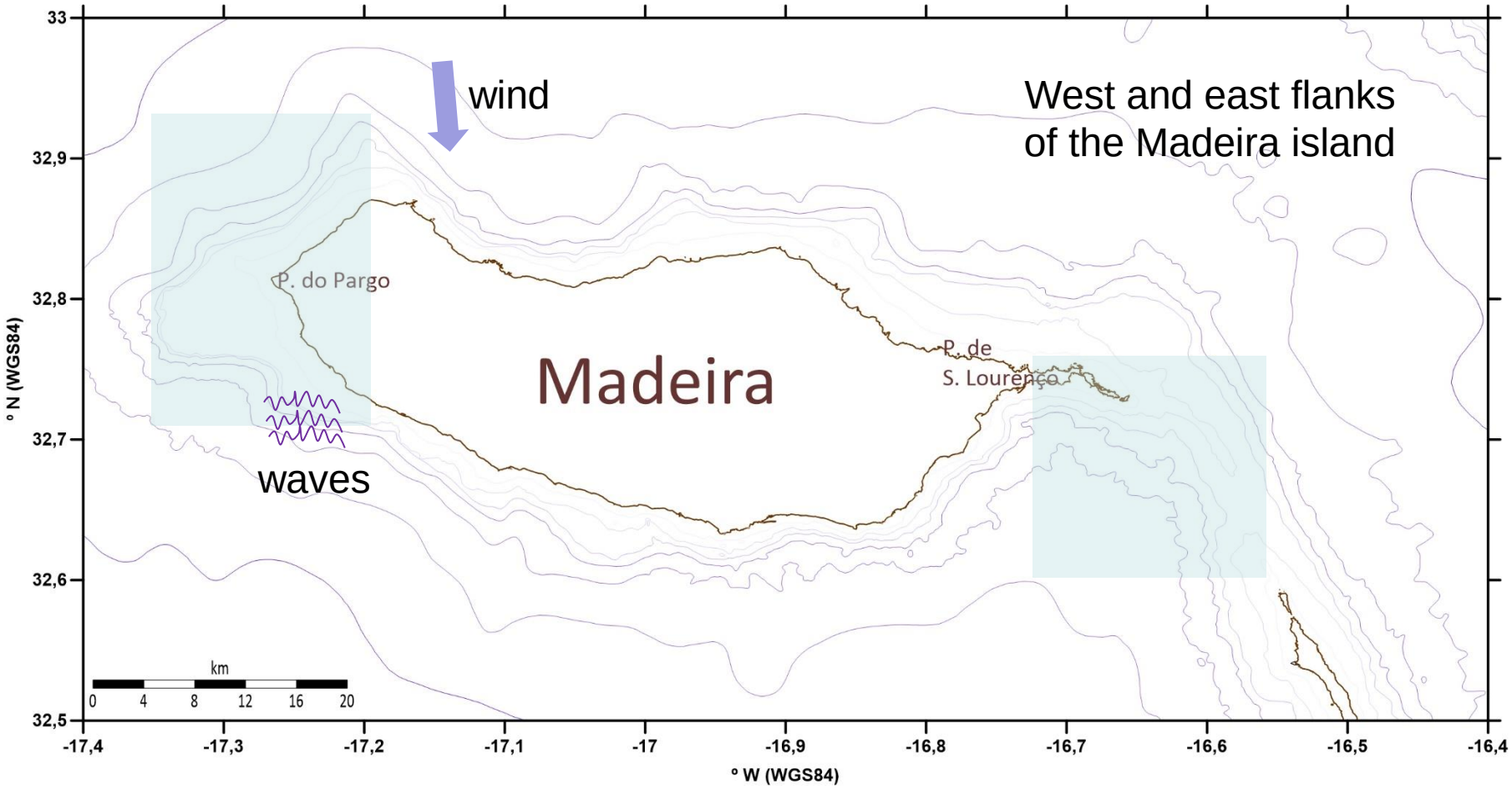
Anabela Oliveira
Ana Isabel Santos
Nuno Zacarias
Luis Melo

Understanding the sea
for the benefit of all

Study area/Objectives

- identify sources of suspended materials (sediments and plankton)
- investigate possible gradients between inshore and offshore waters
- understand the oceanographic phenomena that affect the transport and retention of particles (eddies, fronts, upwelling).

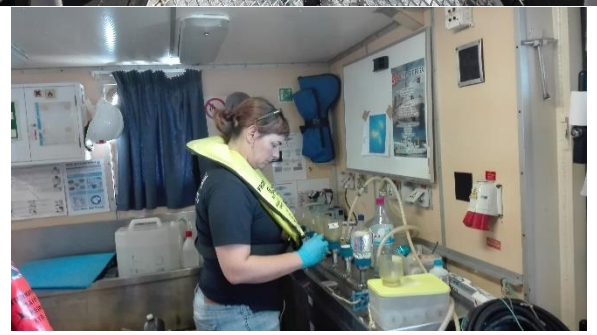
- **Preliminary results of suspended material (plankton and sediments) distribution.**

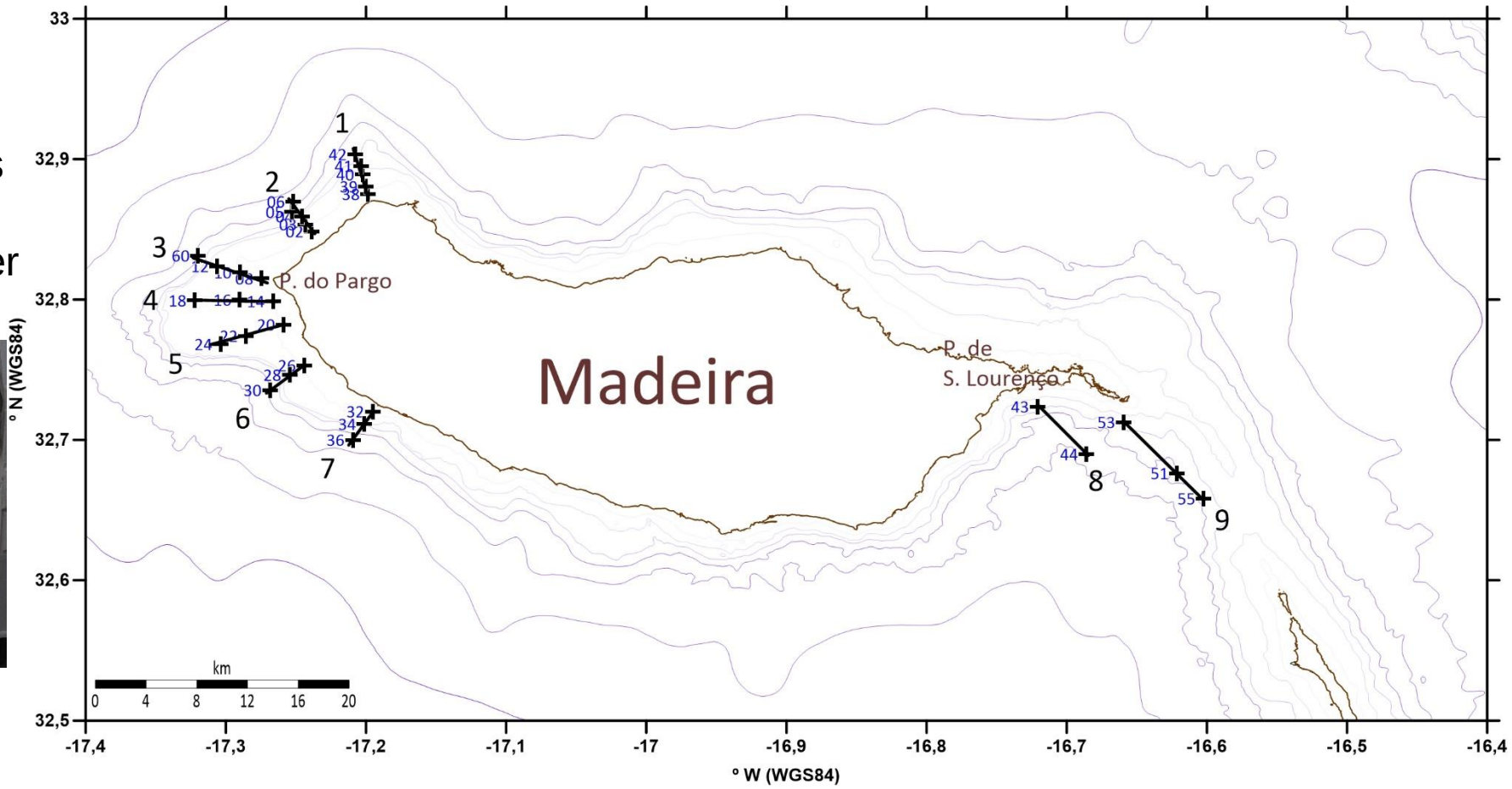


Methods

Summer cruise (3-4 August 2017)

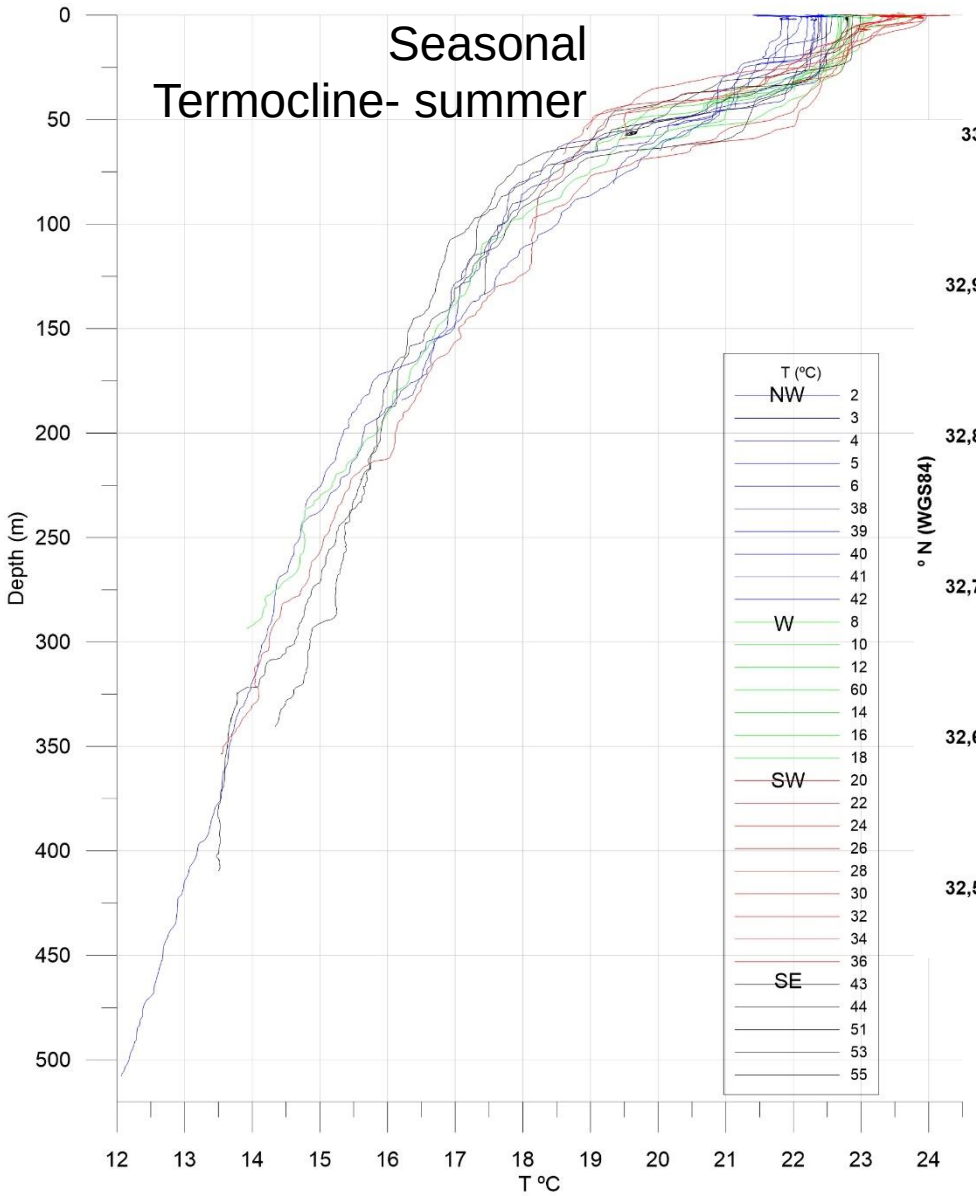
- 31 CTD/fluorometry profiles (max. depth- 500m)
- PMC characterization (water sampling at 5m depth)

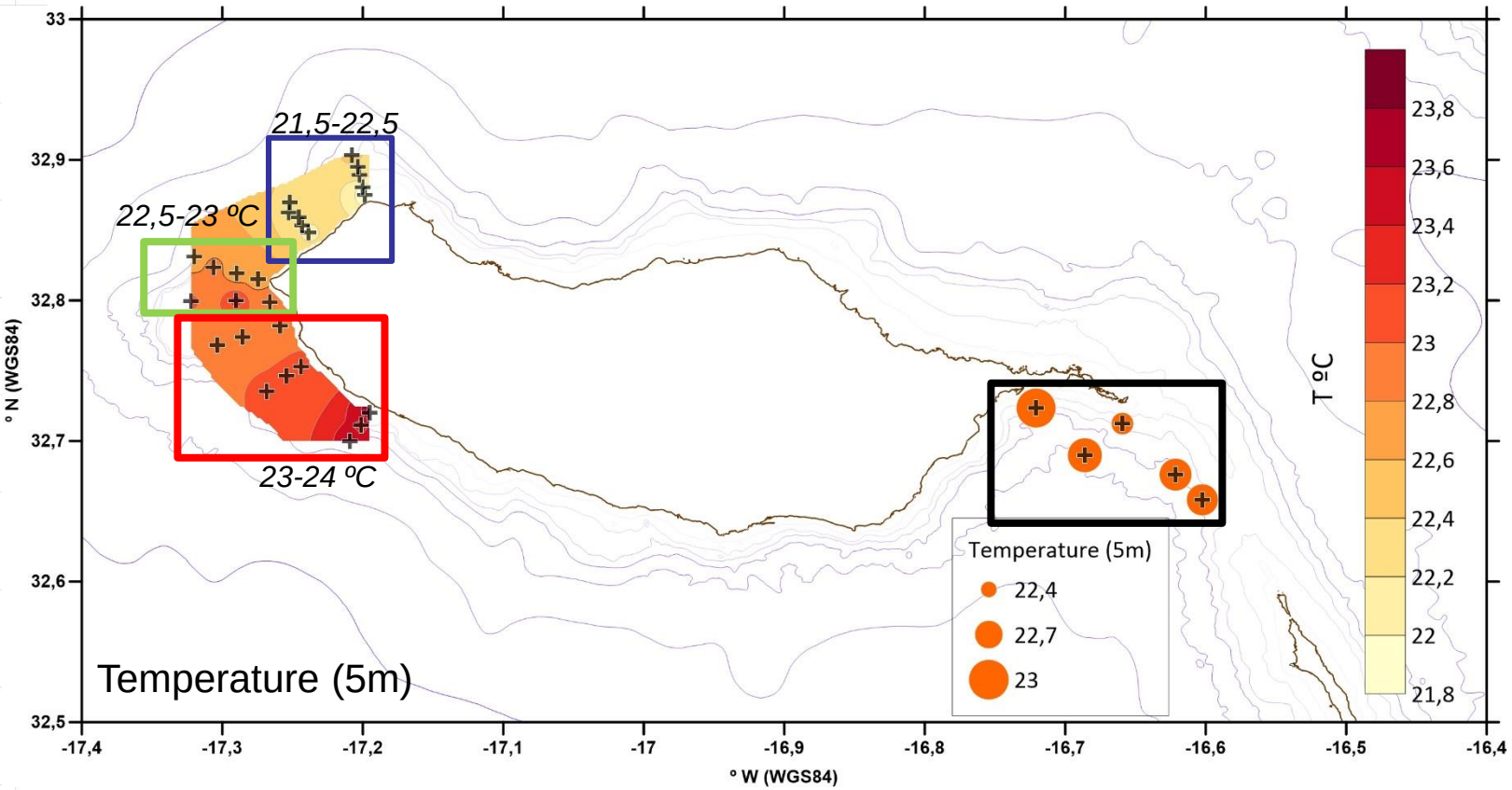




Understanding the sea
for the benefit of all

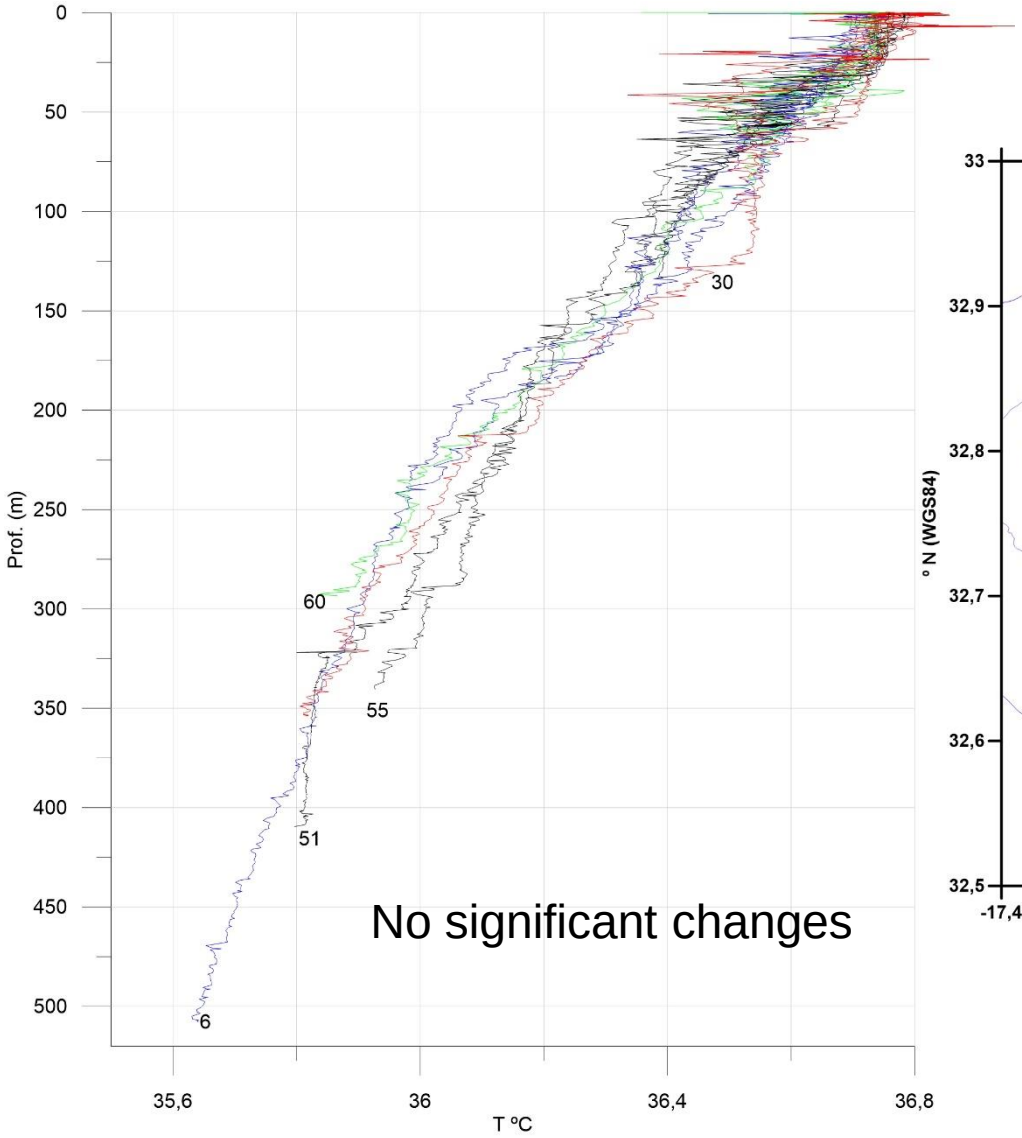
Results-Temperature

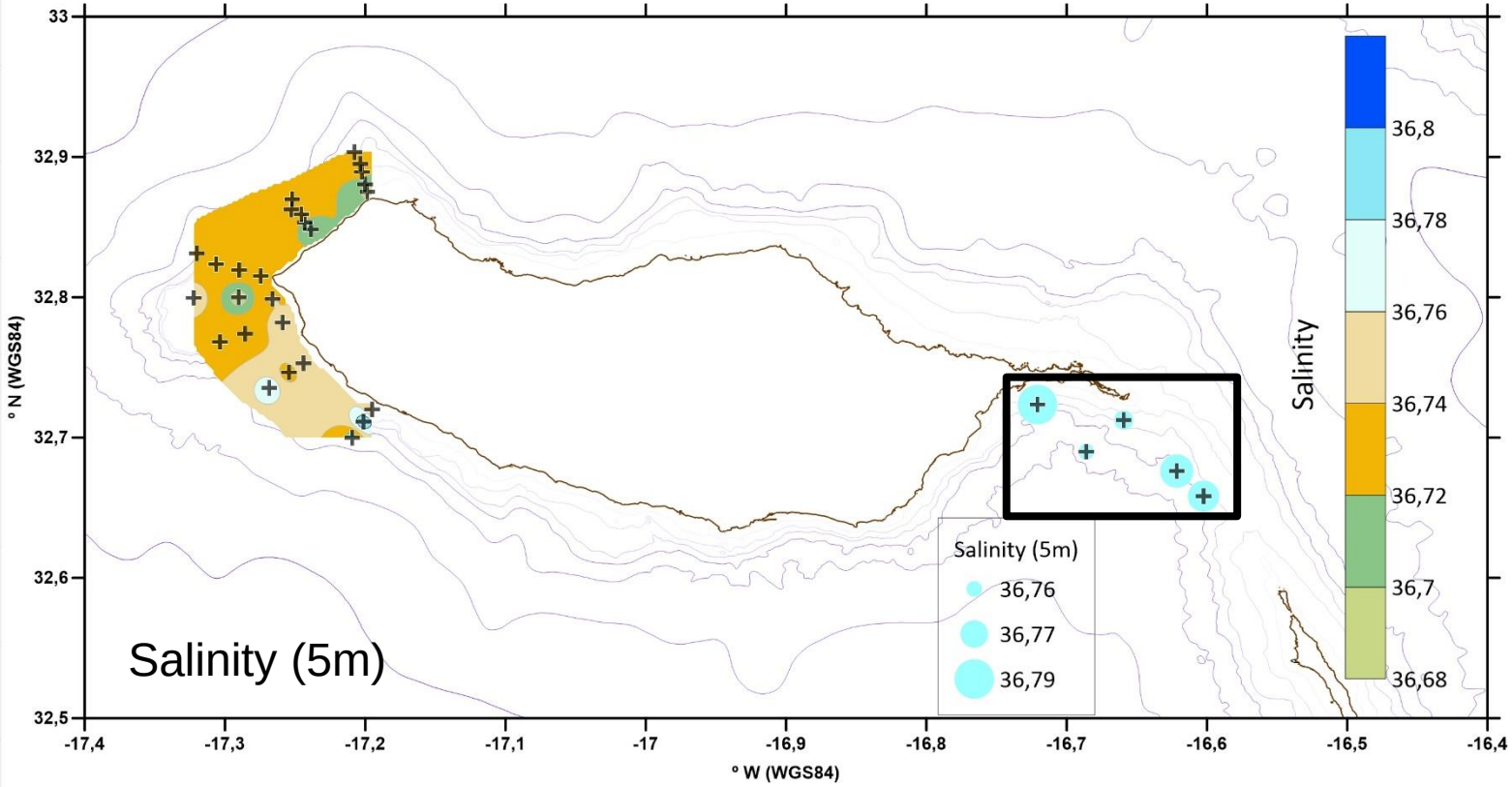




Understanding the sea
for the benefit of all

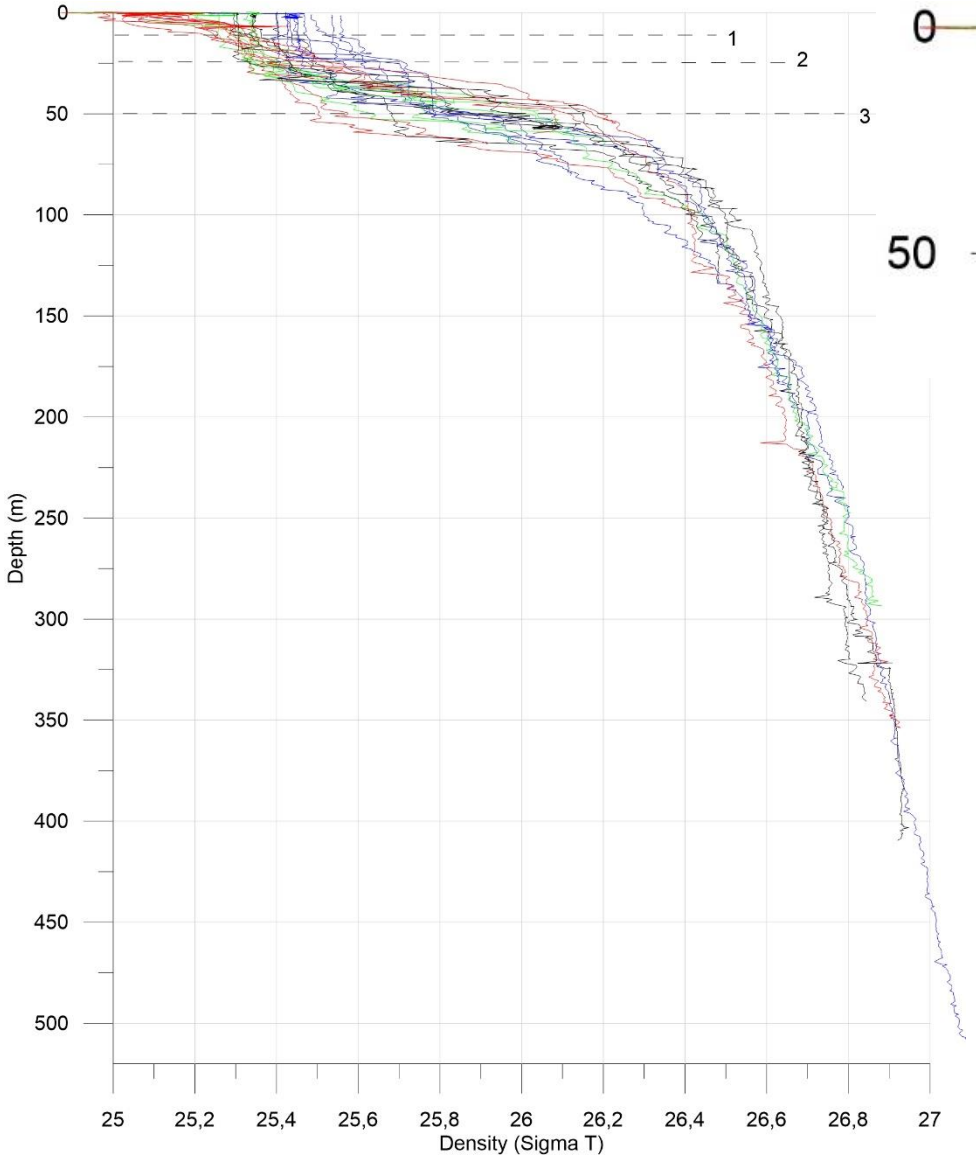
Salinity

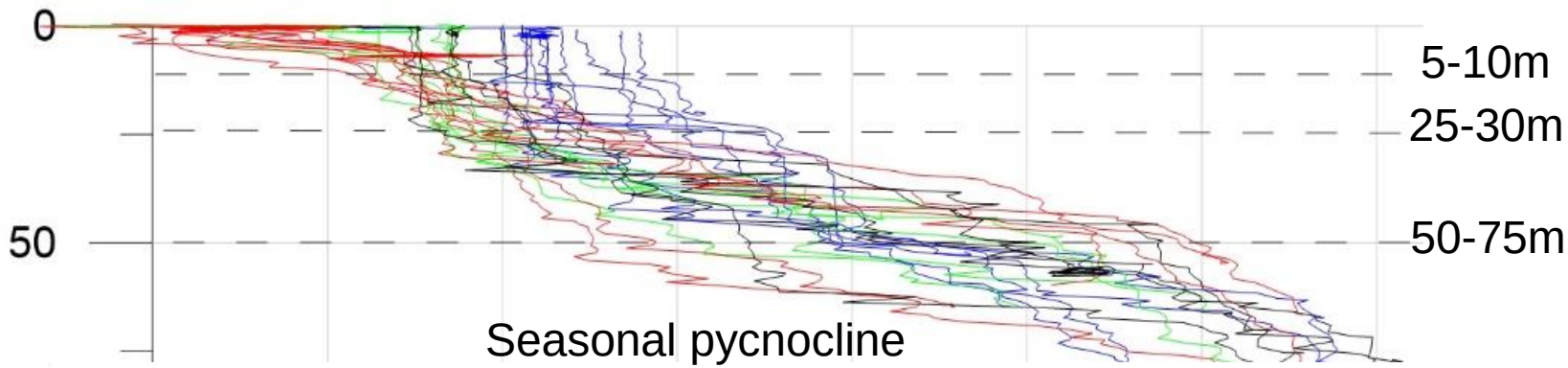


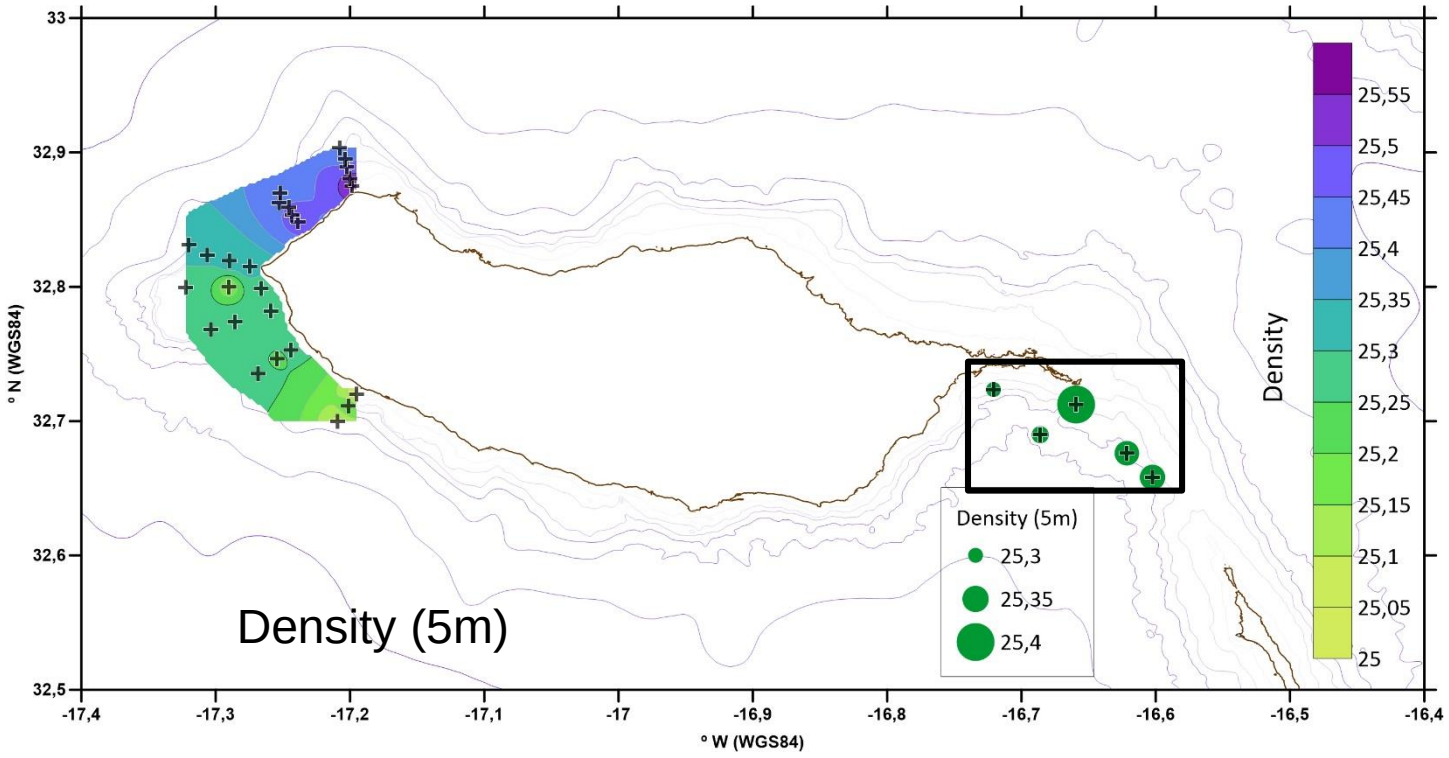


Understanding the sea
for the benefit of all

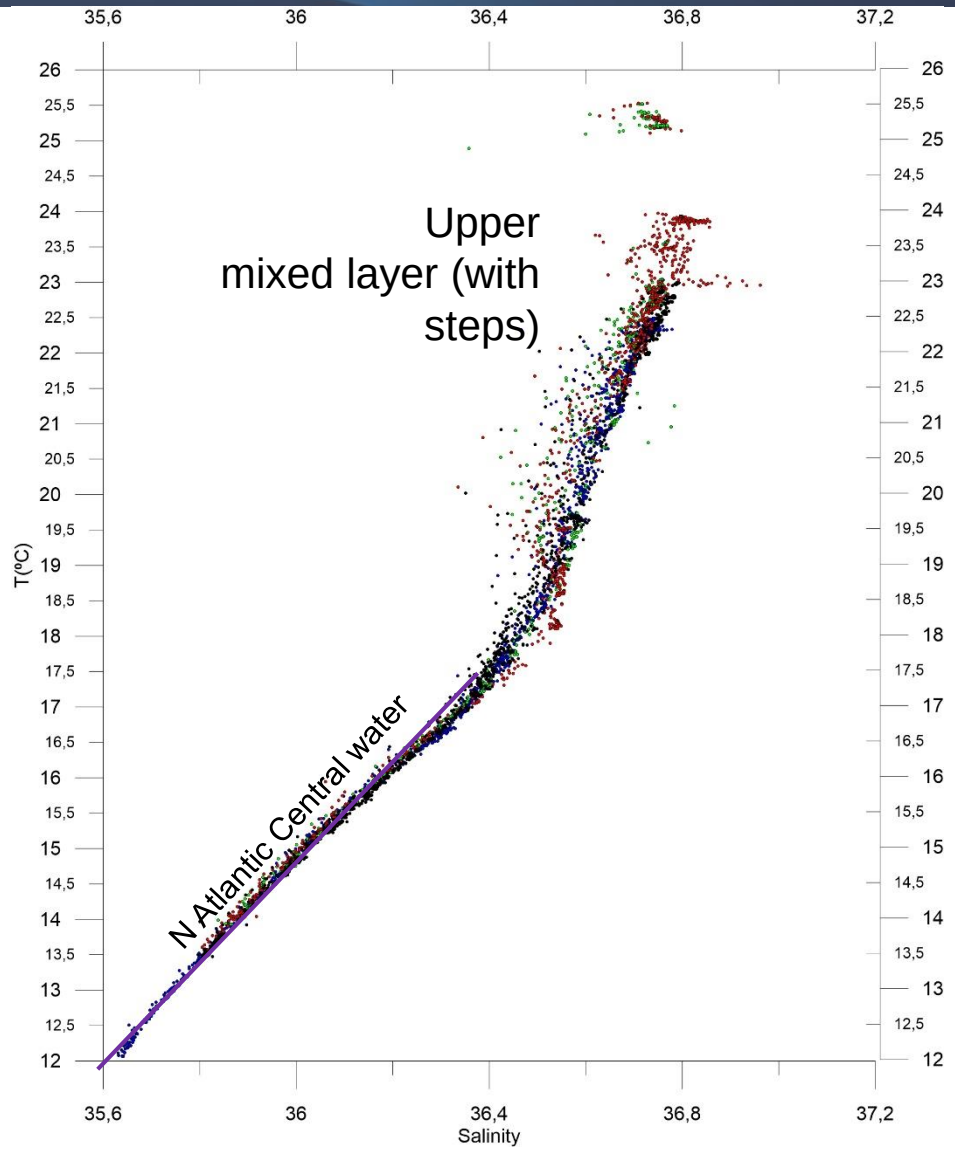
Density


0
50
100
150
200
250
300
350
400
450
500
Depth (m)
1
2
3
25
25,2
25,4
25,6
25,8
26
26,2
26,4
26,6
26,8
27
Density (Sigma T)


0
50
5-10m
25-30m
50-75m
Seasonal pycnocline


33
32,9
32,8
32,7
32,6
32,5
° N (WGS84)
-17,4
-17,3
-17,2
-17,1
-17
-16,9
-16,8
-16,7
-16,6
-16,5
-16,4
° W (WGS84)
Density
25,55
25,5
25,45
25,4
25,35
25,3
25,25
25,2
25,15
25,1
25,05
25
Density (5m)
25,3
25,35
25,4
Density (5m)

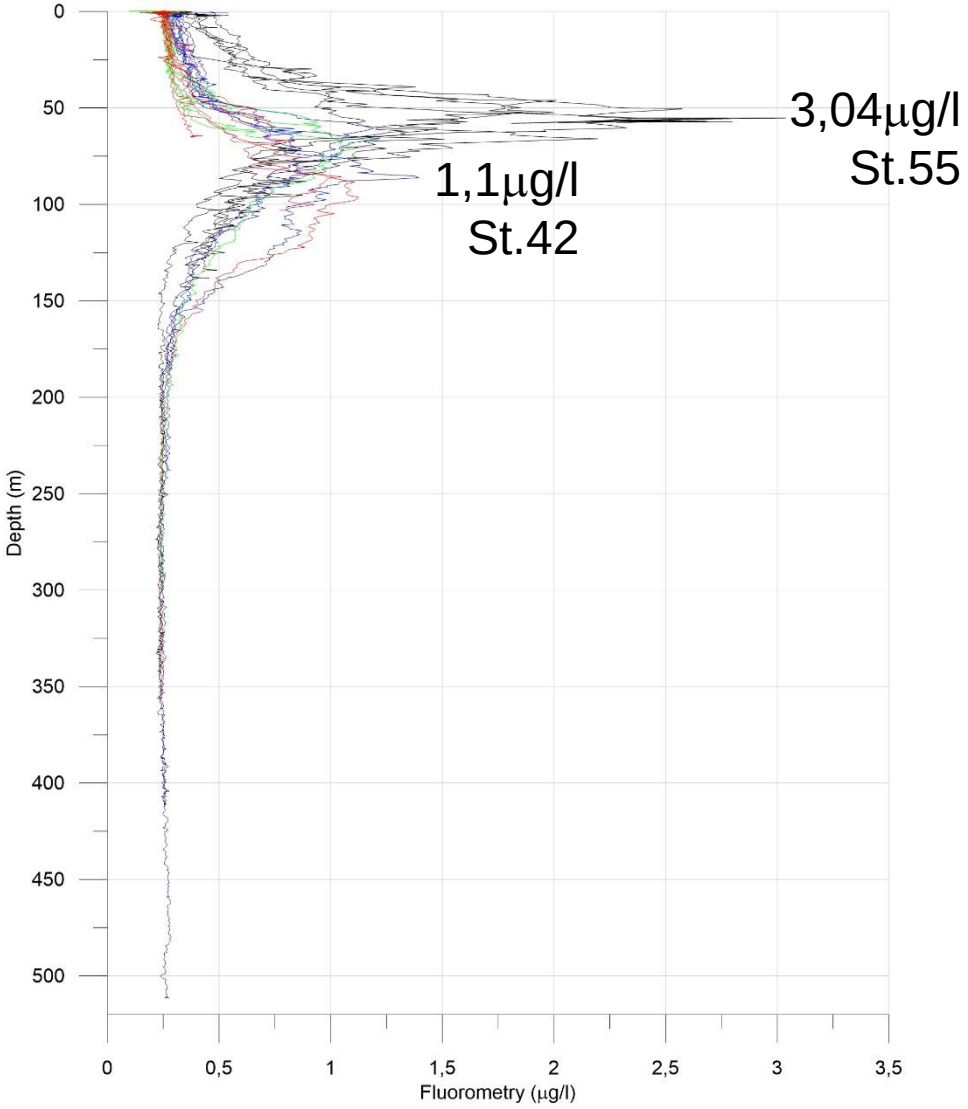
Water masses (TS diagram)

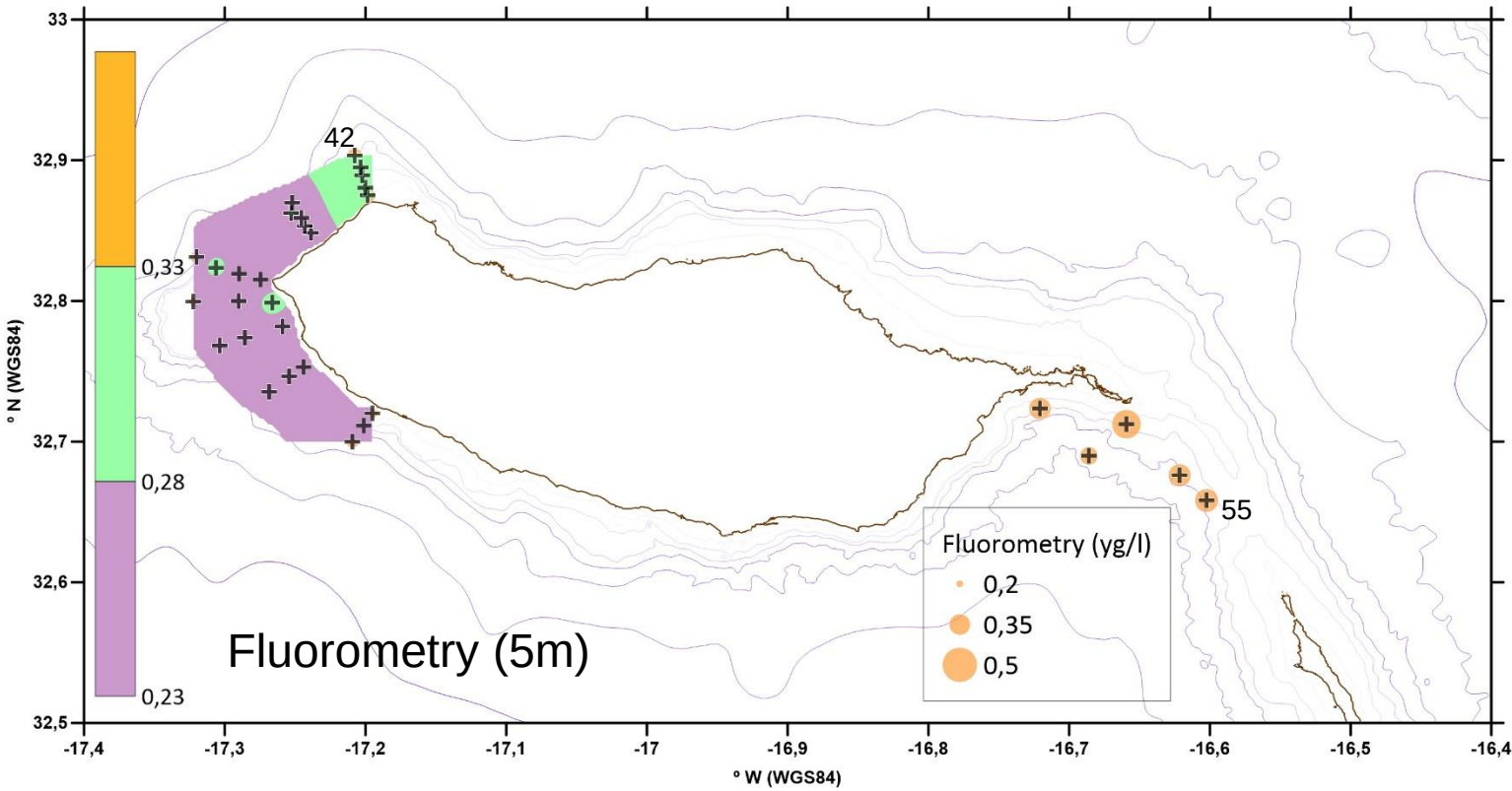


- Upper mixing surface layer (0-75m)
  Surface stress of the wind and heat exchange
- N Atlantic central water (75-600m)

Understanding the sea
for the benefit of all

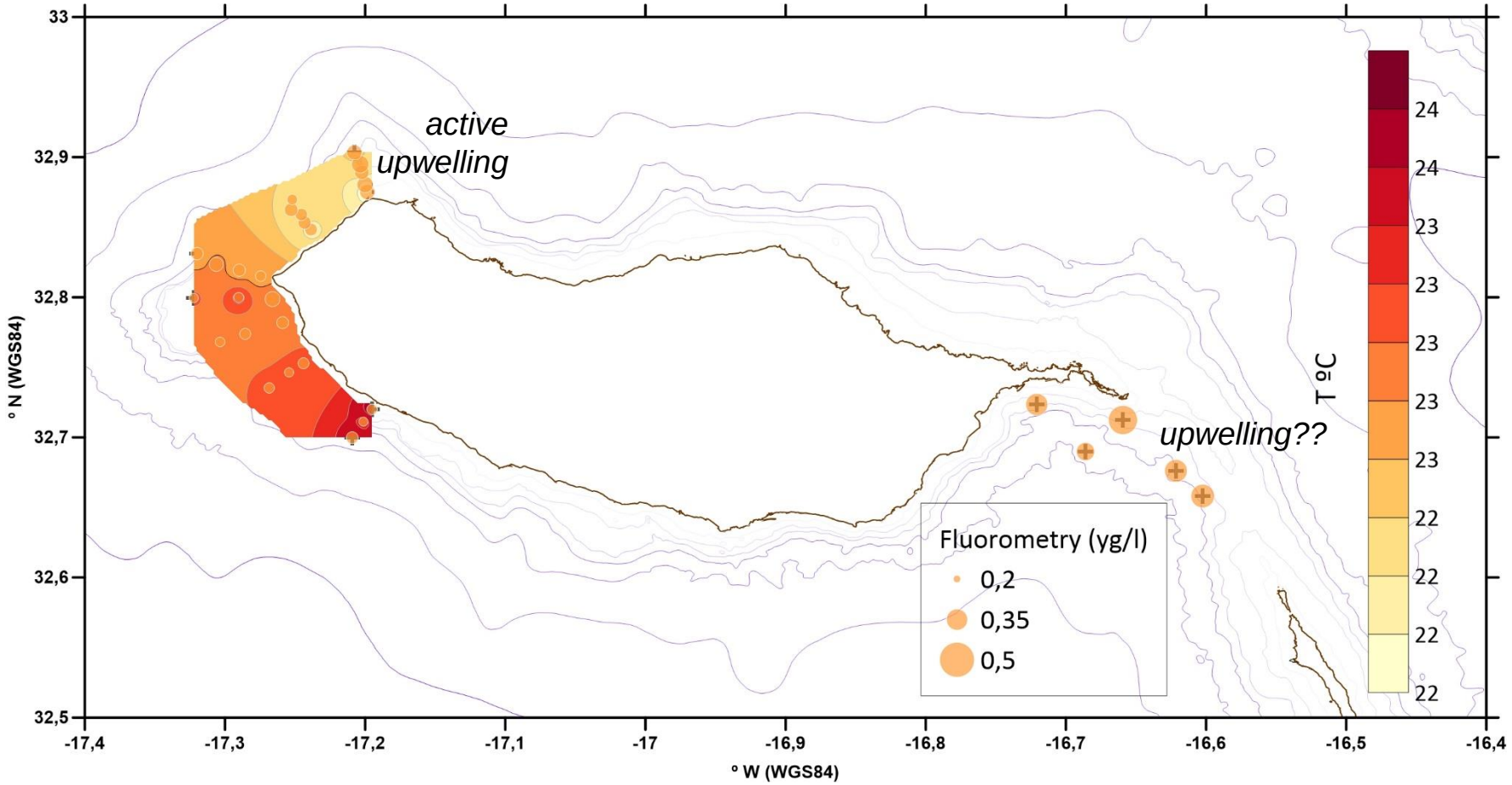
Fluorometry



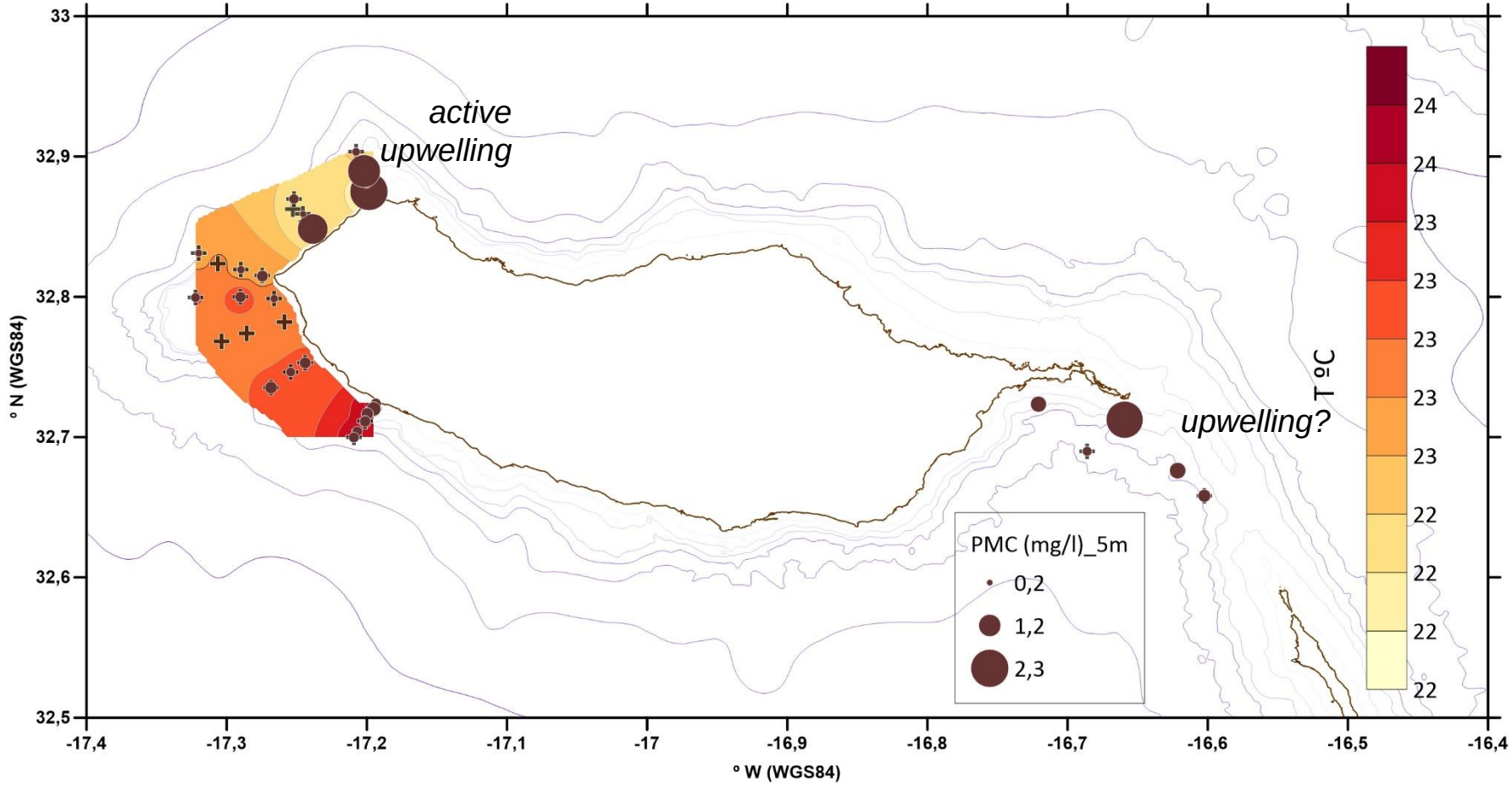


Understanding the sea
for the benefit of all

Flurometry and temperature (5m)



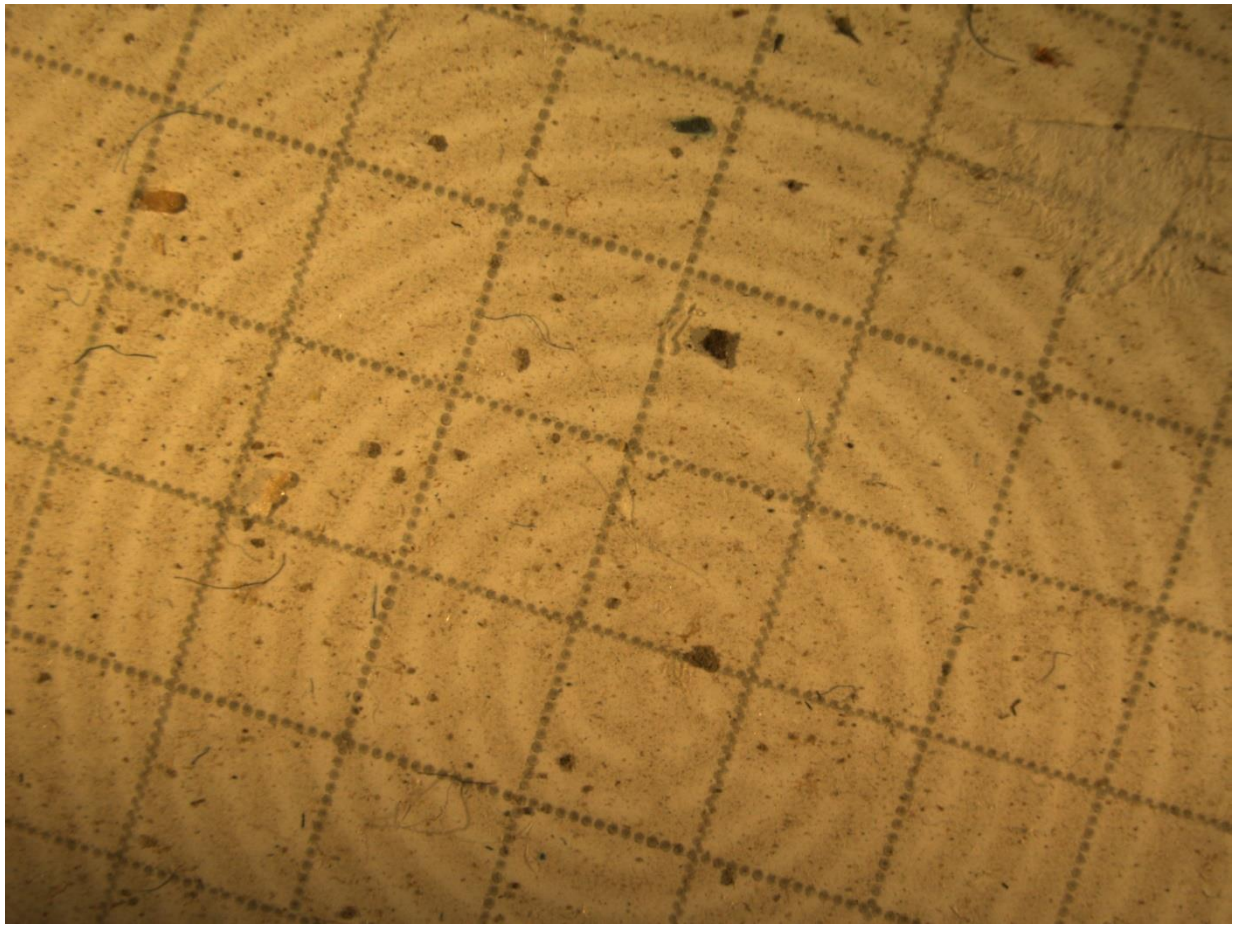
PMC and temperature (5m)



Understanding the sea
for the benefit of all

Final remarks

- During the Madeira August 2017 summer cruise water stratification was observed with the detection of **3 pycnoclines**, corresponding to different episodes of wave/wind mixing.
- Fluorometry and implicit productivity distributions presented **maximum *chlorophyll a* at 55m (3.0µ/l)** in the east flank and a deeper three times lower maximum at 78 m (**1,1µ/l**) in the western flank. **Both maxima were related with the deeper identified pycnocline**.
- Near the surface (5m) the PMC values were low (<2 mg/l), with plankton being the main contributor. *Maximum values in section 1 (due to upwelling).*
- Filters direct observation did not allow for the detection of any terrigenous particles, at 5m depth.



Understanding the sea
for the benefit of all


hidrográfico
marinha • portugal