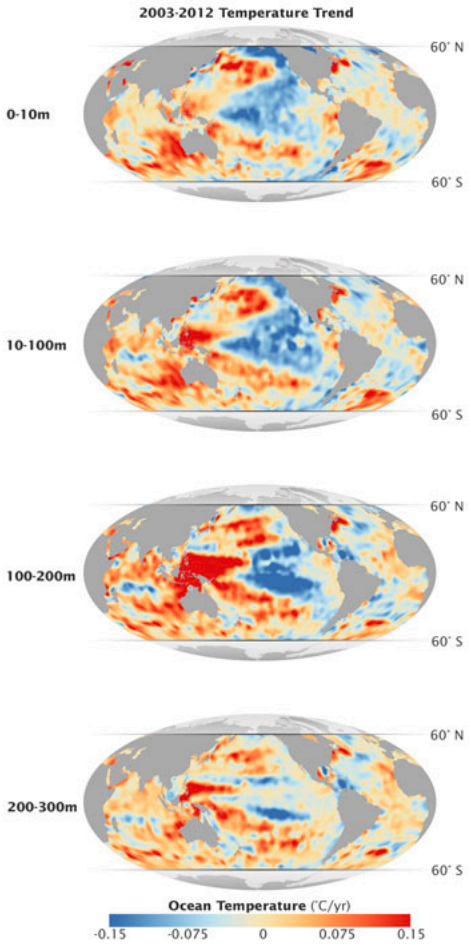
OPEN OCEAN TEMPERATURE AND SALINITY LONG-TERM CHANGES IN THE CANARY CURRENT UPWELLING SYSTEM

Alonso Hernández Guerra

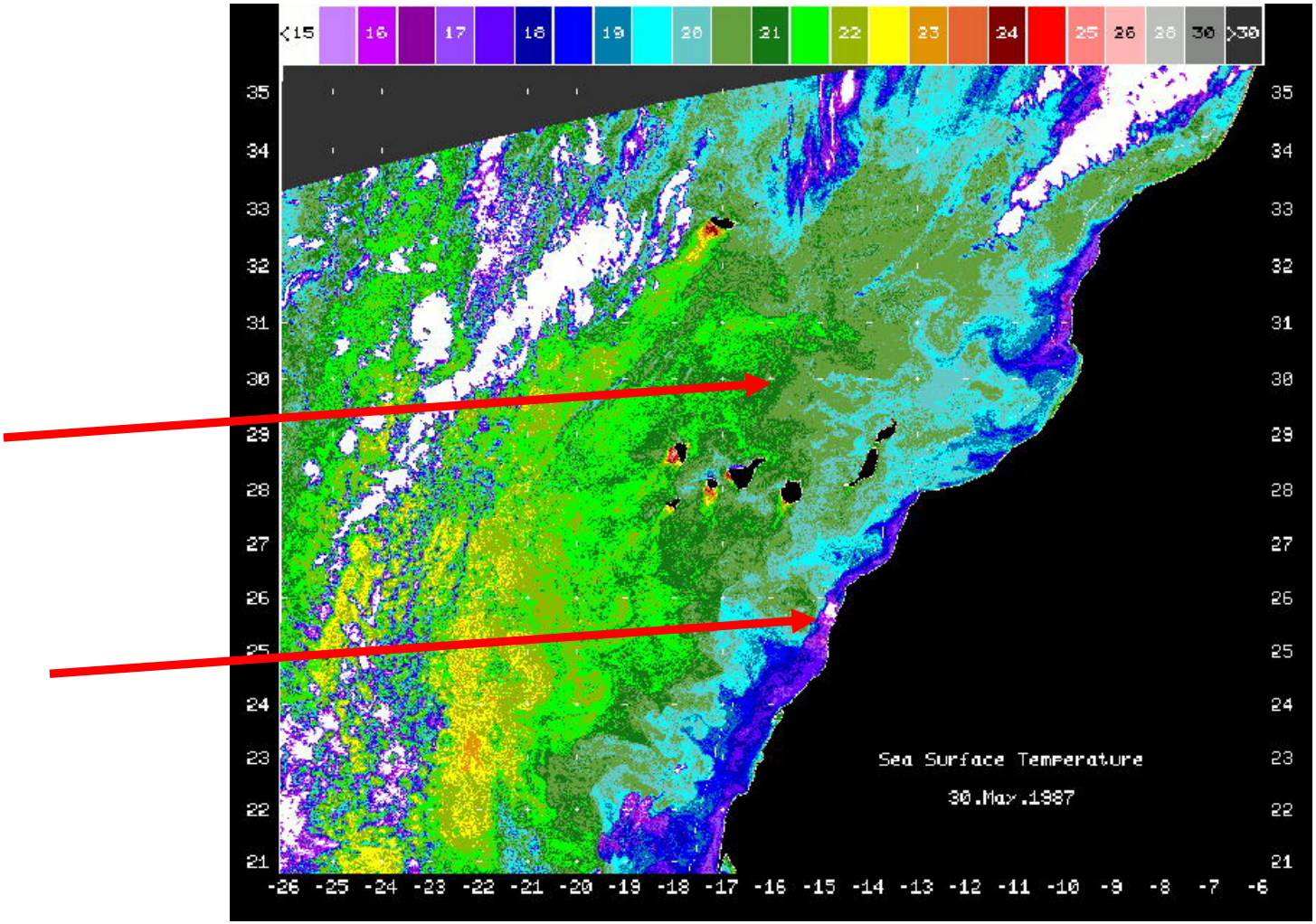


UNIVERSIDAD DE LAS PALMAS DE GRAN CANARIA

IOCAG Instituto de Oceanografía y Cambio Global

INSTITUTO ESPAÑOL DE OCEANOGRAFÍA 1914

Increase of the temperatura in the Canary Basin



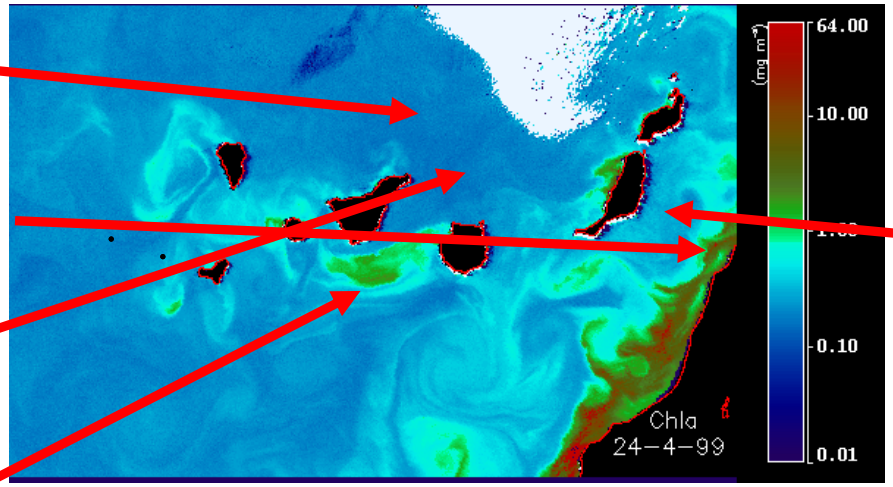
Increase of the temperatura in the Canary Basin

Oceanic waters

Upwelled waters

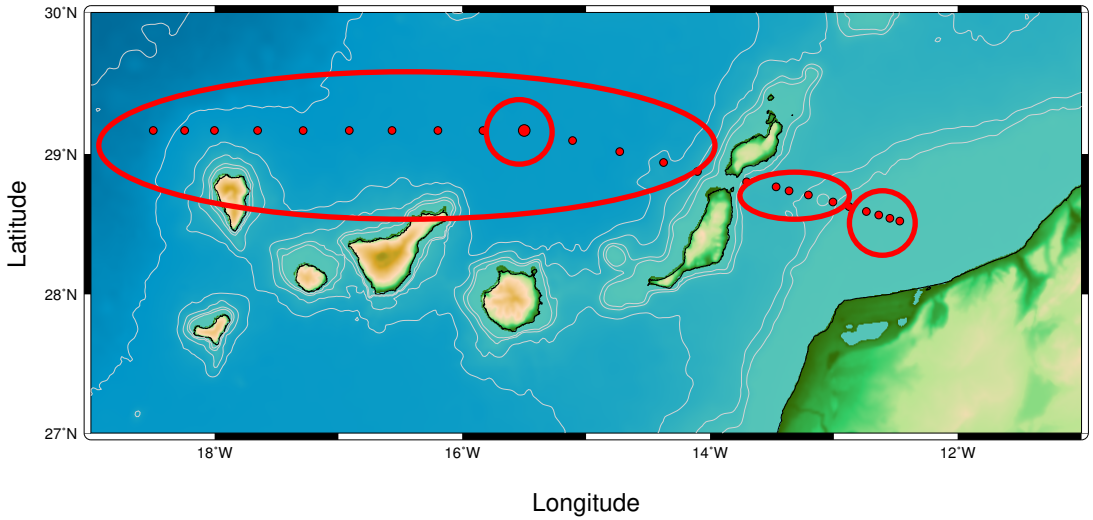
ESTOC station

Mesoscale features



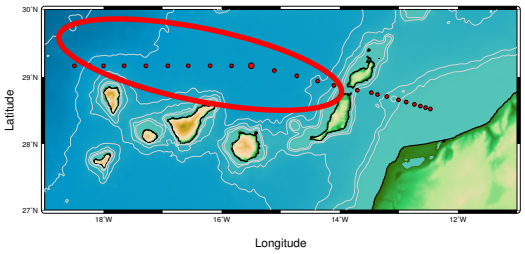
Coastal Transition Zone

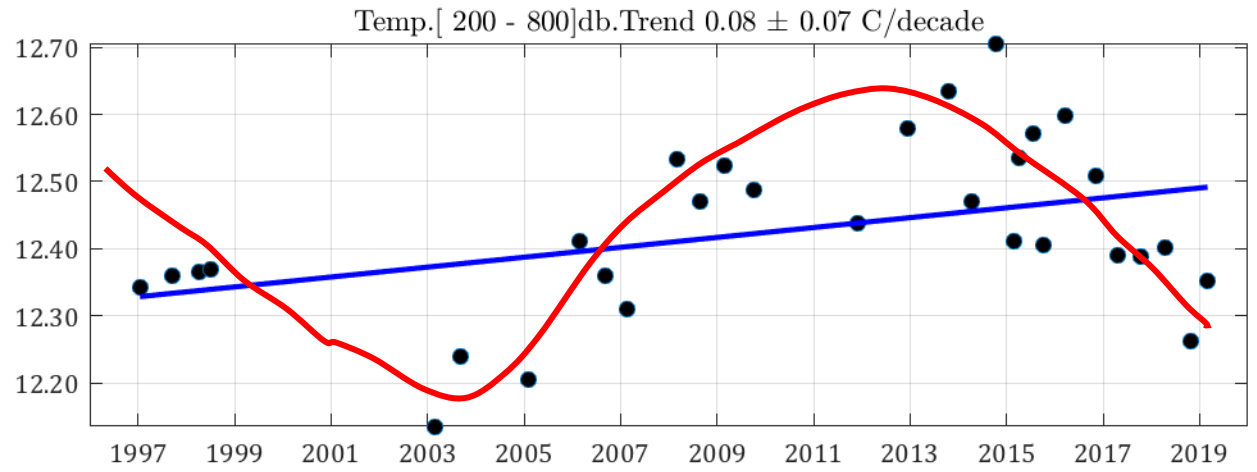
Twice a year since 2012.
Record back to 1997.

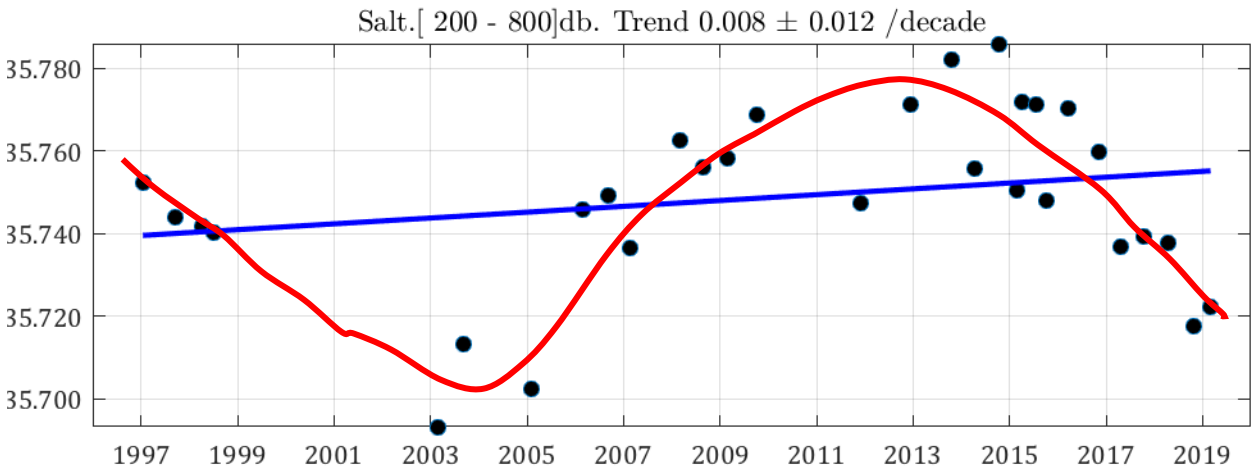


Raprocan Section

Trends in the Oceanic Waters stations (11-22)







Periodicity:
aprox. 18 years

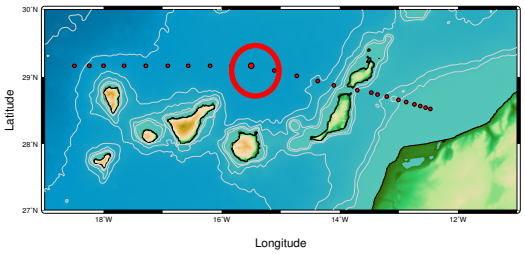
[200-800] m

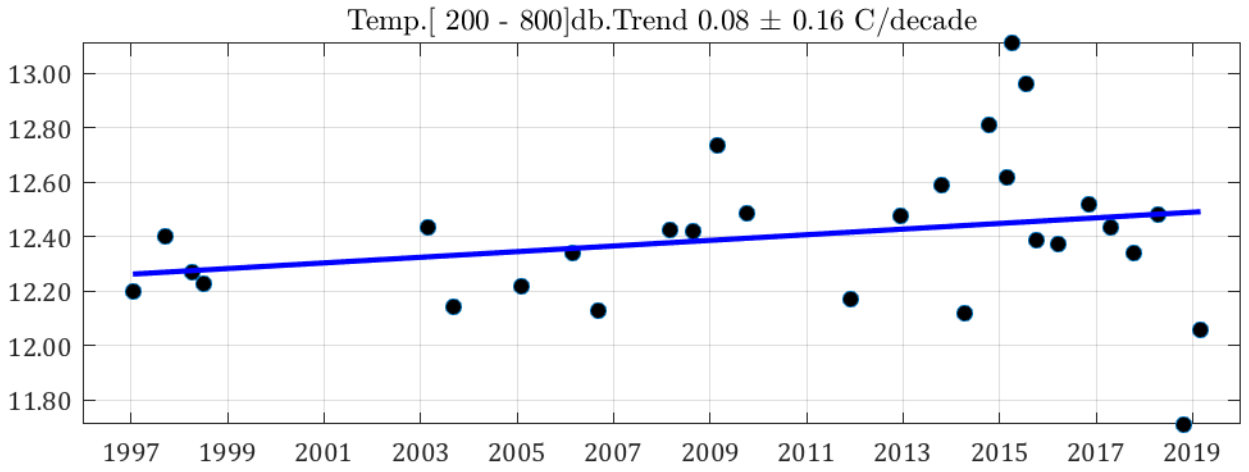
Temp: 0.08±0.07°C/decade

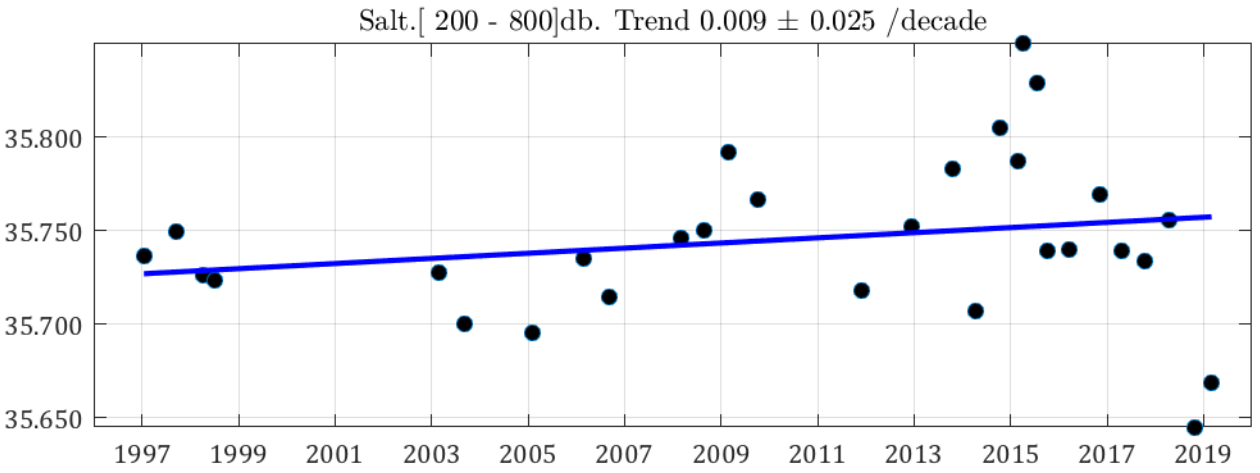
Sal: 0.008 ±0.012 /decade

Raprocan Section

Trends in the ESTOC station (15)







Periodicity:

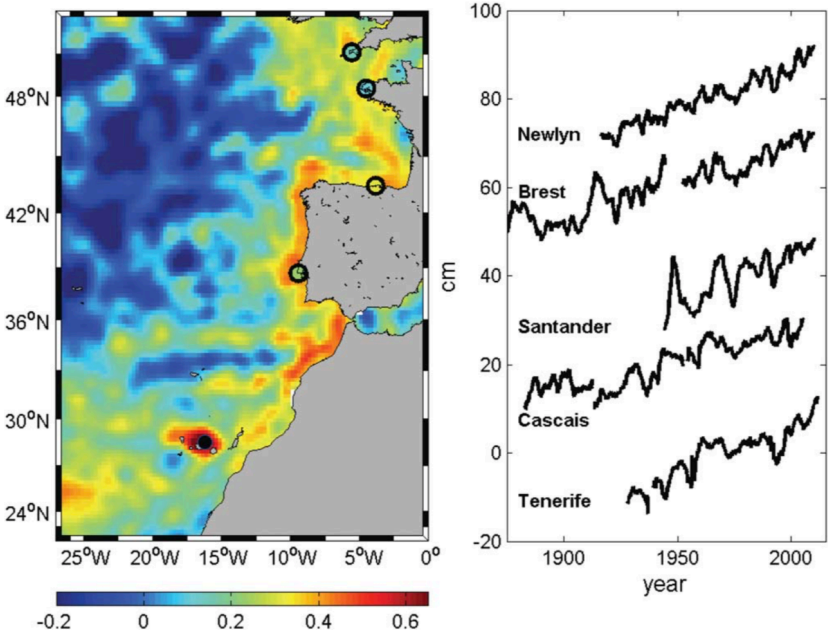
Not shown

[200-800] m

Temp: 0.08±0.16°C/decade

Sal: 0.009 ±0.025 /decade

Consequences of the Temperature increase: Sea Level Rise in the Canary Islands: about 21 cm in the last century



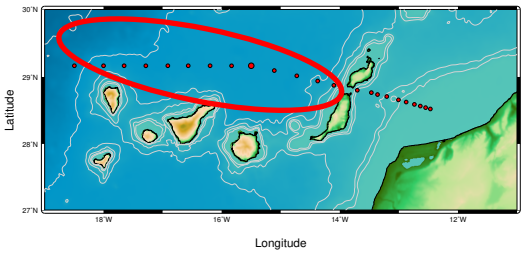
Causes of the Salinity increase:

Less precipitation

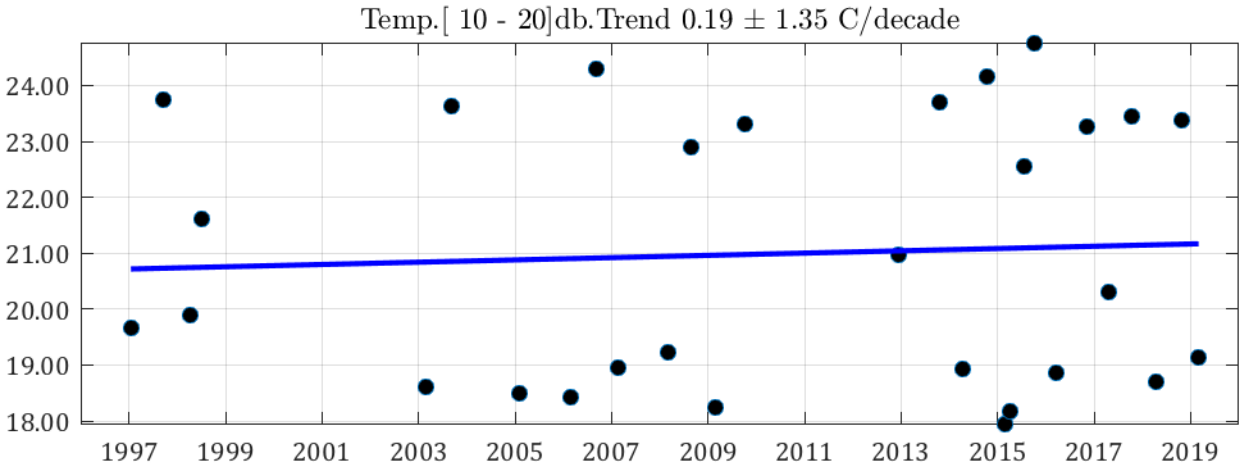
The annual balance of the precipitation trend in the Canary Islands indicates a decline of rainfall in most of the locations in the period 1970-2013

(Mayer et al., 2017)

Raprocan Section

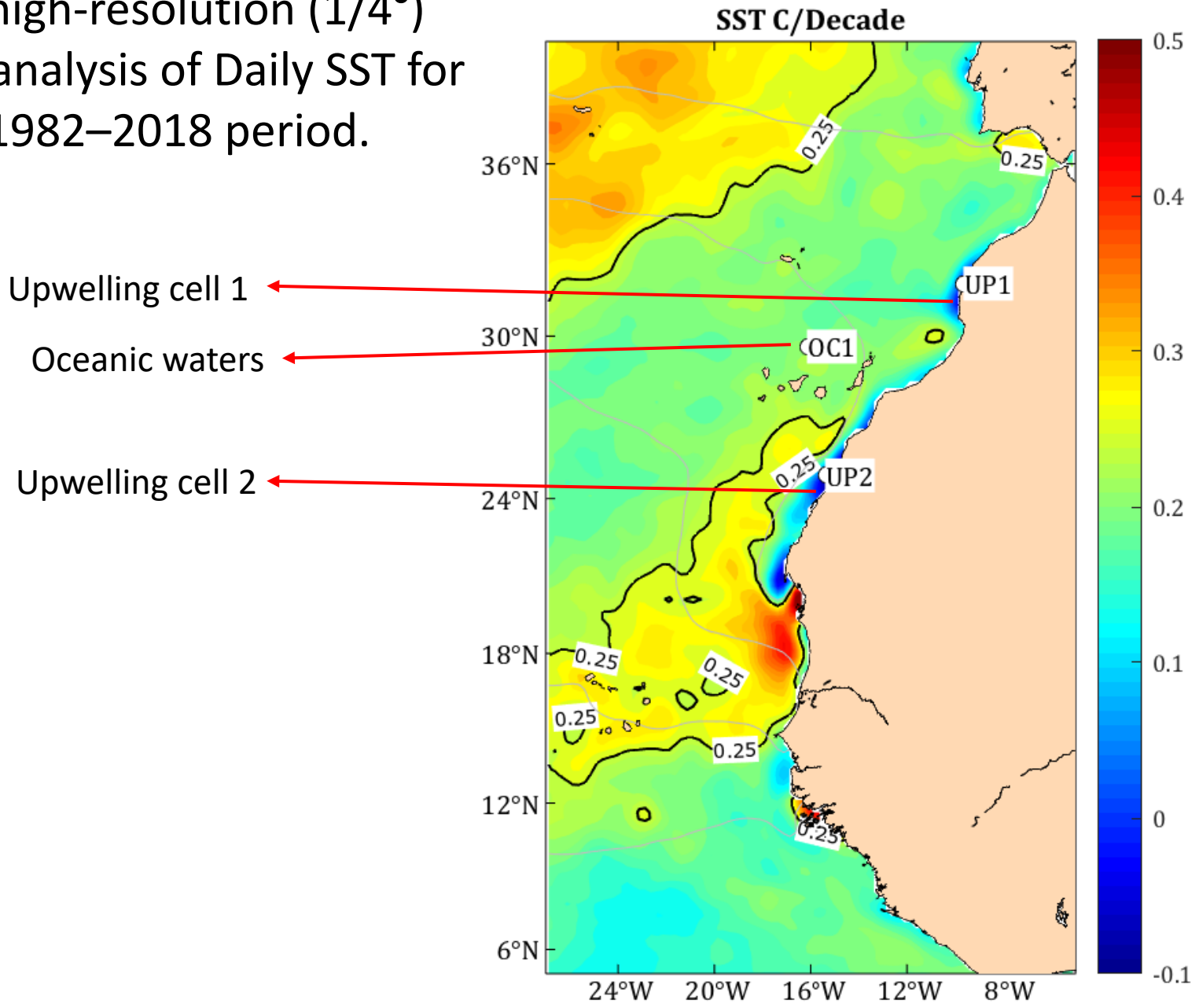


Trends in the Oceanic Waters stations (11-22)



Surface [10-20] m

NOAA high-resolution (1/4°) blended analysis of Daily SST for the 1982–2018 period.

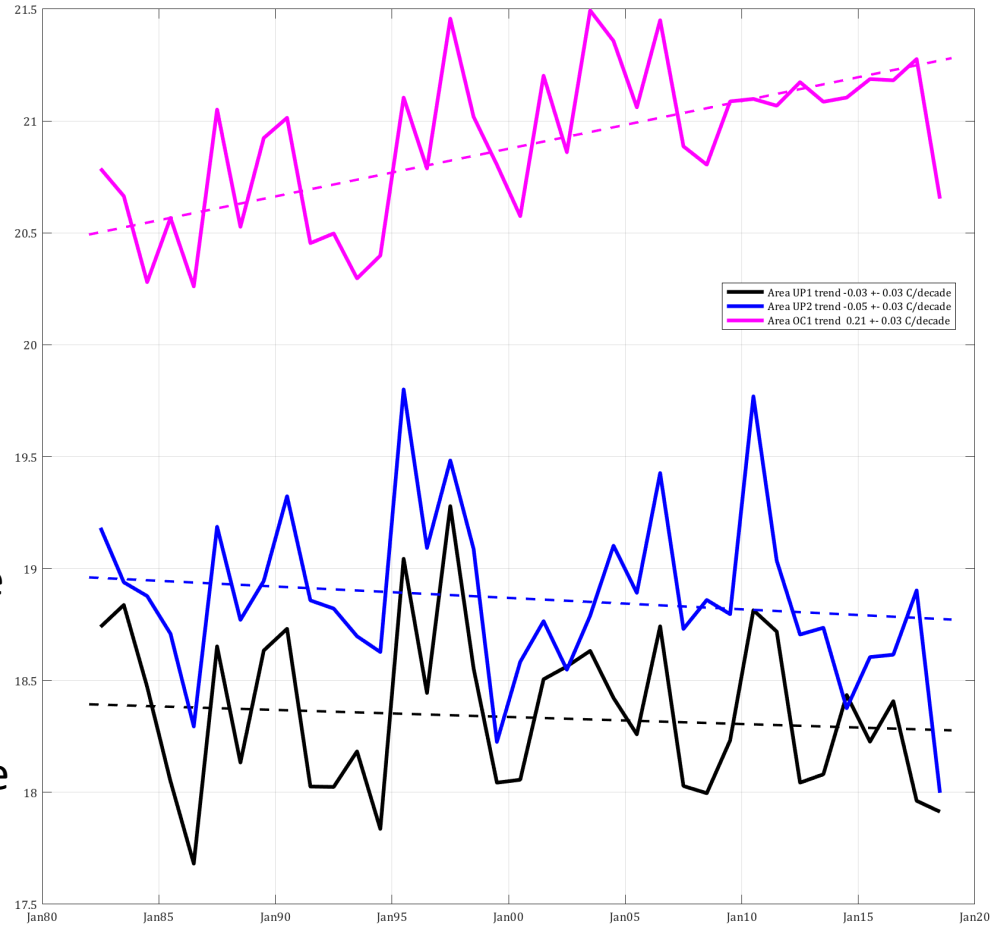


Temperature decrease in the upwelling area off Northwest Africa

Oceanic waters
0.21±0.03°C/decade

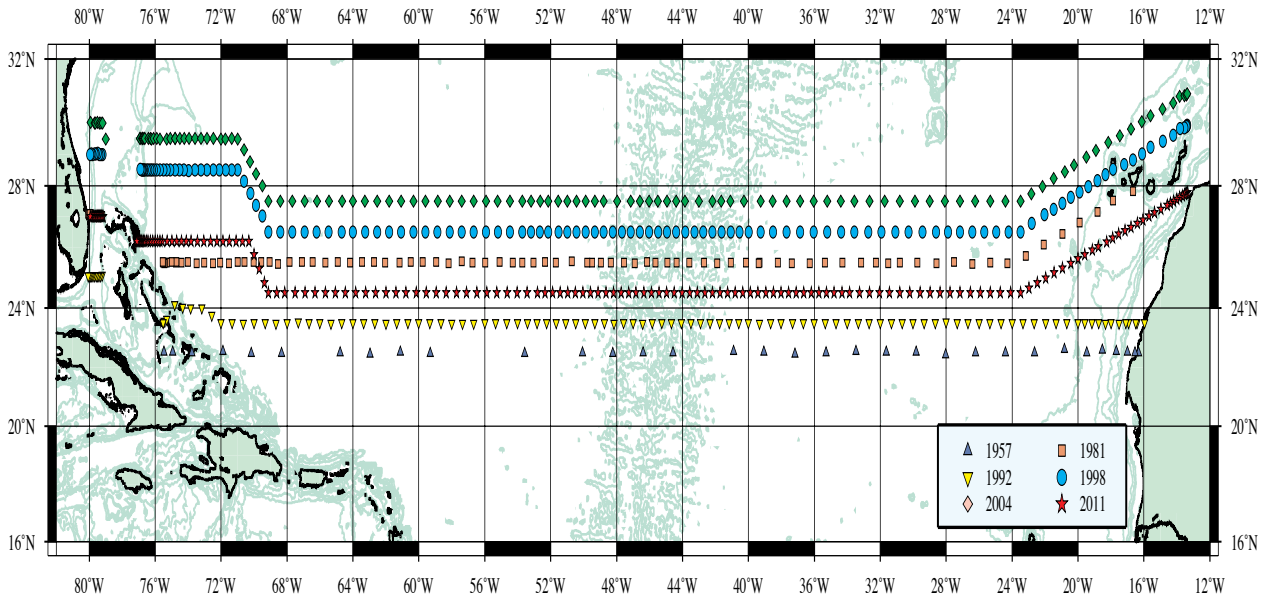
Upwelling cell 1
-0.03±0.03°C/decade

Upwelling cell 2
-0.05 ±0.03°C/decade



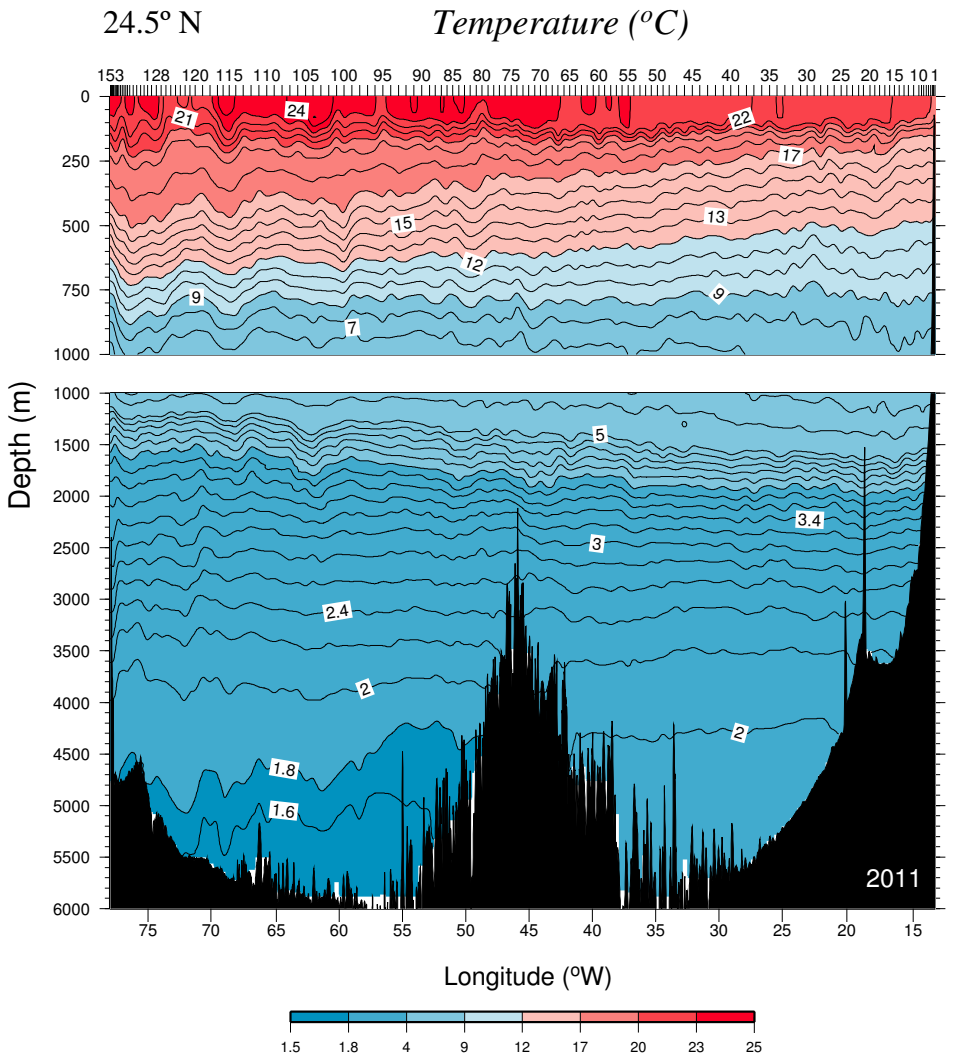
It could be a result of an intensification of the coastal upwelling due to an increase of the alongshore wind stress as mentioned by Bakun (1990)

Variaciación en el Giro Subtropical del Atlántico Norte (sección 24 °N)

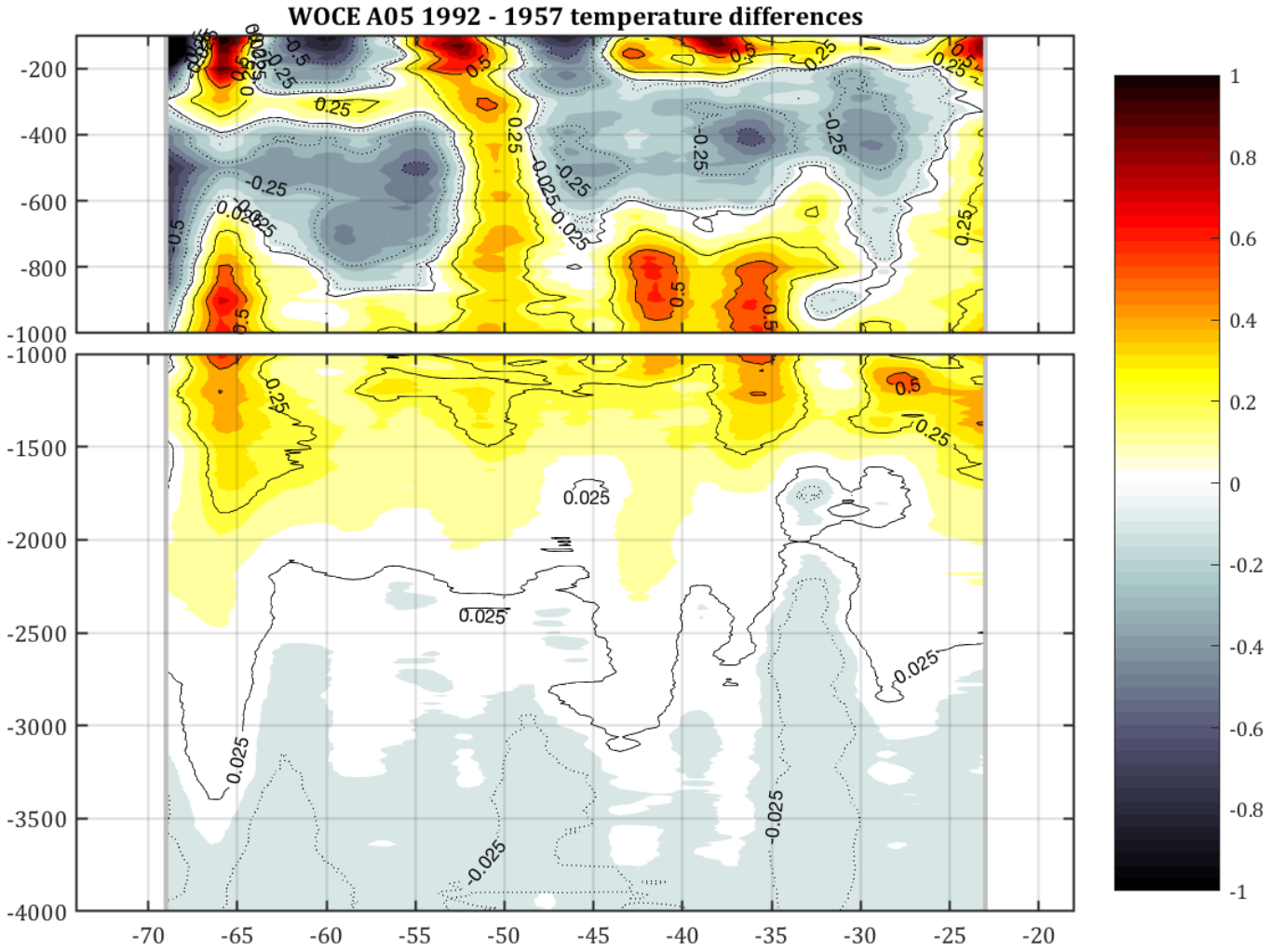


- 1957
- 1981
- 1992
- 1998
- 2004
- 2010
- 2011
- 2015

Variaciación en el Giro Subtropical del Atlántico Norte

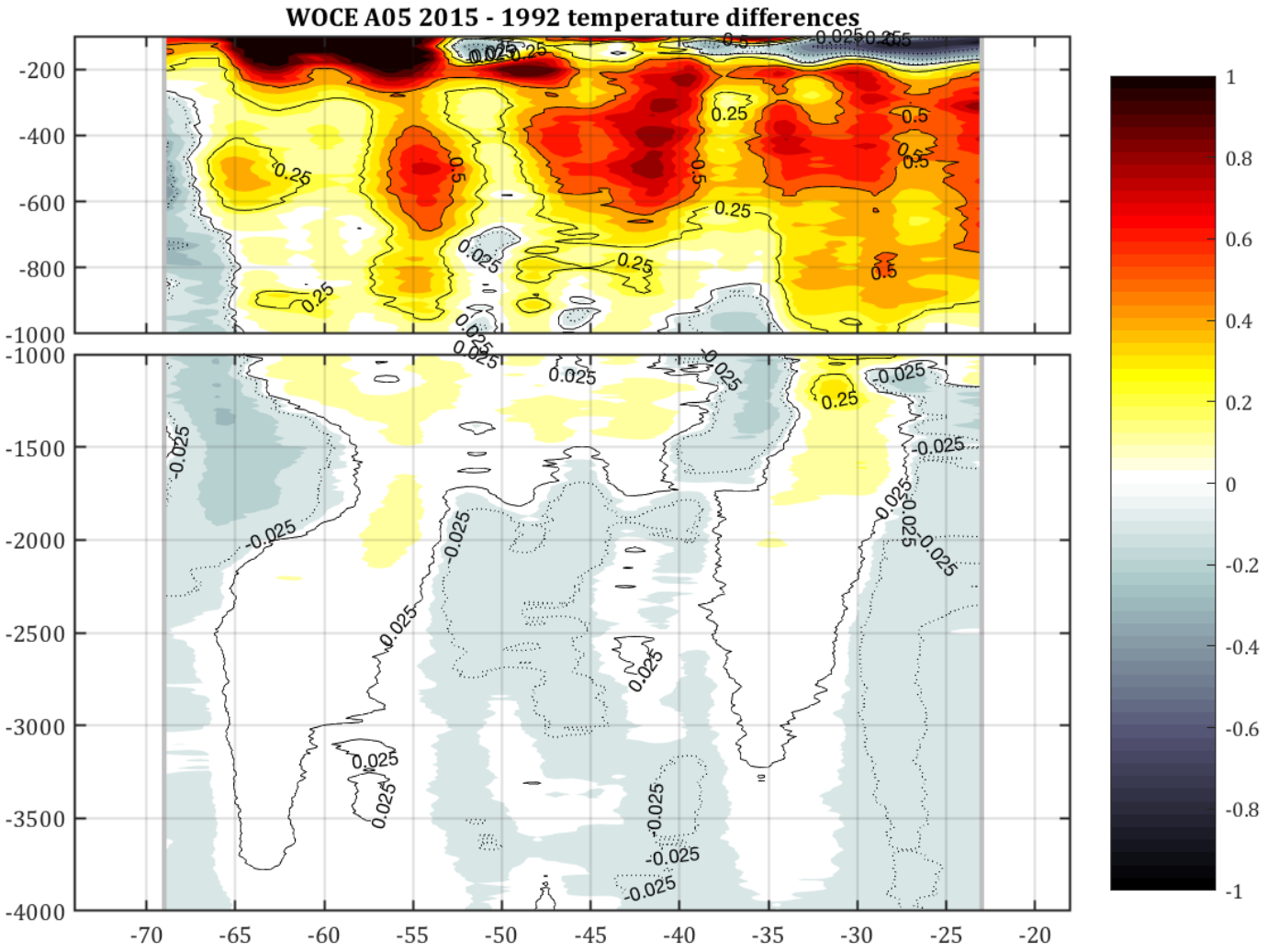


Variaciación en el Giro Subtropical del Atlántico Norte



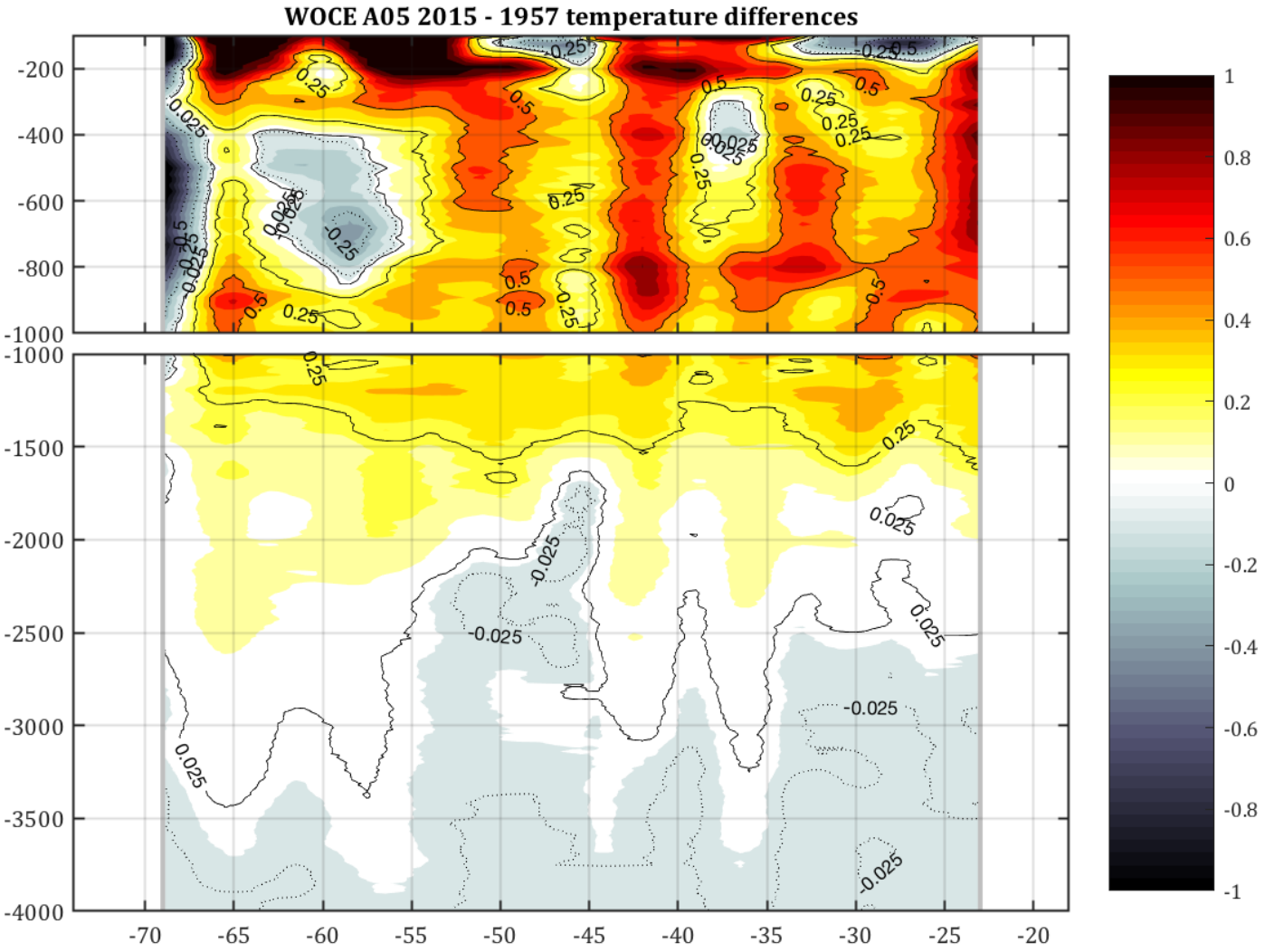
1992-1957: +0.12°C

Variaciación en el Giro Subtropical del Atlántico Norte



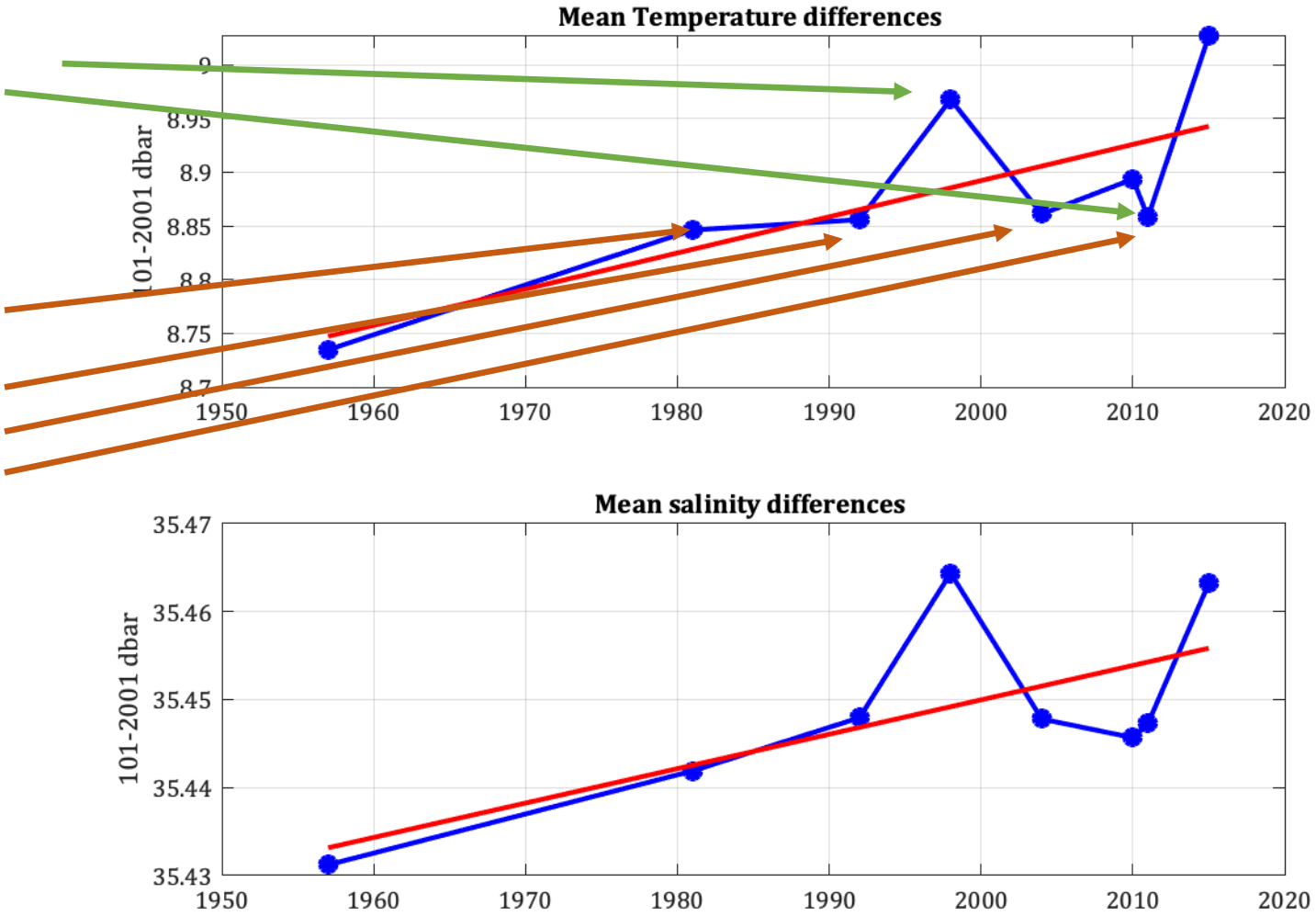
2015-1992: +0.17°C

Variaciación en el Giro Subtropical del Atlántico Norte



2015-1957: +0.29°C

Variaciación en el Giro Subtropical del Atlántico Norte



Temp: 0.034°C/década

Sal: 0.004 /década

Muchas gracias