# Vertical habitat use and diving behaviour of yellowfin tuna, Thunnus albacares, in CABO VERDE

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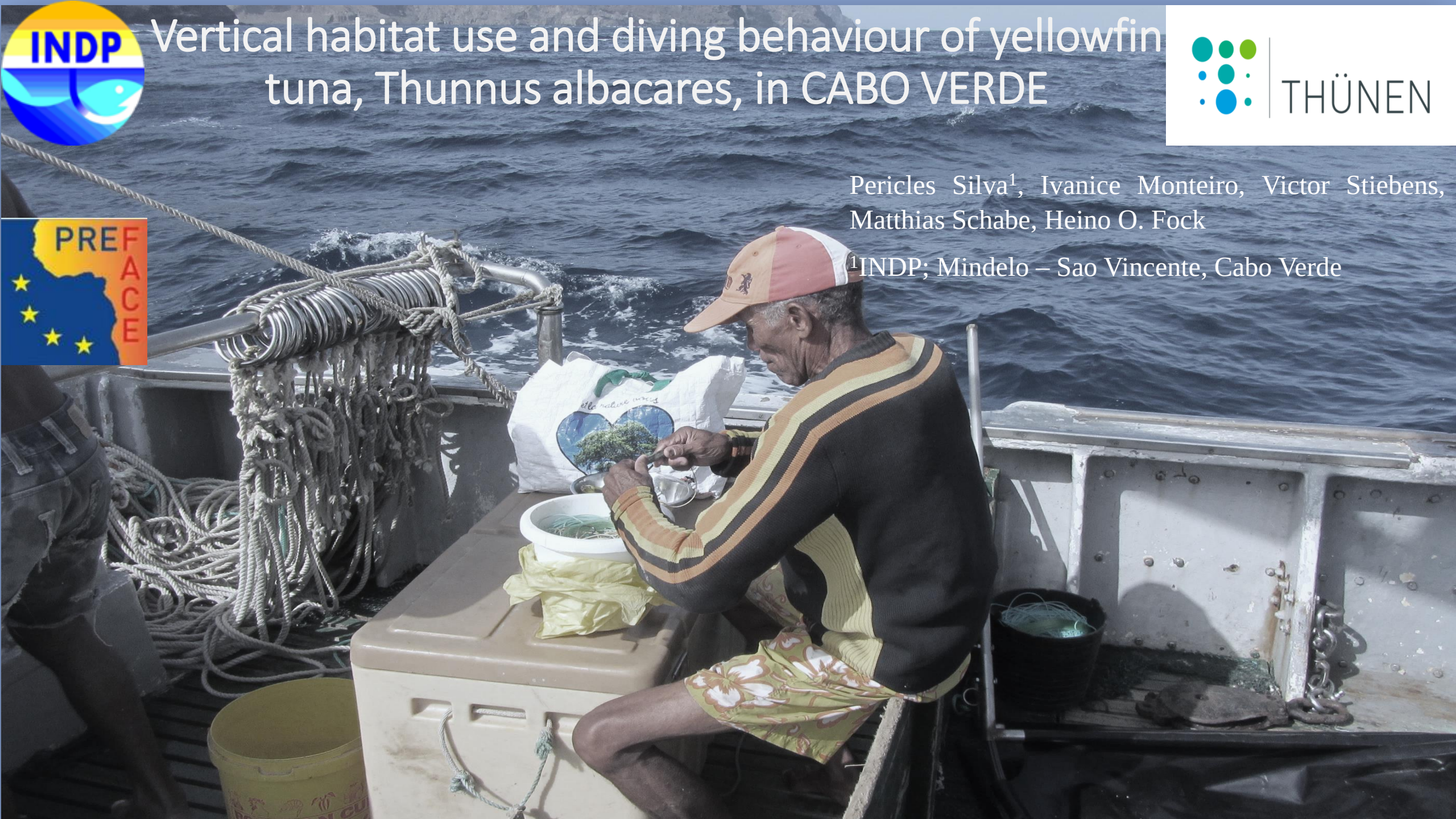
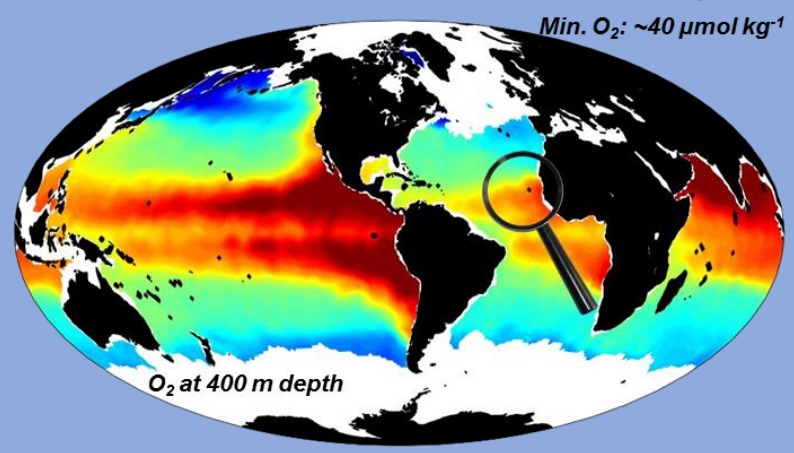


# Framework

- <u>WP12 Environmental and anthropogenic pressures on pelagic ecosystems and fisheries</u>
- Area affected by clime change (OMZ)
- Few data exist about characterization of how most pelagic species actually utilize water depths (Block et al., 1998; Brill and Lutcavage, 2001; Sibert and Nielsen, 2001 in Prince E. D. et al, 2006).
- High-oxygen-demand (≥3.5 ml l −1) (Stramma *et al*, 2010)



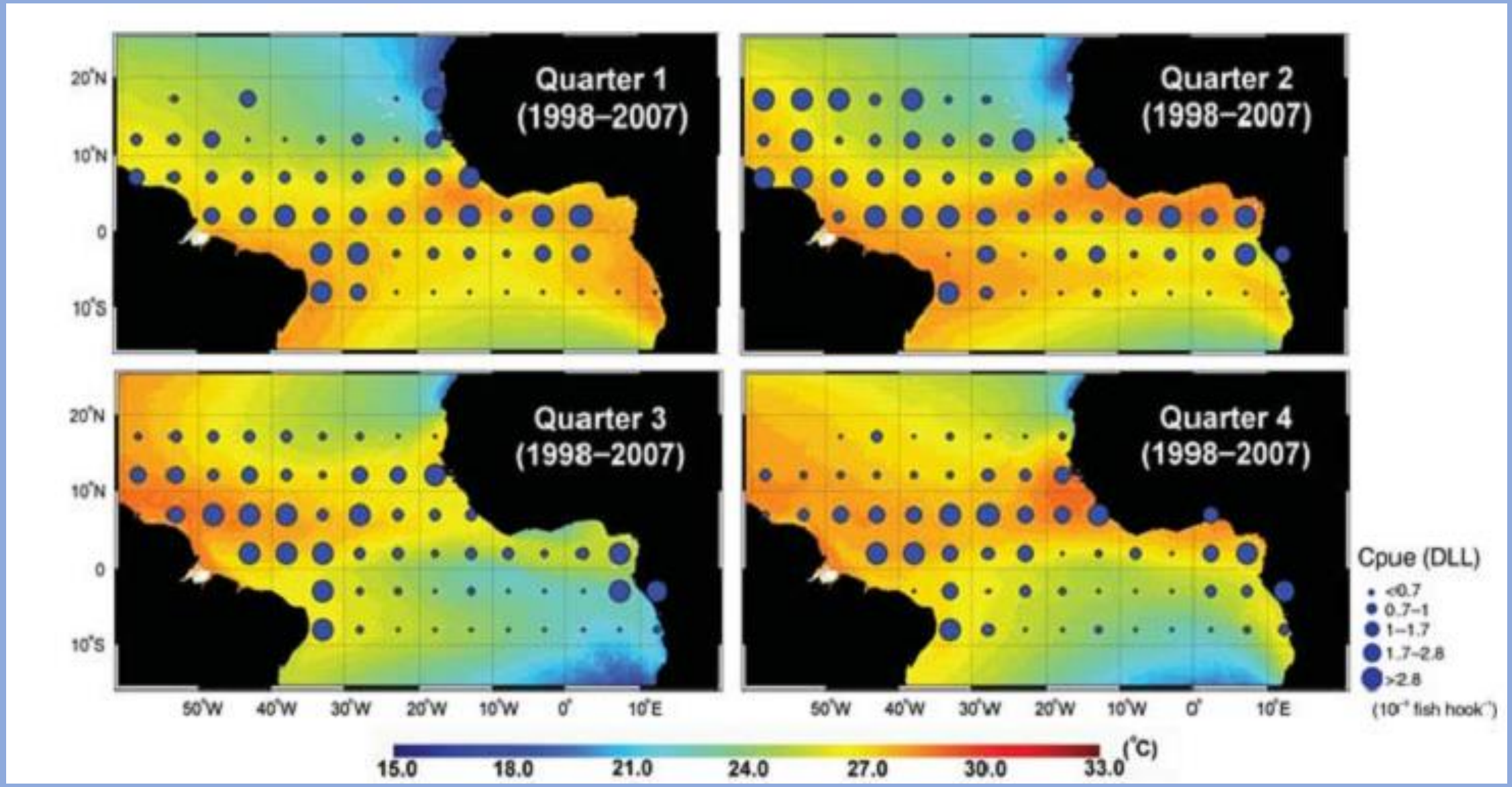

**Main Goal**

• Understand the environmental and anthropogenic pressures on pelagic fish in the tropical Atlantic - Vertical habitat use and diving behaviour

Tuna tagging campaign from 2014 to 2016 by TI and INDP.

# Framework

(Lan et al, 2011)



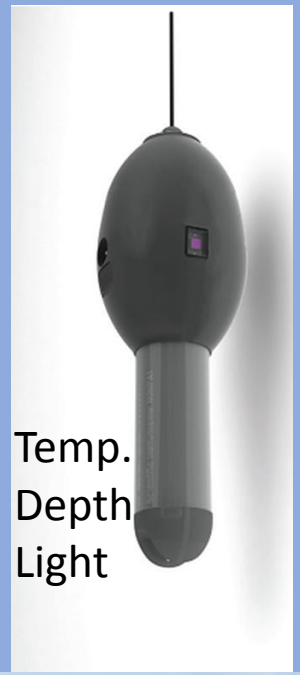

Spatial distribution of CPUE for YFT using deep LLs overlaid on SST images for the four quarters (mean value for 1998 – 2007)

# Methodology

- All fish were captured by means of hand line fishing and of rod fishing, applying circle hooks or J-hooks, depending on the fishermen's experience in using circle hooks.

<u>4 Yellow fin tuna tagged in 2016 with External pop-up satellite tags (Wildlife Computers MiniPAT) .</u>

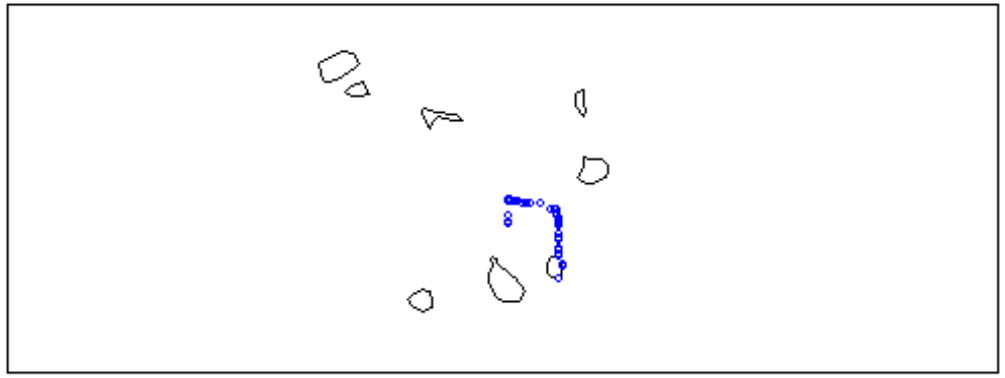
- 13  April 2016, on Maio Island (SF1).
- SF3 was deployed 1 Agoust  south of São Nicolau island.
- Tuna  20.09.2016/Boavista_Piko_D_Home  16°05.667  23°02.012
- Tuna  17.10.2016/Boavista_West  16°10.046  23°01.564



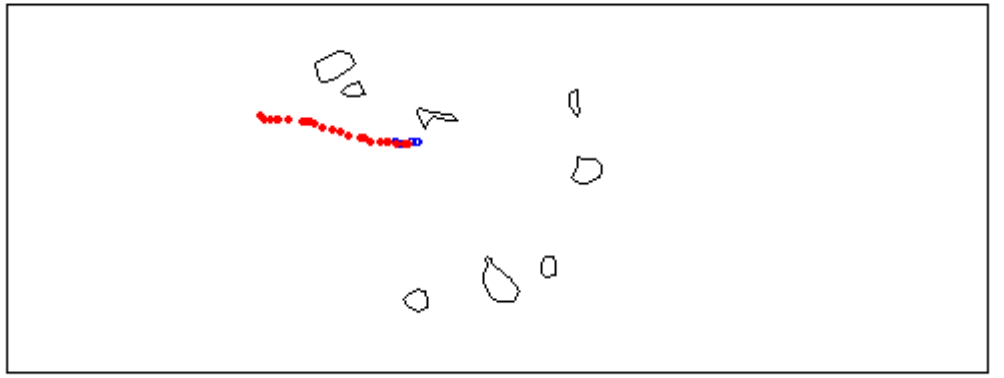


# Results

SF1



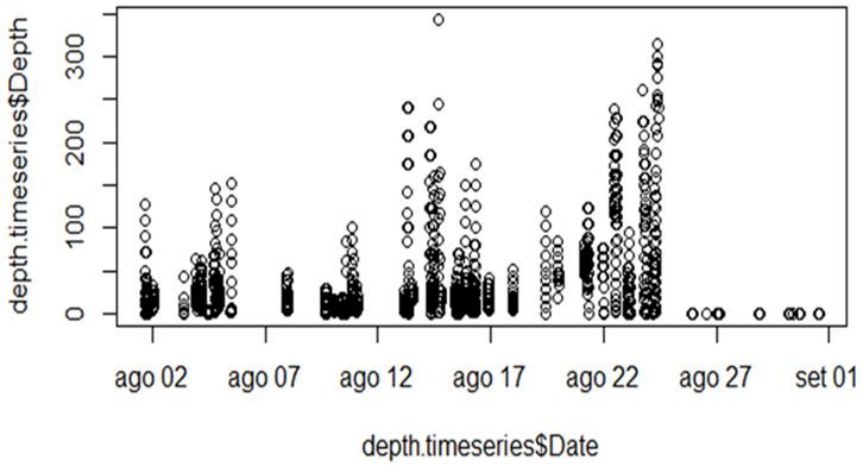
SF3



*Maio - CV, April 2016*

*São Nicolau - CV, August 2016*

# Results



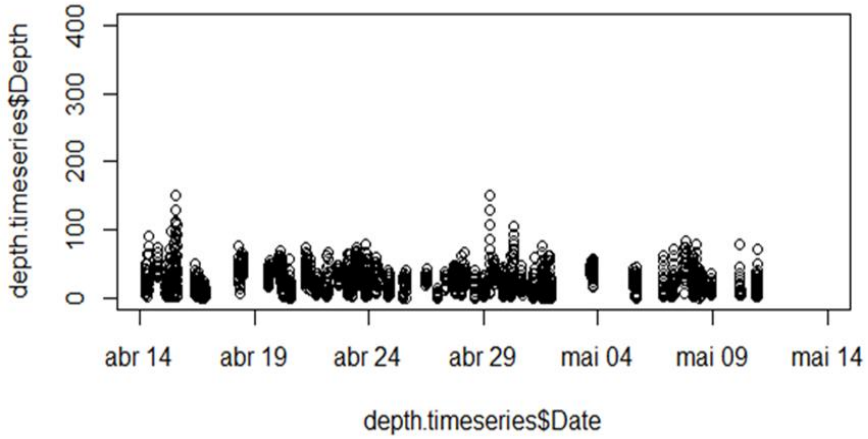



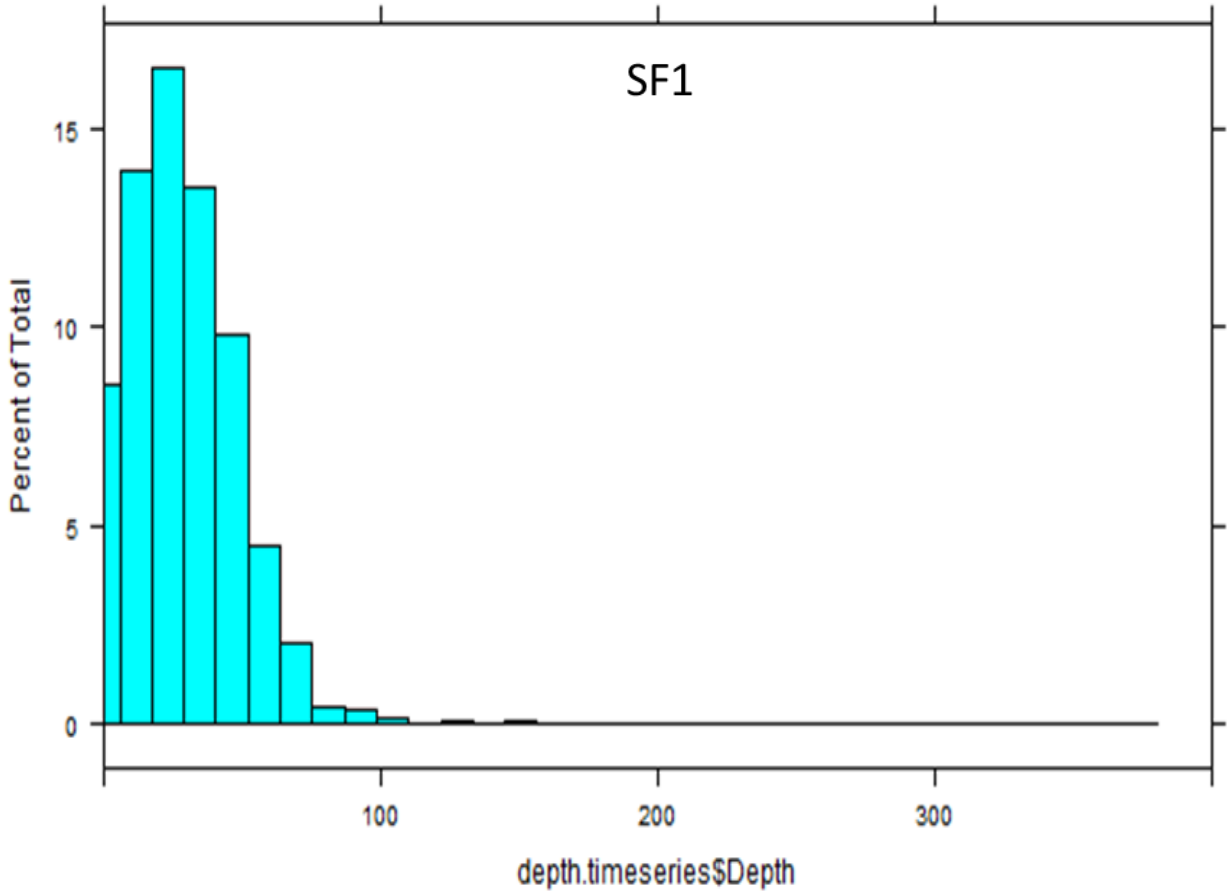


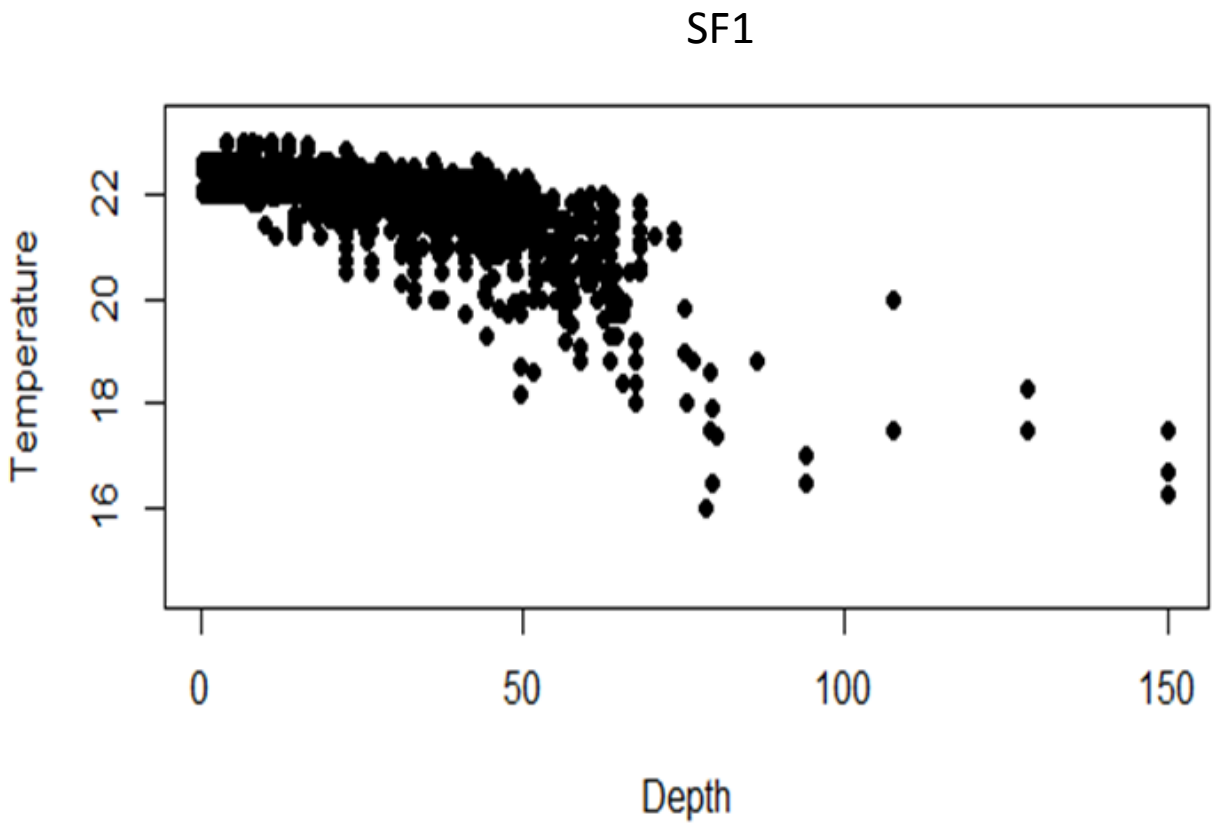

TABLE II. Summary of *Thunnus albacares* tracks from pop-up satellite archival tags in 2000

| Fish | $L_F$ (cm)* | Date tagged | Duration (days) | Deployment position | Pop-up position | Greatest depth (m) | Lowest temperature (° C) |
|---|---|---|---|---|---|---|---|
| 99-722 | 136 | 25 April | 6 | 26°23′ N; 91°20′ W | 25°47′ N; 93°20′ W | 150 | 16·4 |
| 99-535 | 154 | 3 May | 28 | 27°35′ N; 87°45′ W | 26°24′ N; 84°39′ W | 432 | 12·6 |
| 99-696 | 140 | 9 May | 12 | 27°49′ N; 86°43′ W | n/a† | 188 | 16·4 |
| 99-577 | 145 | 10 May | 10 | 28°04′ N; 86°36′ W | n/a† | 250 | 13·0 |
| 99-600 | 148 | 10 May | 74 | 27°55′ N; 86°42′ W | n/a† | 272 | 10·2 |
| 99-601 | 155 | 10 May | 80 | 28°02′ N; 86°37′ W | n/a† | 300 | 12·8 |

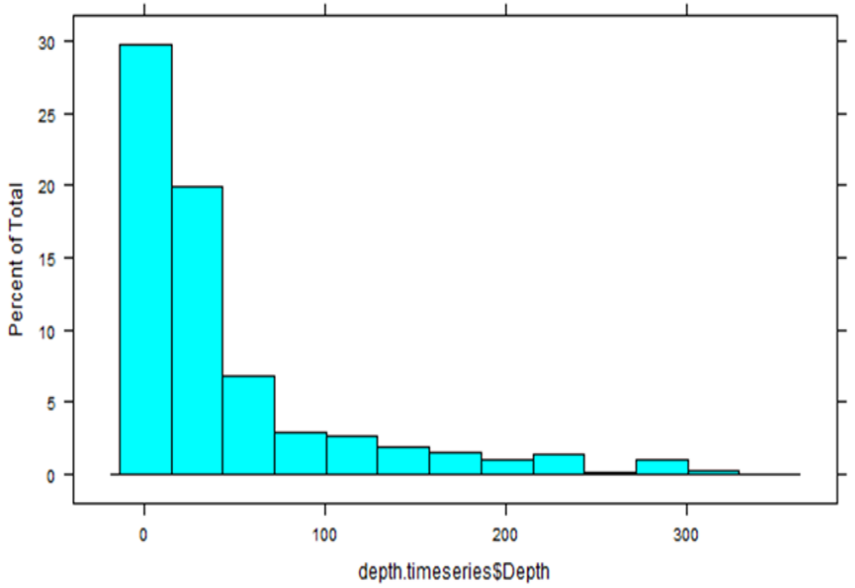
n/a, not available.
*Fork length ($L_F$) estimated by sight.
†Premature release of tags occurred, followed by a drifting phase, so pop-up position did not represent position of fish.

# Results

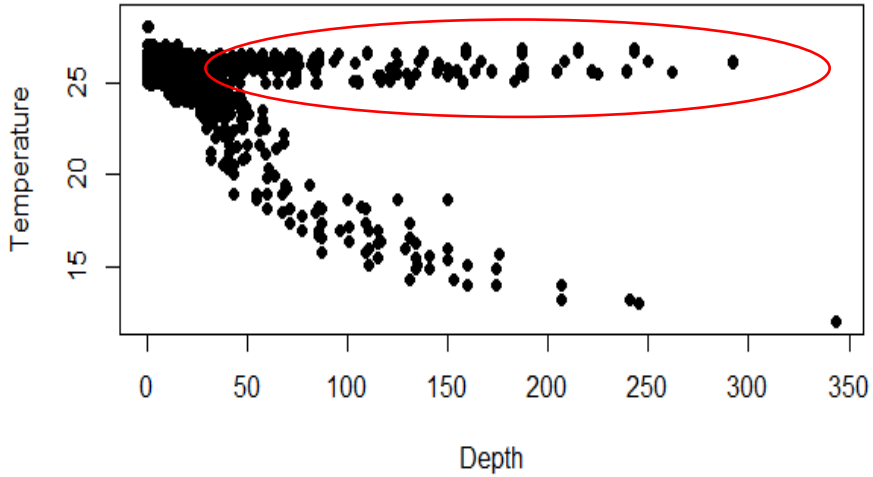

SF1
Percent of Total
0
5
10
15
100
200
300
depth.timeseries$Depth


SF1
Temperature
16
18
20
22
0
50
100
150
Depth

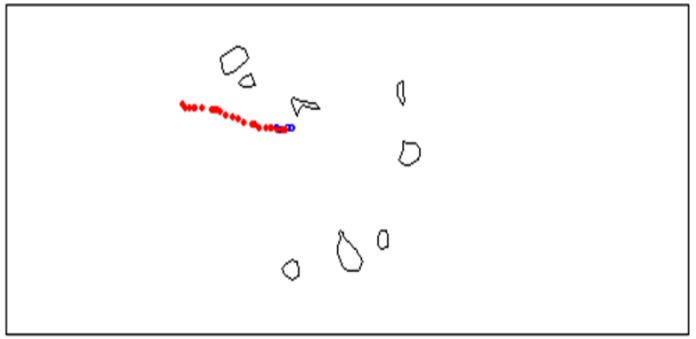
# Results



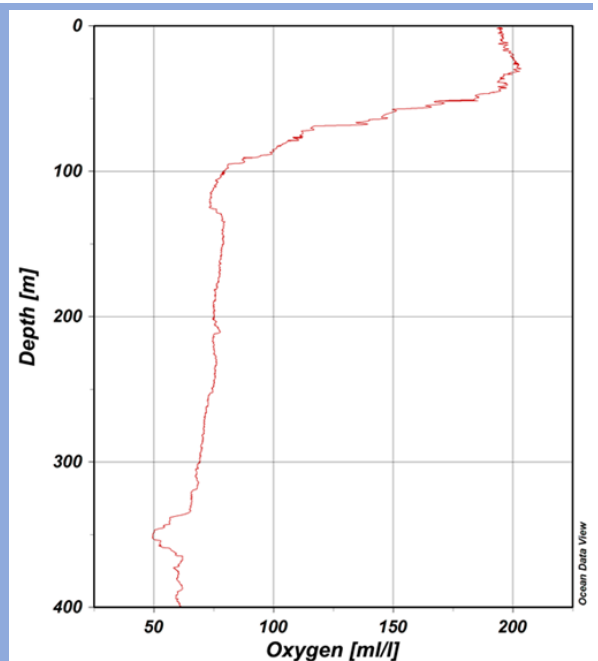

**PREDATION EVENT!!!?**

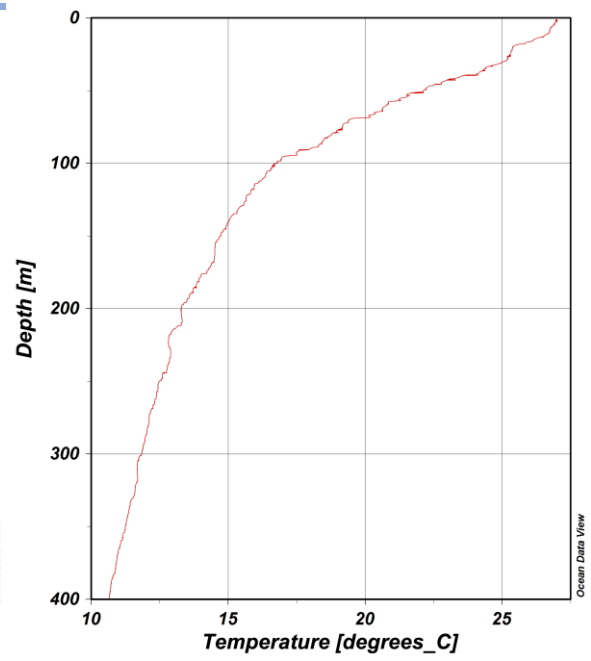


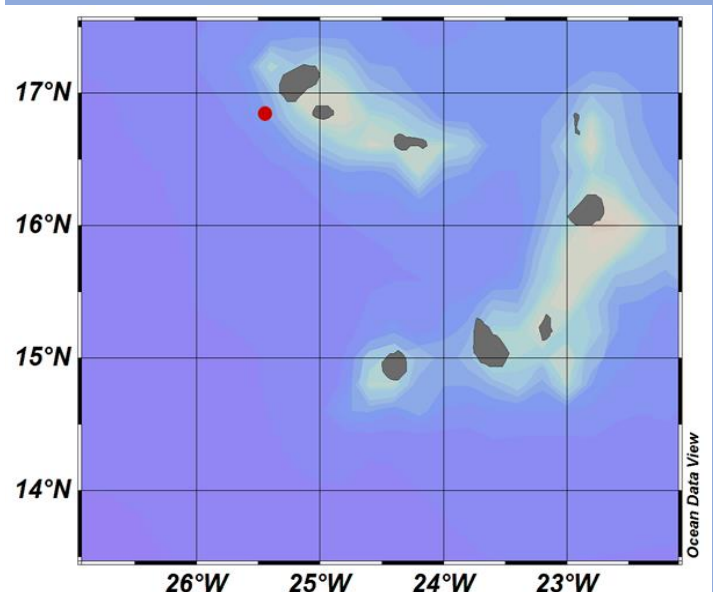

SF3



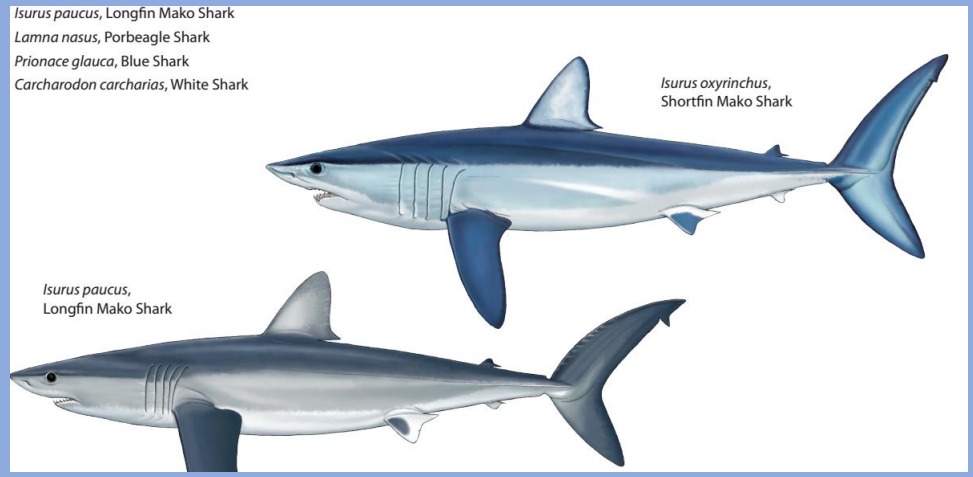
São Nicolau - CV, August 2016



# Short fin mako shark (*Isurus oxyrinchus*) (http://www.iucnredlist.org/details/39341/0)

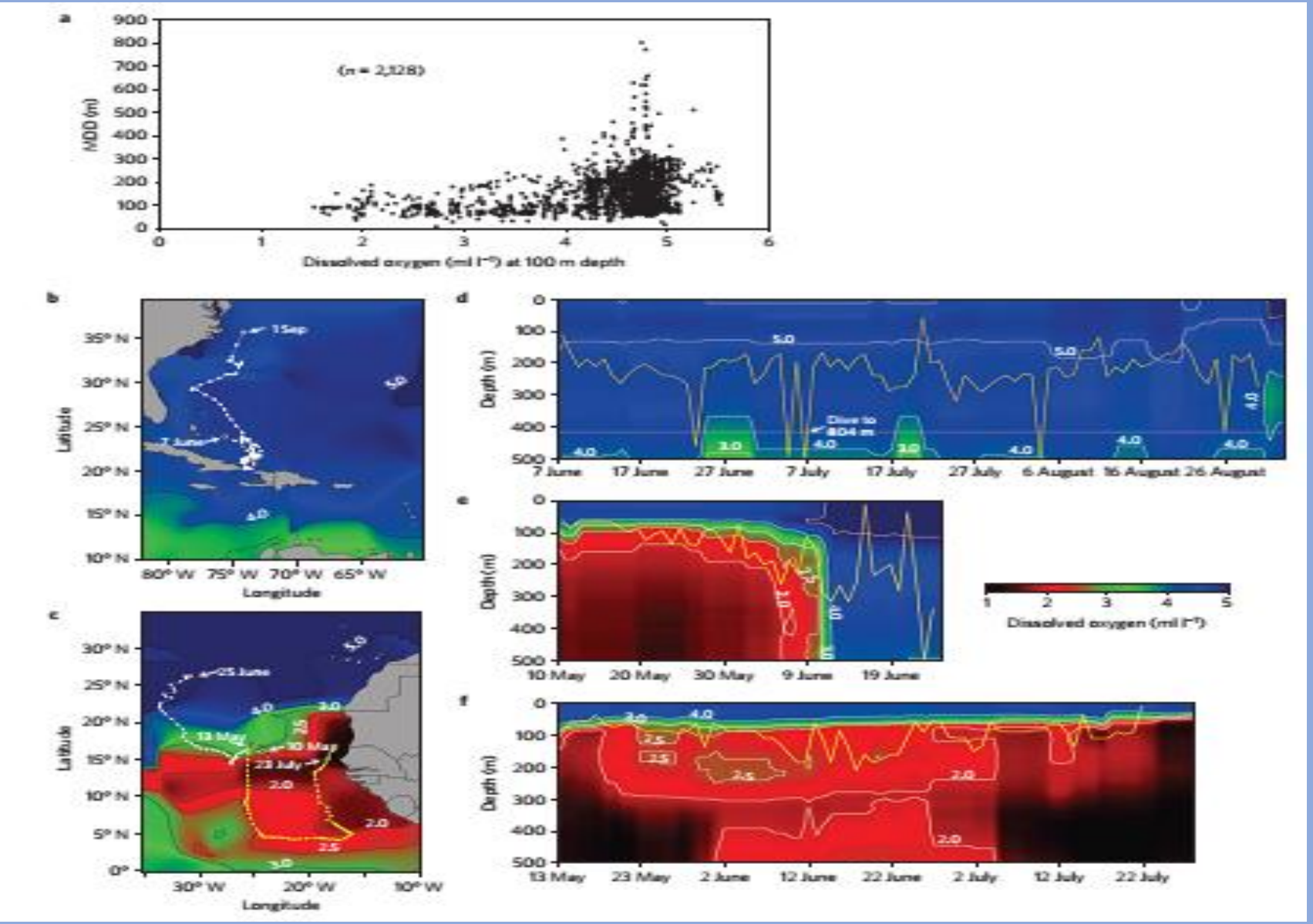




all oceans from about 50°N (up to 60°N in the northeast Atlantic) to 50°S

**Diet**

The diet of Shortfin Makos has been reported to consist mainly of teleost fishes (including mackerels, tunas, bonitos and other scombrids, anchovies,, swordfish)

(Stramma *et al,* 2012)



# Summary

- Remaining in surface and mixed layer and thermocline
- Stayed at temperatures wormer then 14˚C to 16˚C  well above temperature minimum of 10˚C (weng *et al*, 2009) because Oxygen could be more limiting then temperature.
- Results are consistent with the results of earlier studies conducted on T. albacares in other oceans.
- Further analyses to be done