

Vertical behavior of juvenile swordfish revealed by electronic tags

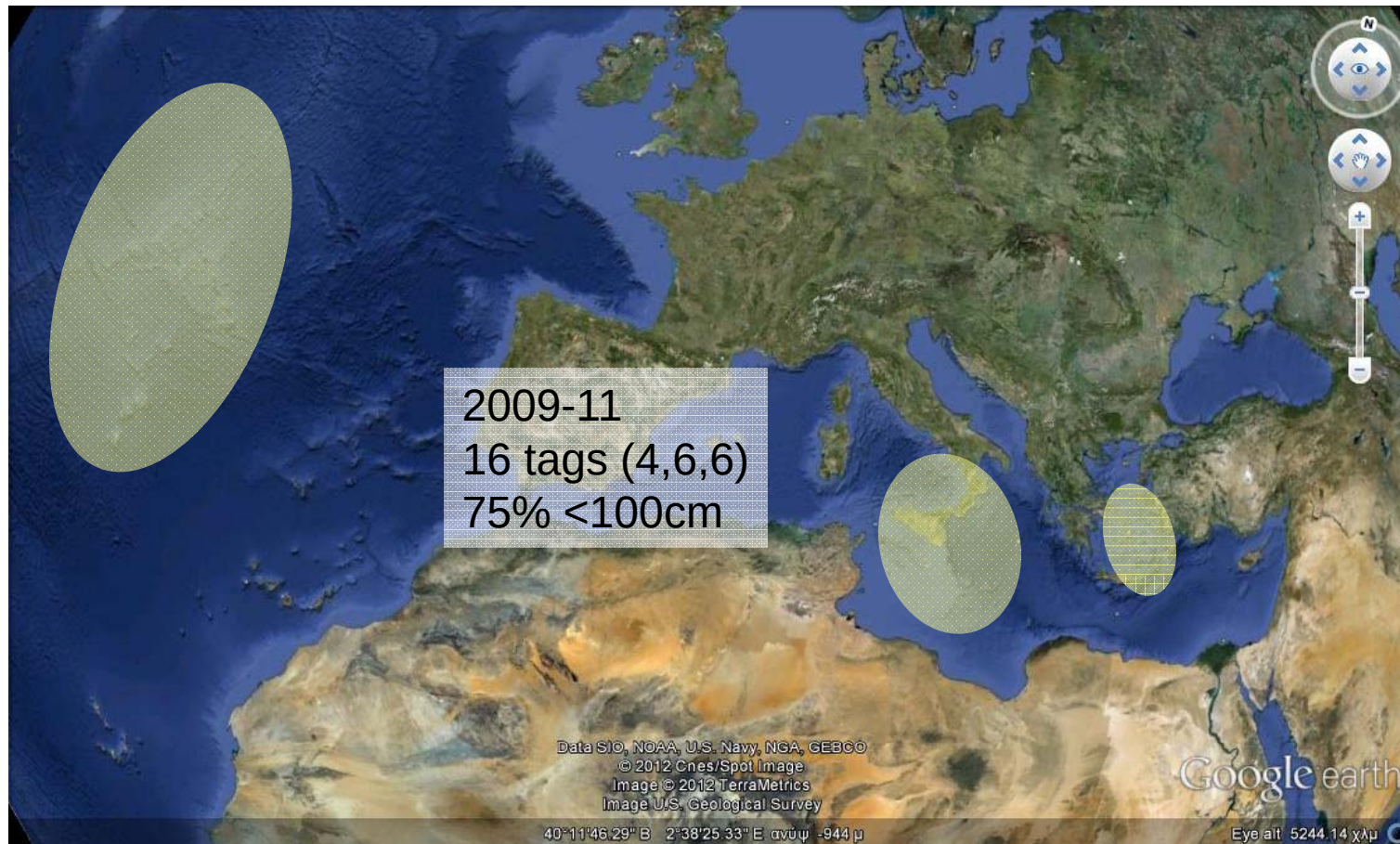
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George Tserpes

University of Patras
University of the Azores
Hellenic Centre for Marine Research
Aquastudio
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Hellenic Centre for Marine Research

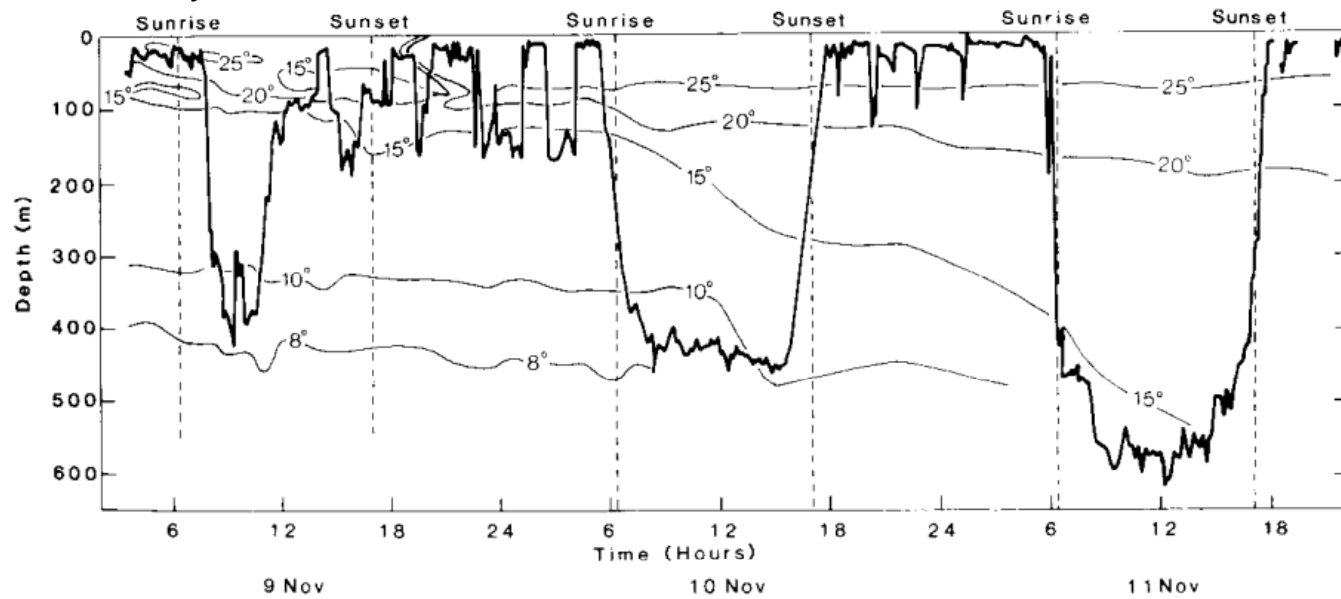


Horizontal and vertical behavior of swordfish juveniles (undersized individuals):

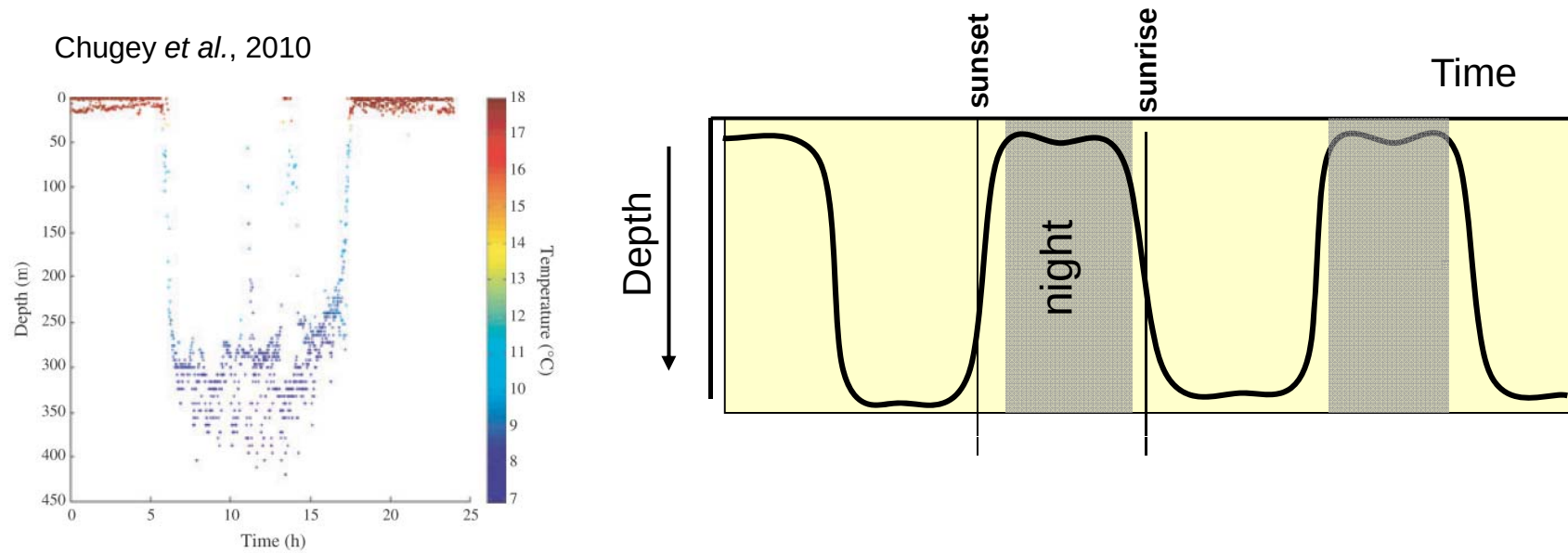
- Spatial measures
- Technical measures



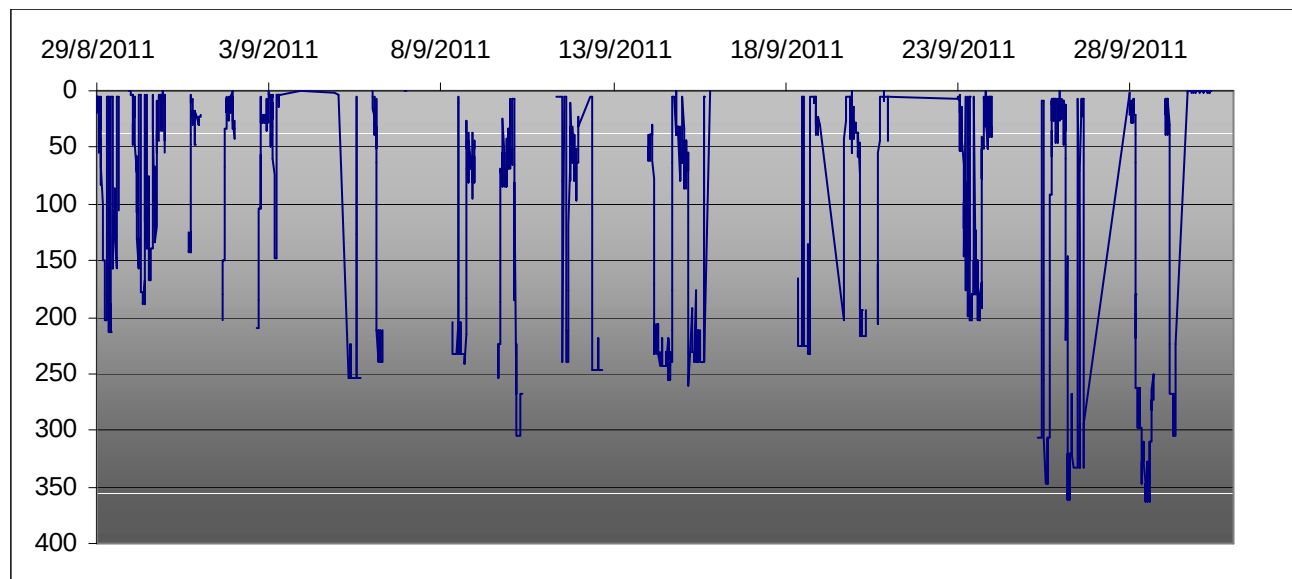
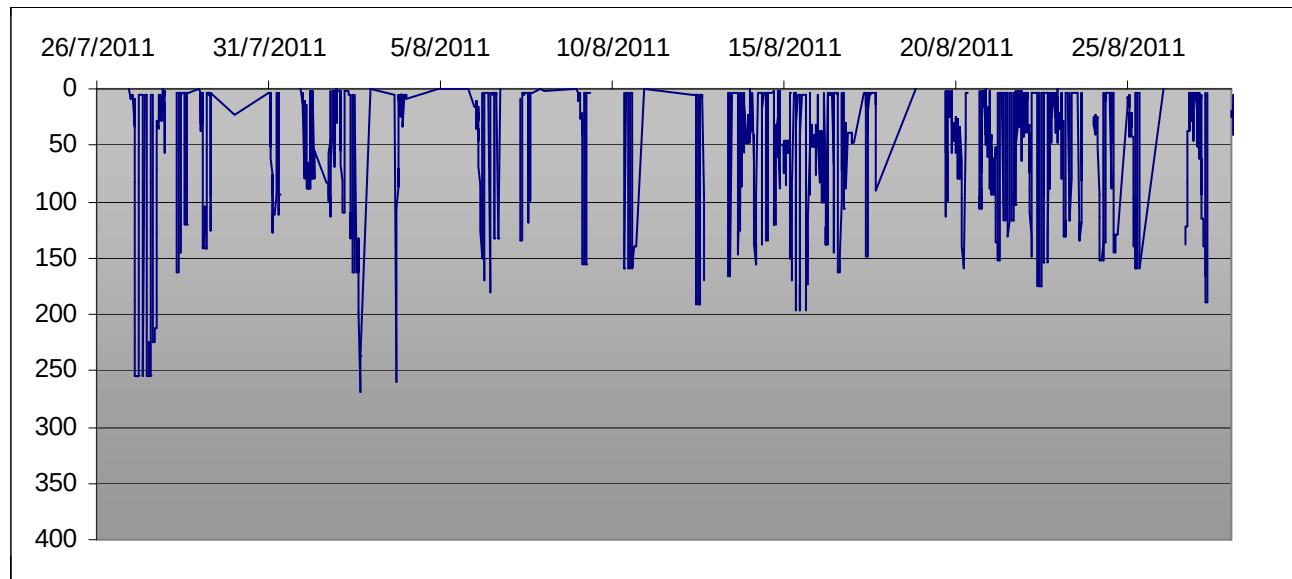
Carey and Robinson, 1981



Chugey *et al.*, 2010

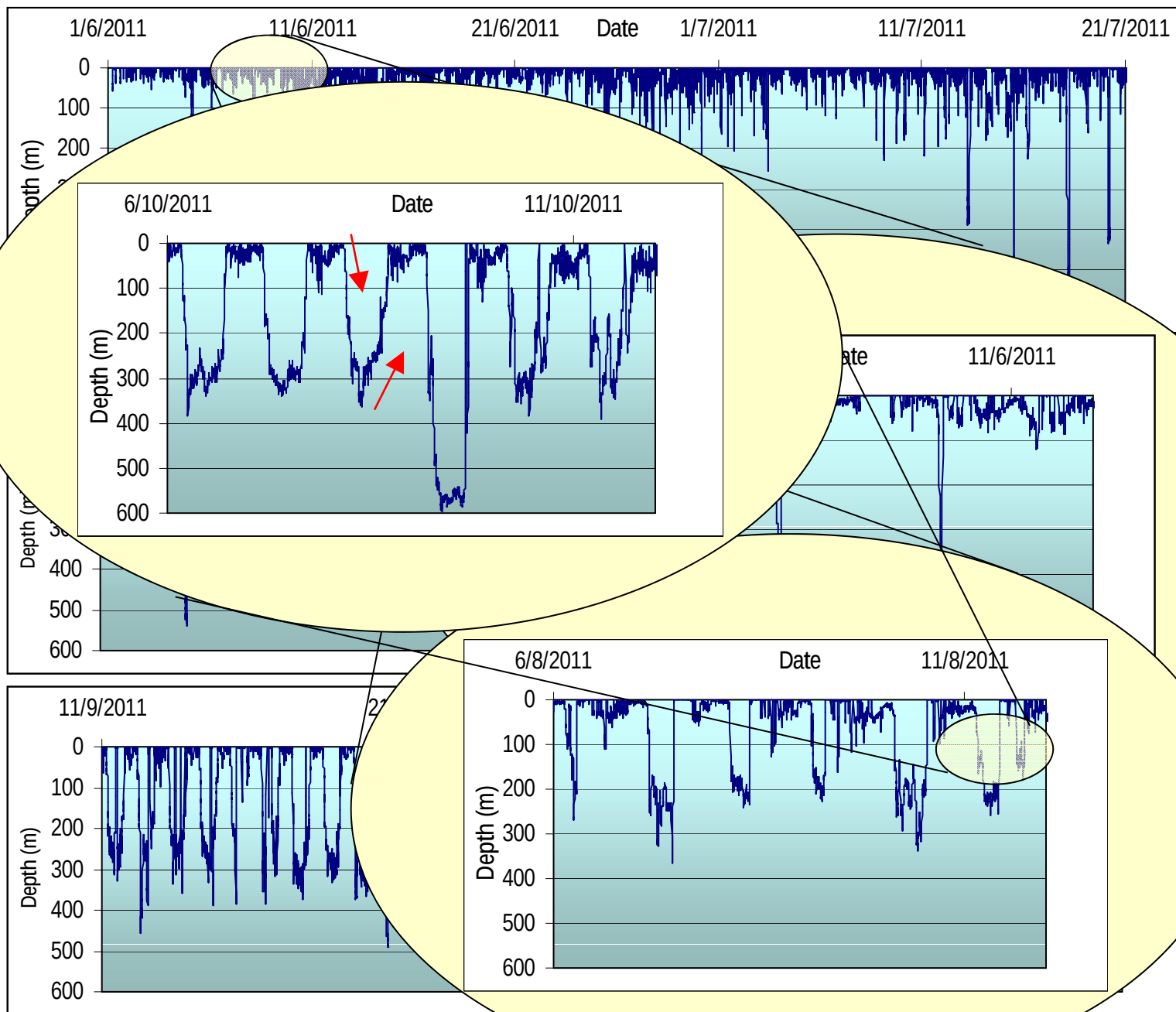


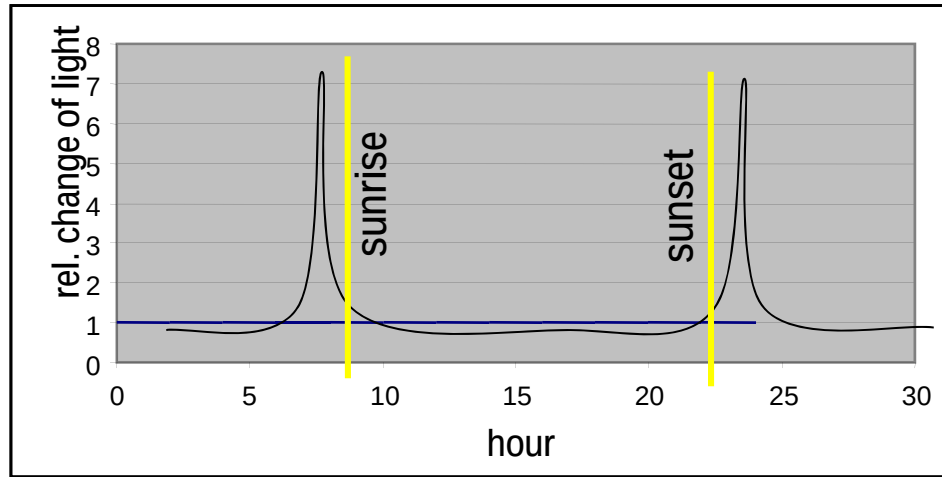
Time series of satellite received data



3 recovered tags (2 recaptures, 1 tag on the shore)



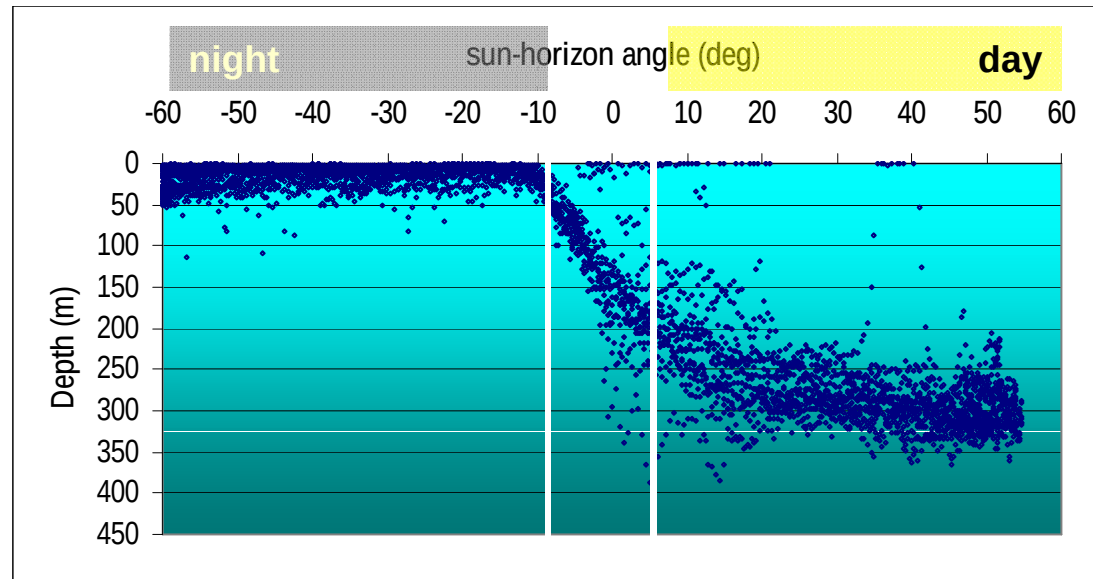
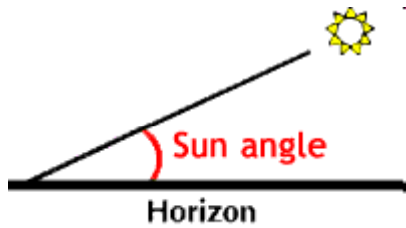


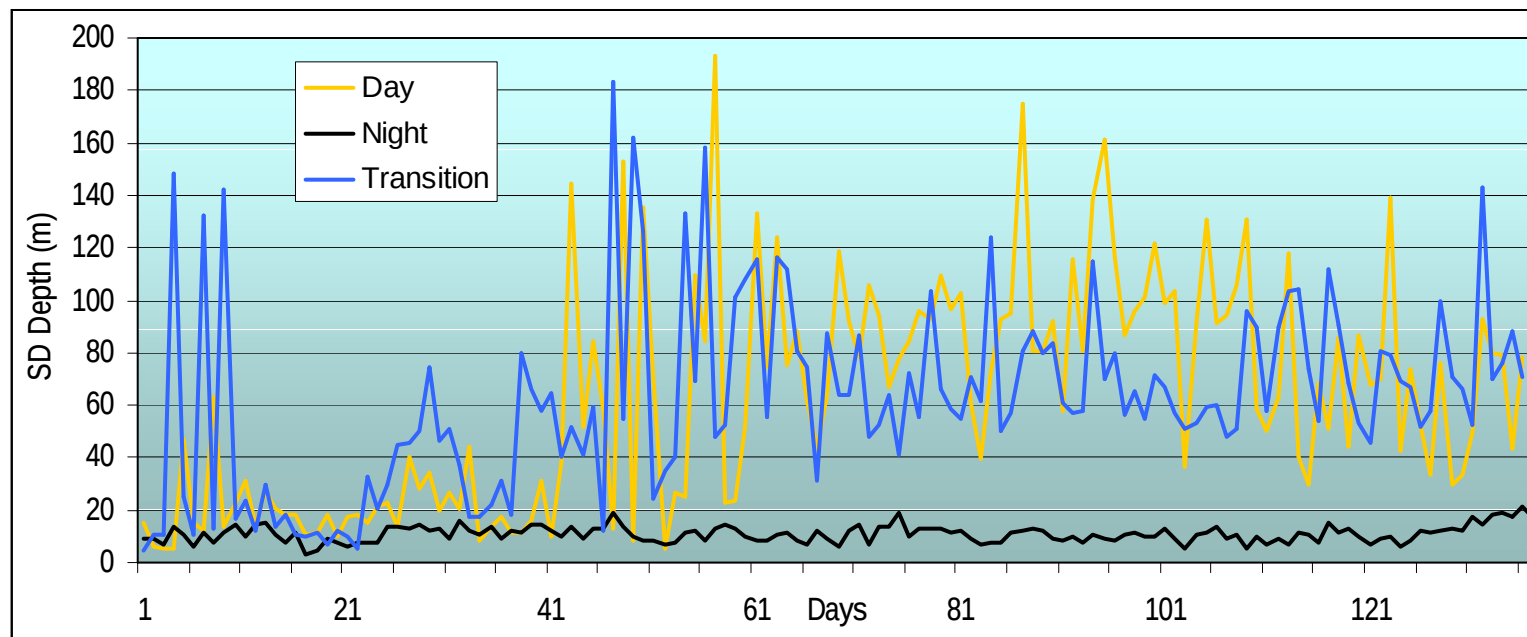
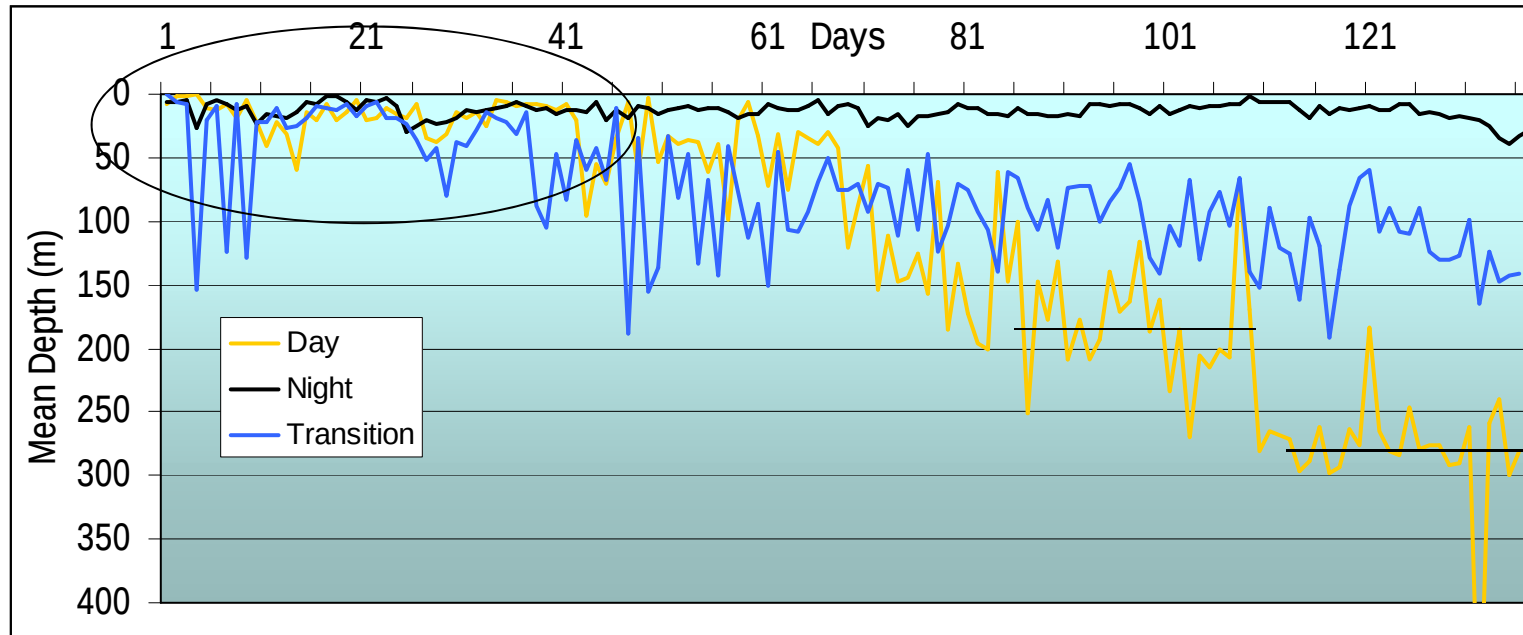


Endogenous rhythms synchronized by natural cyclic phenomena (zeitgeber)

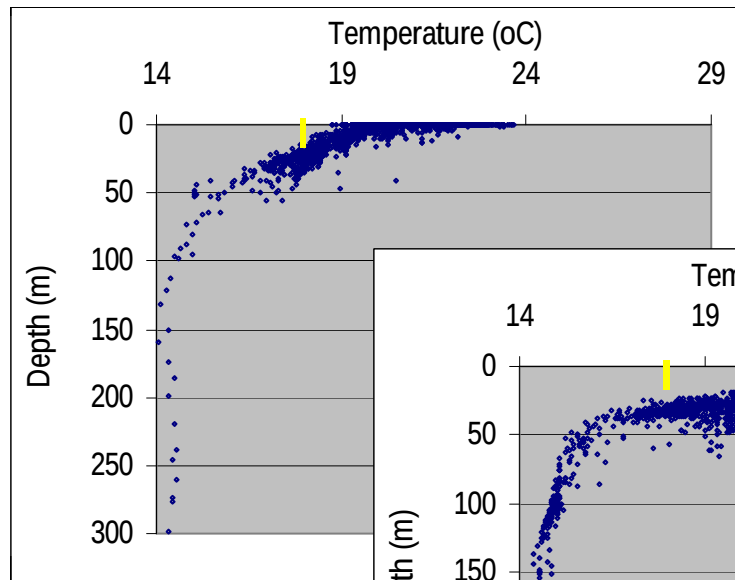
and/or

Fish try to follow a specific light intensity (isolume)

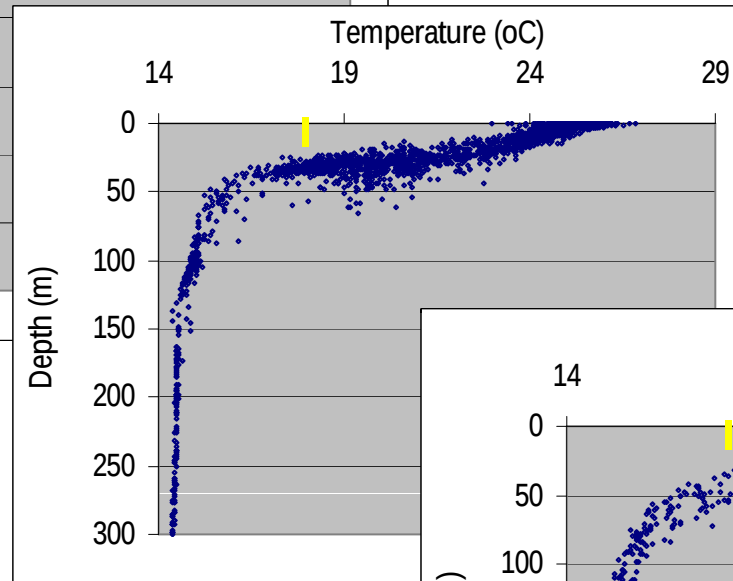




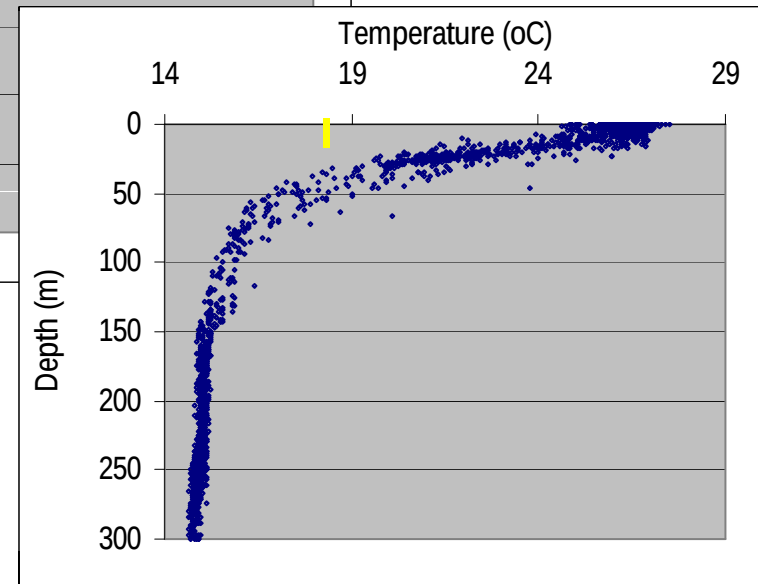
1-6 Jun 2010

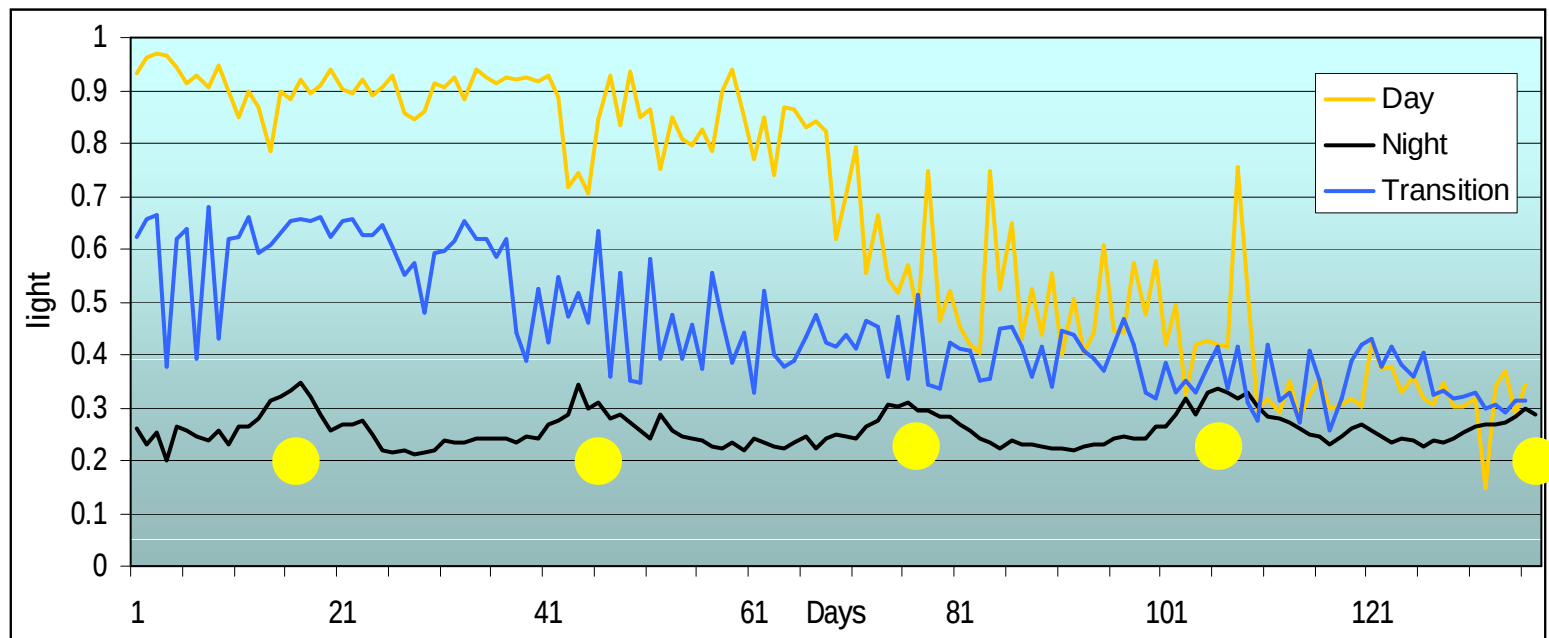
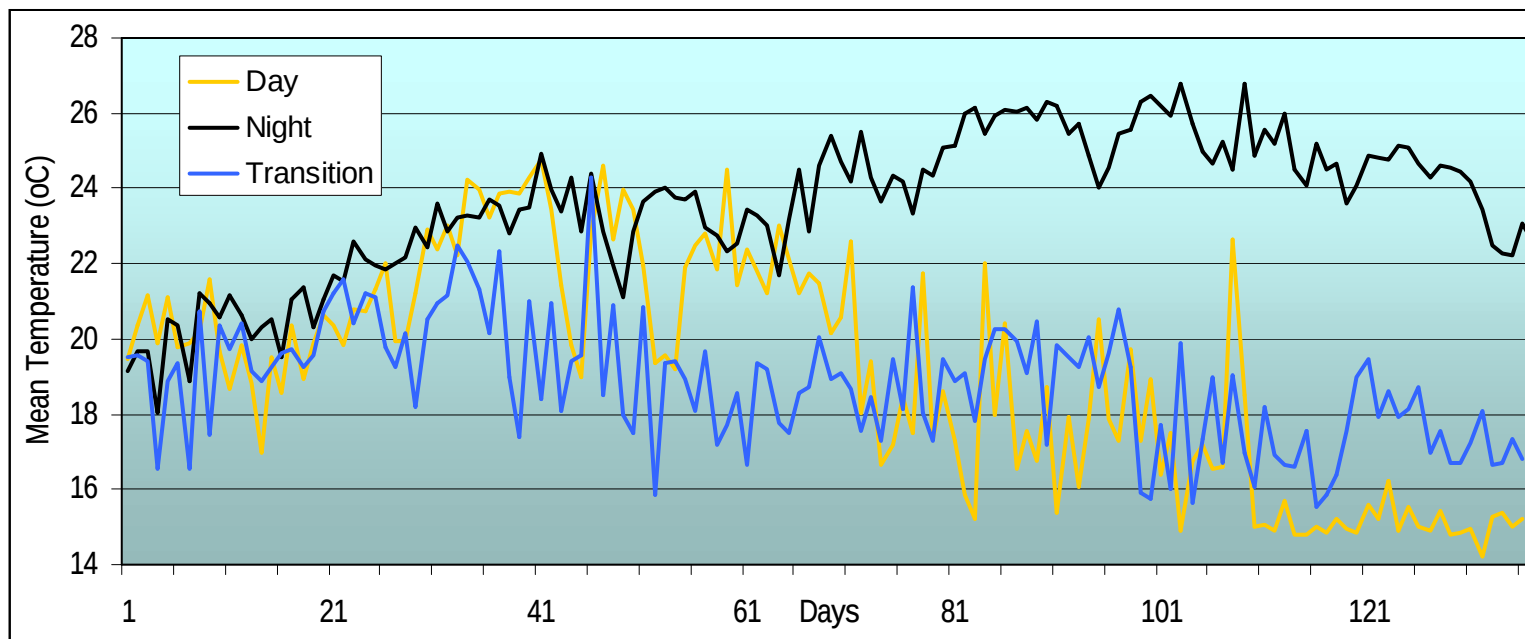


22-27 Jul 2010

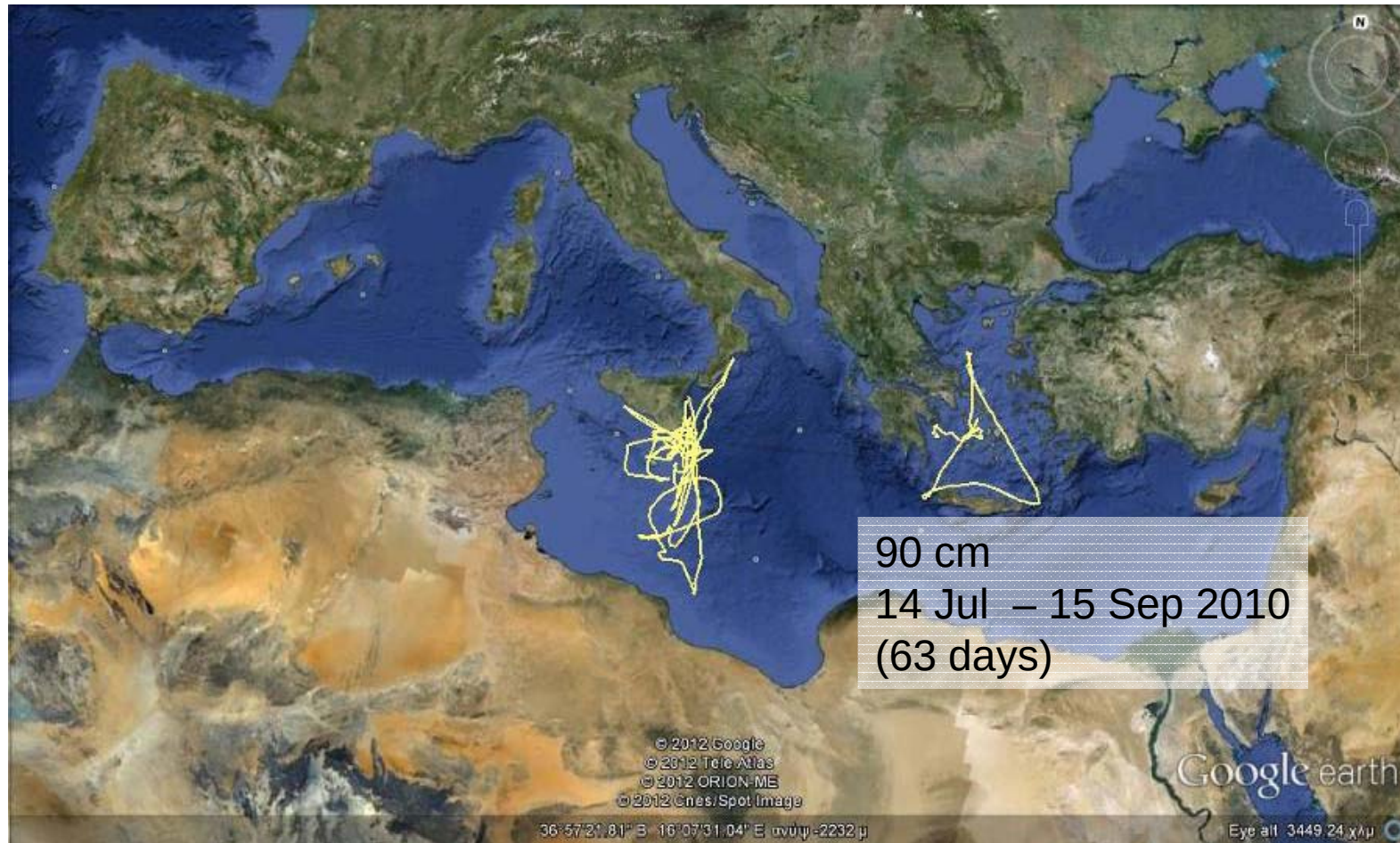


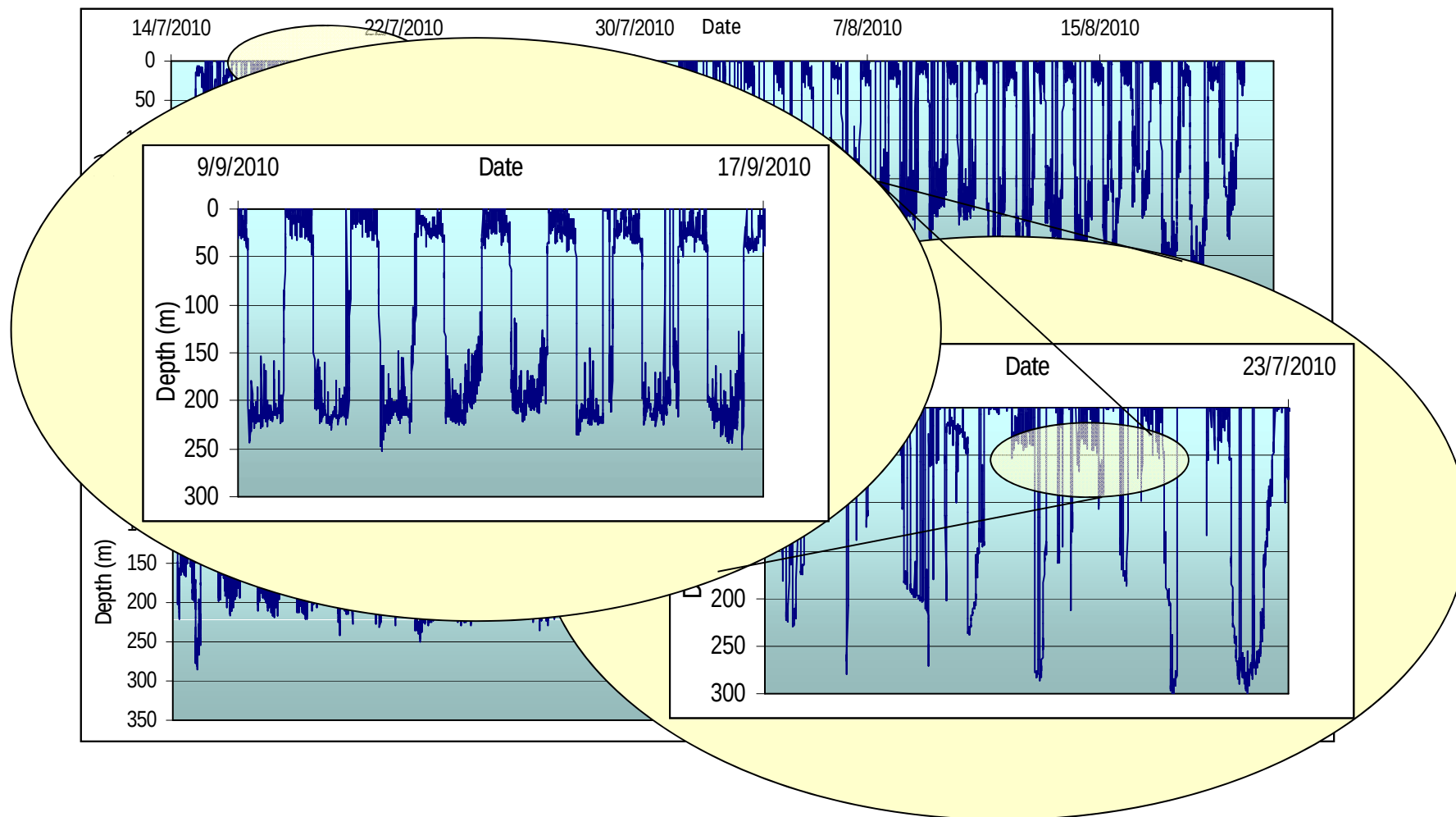
10-15 Sep 2010

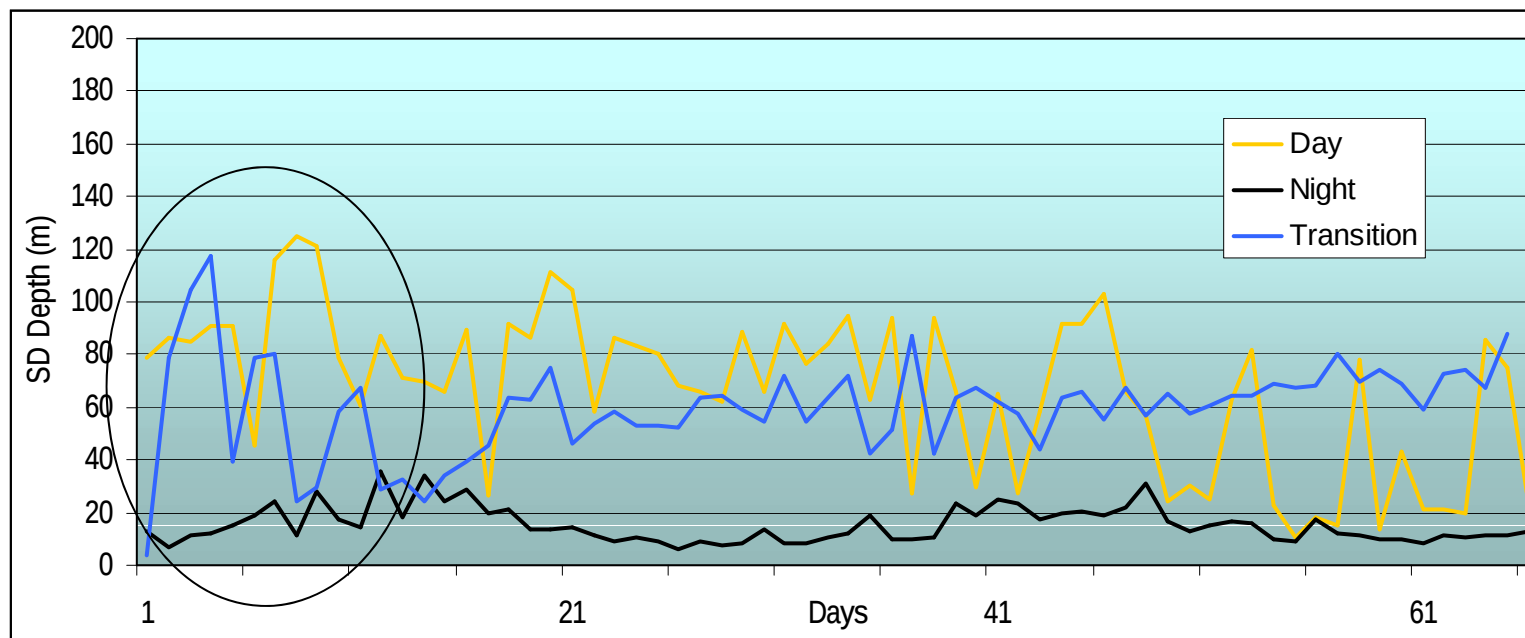
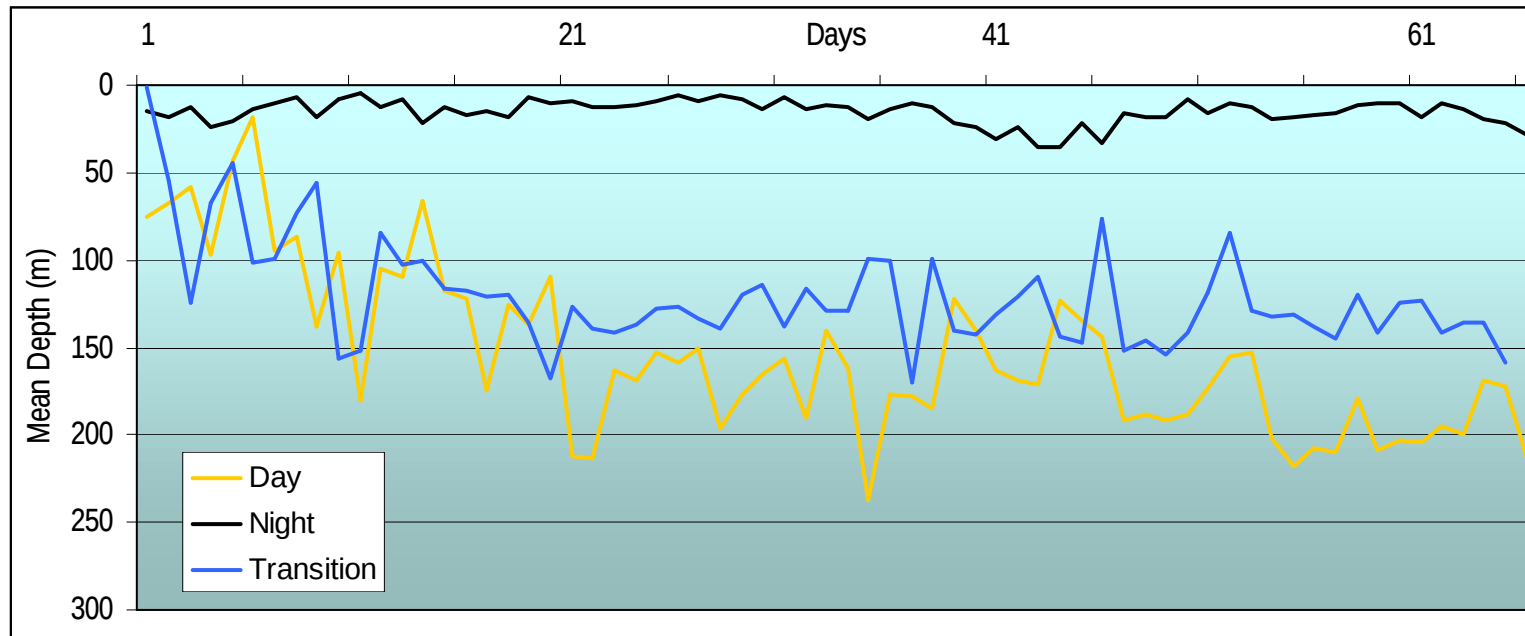




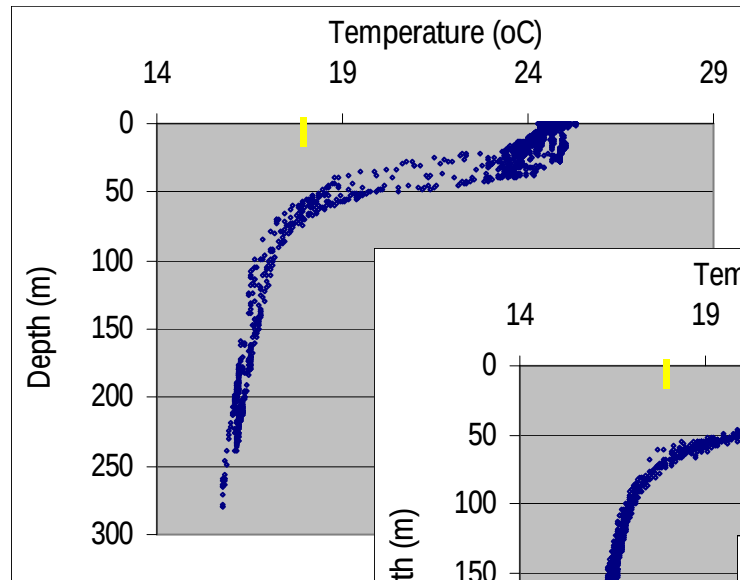
3 recovered tags (2 recaptures, 1 tag on the shore)



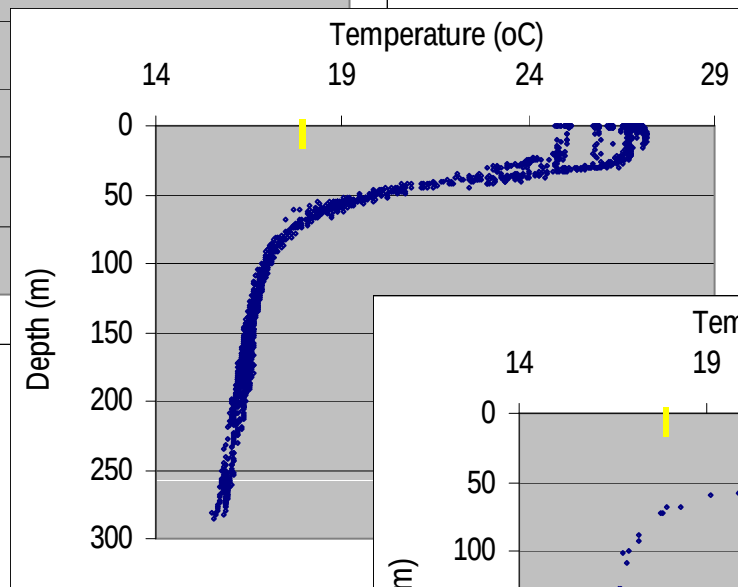




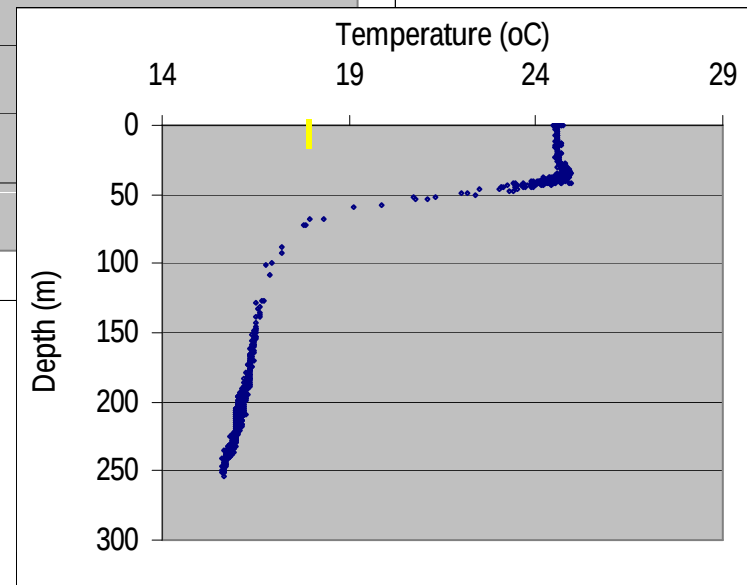
14-18 Jun 2010

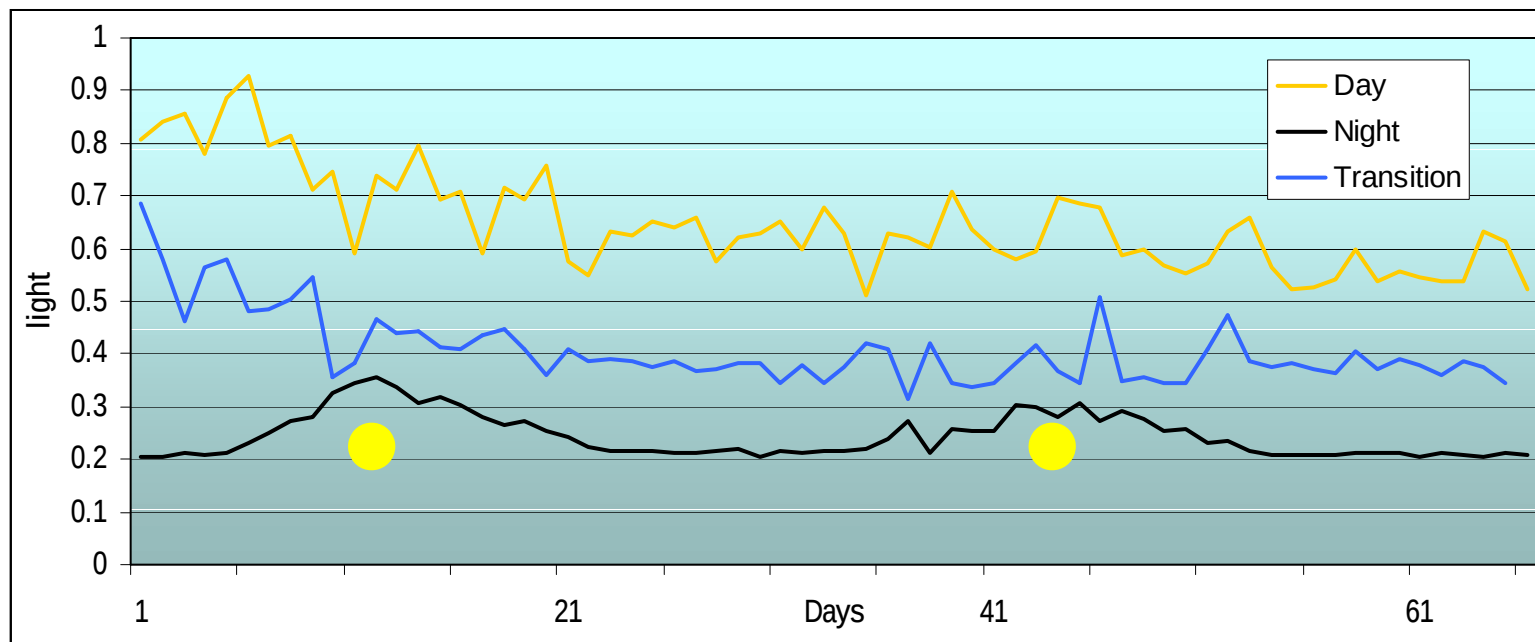
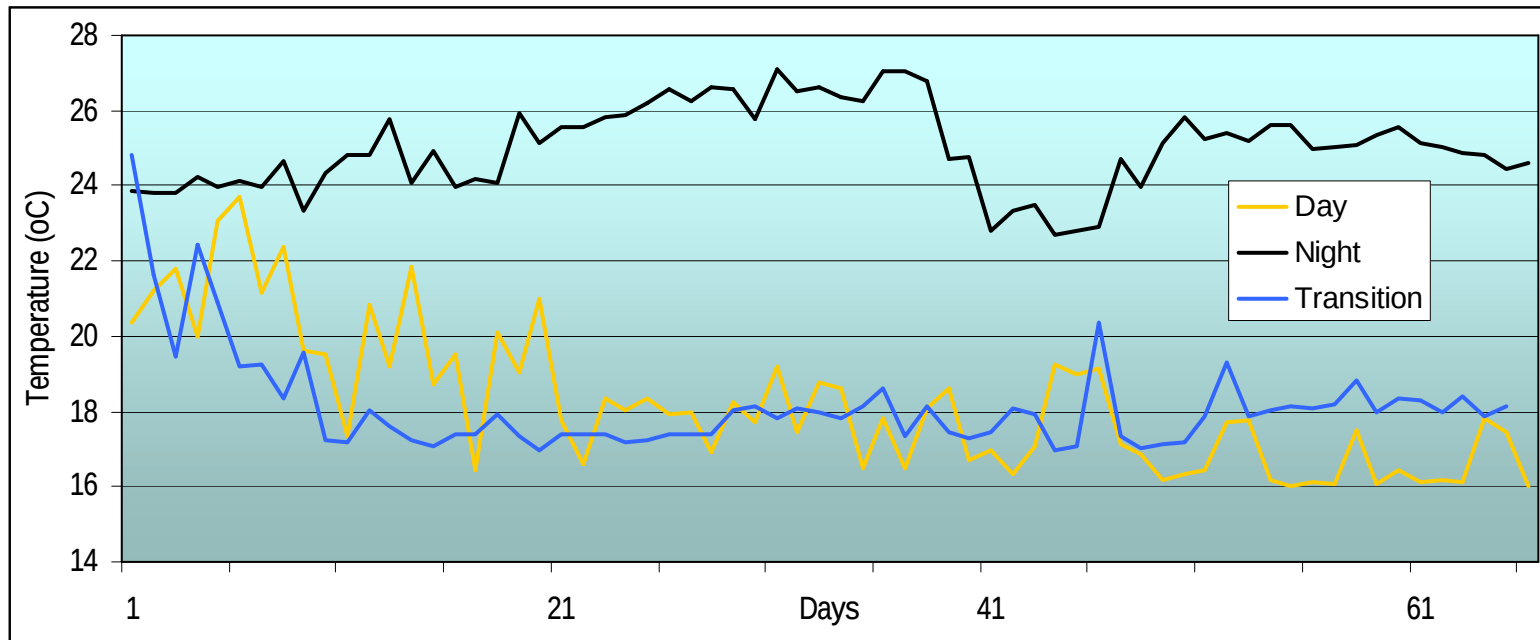


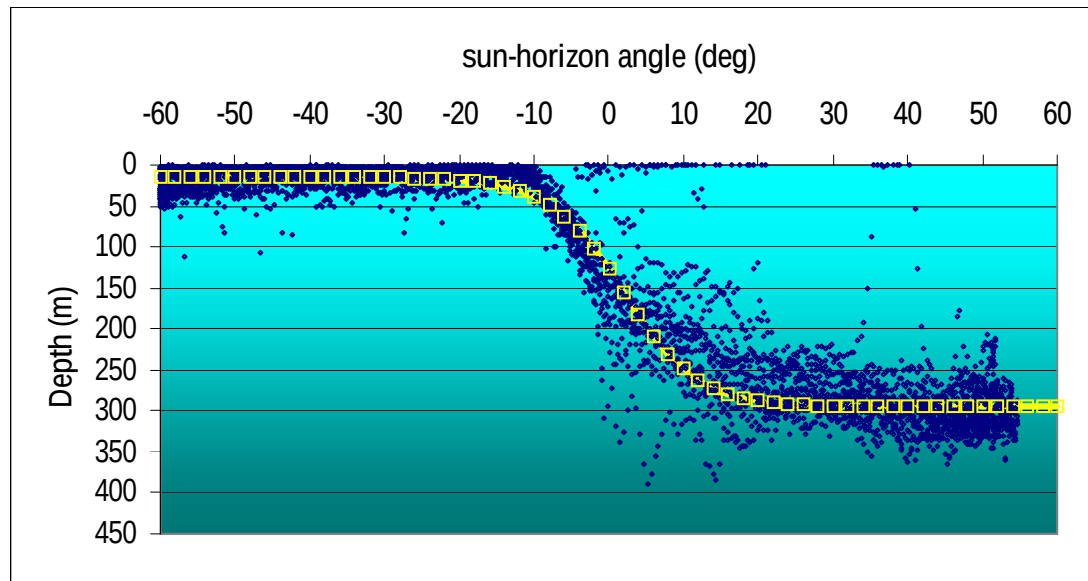
19-23 Jul 2010



16-18 Sep 2010

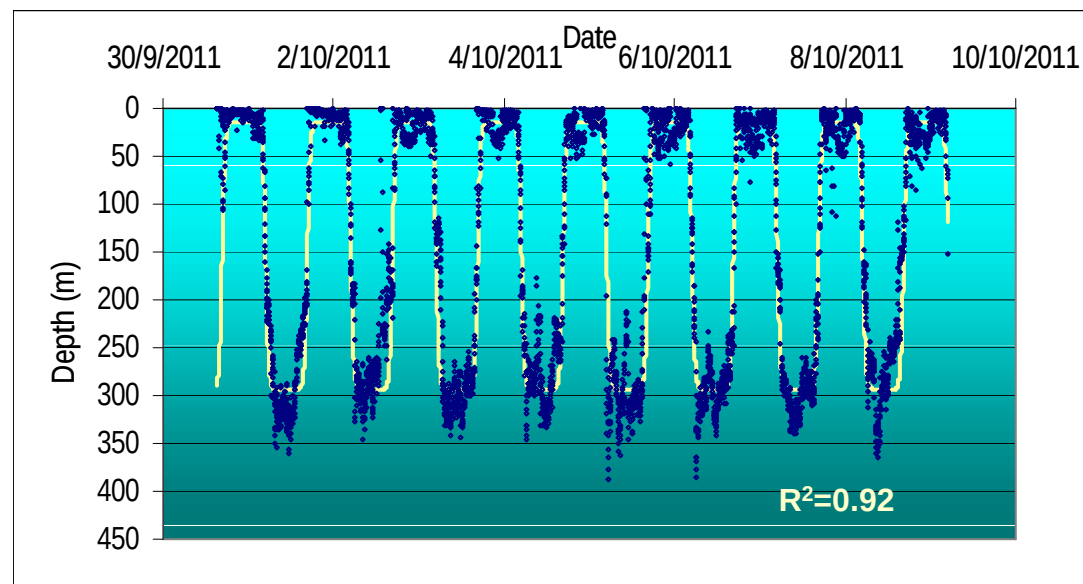


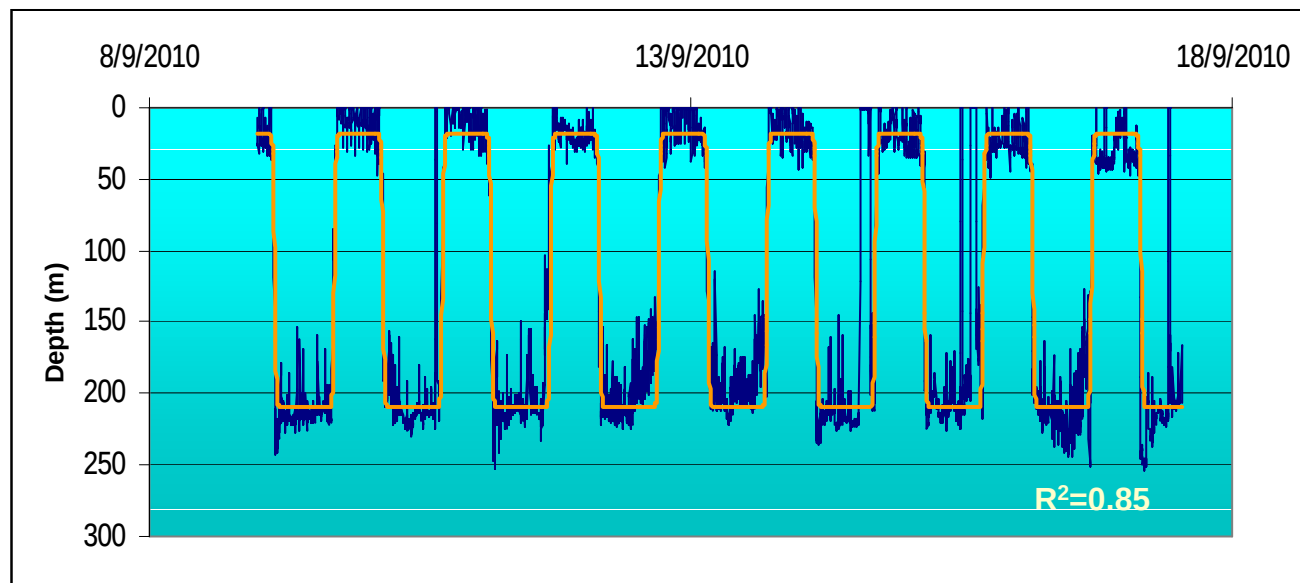
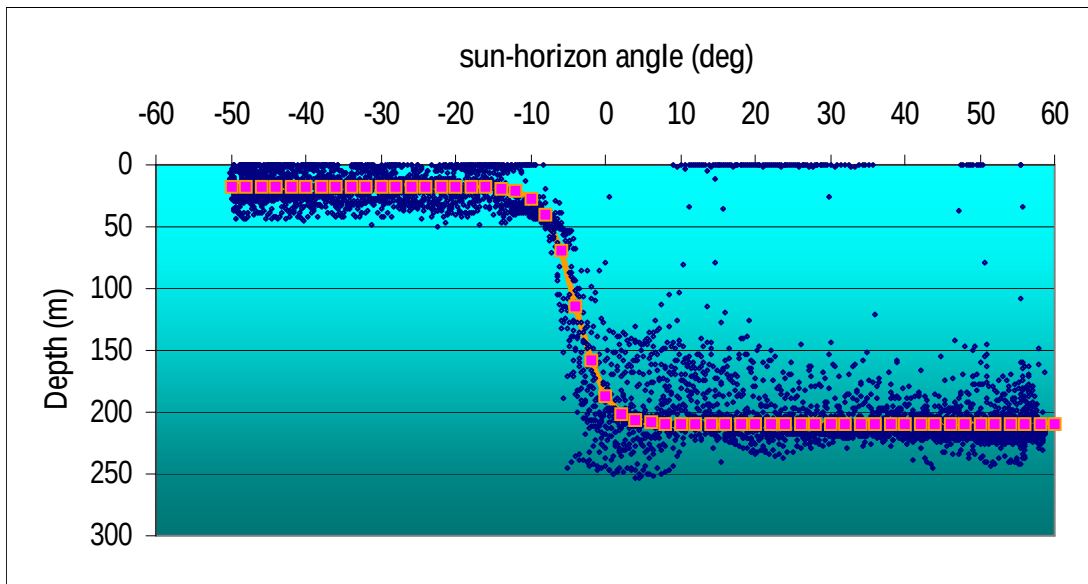


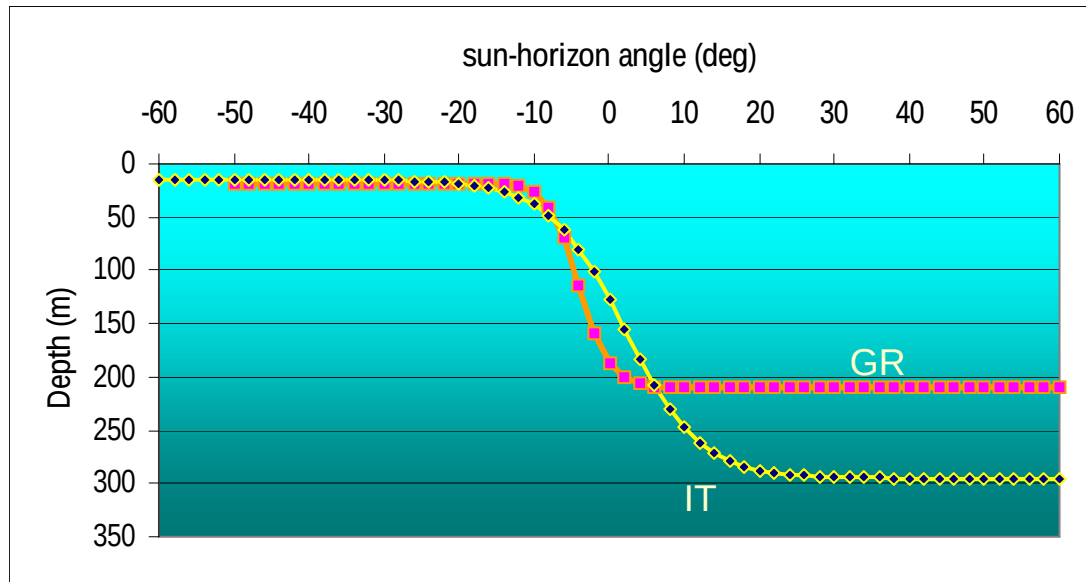


$$D = D_{\min} + (D_{\max} - D_{\min}) \frac{e^{r(a - a_{ref})}}{1 + e^{r(a - a_{ref})}}$$

Logistic equation [$depth = f(\text{sun angle})$]
Sun angle = $f(\text{lat, lg, date, hour})$







- “In normal conditions” the vertical position is predictable (timing and pattern)
- “troubled behavior”: environmentally induced or tagging effect?
- Are the between sites and seasons differences in max depth and pattern linked to environment?
- is the adult behavior different?



Thank
You

