Daily larval availability and settlement of *Tetraclita stalactifera* (Cirripedia) at Cabo Frio, Brazil: Effect of tidal and upwelling transport

Luís Felipe **SKINNER**

Historical view

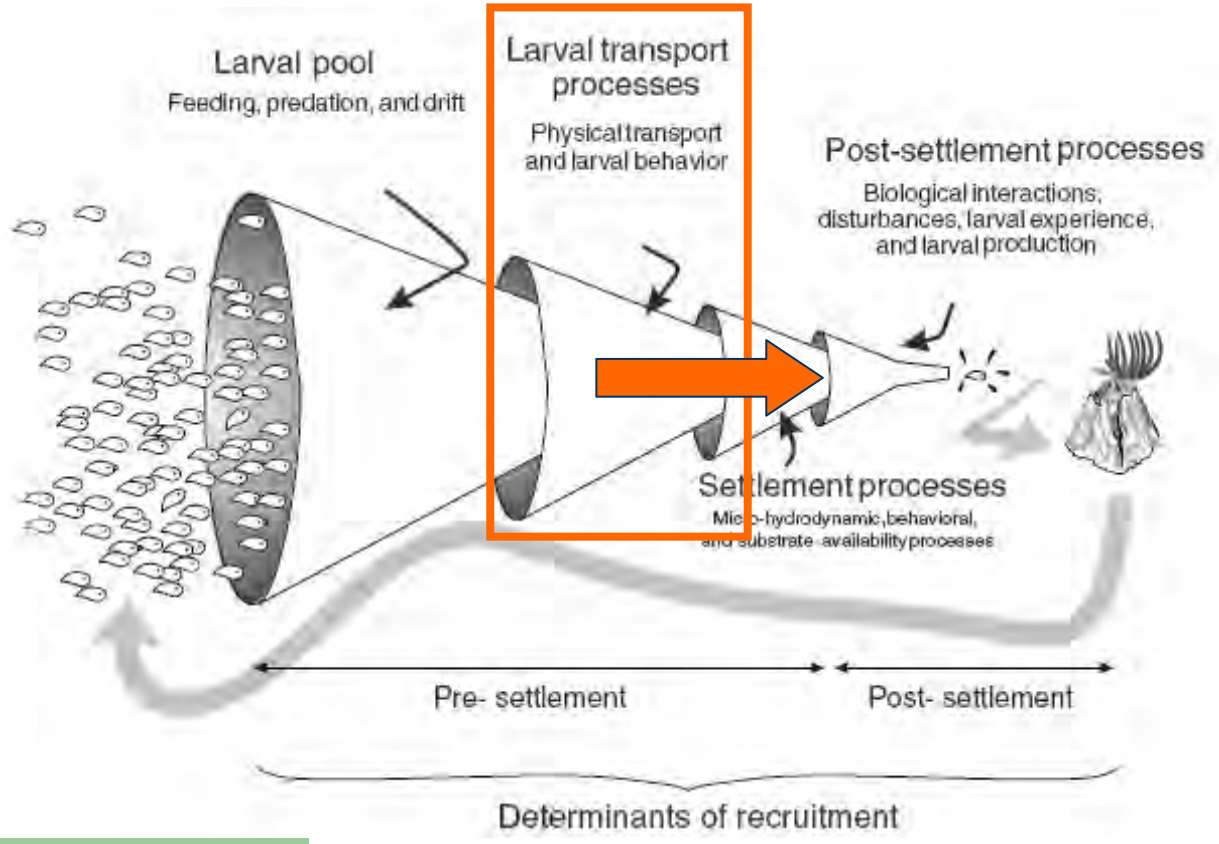
- The relationship between the availability of marine invertebrate larvae and benthic settlement or recruitment on rocky shores has been a provocative question in marine ecology

- Variations in the systems of winds, tides, day-night cycles, fluctuations in upwelling and physicochemical characteristics of water as factors that influence the distribution of larvae and, consequently, the processes of settlement/recruitment and community structure

Upwelling

Tidal cycle

Fig. 1 Processes influencing recruitment in bottom-dwelling species. Modified from Pineda (2000)

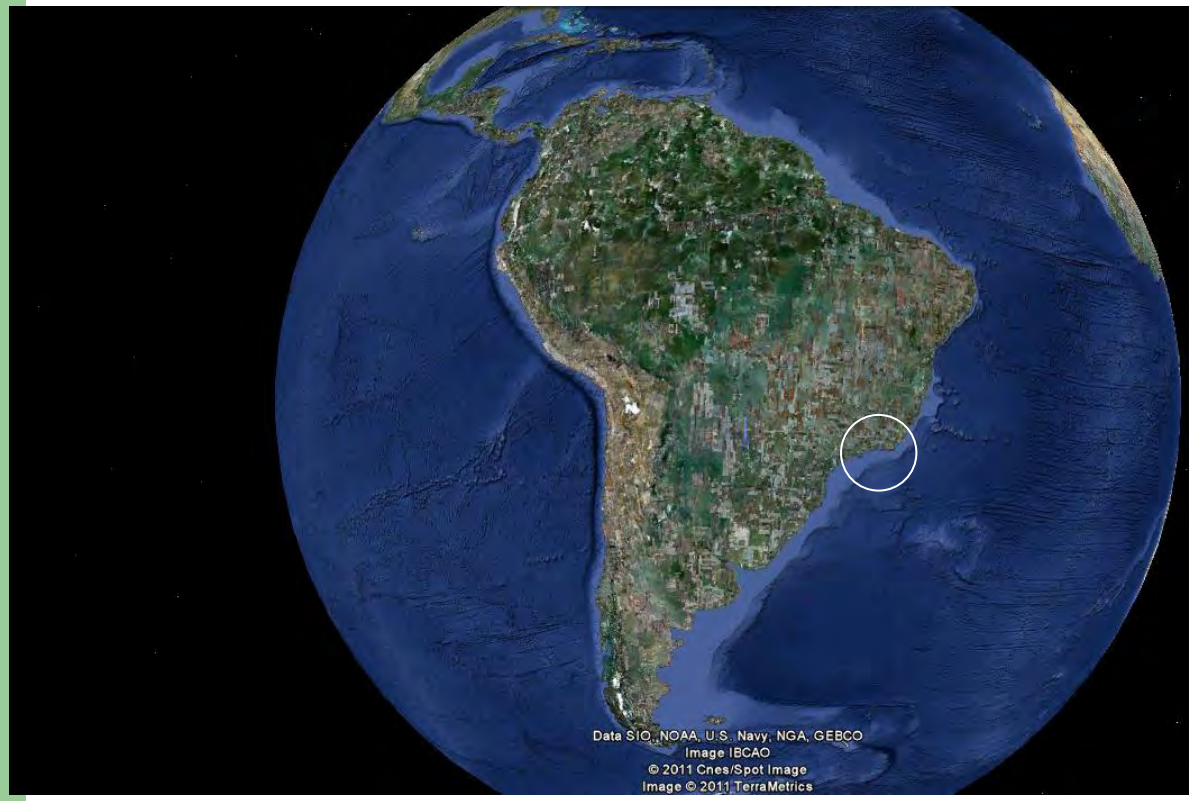


Pineda et al., Popul Ecol (2009) 51:17–32

Model organism

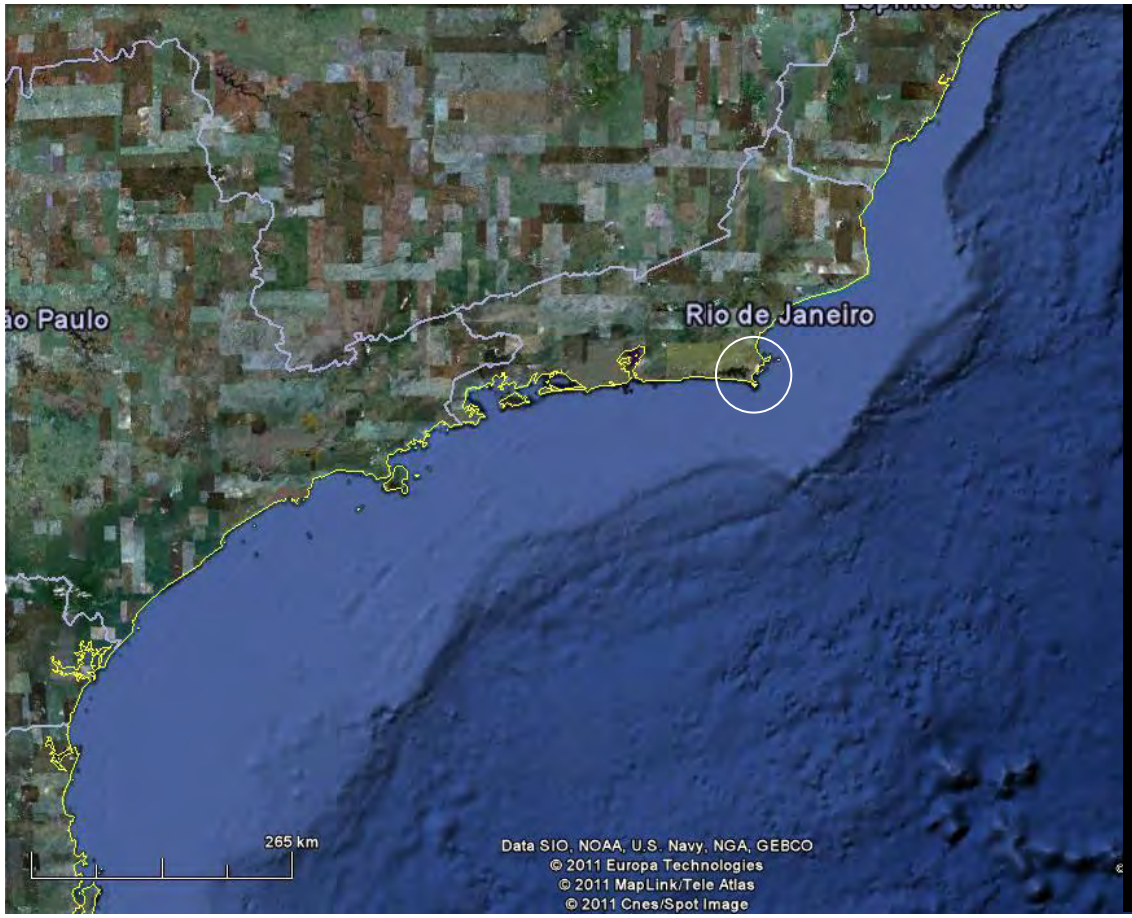
- Intertidal Barnacle ***Tetraclita stalactifera***
- Lives only in middle to upper intertidal zone. From N to S of Brazil

Study site



- Southeastern Brazilian coast (west south atlantic)
- Upwelling region (South Atlantic Central Water - SACW)

Study site



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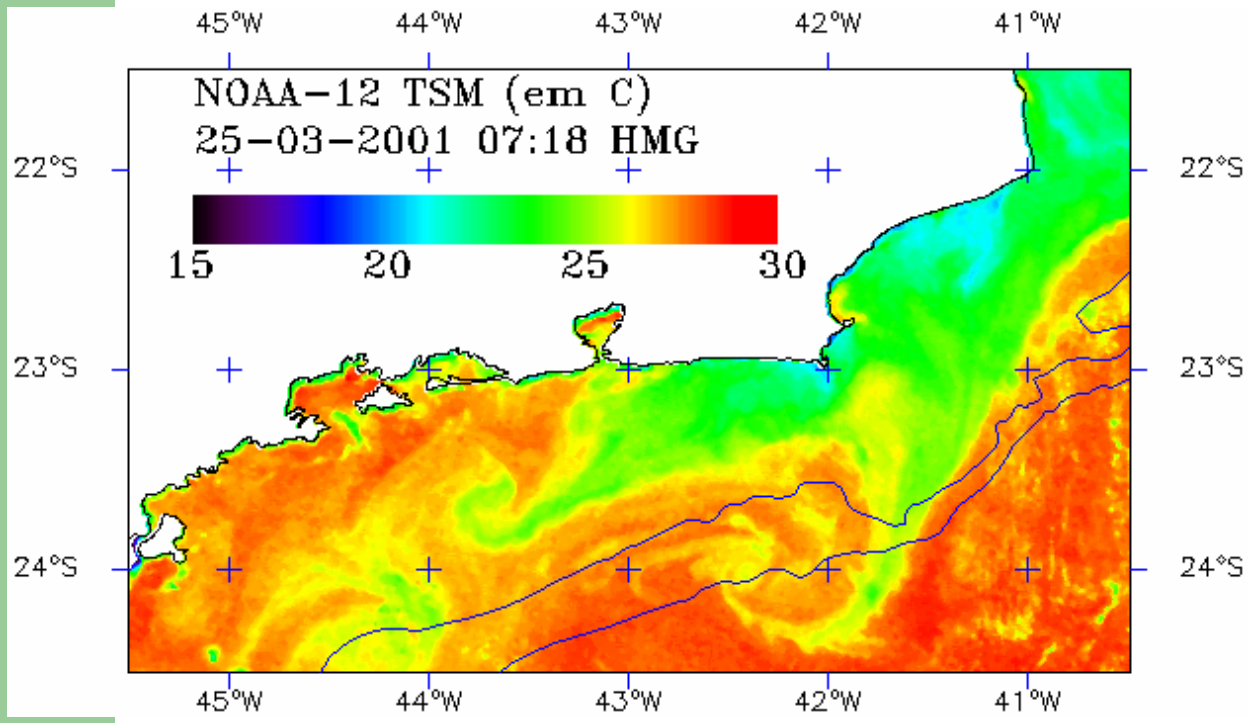
Study site

Non upwelling



- Southeastern Brazilian coast (west south atlantic)
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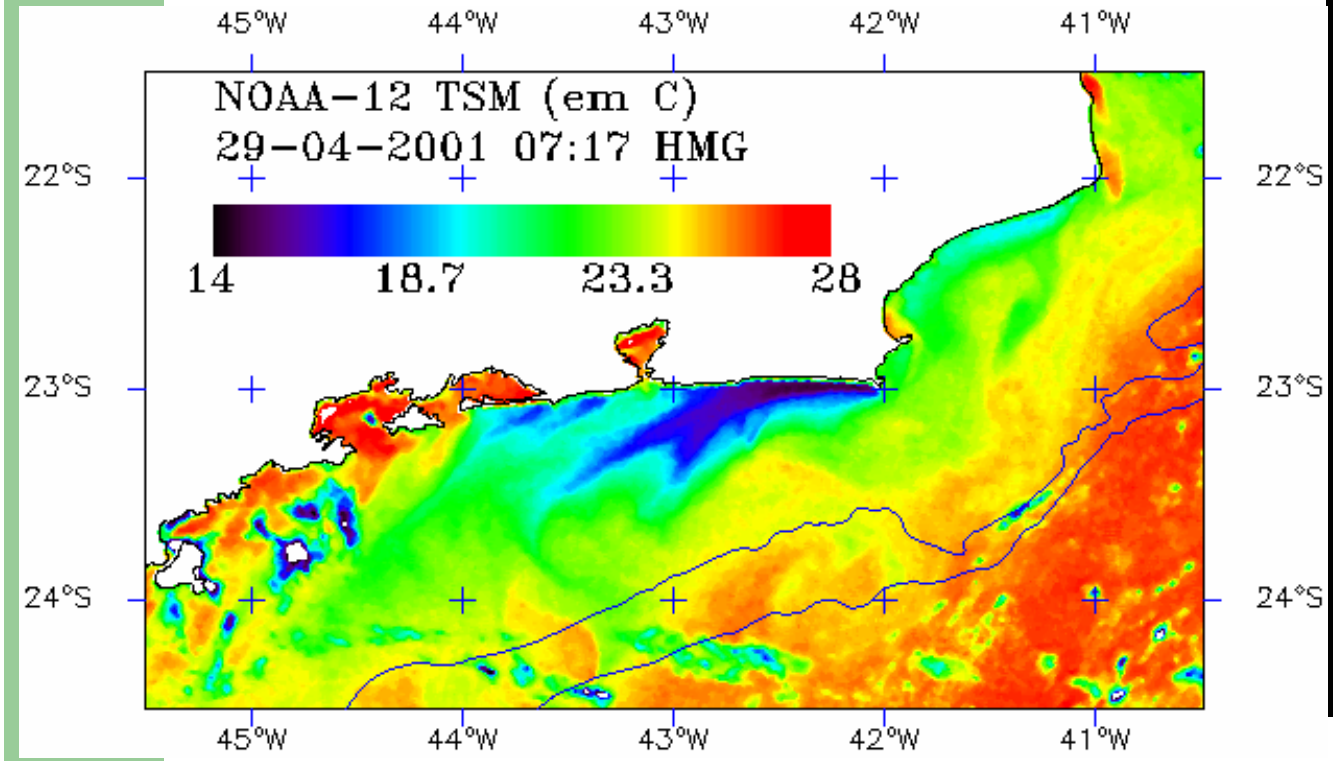
Study site

Upwelling



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Study site


Arraial do Cabo - Upwelling
3.92 km
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2011 TerraMetrics
Image © 2011 GeoEye
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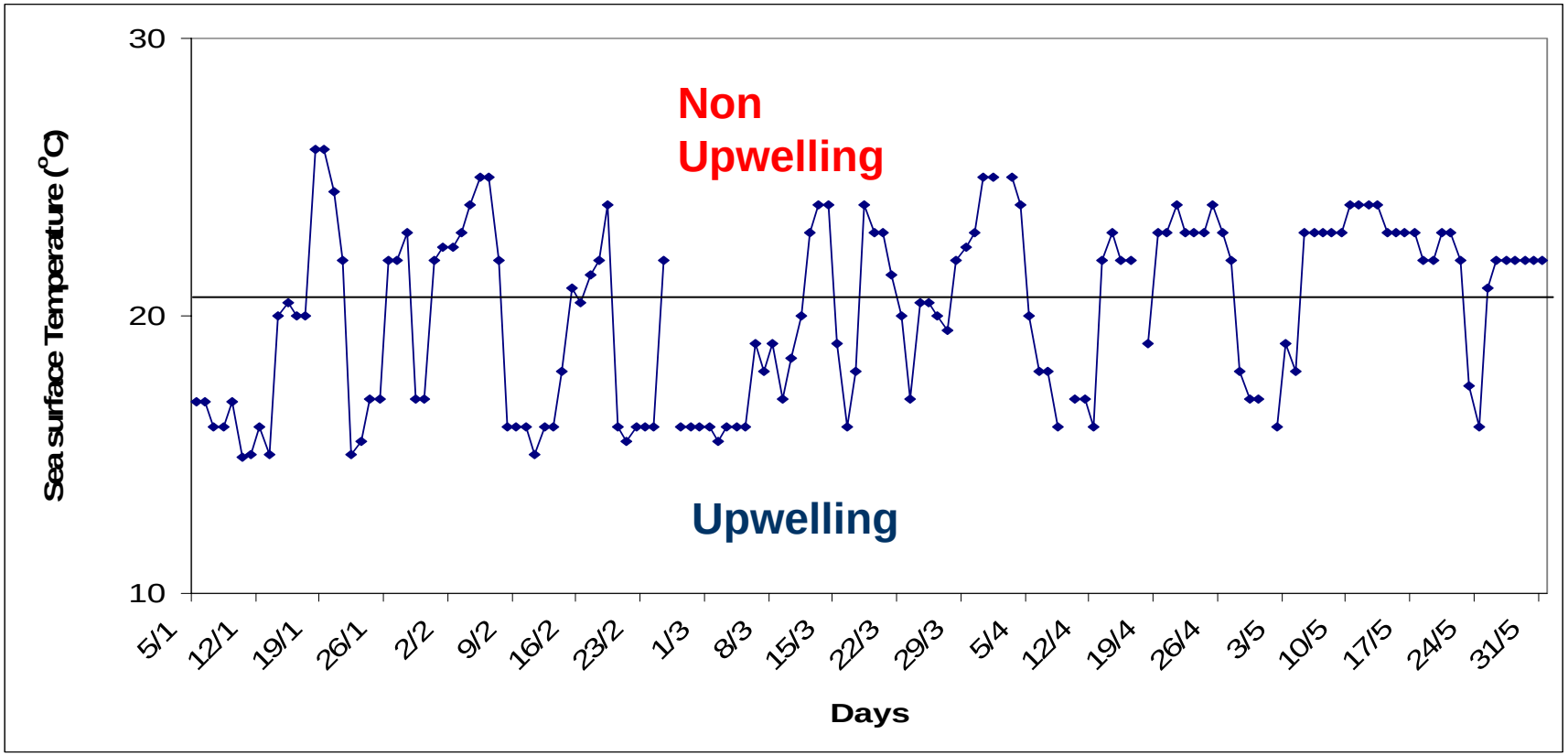
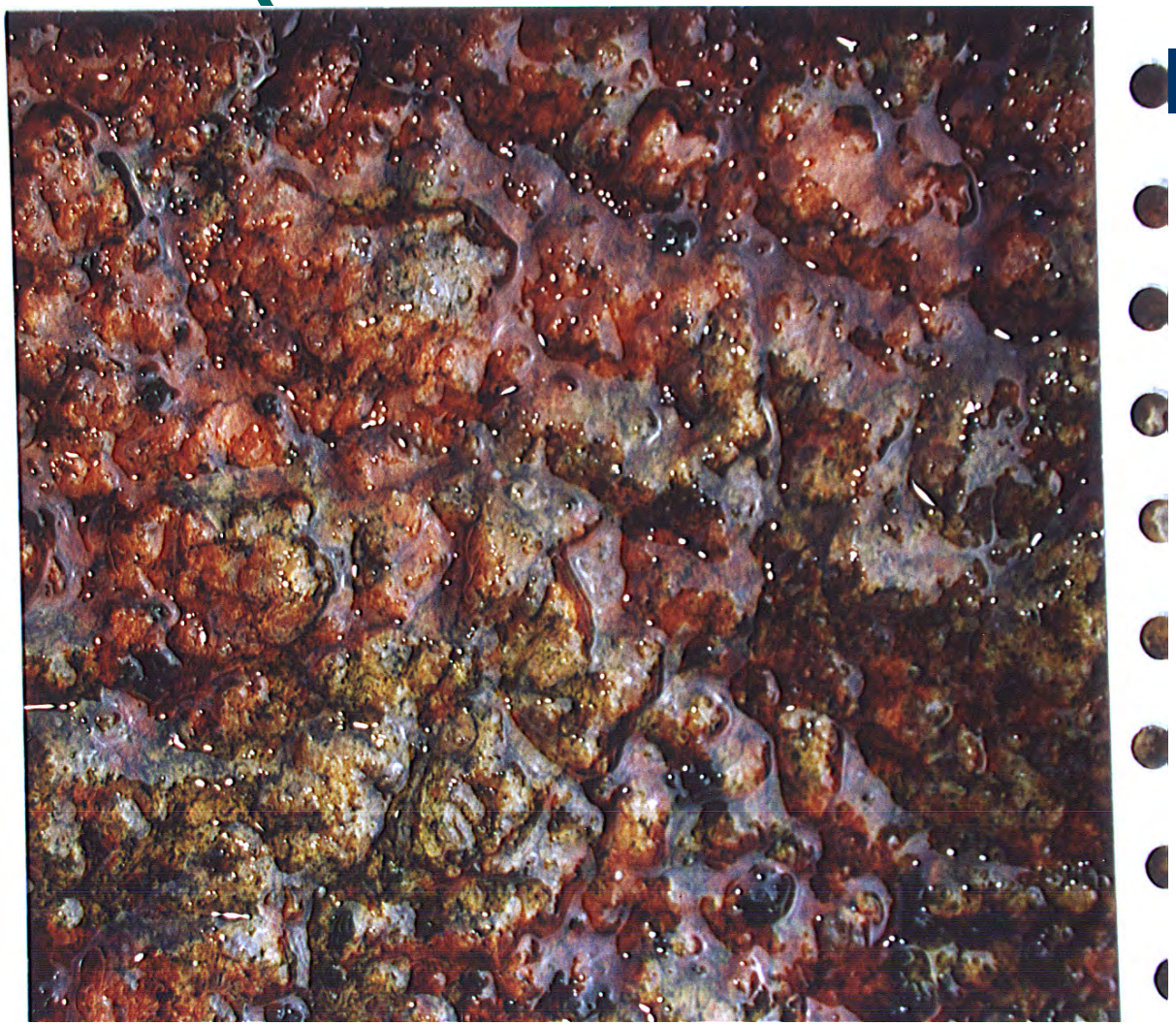
Sampling design

- Daily sampling from January up to May, 2000 (150 days)
- Plankton sampling directlly over rocky shore during diurnal low tide
- Daily Barnacle settlement observations

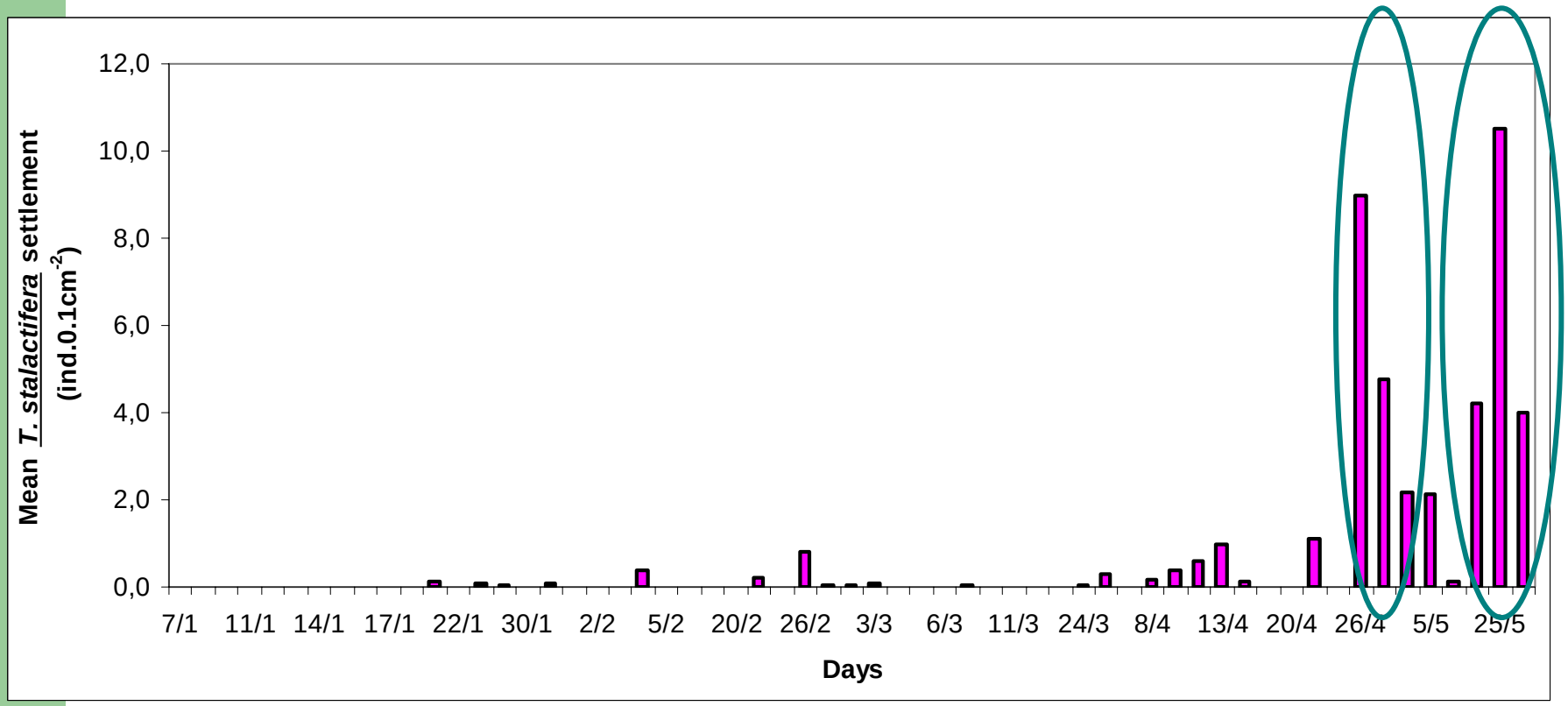
Results (sea surface temperature)



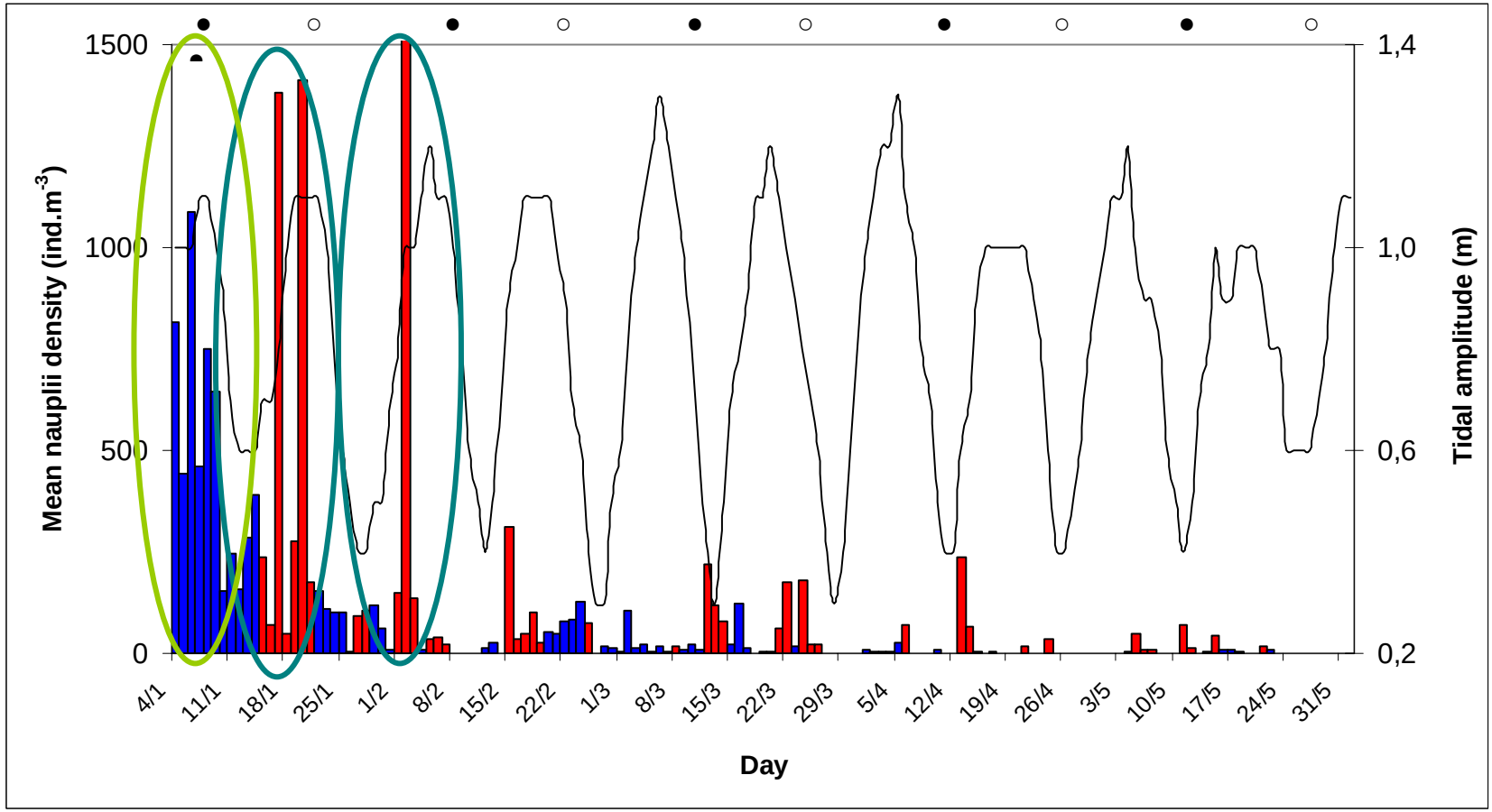
Results (*Tetraclita* settlement)



Results (*Tetraclita* settlement)

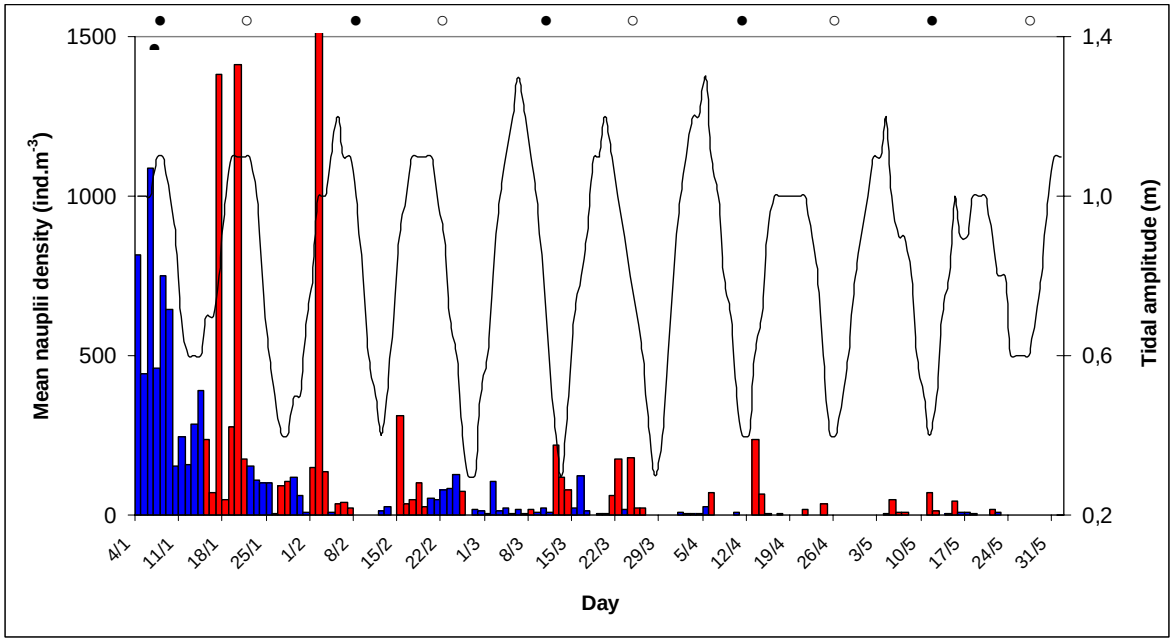


Results (Nauplii availability)



ANOVA Results (Nauplii availability)

Factor	F	p
Tide (N or S)	0,095	0,7577
Upwelling (Y or N)	1,57	0,2107
Tide x Upwelling	**7,52**	**0,0064****



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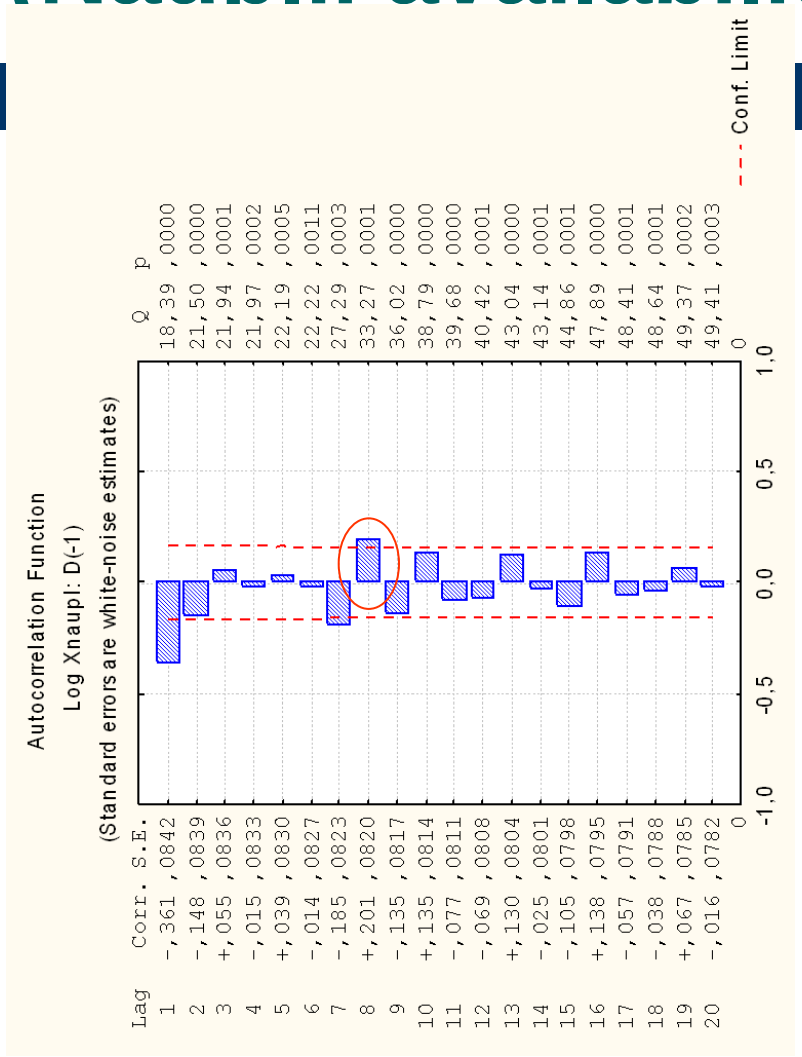
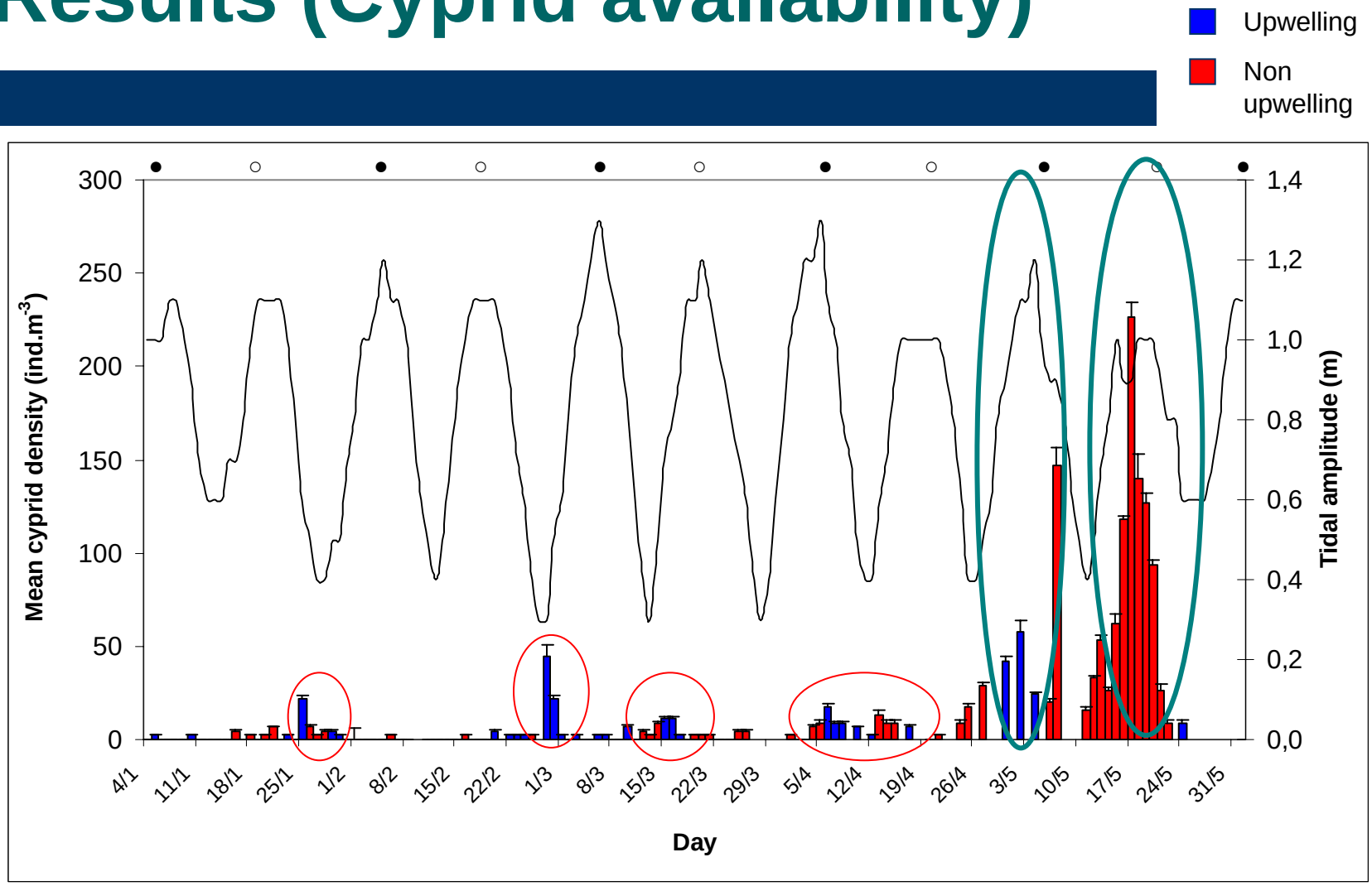
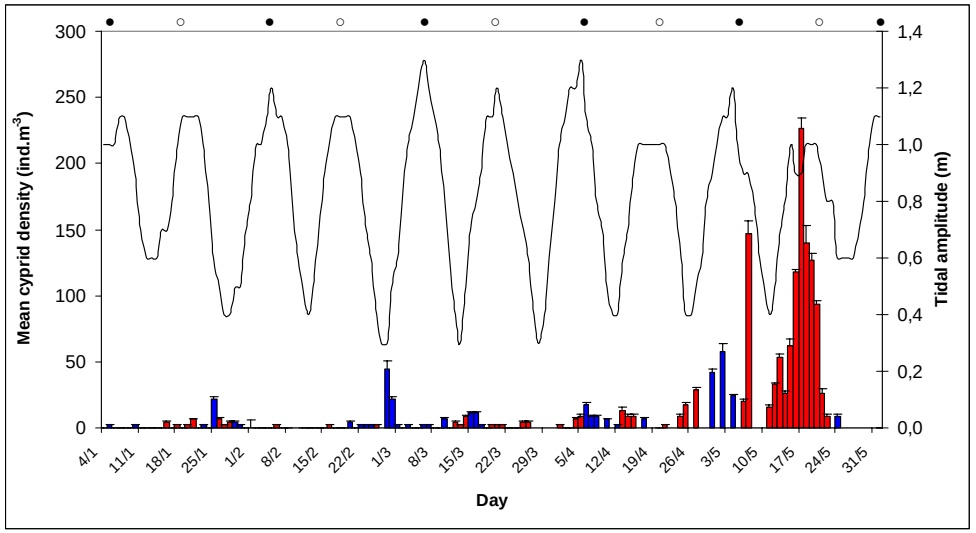


Results (Cyprid availability)



ANOVA Results (Cyprid availability)

Factor	F	p
Tide (N or S)	0,0079	0,929095
Upwelling (Y or N)	**7,8390**	**0,005402**
Tide x Upwelling	0,3450	0,557336



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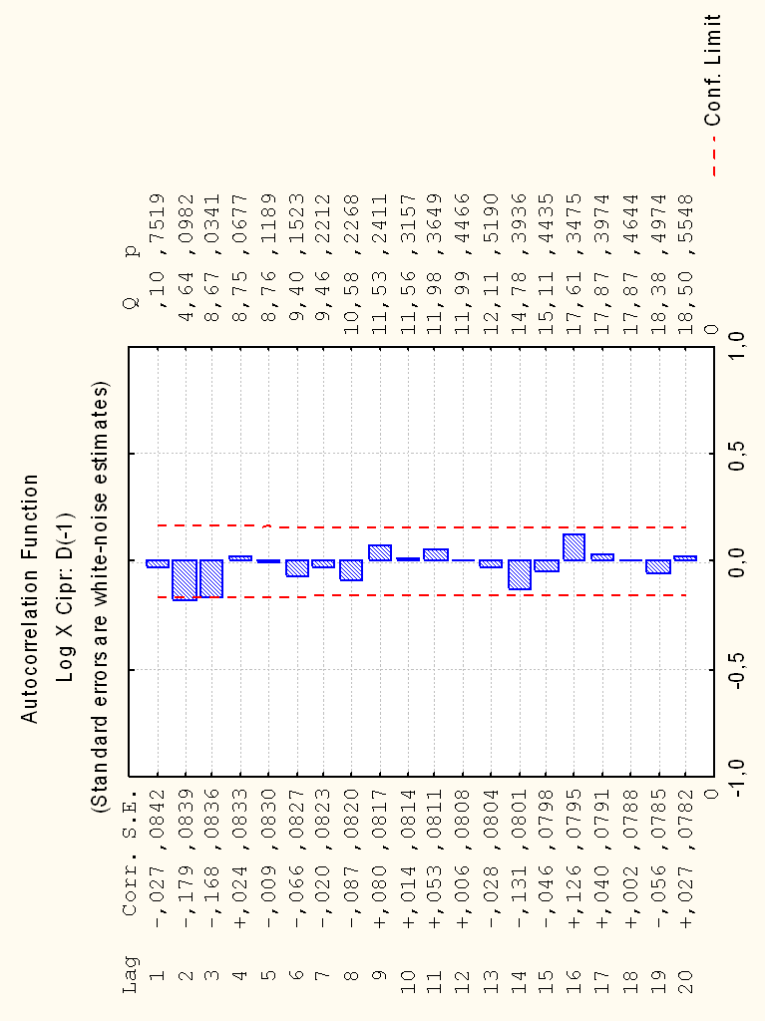

Conclusions

- Nauplii availability is related to tide and Upwelling. Strong changes on these factors could promote inshore/offshore transport of larvae

- Cyprid availability is related to non upwelling times indicating inshore transportation of larvae. Higher cyprid densities during spring tides could indicate the influence of tidal transport.

- *Tetraclita stalactifera* settlement increases during non upwelling events (inshore transportation).

Thank you ! Gracias !

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- http://benthos-uerj.blogspot.com/