
INSTITUTE OF MARINE RESEARCH
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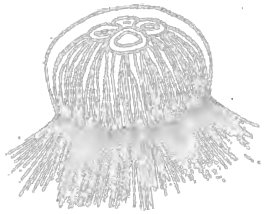
Scyphozoan jellyfish trends during 1992-2010 at Flødevigen, Southern Norway



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Lars Johan Naustvoll

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Jellyfish increase

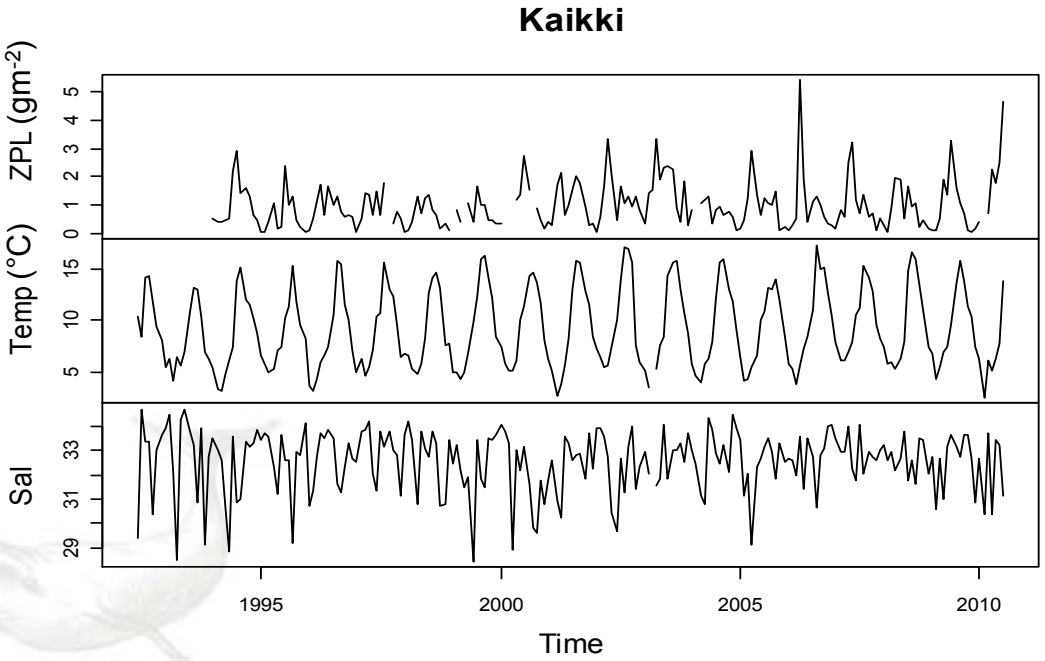
- Problems several places
  - Fisheries, tourism, industry
- Anthropogenic causes
  - Overfishing, eutrophication, lower visibility and O_2, introduced species, climate change, artificial constructions etc.
- BUT: Few time series

Explanatory variables (monthly)

- Temperature at 20 m
- Salinity at 20 m

} Lista

- Zooplankton DW 0-50 m (1994 →)



→ Deseasonalised & detrended

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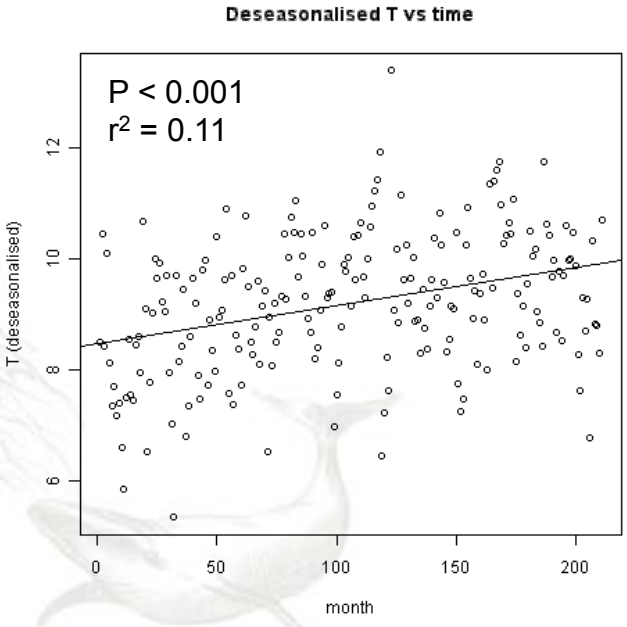
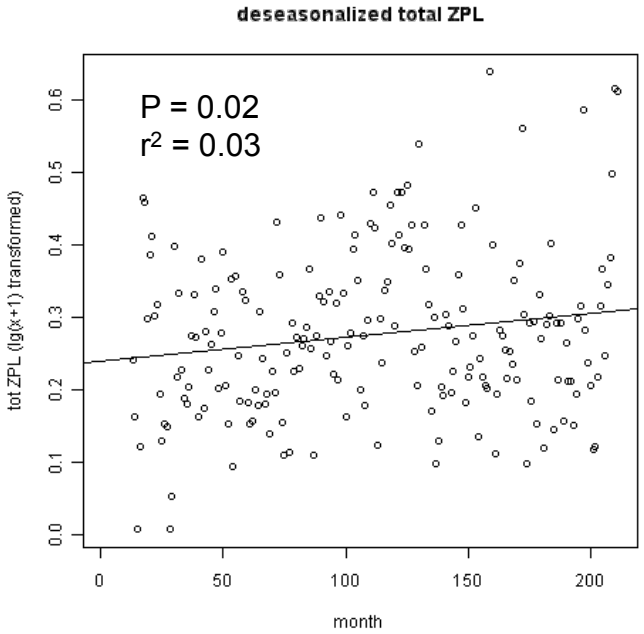
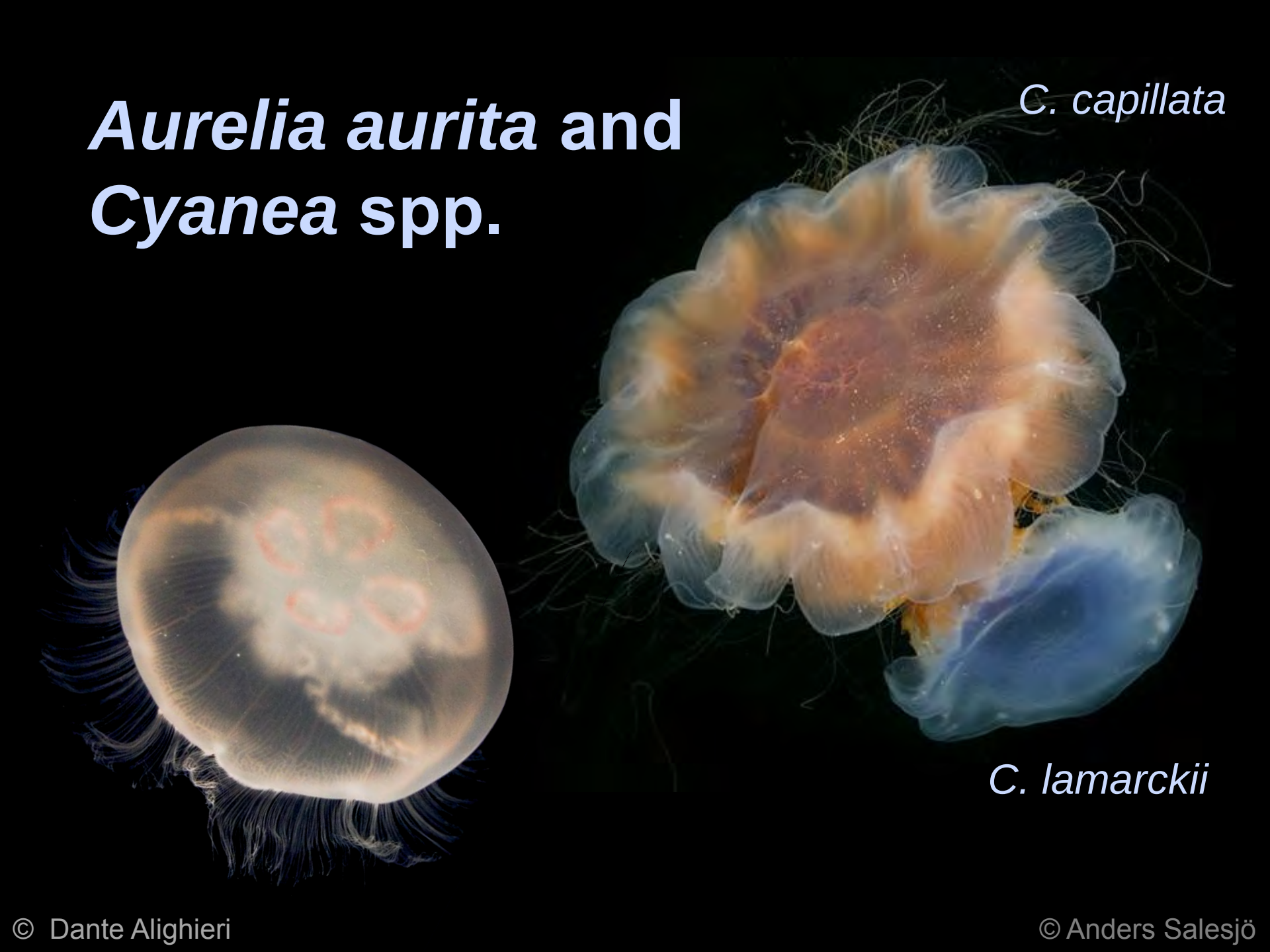




→ Deseasonalised & detrended

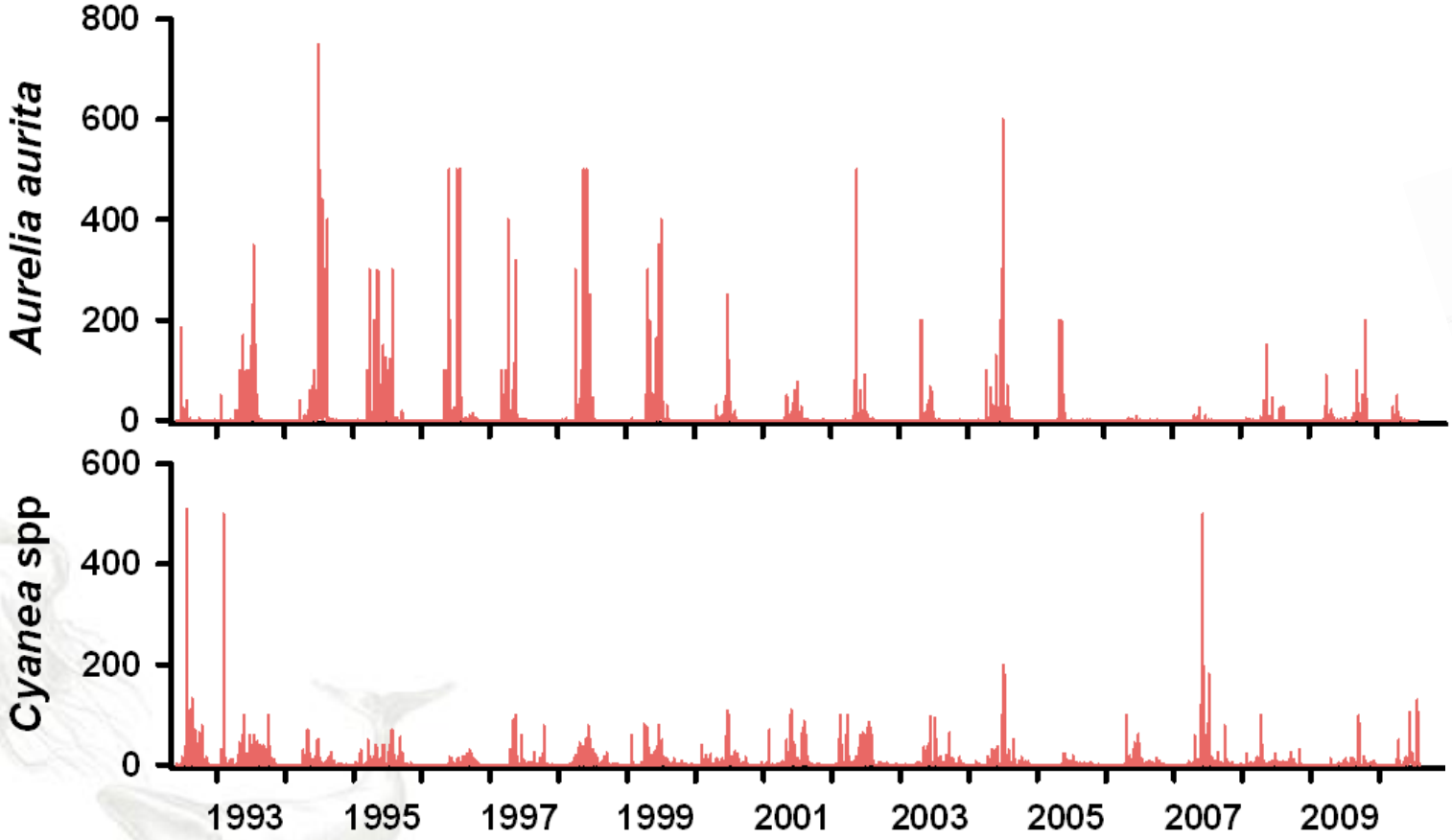
Aurelia aurita and *Cyanea* spp.

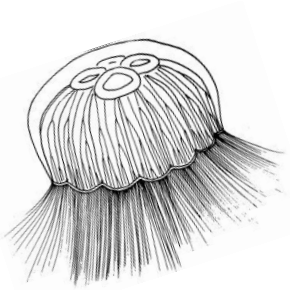


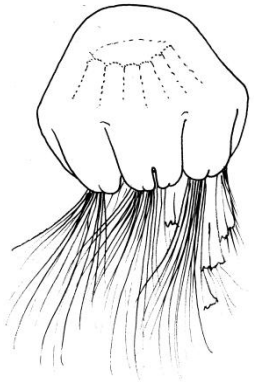
C. capillata

C. lamarckii

Daily observations

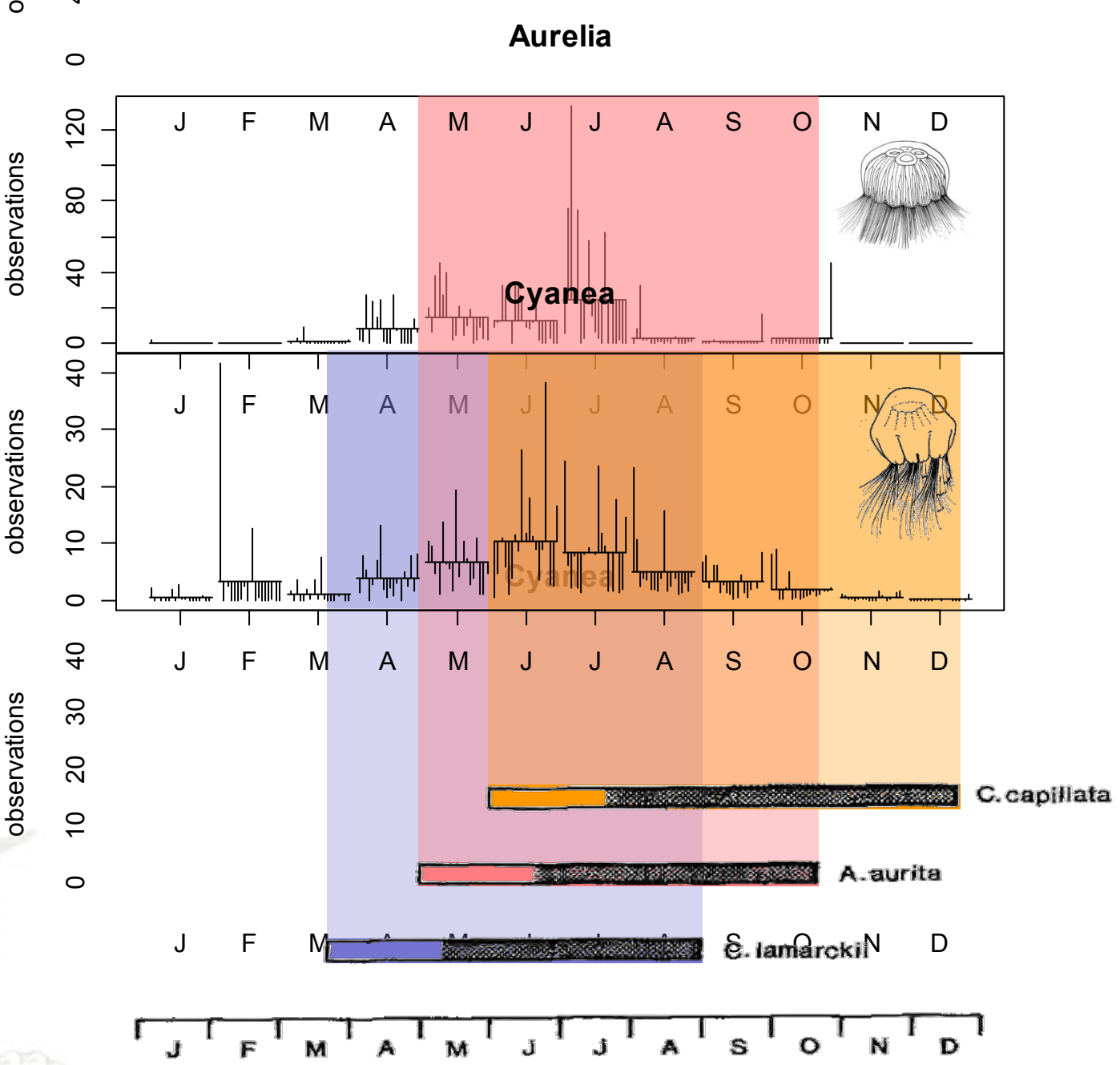




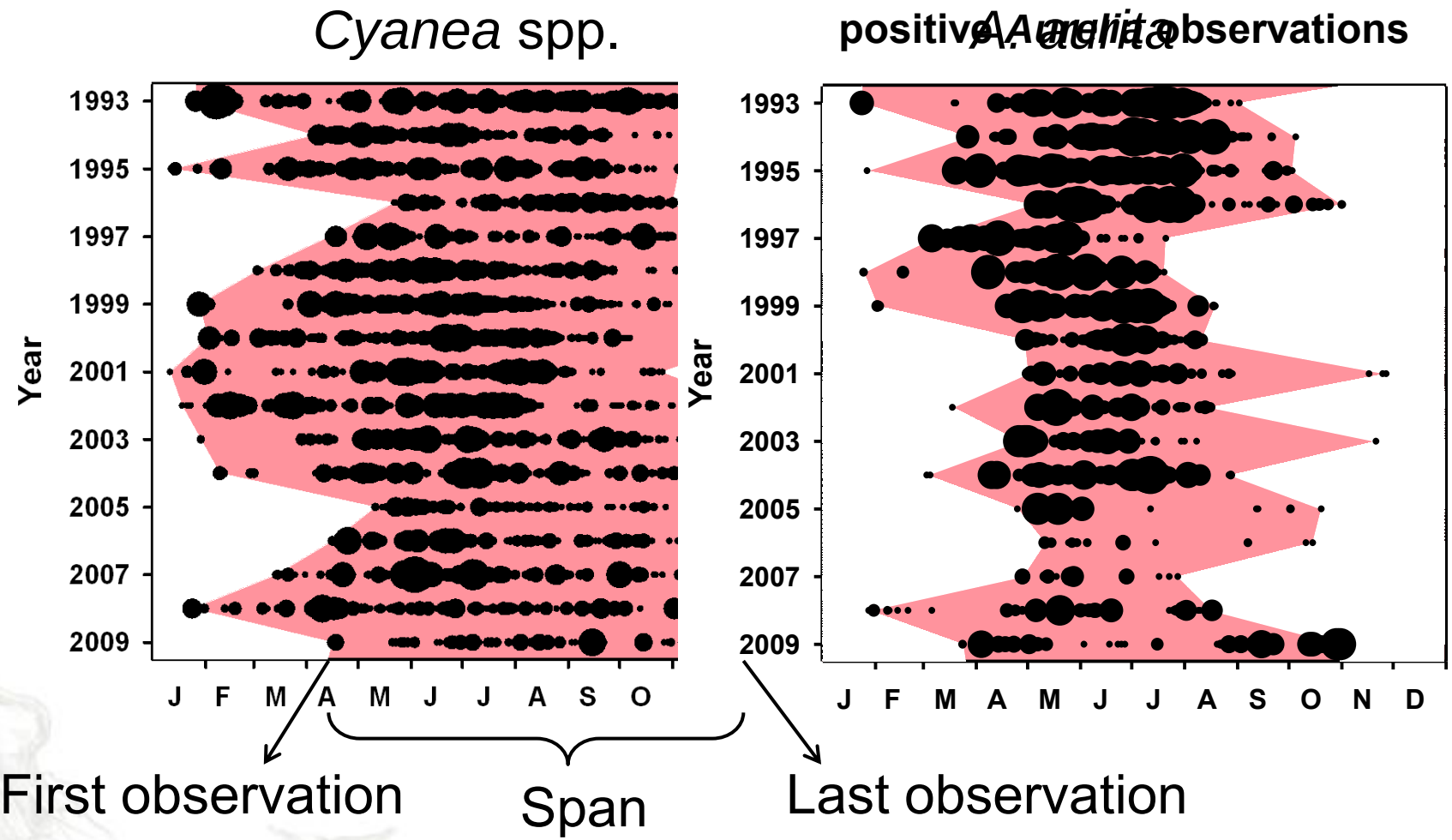


A. aurita

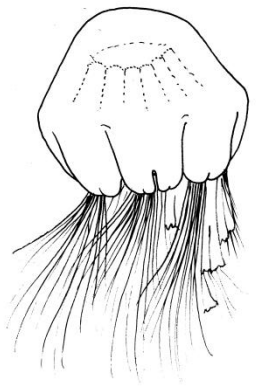
Cyanea spp.



Modified from Gröndahl 1988



- % positive observations within span
- Average positive observation



first C
last C
span C
% pos C
av pos C
first A
last A
span A
Res % pos A
Res av pos A

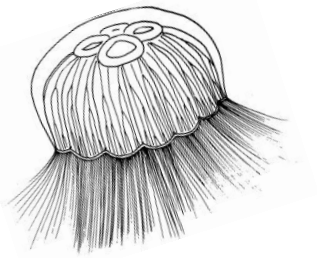
-0.83
-0.64
-0.57
0.70
0.66
0.56
-0.59
-0.53
0.61

p (Spearman):

0.05 - 0.01

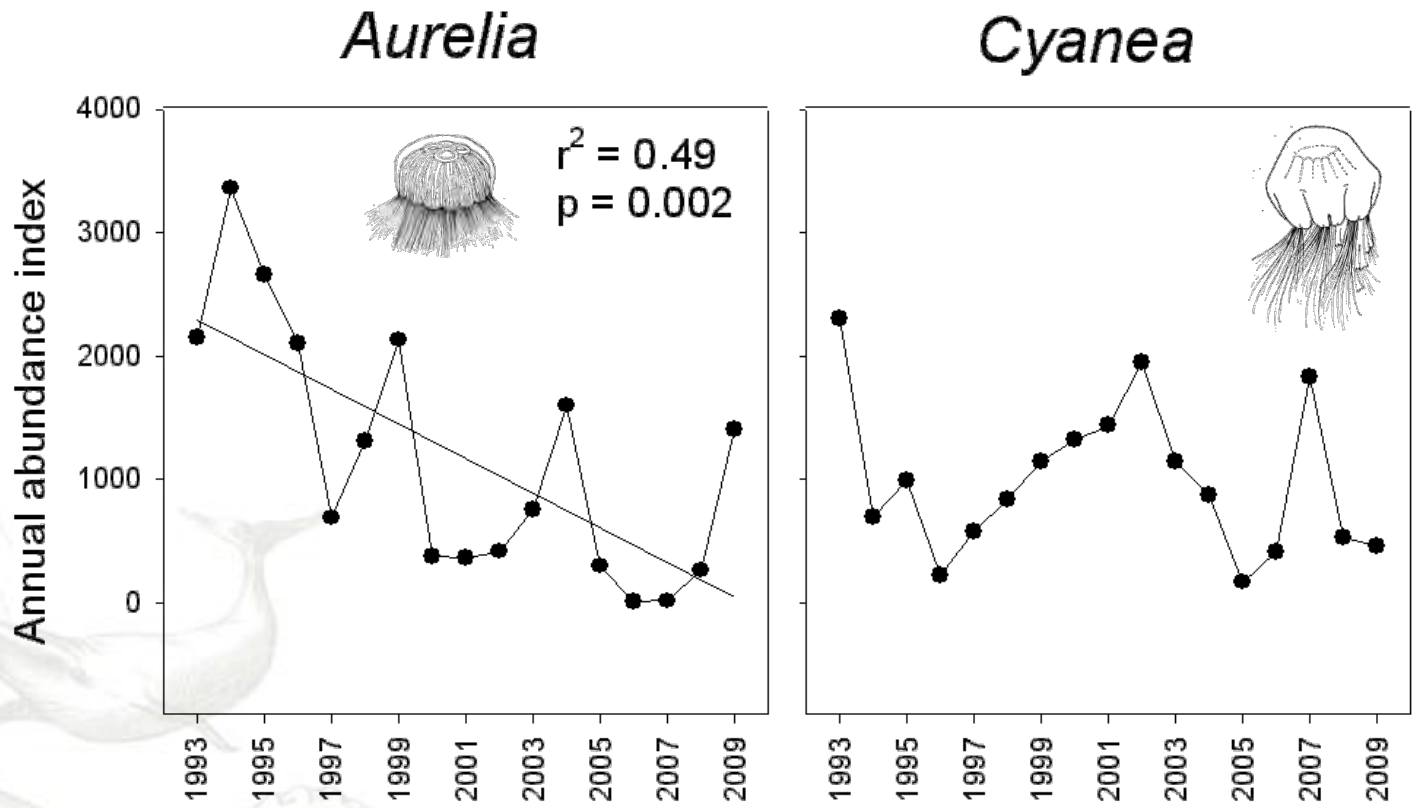
0.01 - 0.001

< 0.001



Index of annual abundance

span * % pos. obs. * average pos. obs.

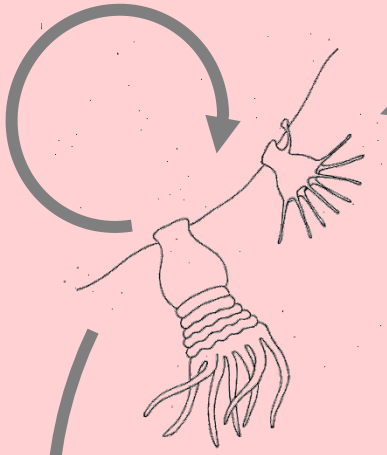


Jellyfish life cycle

Asexual reproduction

POLYP

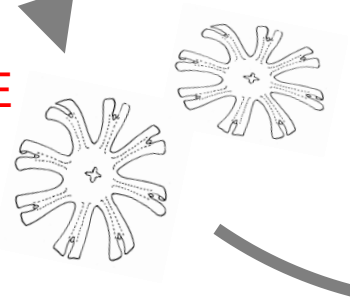
Strobilation

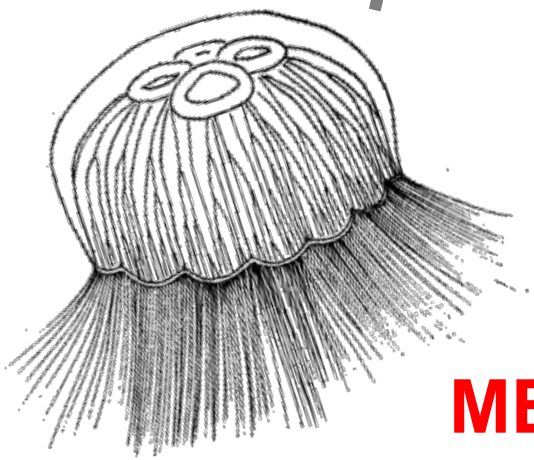


PLANULA LARVAE

Sexual reproduction

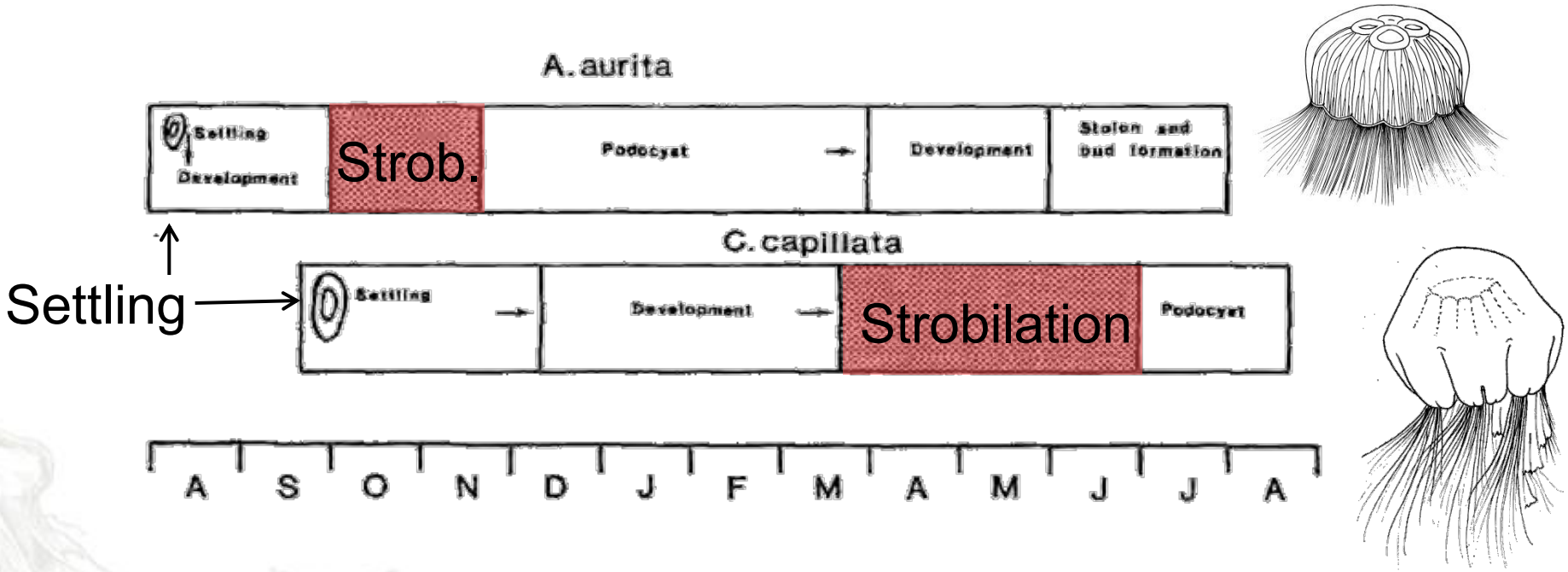
EPHYRAE





MEDUSA

Seasonal development of polyps

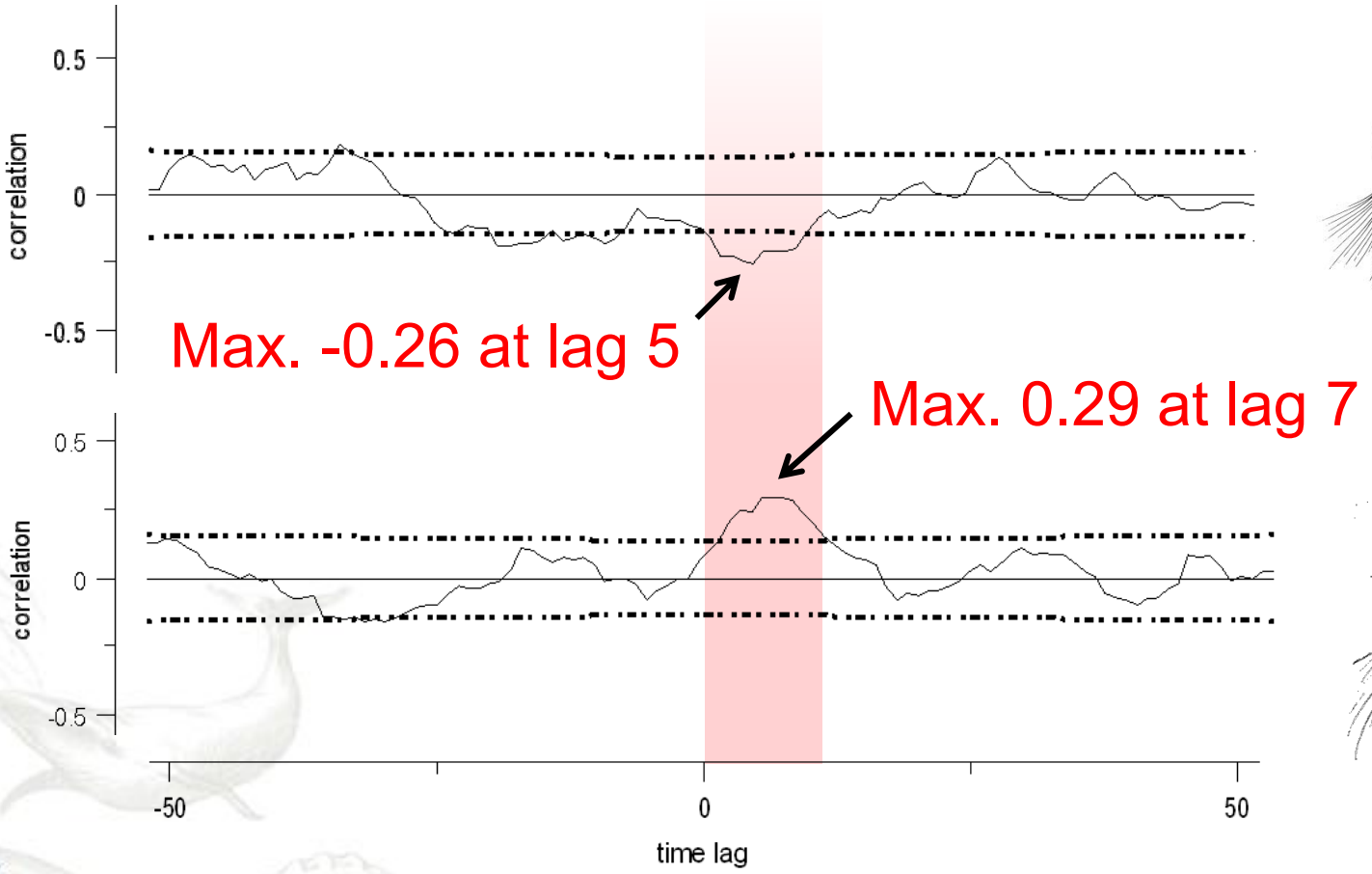


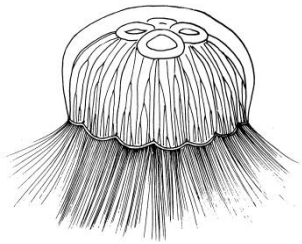
Set seasonality – varies between populations

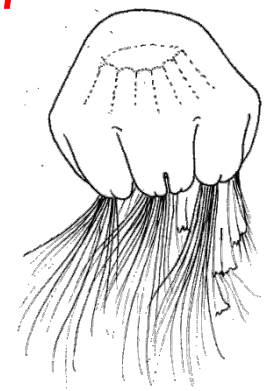
Modified from Gröndahl 1988

Abundance index vs. T anomaly

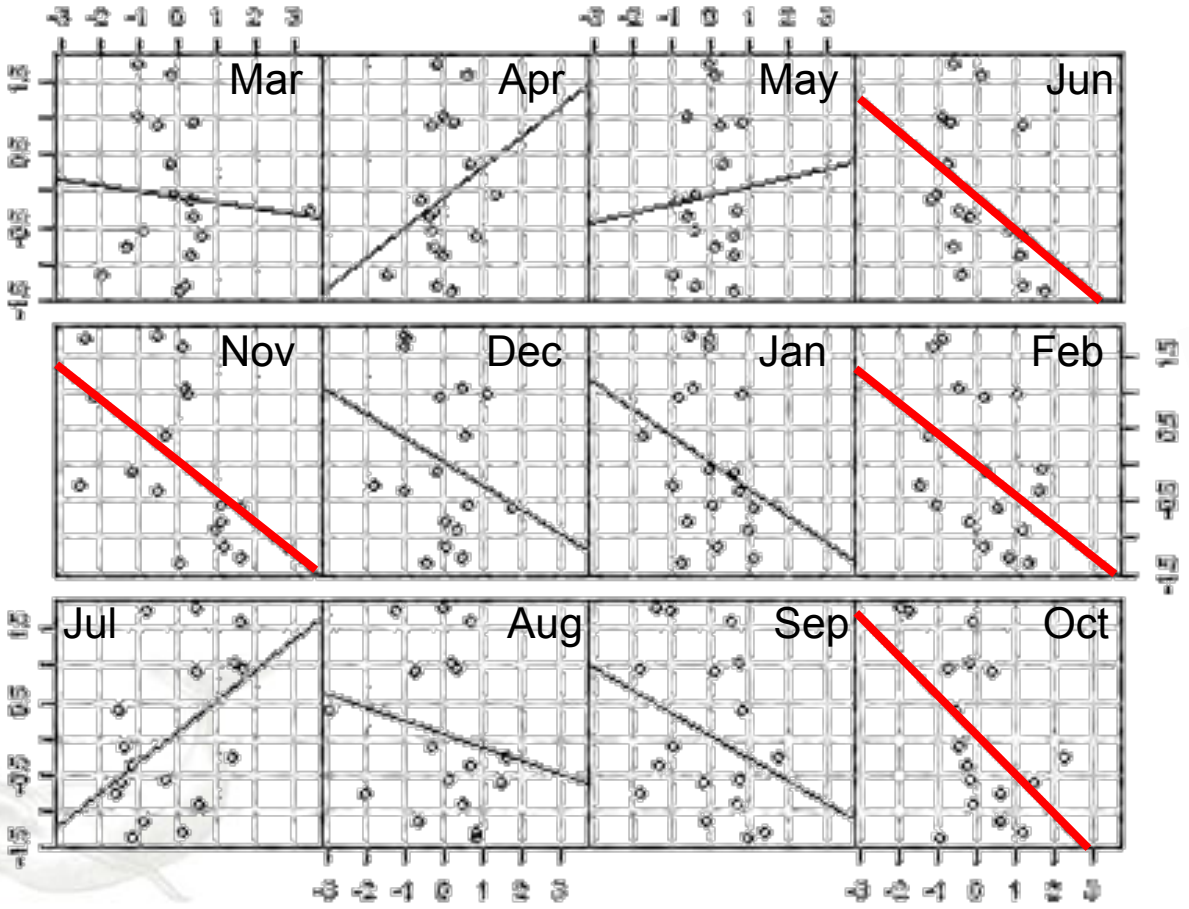
crosscorrelations

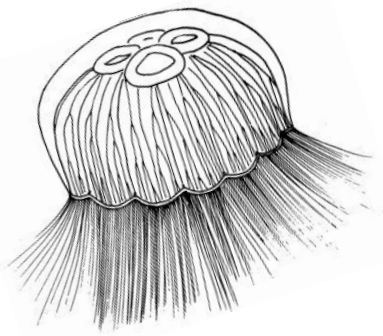






T effect: preceeding 12 months





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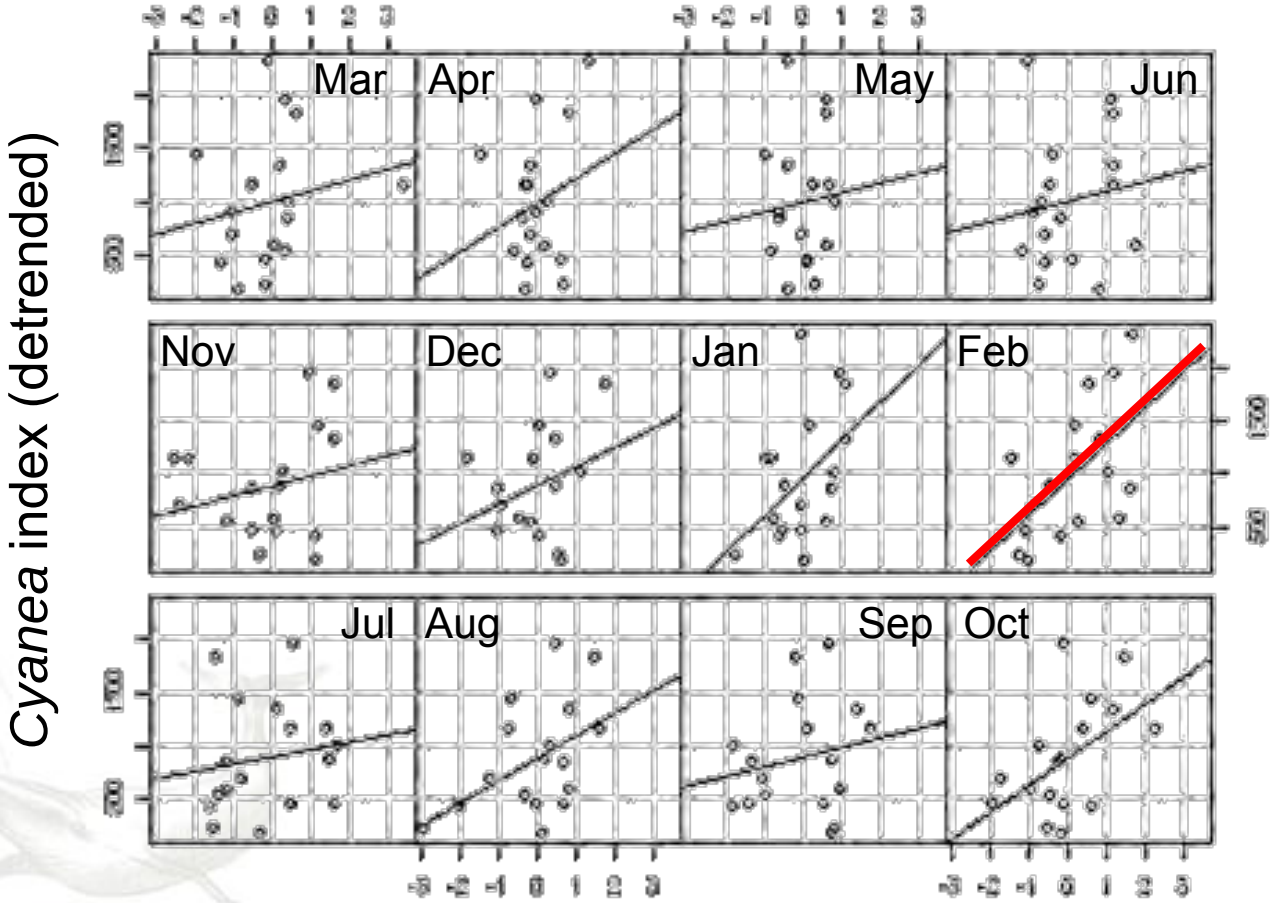

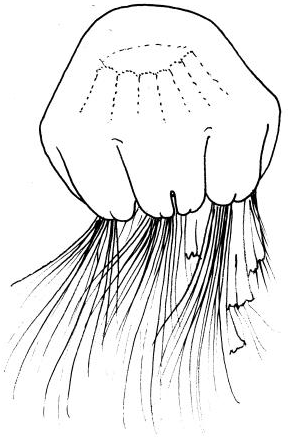

Other considerations

- T – or something else?
- Interactions between *Cyanea* and *Aurelia*
- Local production vs. transport from further away (e.g. southern North Sea)?
- 2 species of *Cyanea*
- Competition/predation by *Mnemiopsis leidyi?*

Conclusions

- Early *Cyanea* observations indicate an abundant *Cyanea* year to come
- *Aurelia* abundances exhibit a decreasing trend
- T anomalies during the 12 months preceeding the annual abundance max correlate negatively with *Aurelia* and positively with *Cyanea* abundance.
  - Conditions experienced during the polyp stage may be of importance.

To be continued…