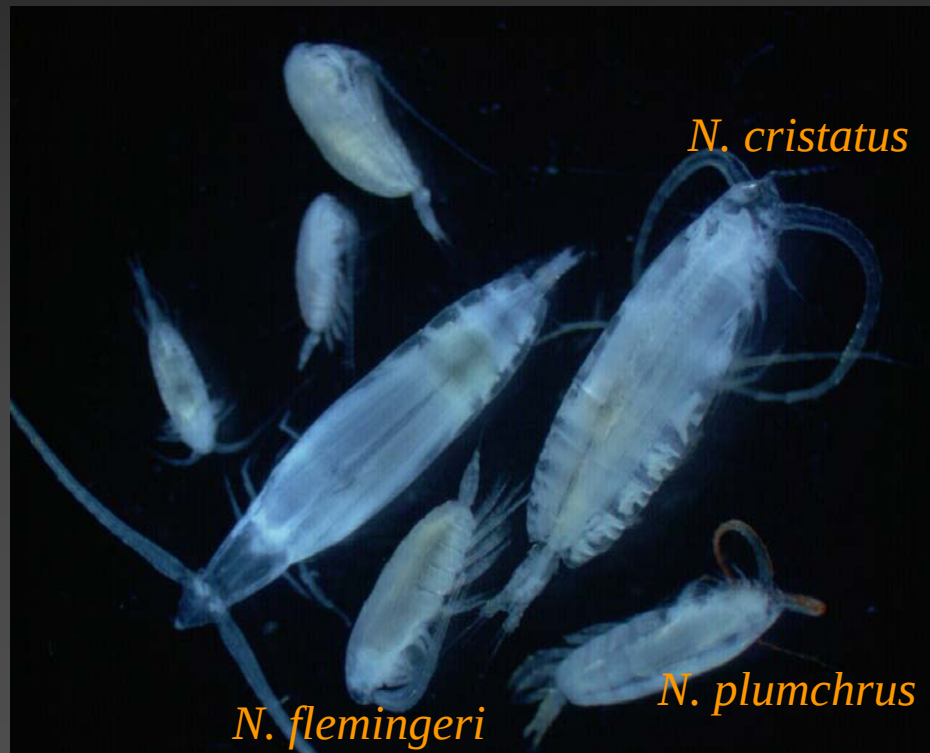


Interdecadal variability in body size of *Neocalanus* copepods
in the Oyashio waters from 1960 to 2002
-a study of the Odate Project -

Kazuaki Tadokoro¹, Toru Kobari, Hiroya Sugisaki, Hiroaki Saito
1: Hokkaido Univ., Tokai Univ.



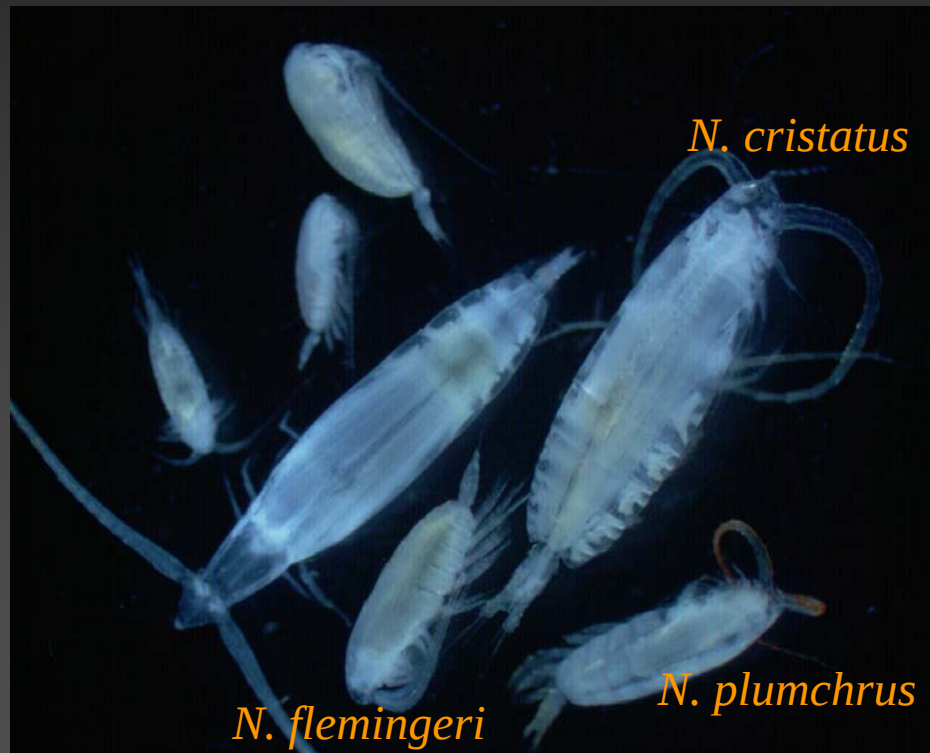
Neocalanus in the subarctic Pacific

Large size

Predominant in mesozooplankton biomass

Feed on phytoplankton, microzooplankton, POM

One year life cycles

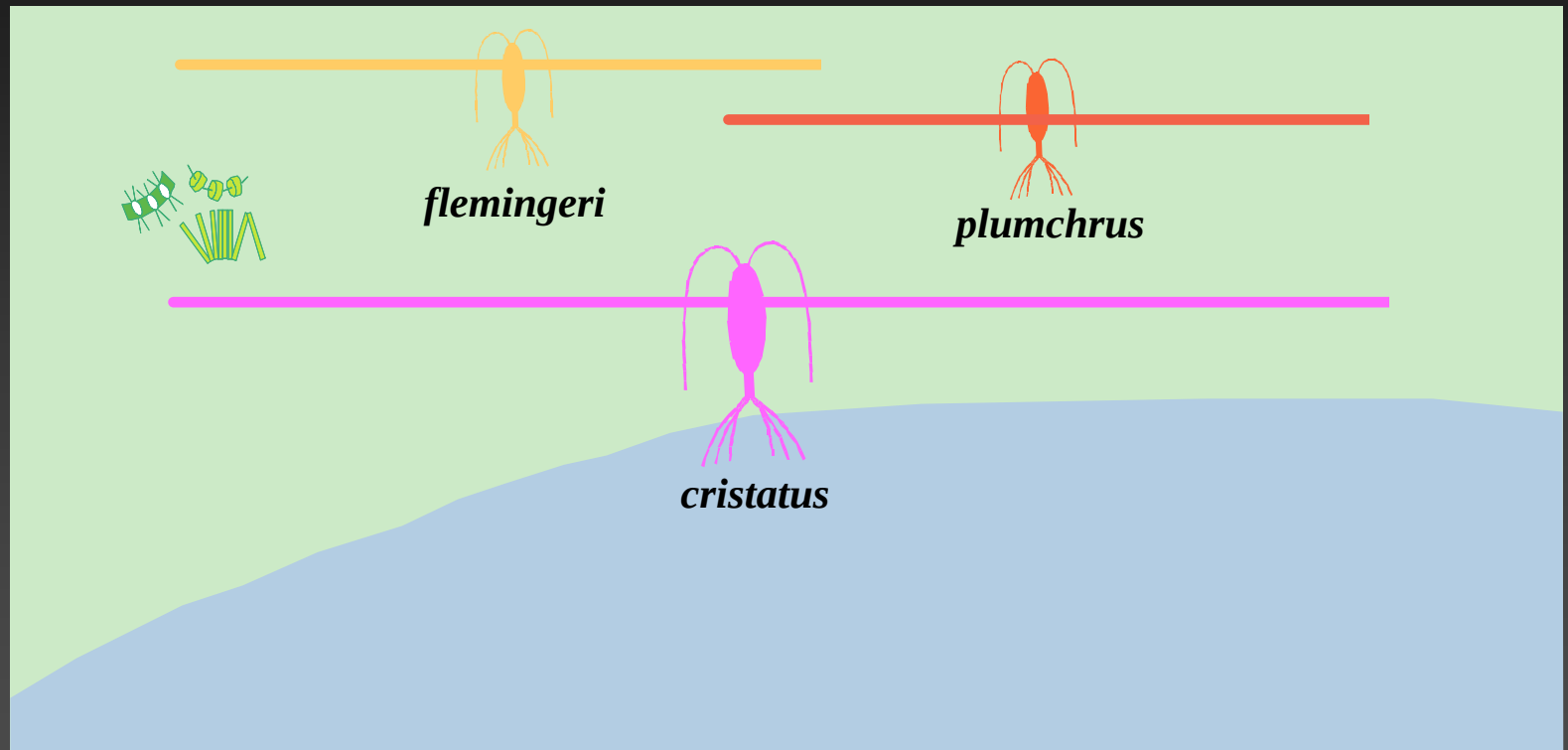


Life cycles

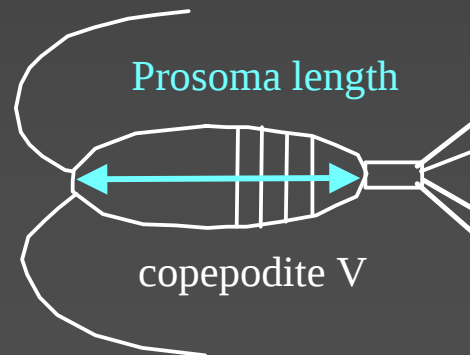
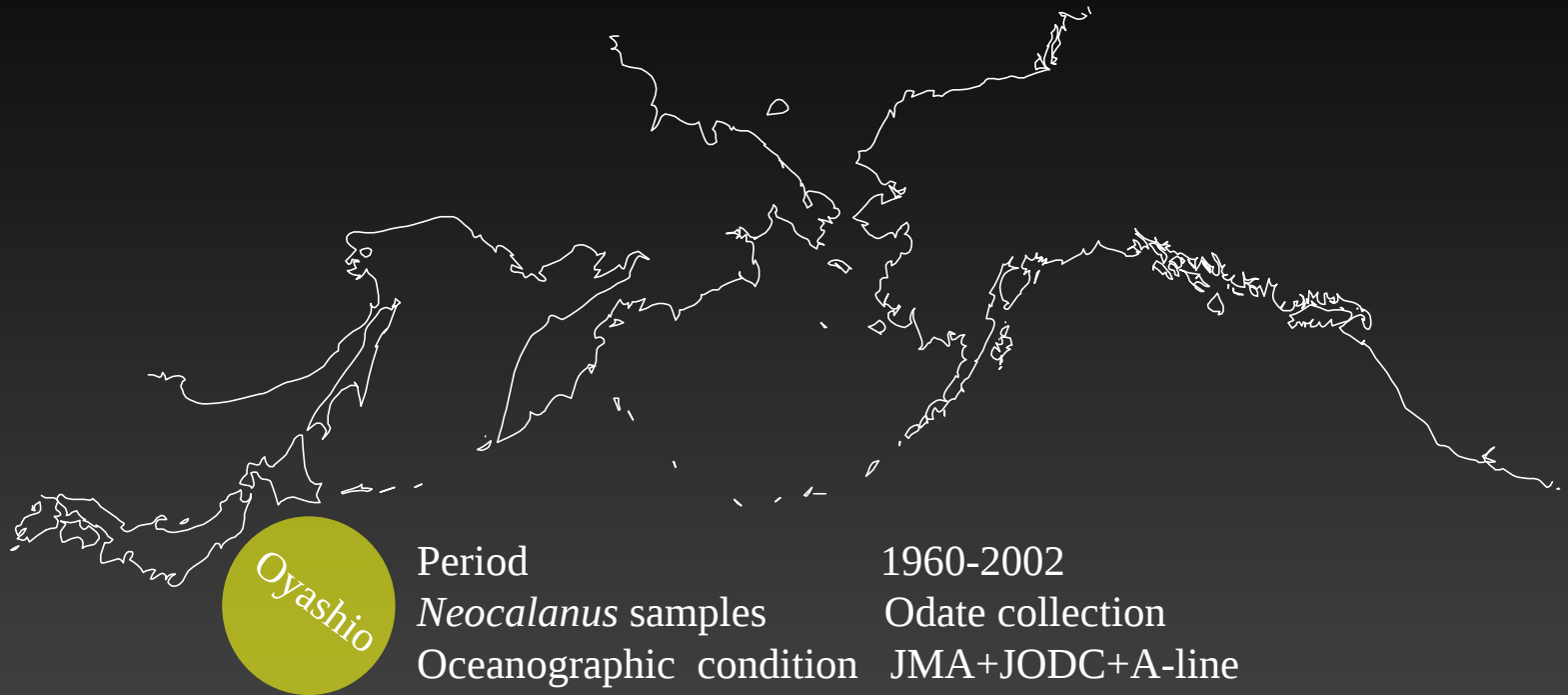
Winter

Spring

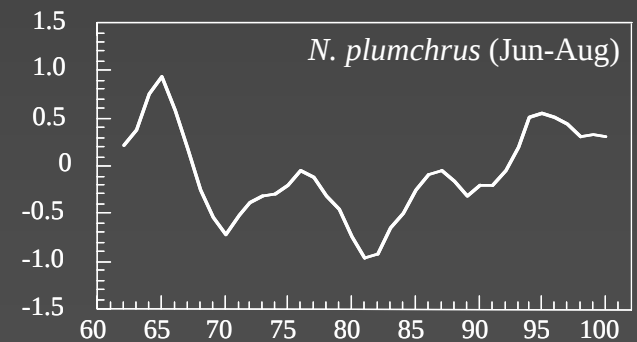
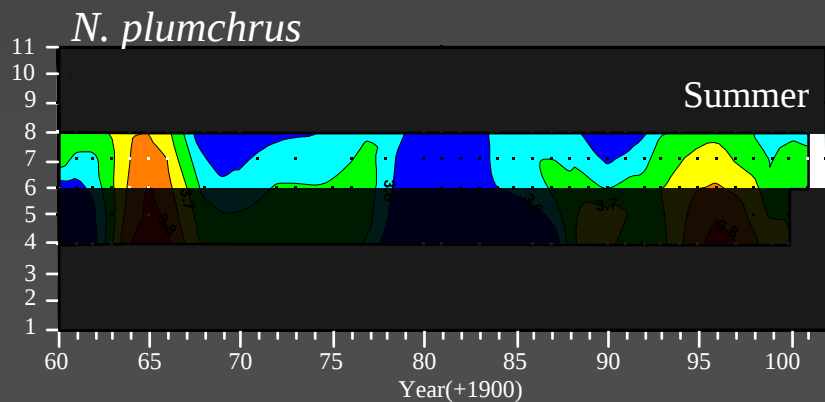
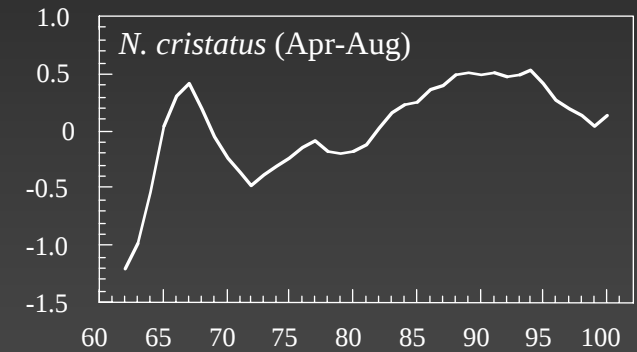
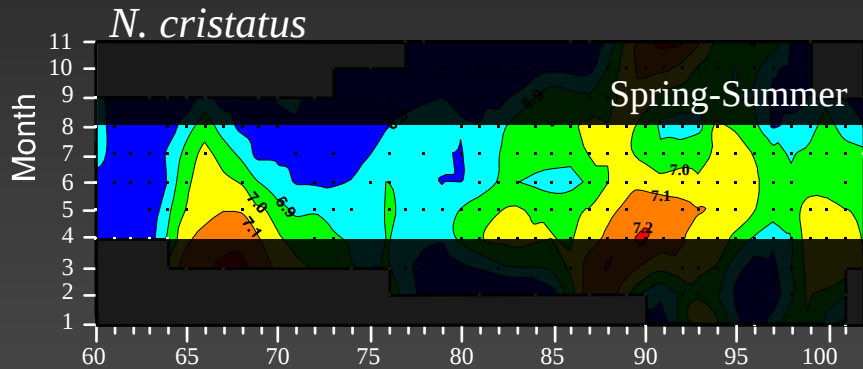
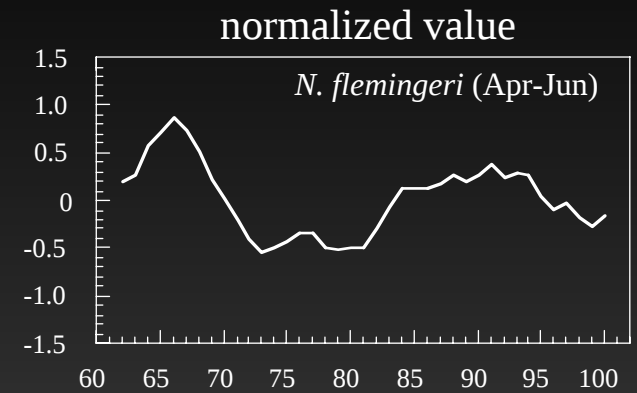
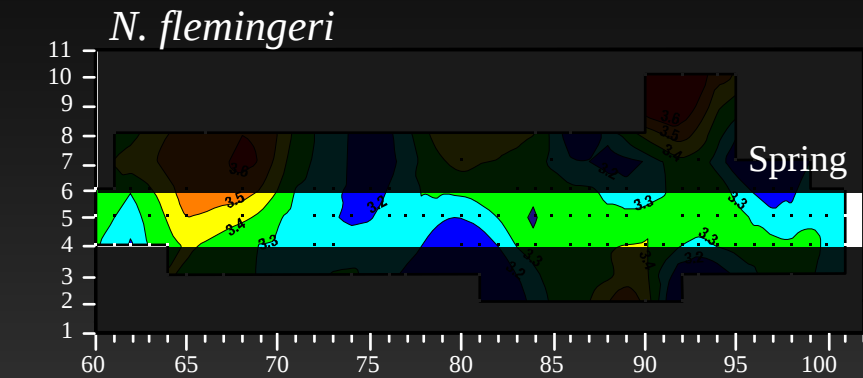
Summer



Materials & Method



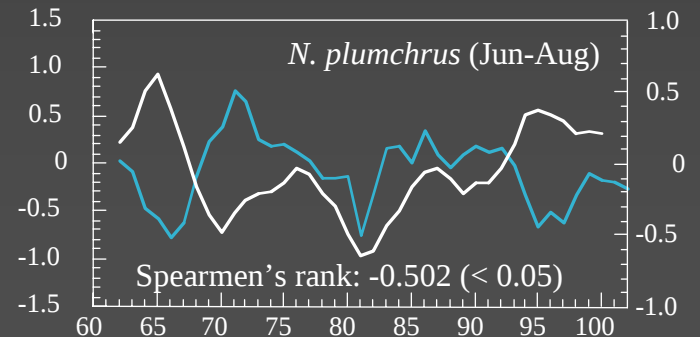
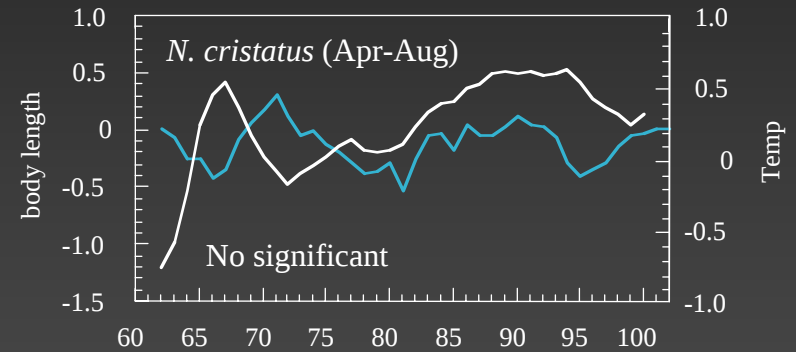
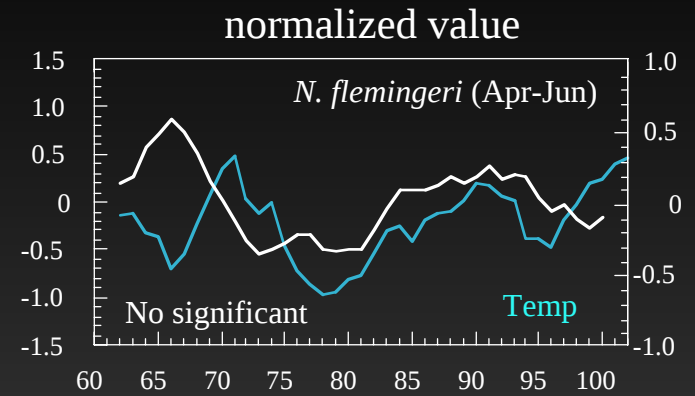
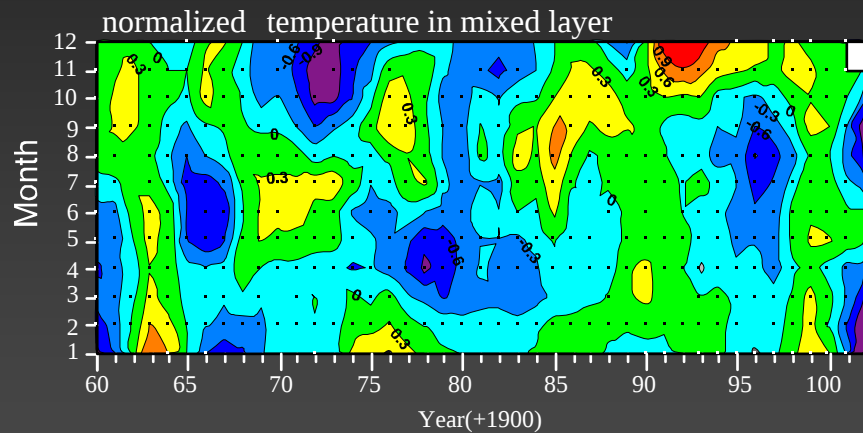
Variations in body length



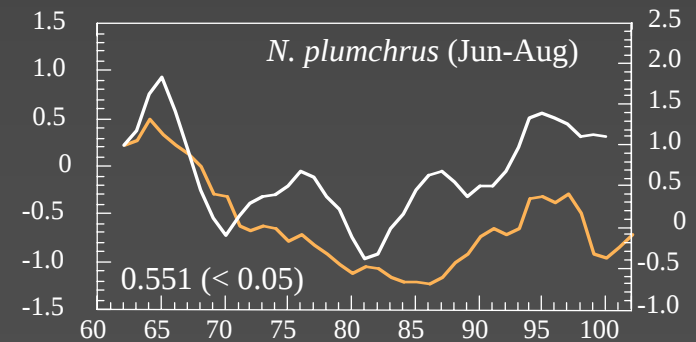
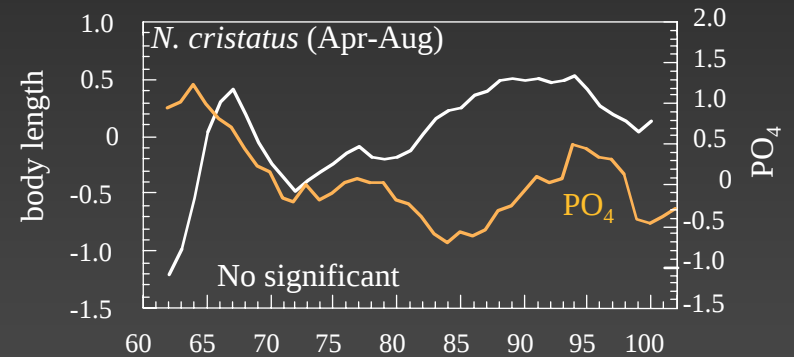
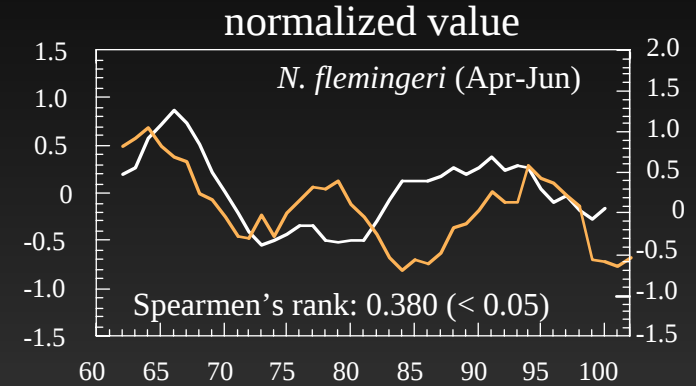
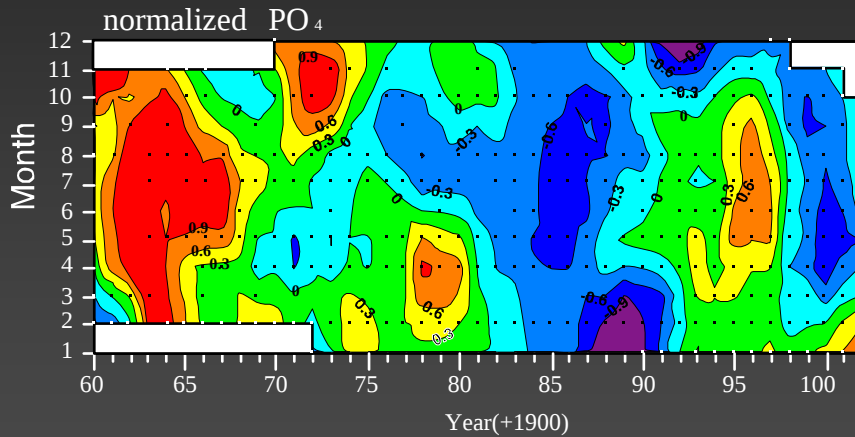
Body size of copepods has **negative** and **positive** relationship
with ambient **temperature** and **food availability**, respectively

e.g. Deevey 1960

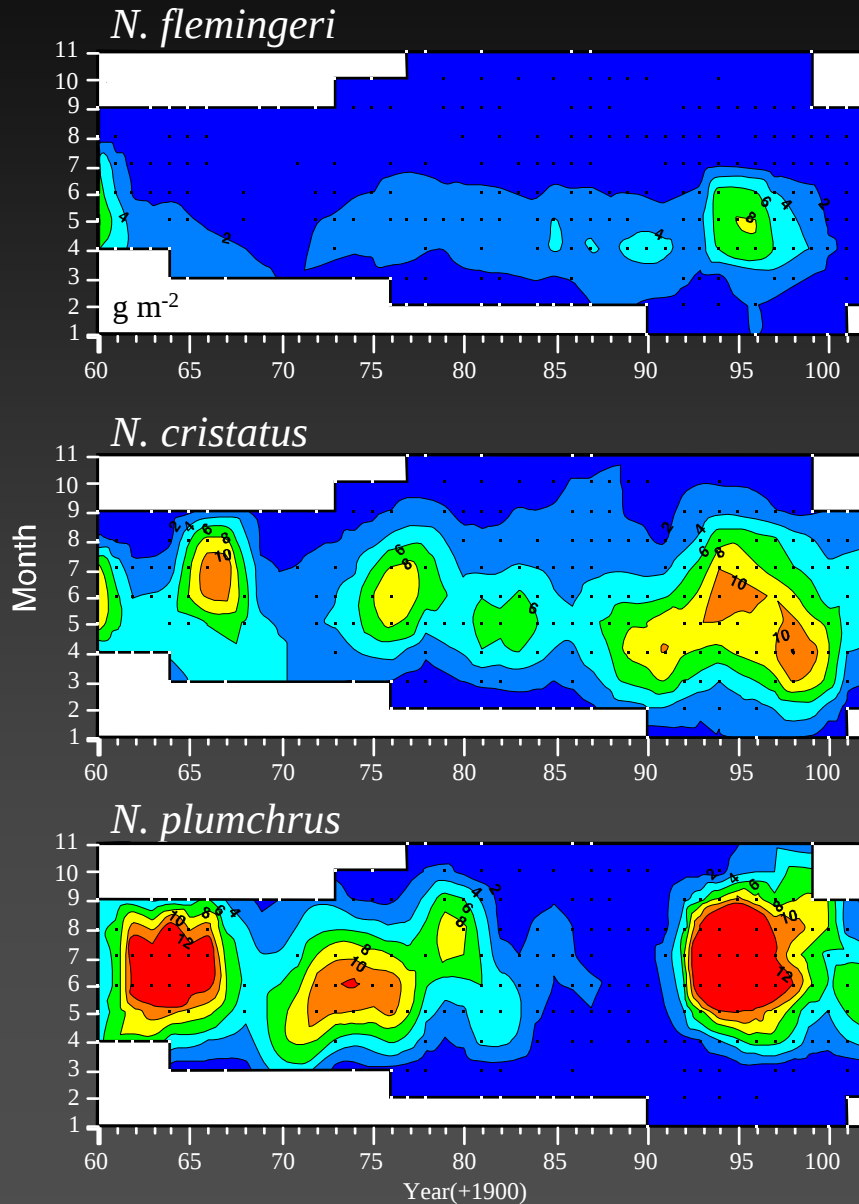
Comparison with temp.



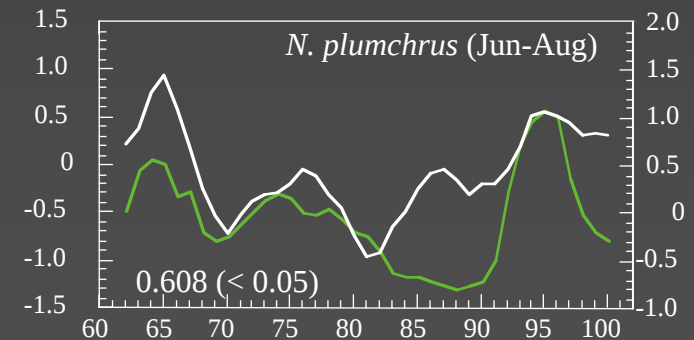
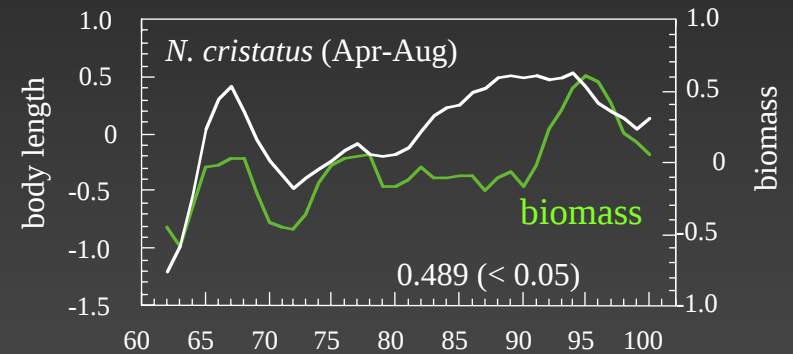
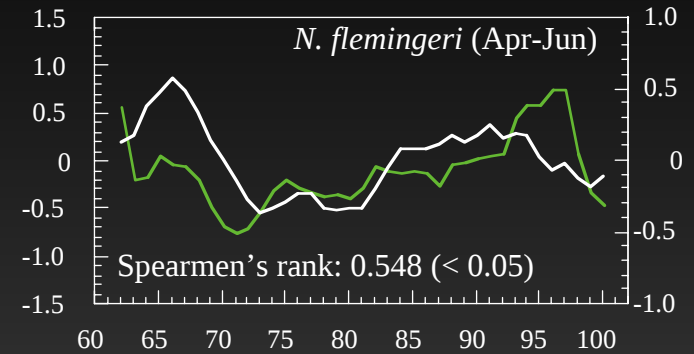
Comparison with PO₄ at surface



Comparison with the biomass



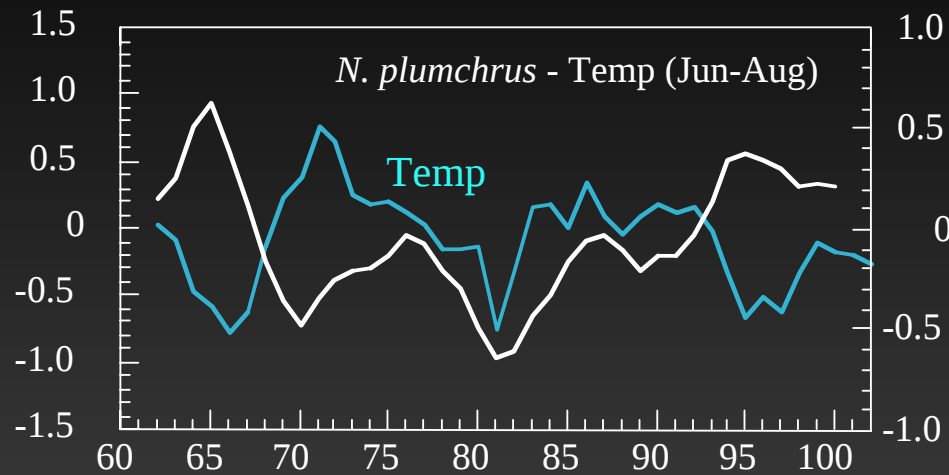
normalized value



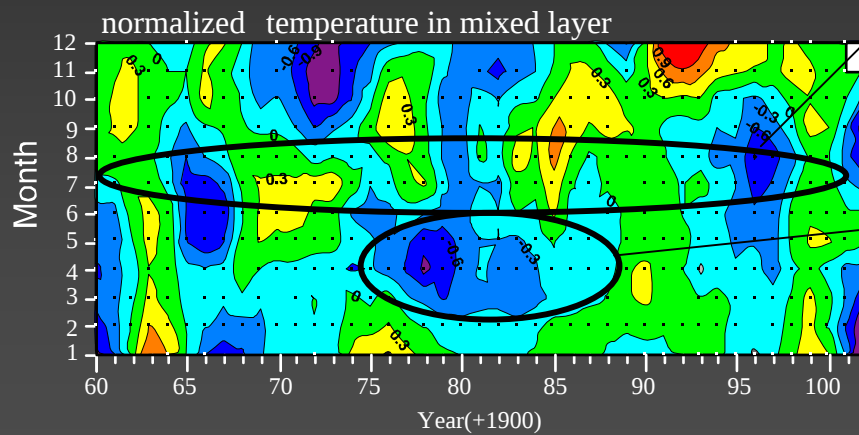
Comparison with environmental variables

	Temp	PO ₄	Biomass
<i>N. flemingeri</i>	No	0.380	0.548
<i>N. cristatus</i>	No	No	0.489
<i>N. plumchrus</i>	-0.502	0.551	0.608

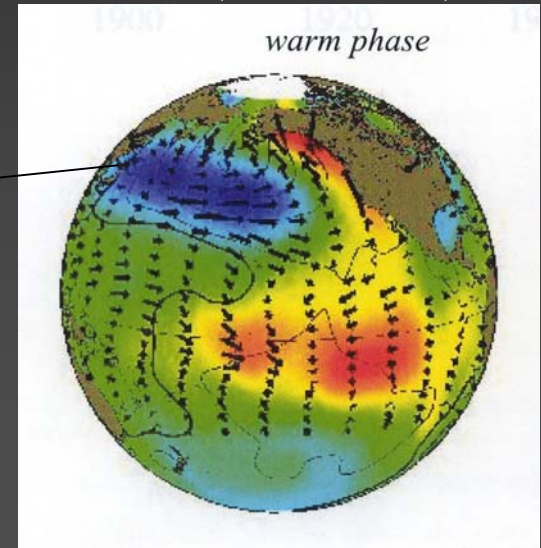
Process temperature change



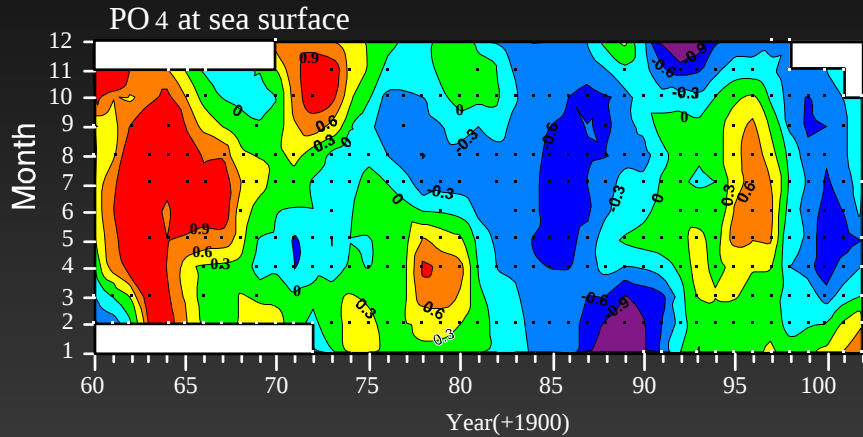
AO ?



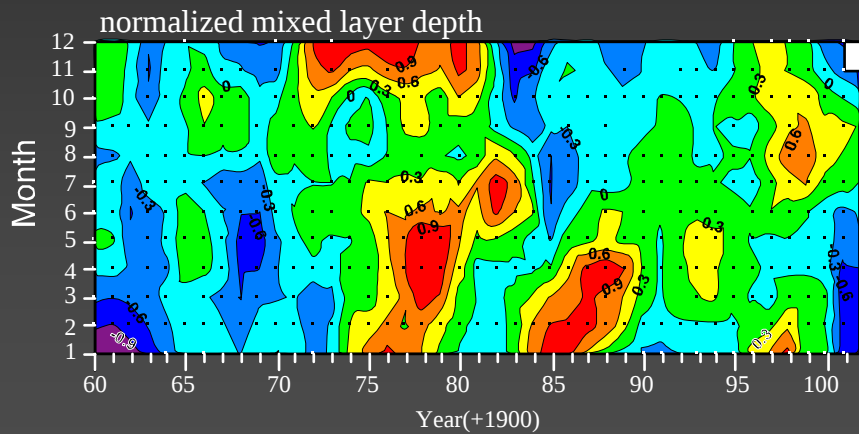
PDO (1976/77-88/89)



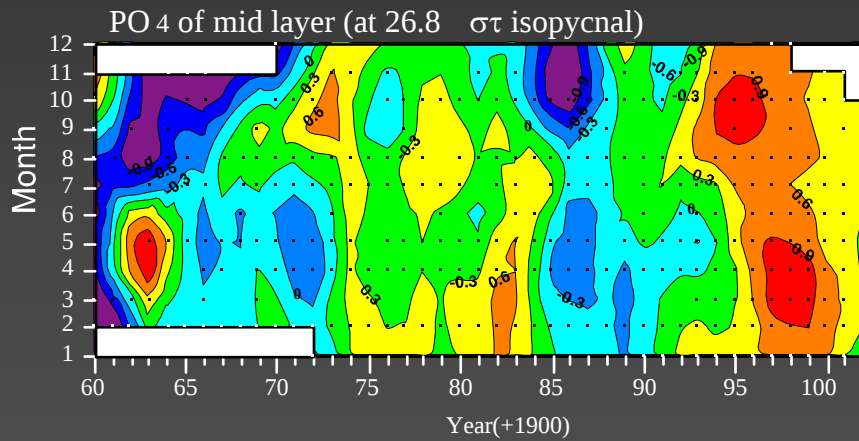
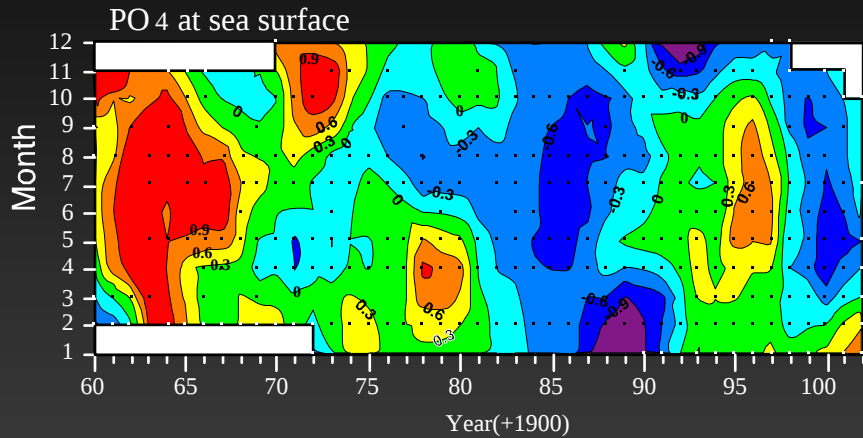
Process of PO_4 change



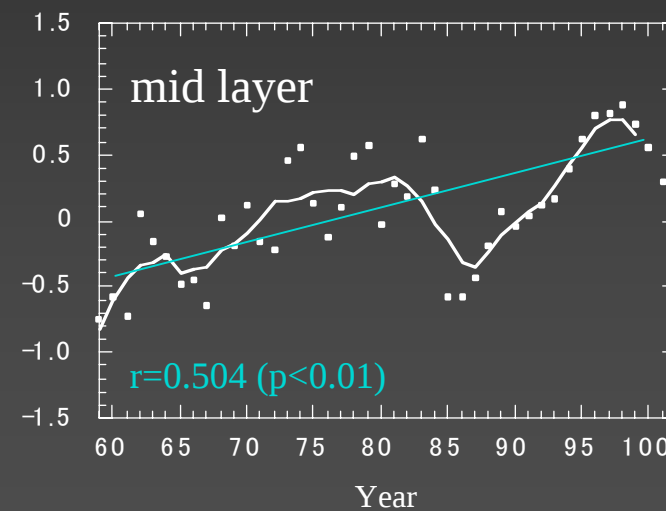
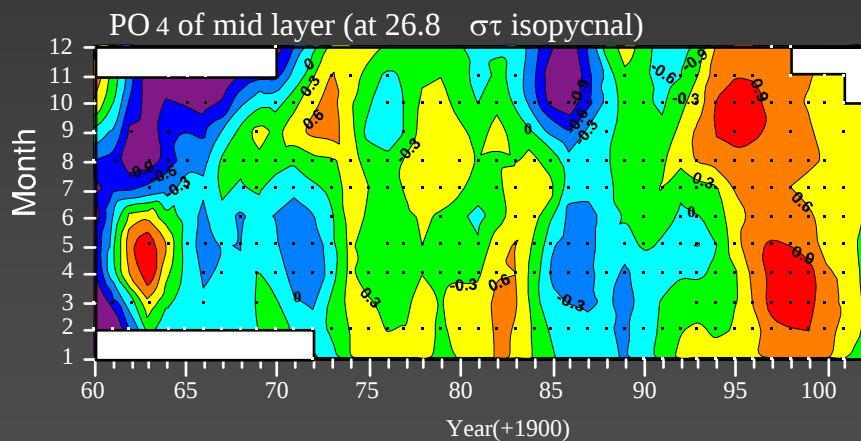
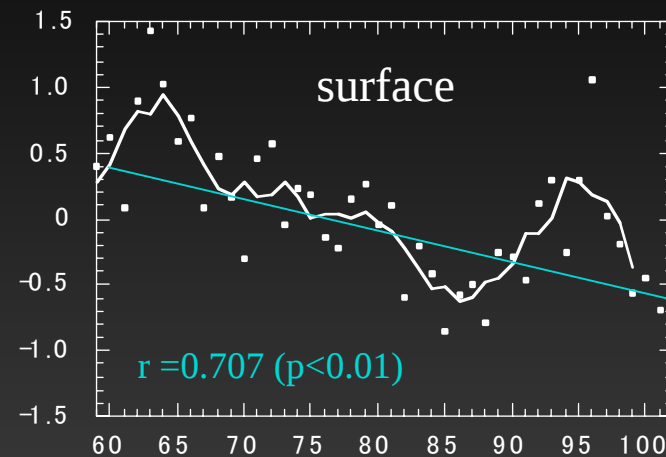
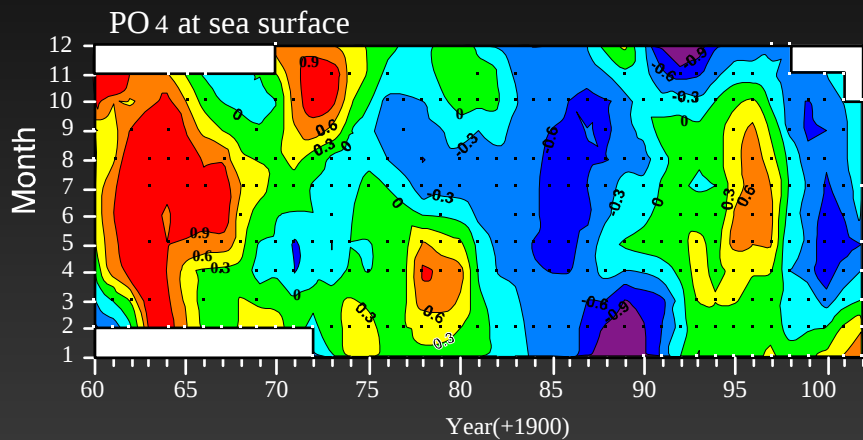
MLD did not correspond to PO_4 variation



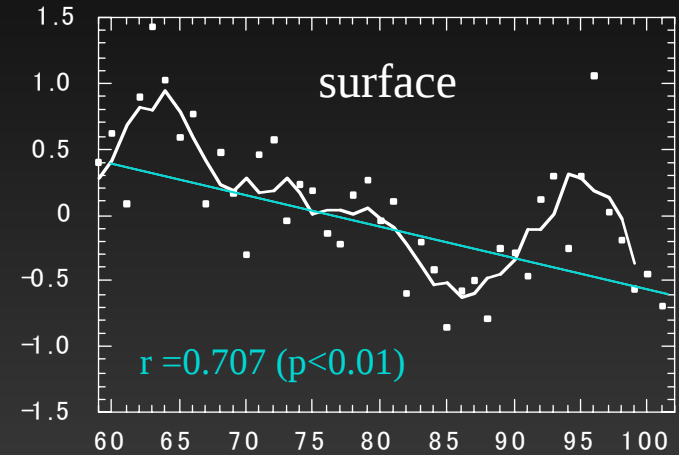
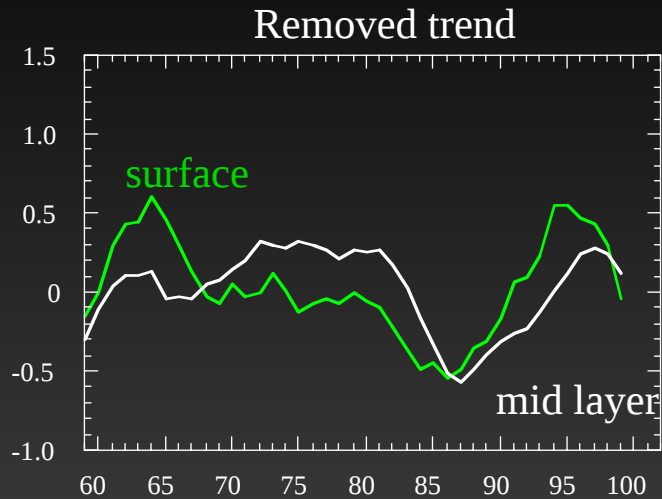
Process of PO_4 change



Process of PO_4 change



Process of PO_4 change

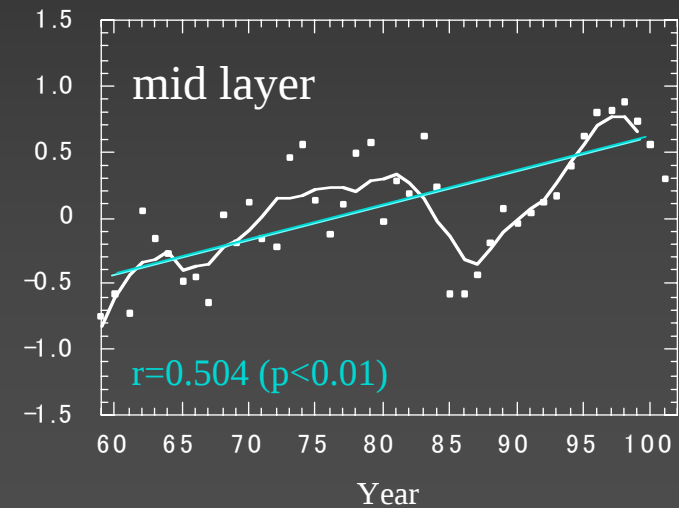


Trend:

decrease in mid to surface layer water exchange ?

Decadal fluctuation:

18.6 y cycle tidal mixing ?
(Prof. Yasuda's hypothesis)



Summary

Body size of the *Neocalanus* had decadal scale variability

SST negatively correlated with body size of *N. plumchrus*

PO₄ positively correlated with body size of
N. plumchrus and *N. flemingeri*

Increase in temp. during 70s-80s might be related to AO variation

PO₄ had decadal scale fluctuation superimposed on
negative and positive trends in surface and mid layer, respectively