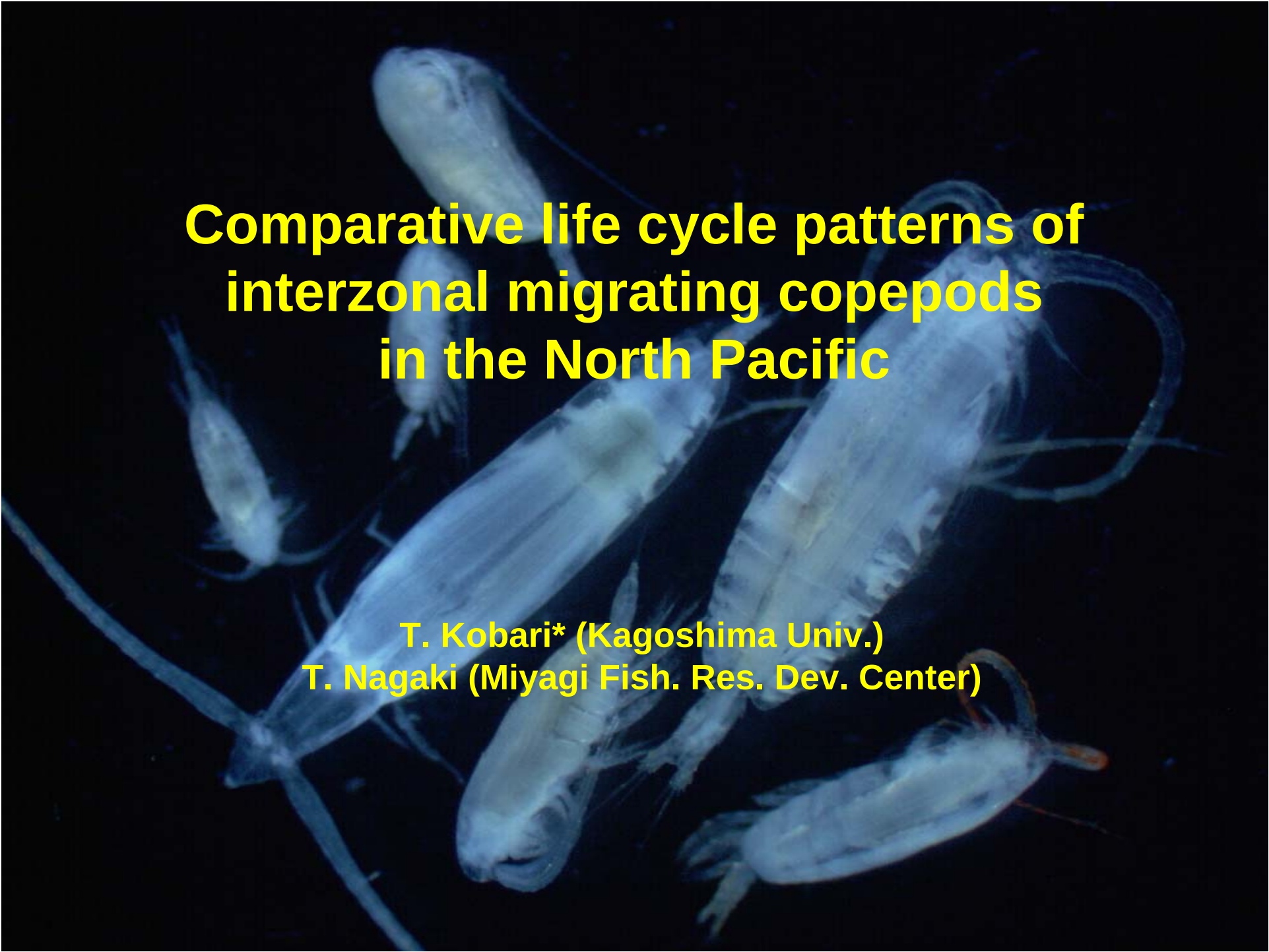
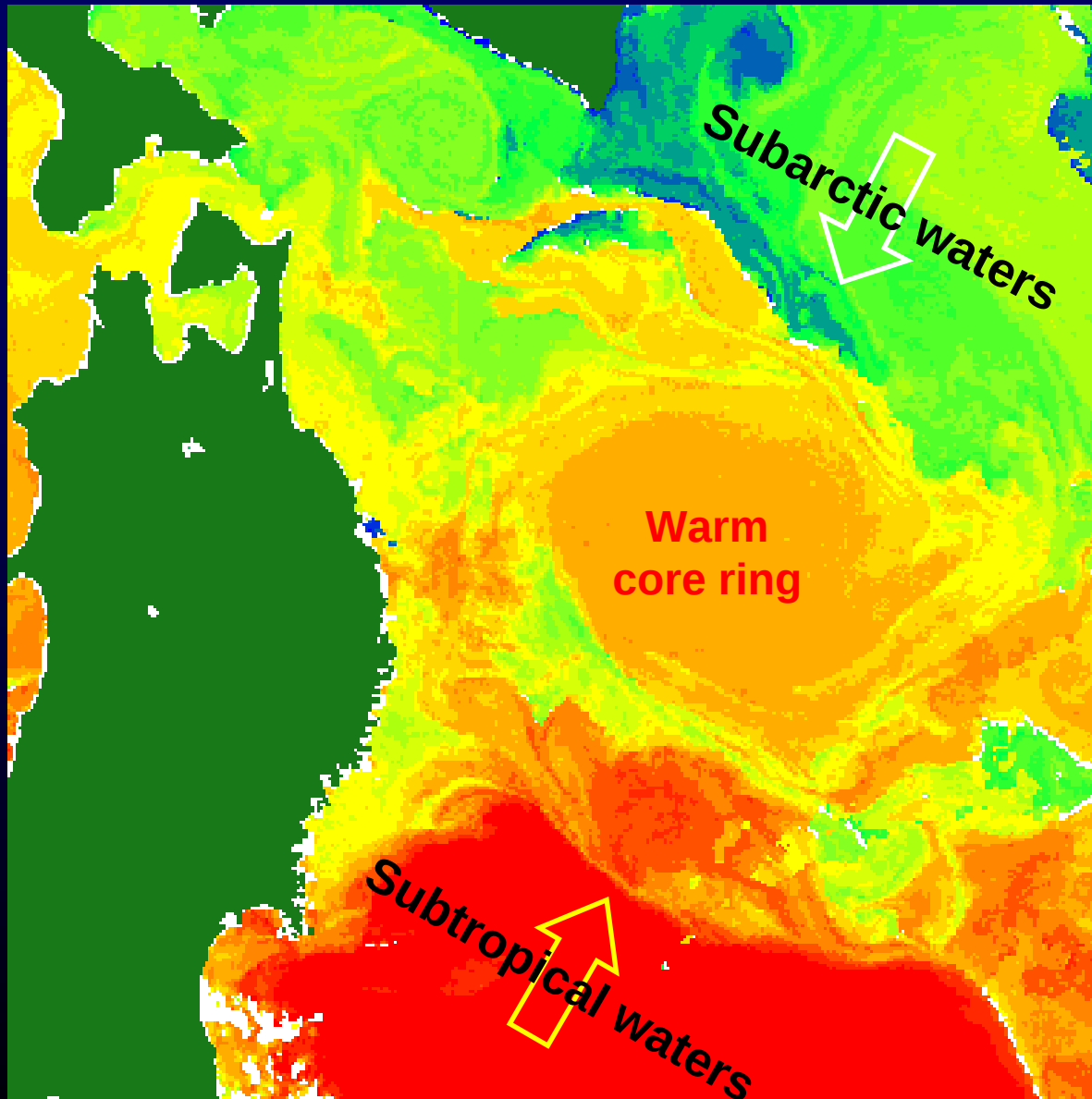


A microscopic image showing several copepods, which are small crustaceans, against a dark background. The copepods are translucent and have long, thin appendages. One large copepod is prominently displayed in the center, with its body and legs clearly visible. Other smaller copepods are scattered around it. The text is overlaid on the image in a yellow font.

Comparative life cycle patterns of interzonal migrating copepods in the North Pacific

**T. Kobari* (Kagoshima Univ.)
T. Nagaki (Miyagi Fish. Res. Dev. Center)**

Oyashio-Kuroshio Mixed region



Oyashio Front

Oyashio-Kuroshio
Mixed region

Kuroshio Front

Objective

- (1) to establish life cycle patterns of interzonal migrating copepods in the Oyashio-Kuroshio Mixed region**
- (2) to compare these patterns among species and among populations in the North Pacific**

Sampling

Zooplankton samples

A: Monthly population structure

0-1000 m

March 2000 - March 2001

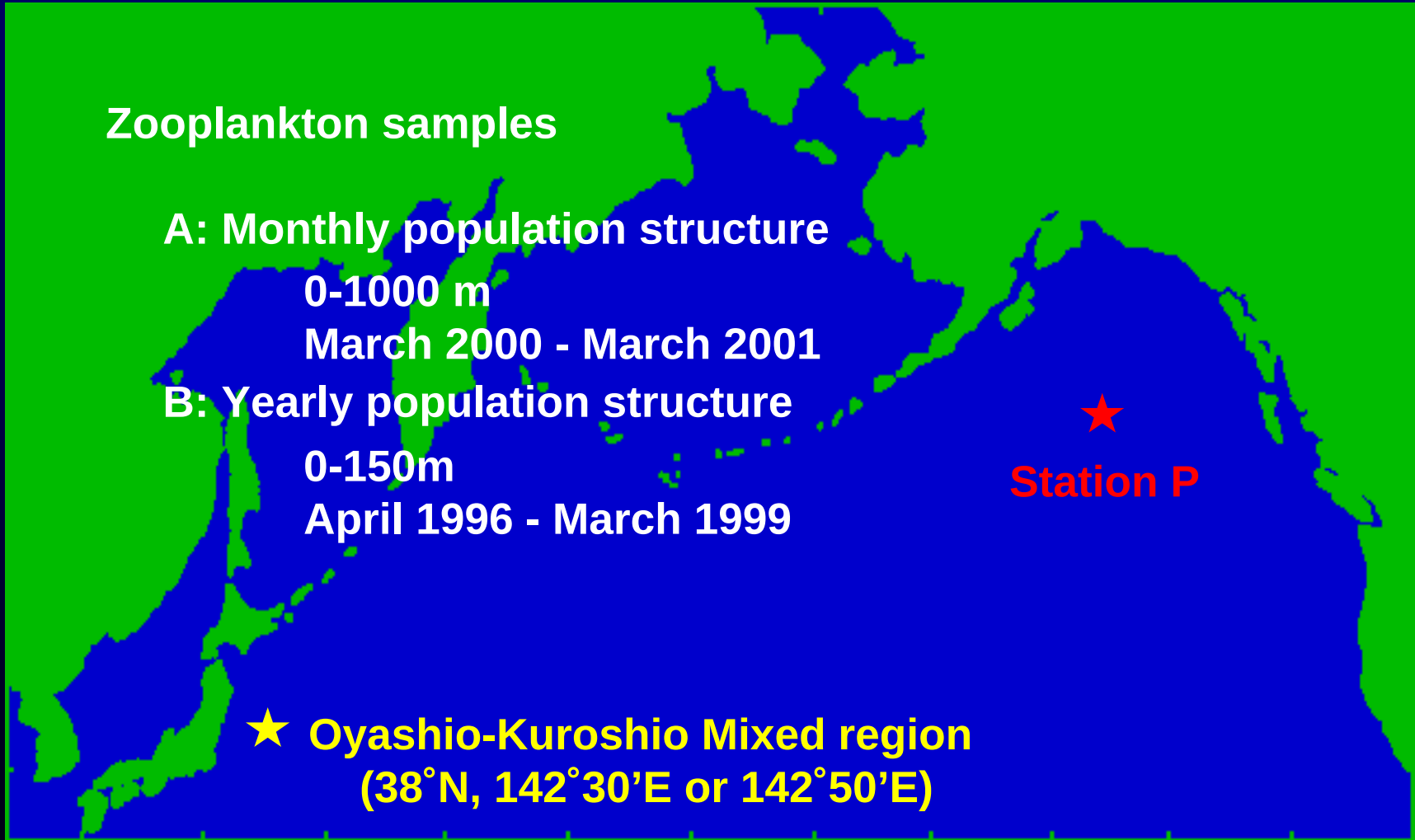
B: Yearly population structure

0-150m

April 1996 - March 1999

★
Station P

★ Oyashio-Kuroshio Mixed region
(38°N, 142°30'E or 142°50'E)



Interzonal migrating copepods

“Surface spawners”

C. pacificus

M. pacifica

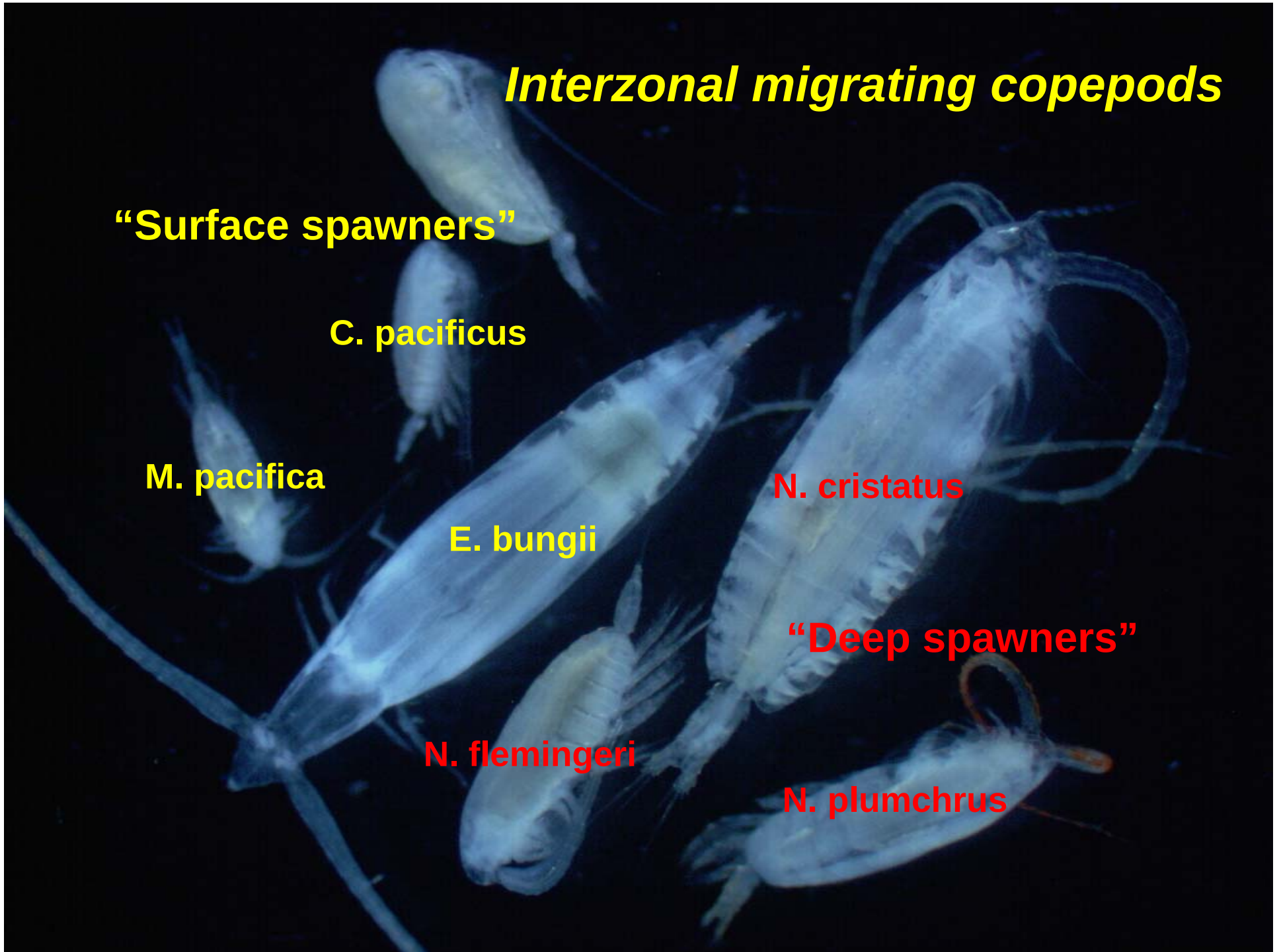
E. bungii

N. cristatus

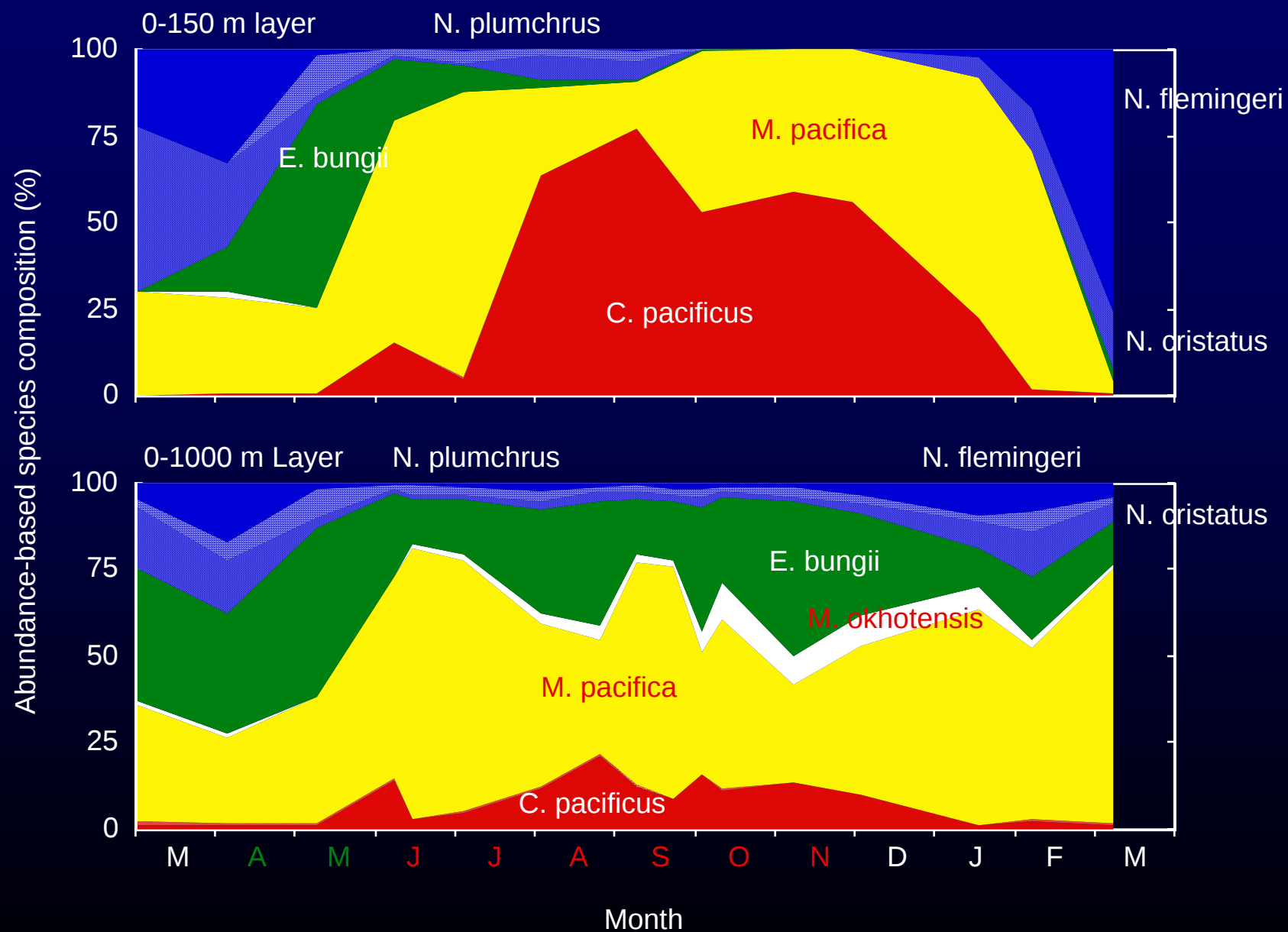
“Deep spawners”

N. flemingeri

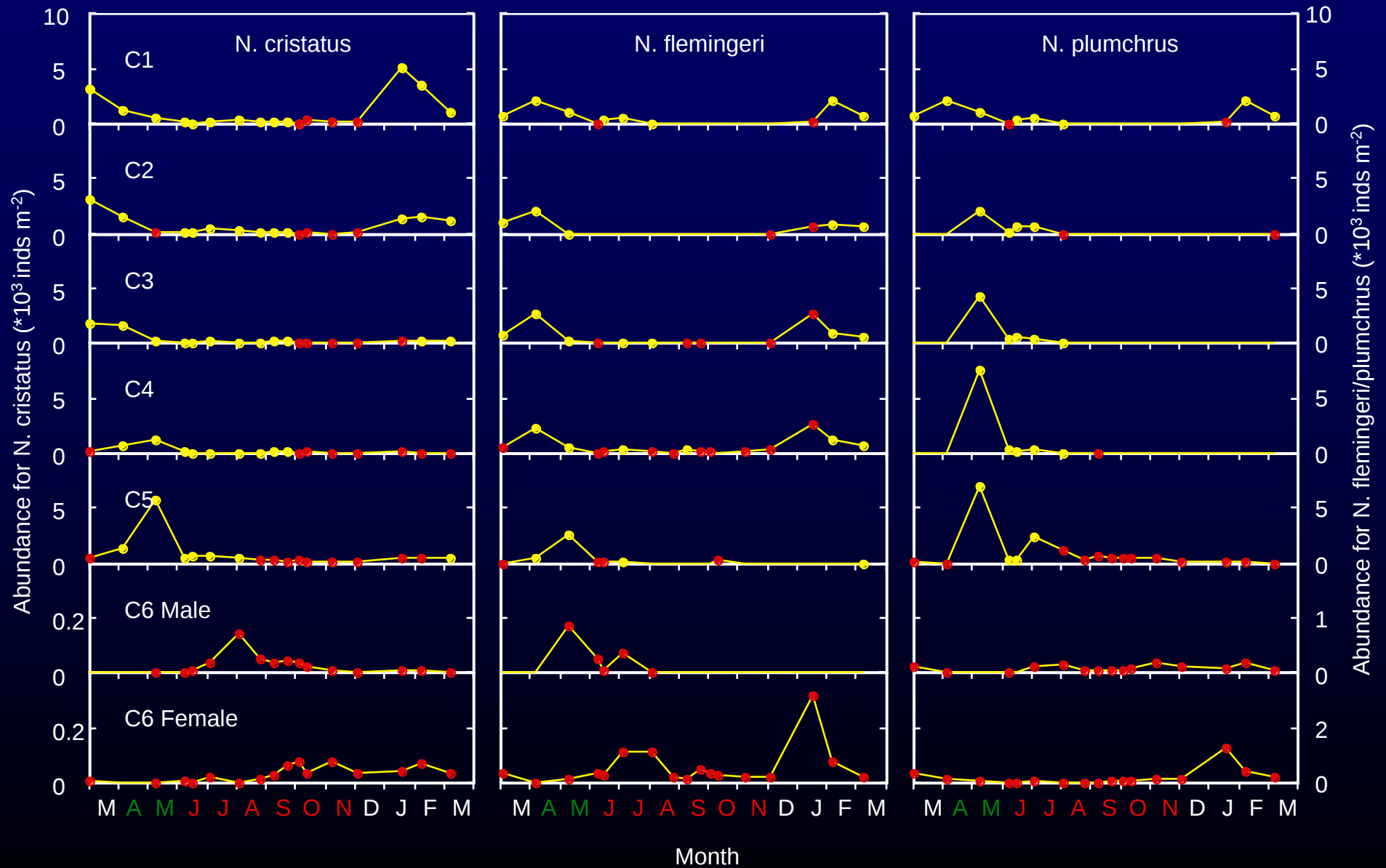
N. plumchrus



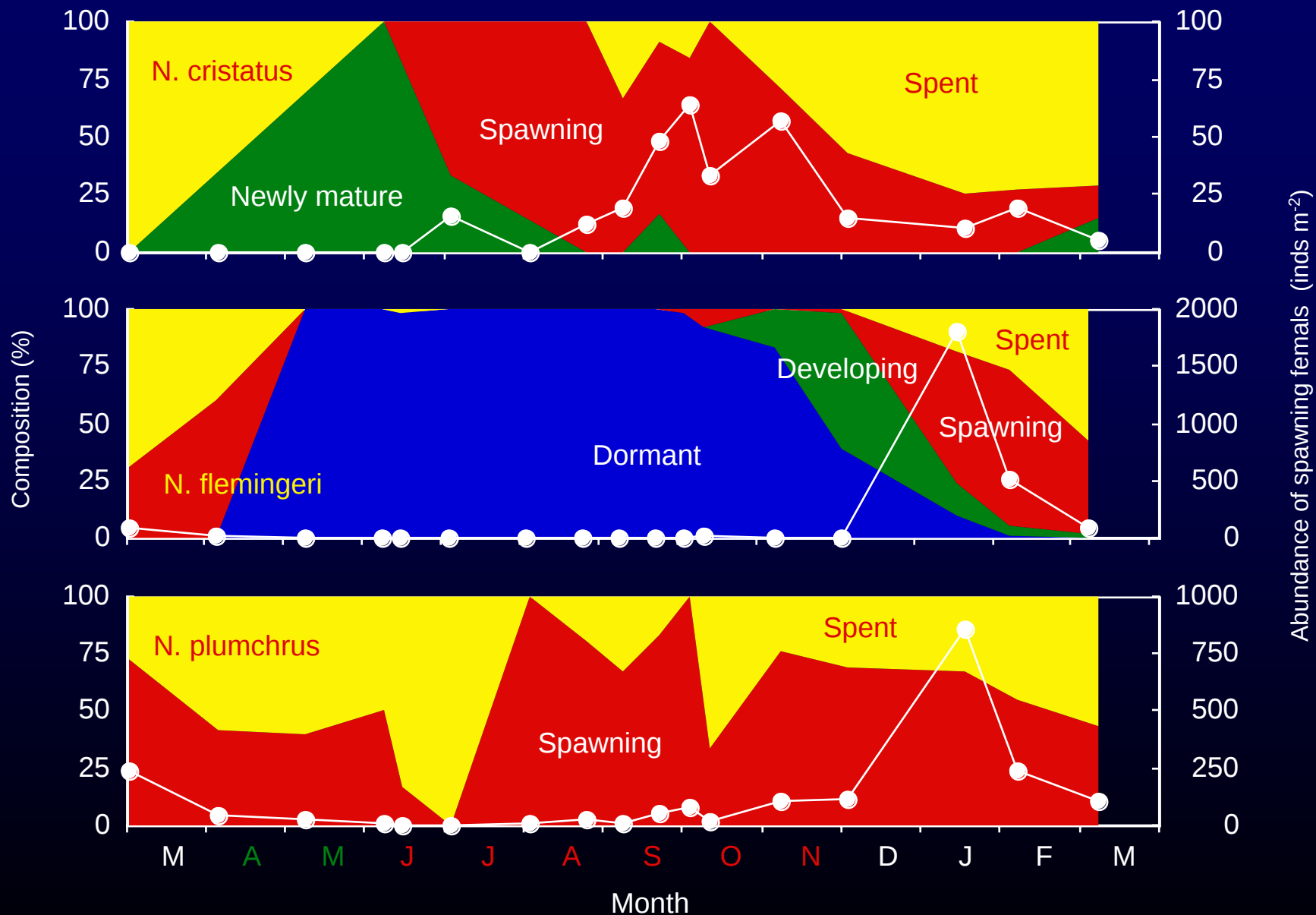
Species composition



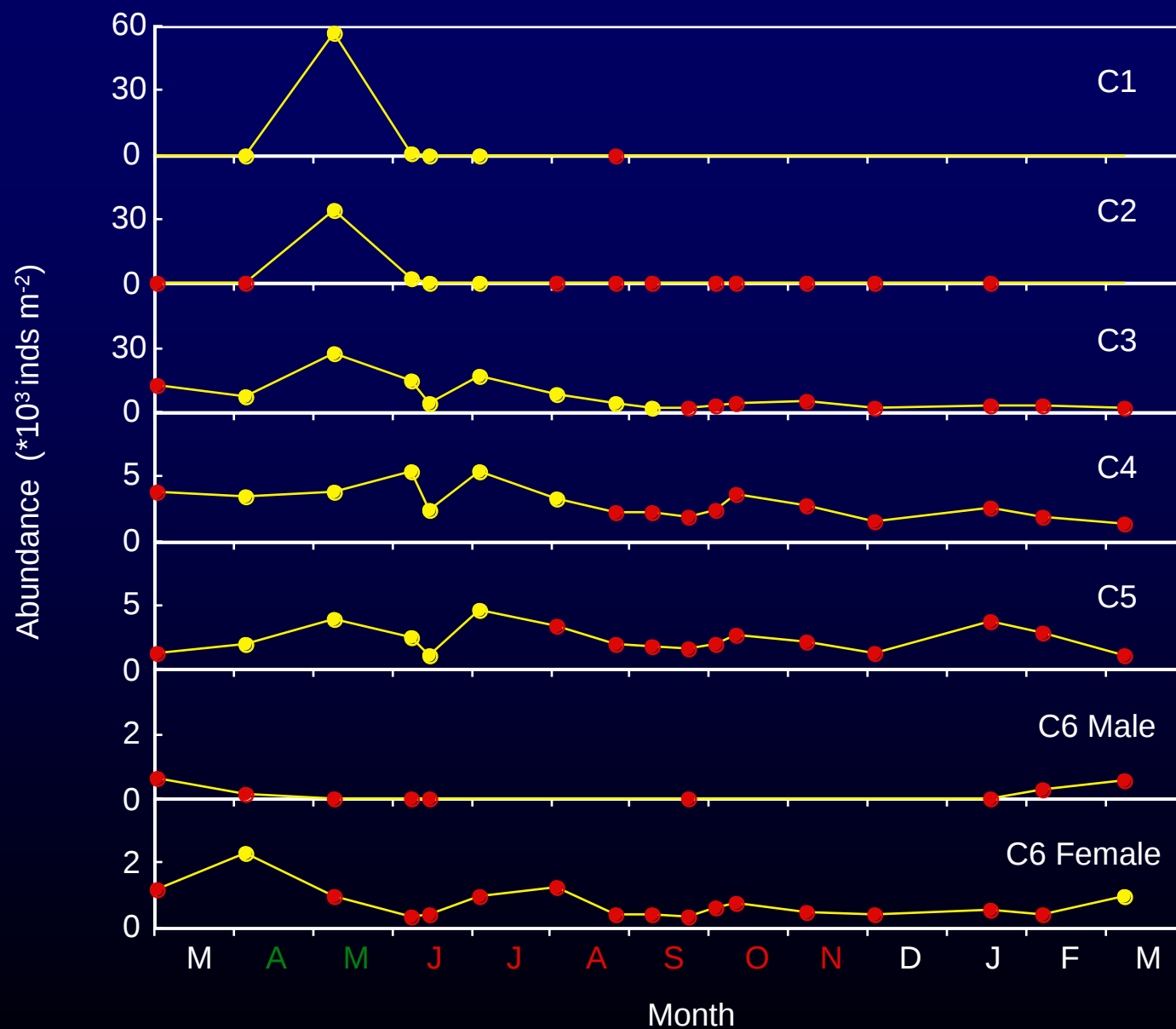
Seasonal abundance of *Neocalanus* (0-1000m)



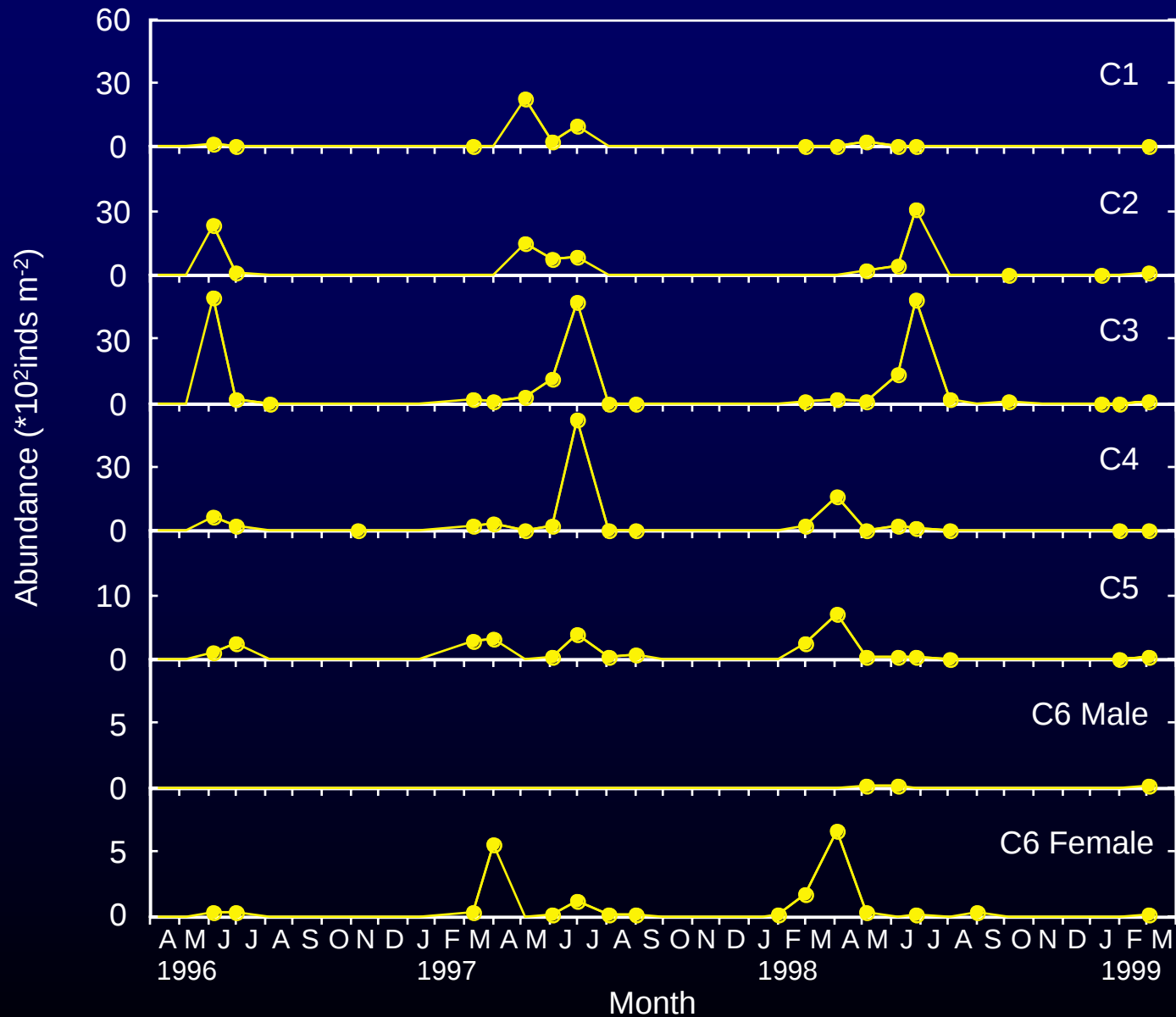
Gonad conditions of Neocalanus



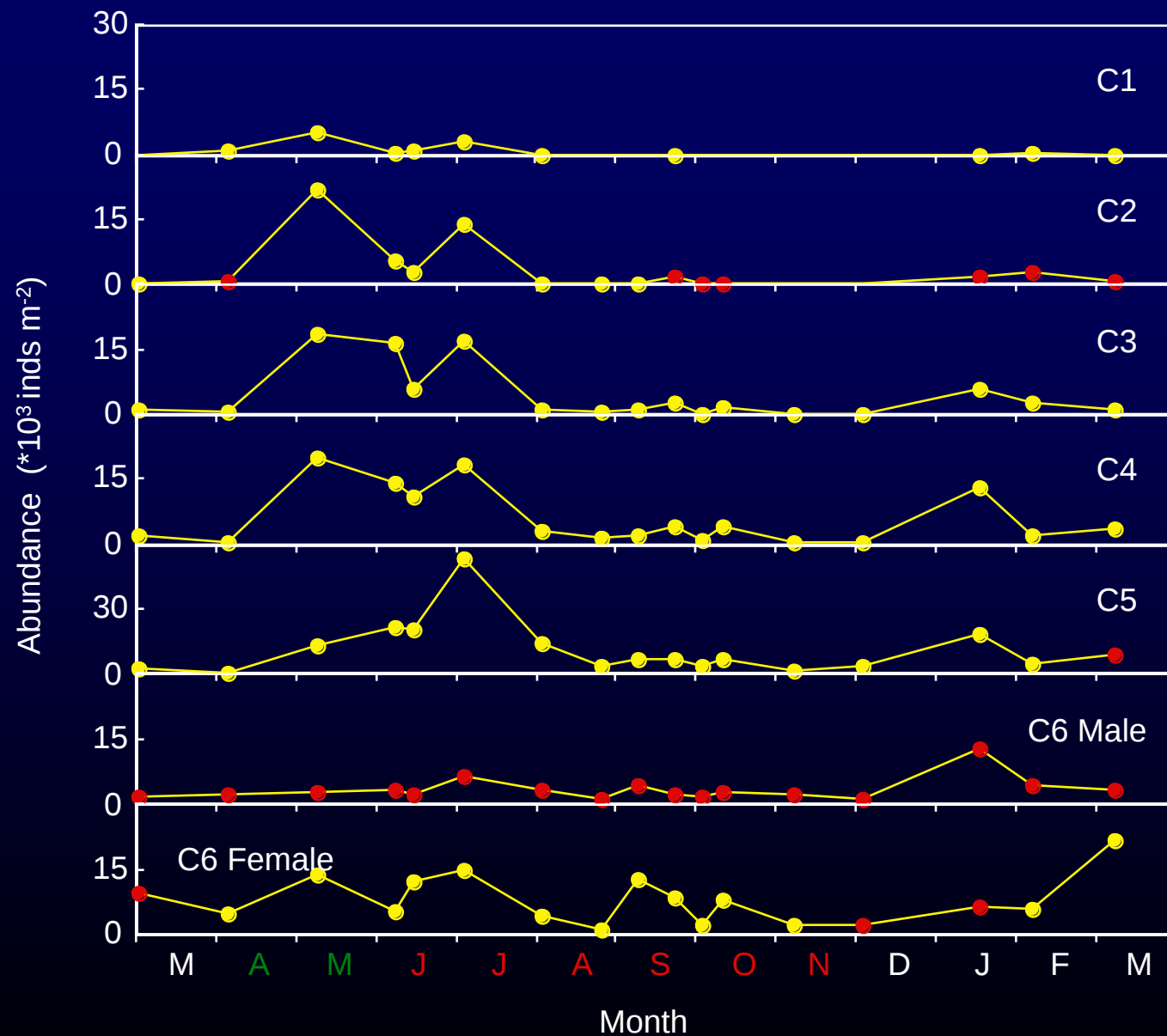
Seasonal abundance of *Eucalanus* (0-1000m)



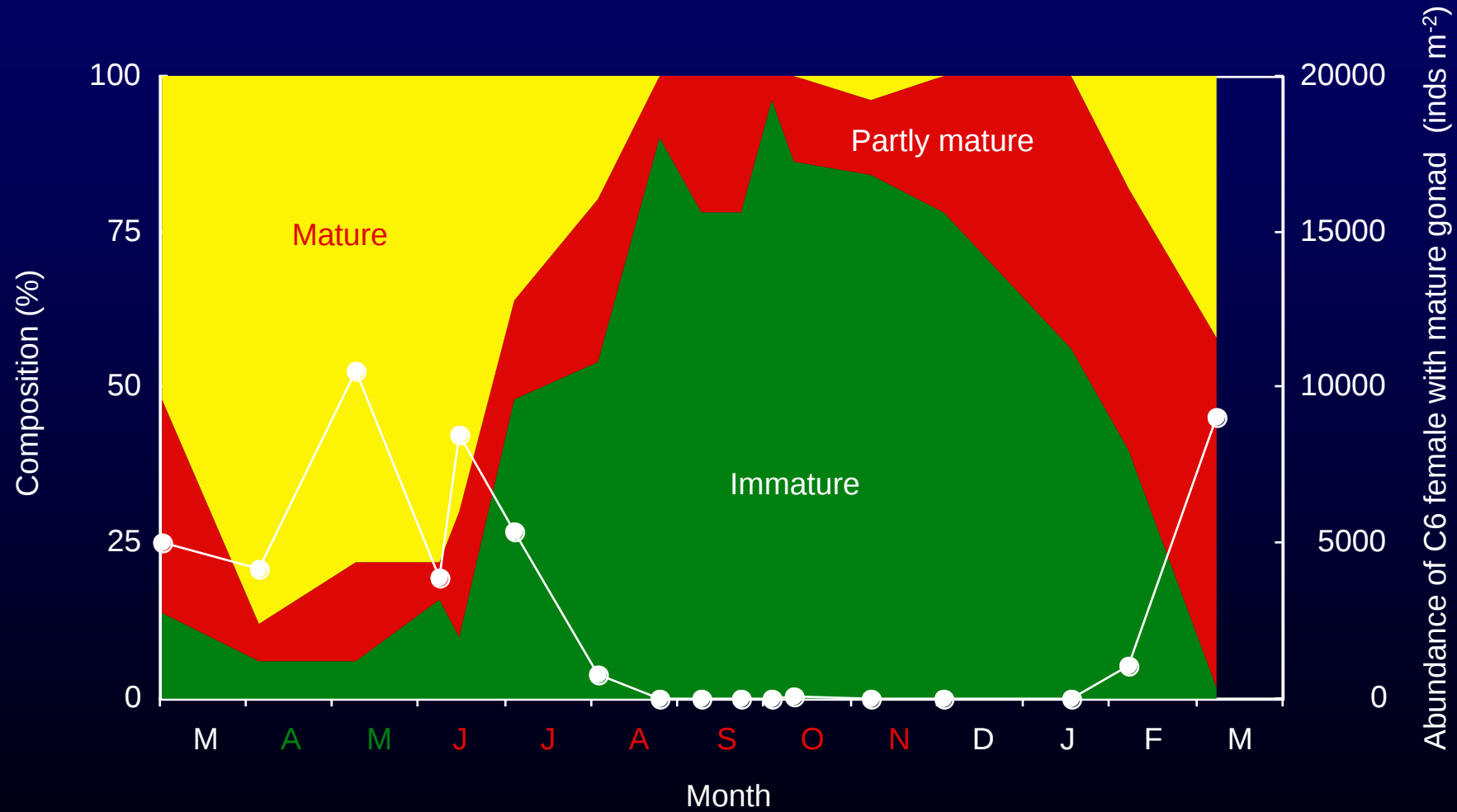
Interannual abundance of Eucalanus (0-150m)



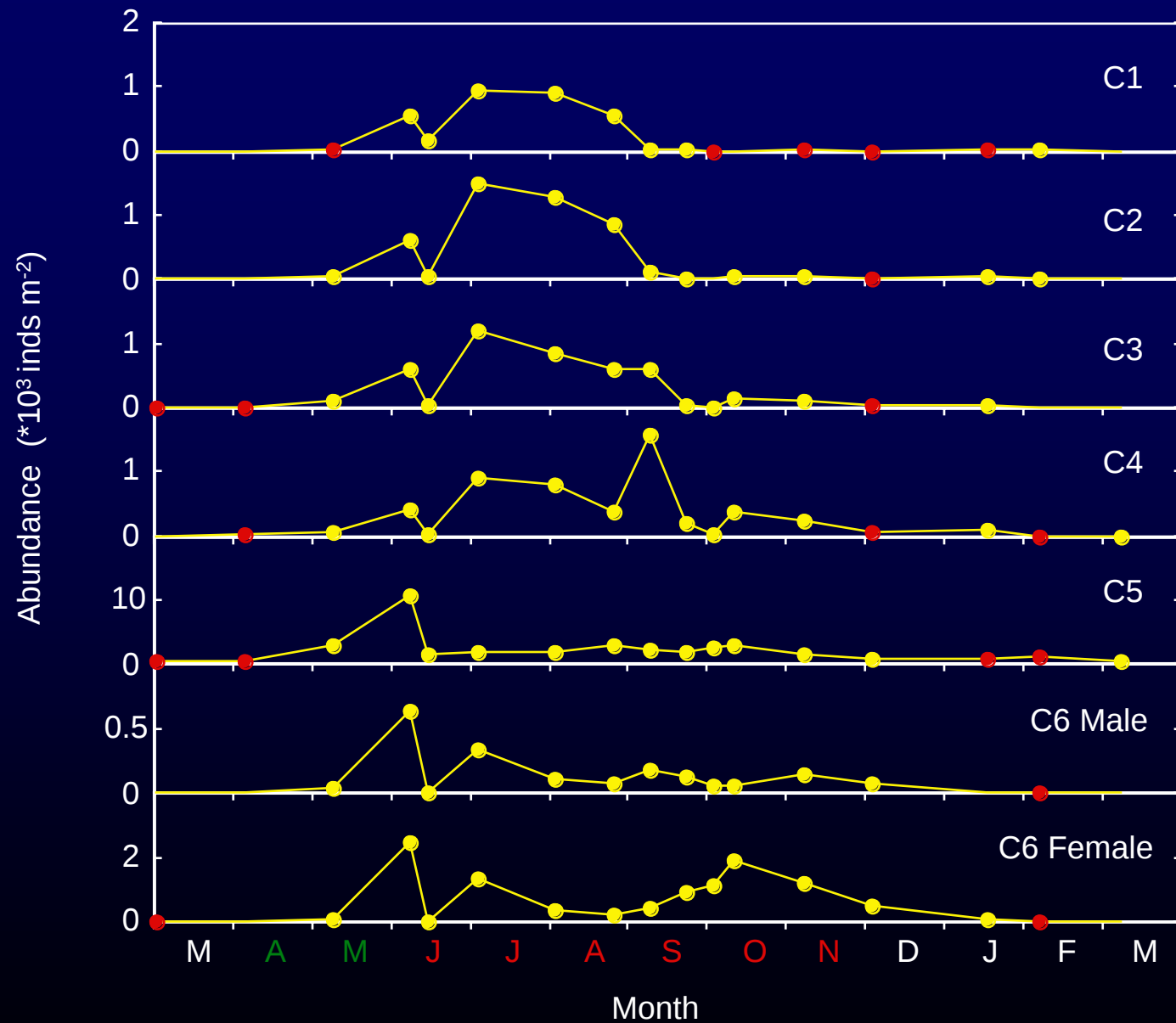
Seasonal abundance of Metridia (0-1000m)



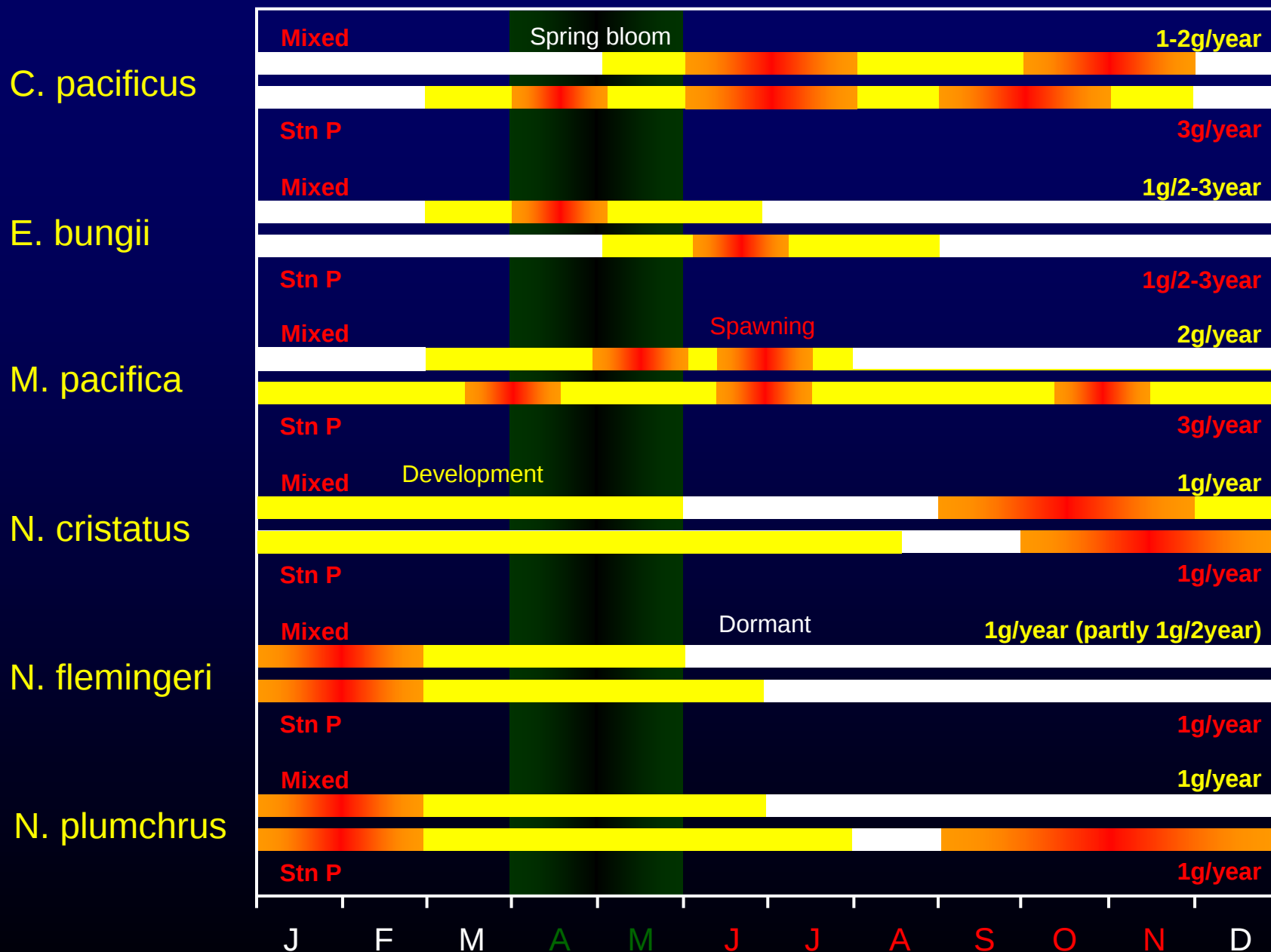
Gonad conditions of Metridia



Seasonal abundance of *Calanus*



Comparison of life cycle patterns



Adaptive significance of dormant

C. pacificus M. pacifica

***Avoidance in time
from unfavorable environmental conditions***

E. bungii

***Optimization of the life cycle timing
to seasonal cycle of environments***

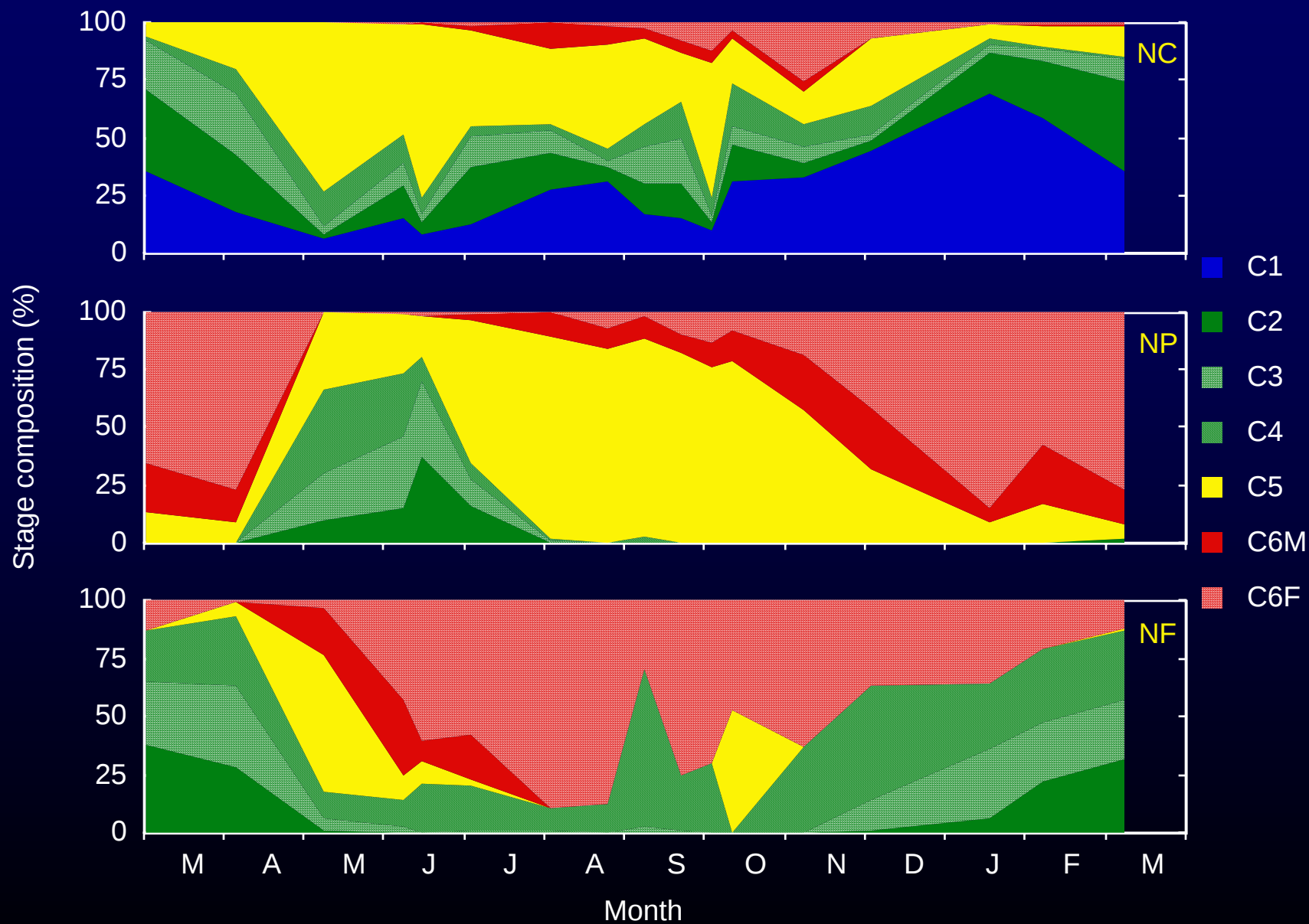
Neocalanus spp.

Comparison of life cycle patterns

Parameters		WN Pacific Mixed	Oyashio	EN Pacific Stn P
Environments				
SST (°C)		2.3-25.4	0.2-22.0	5.6-13.9
Surface Chl-a (mg m ⁻³)		0.1- 2.5	0.1-19.0	0.1- 0.6
Phytoplankton bloom		Mar-Apr	Apr-May	Jun-Jul
Number of generations per year				
Calanus	pacificus	1-2g/year	No Data	3g/year
Metridia	pacifica	2g/year	No data	3g/year
Eucalanus	bungii	1g/2-3year	No data	1g/2-3year
Neocalanus	cristatus	1g/year	1g/year	1g/year
N.	flemingeri	1g/year *	1g/year *	1g/year
N.	plumchrus	1g/year	1g/year	1g/year

* partly 1g/2year

Stage composition of deep spawners



Stage composition of surface spawners

