2010-PICES Annual Meeting: S13

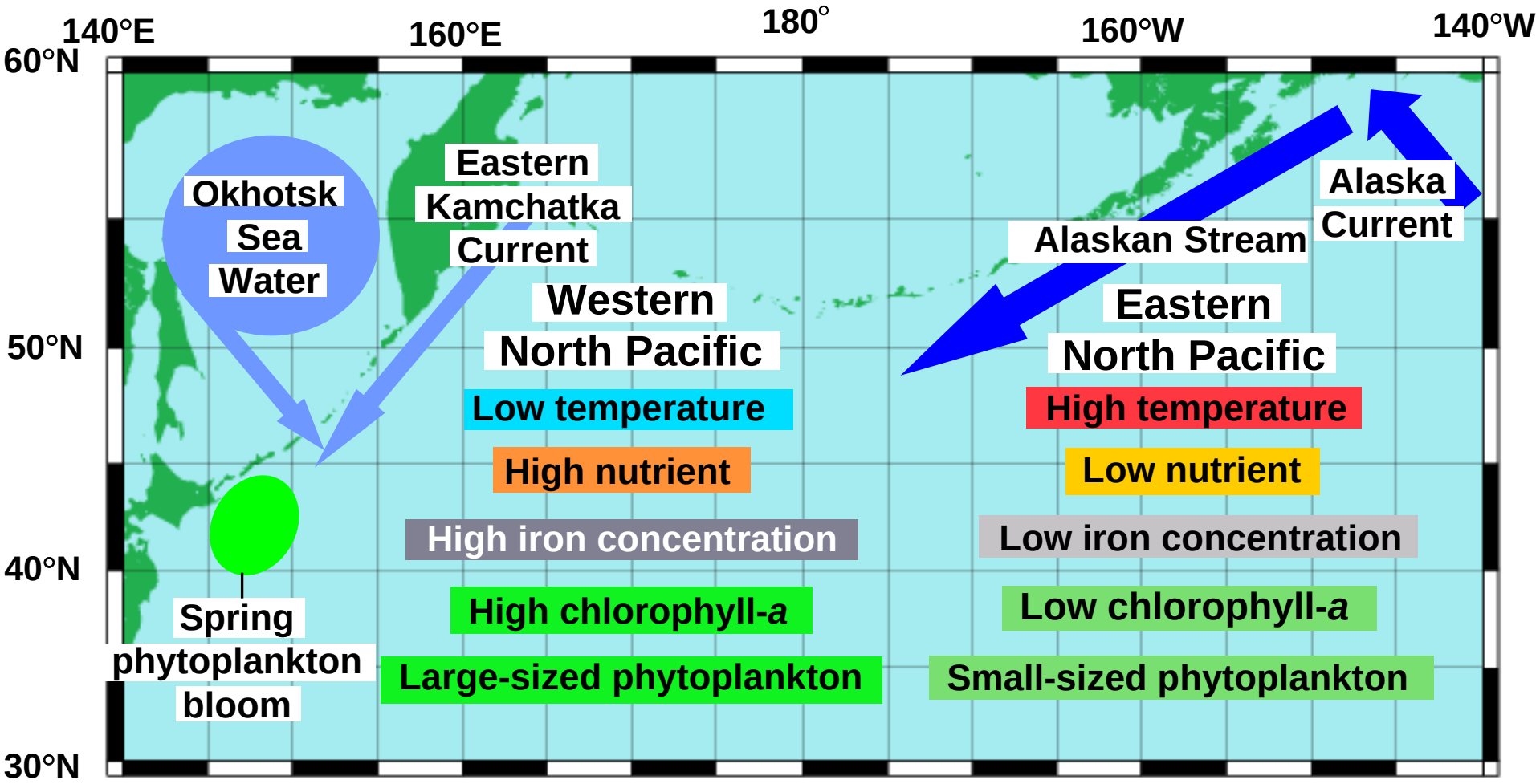
East-west comparison of the zooplankton community in the subarctic Pacific during summers of 2003-2006

T/S Oshoro-maru

Rui Saito[1], Atsushi Yamaguchi[1], Ichiro Imai[1], Sei-Ichi Saitoh[2] and Kenshi Kuma[3]

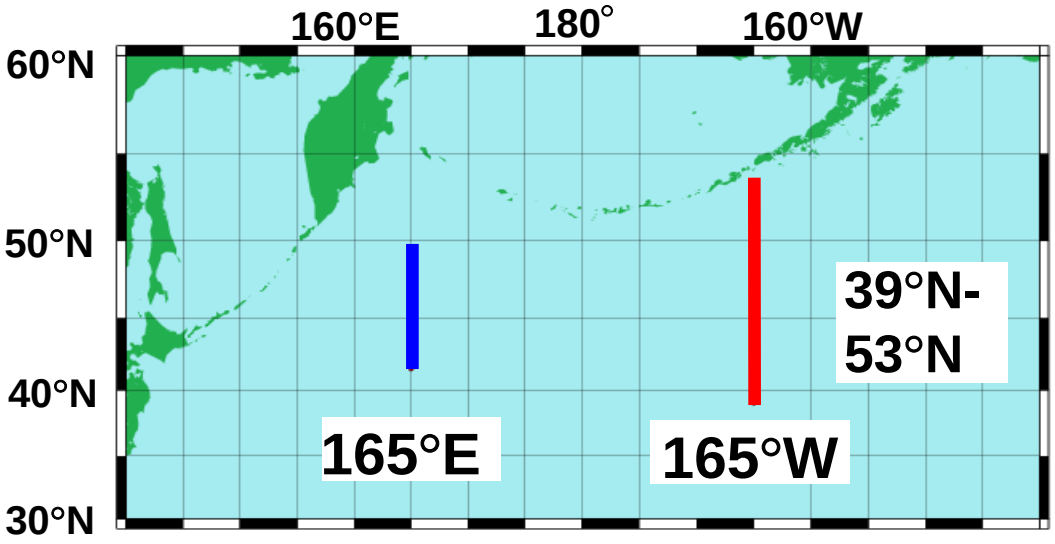
Plankton Laboratory[1],
Satellite Fisheries and Oceanography Laboratory[2],
Marine Environmental Science Laboratory[3],
Graduate School of Fisheries Sciences,
Hokkaido University

1. Introduction



We compared zooplankton community in the eastern and western North Pacific

2. Materials and Methods



June-August, 2003-2006

Twin NORPAC net (0.335, 0.100 mm)

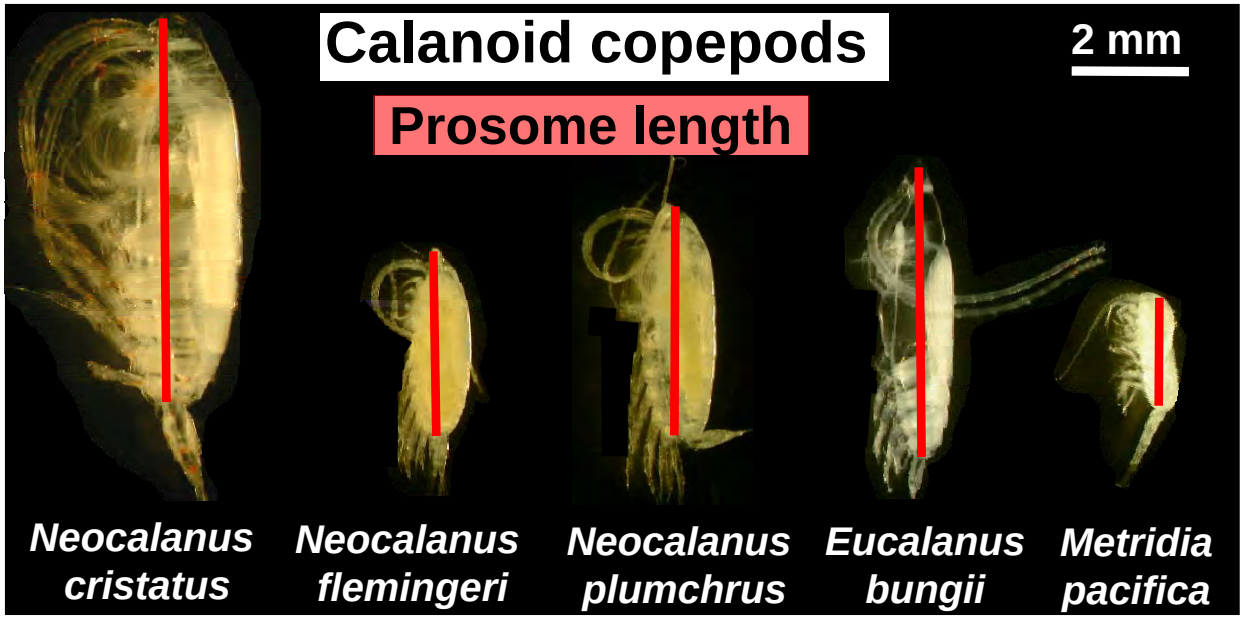
0-150 m vertical haul

CTD: Temperature

Water samples (0-150 m): Chl-*a*

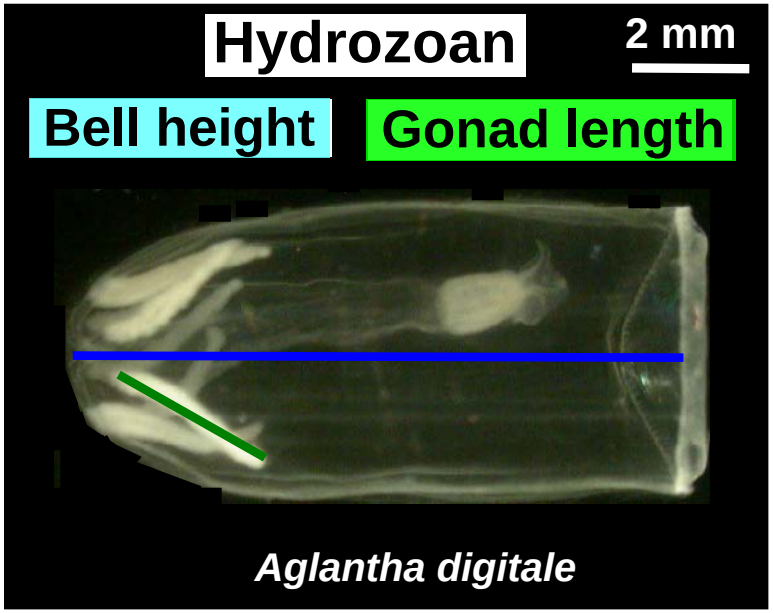
0.335 mm samples: Measure wet mass

0.100 mm samples: Count zooplankton taxonomic group



Count with copepodid stage (C1-C6)

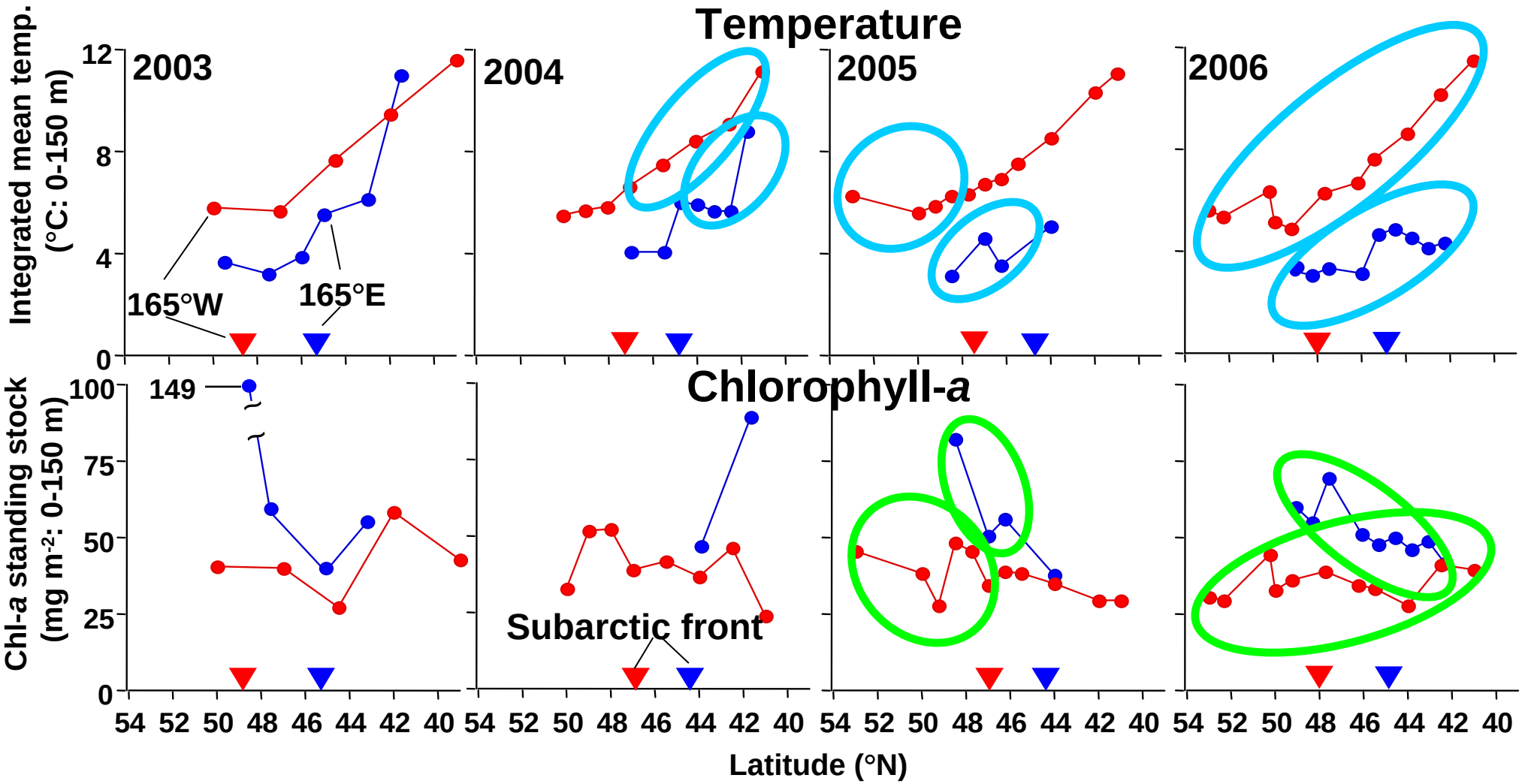
Measure prosome length



Count *Aglantha digitale*

Cohort analysis

3. Temperature and Chlorophyll-*a*

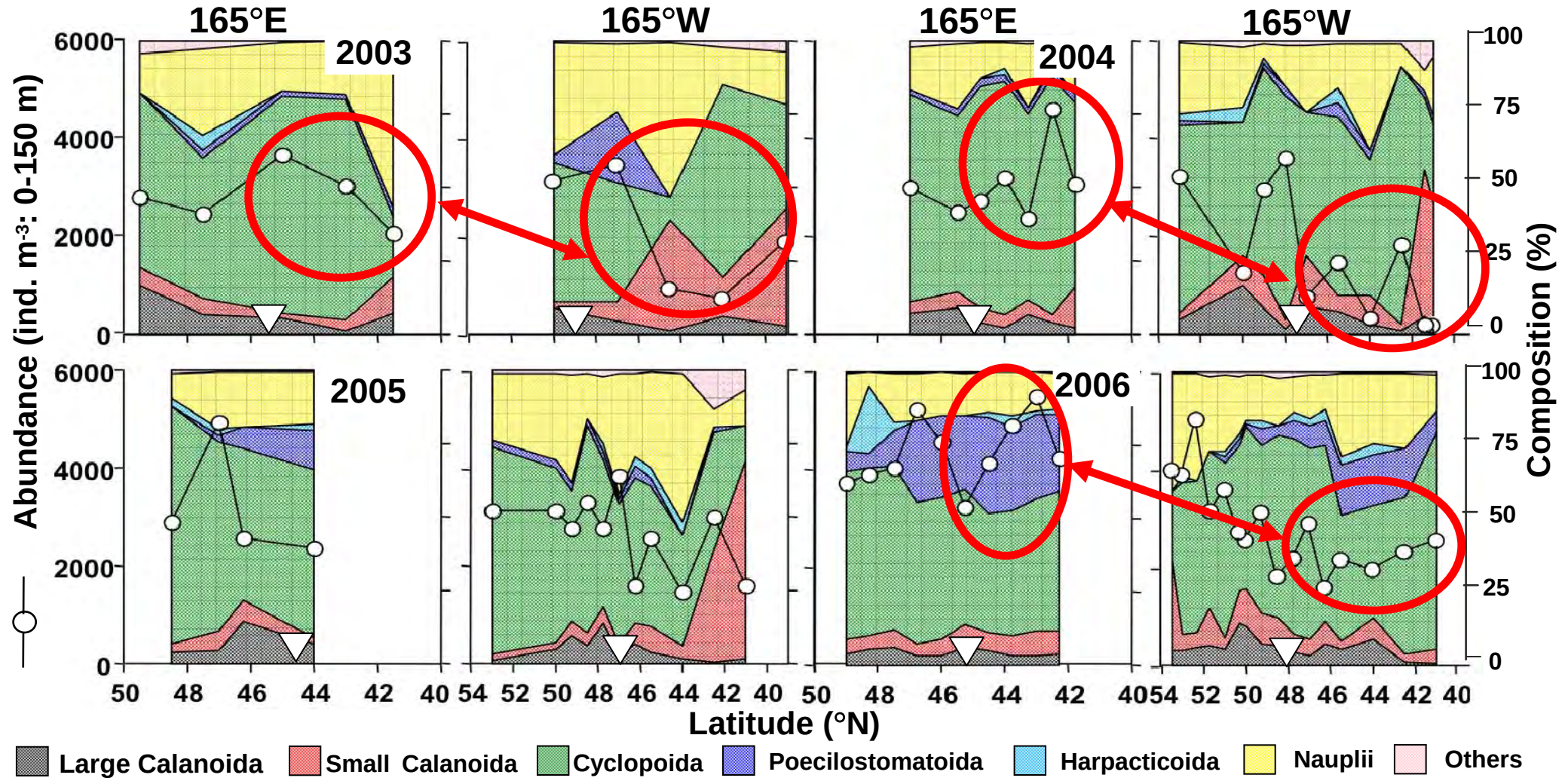


Significant east-west difference in environmental parameters

Temperature: Higher in the East

Chl-*a*: Higher in the West

4. Zooplankton abundance

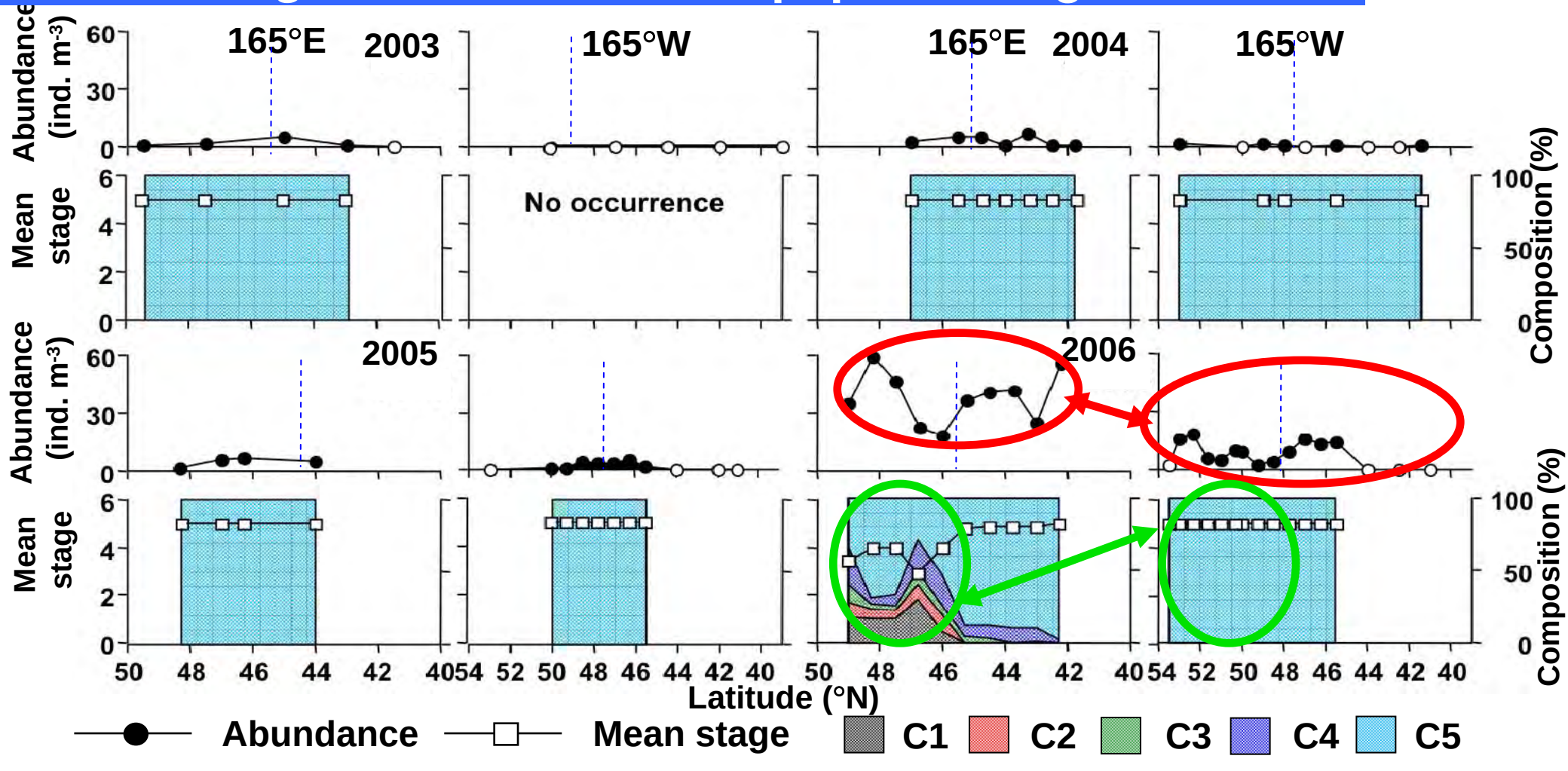


Significant east-west difference **West > East**

Cyclopoid copepods and Nauplii were abundant

West: Higher Chl-*a* ⇒ Abundant small copepods ⇒ Greater total abundance

5. *N. flemingeri* abundance & copepodid stage structure



Significant east-west difference in abundance

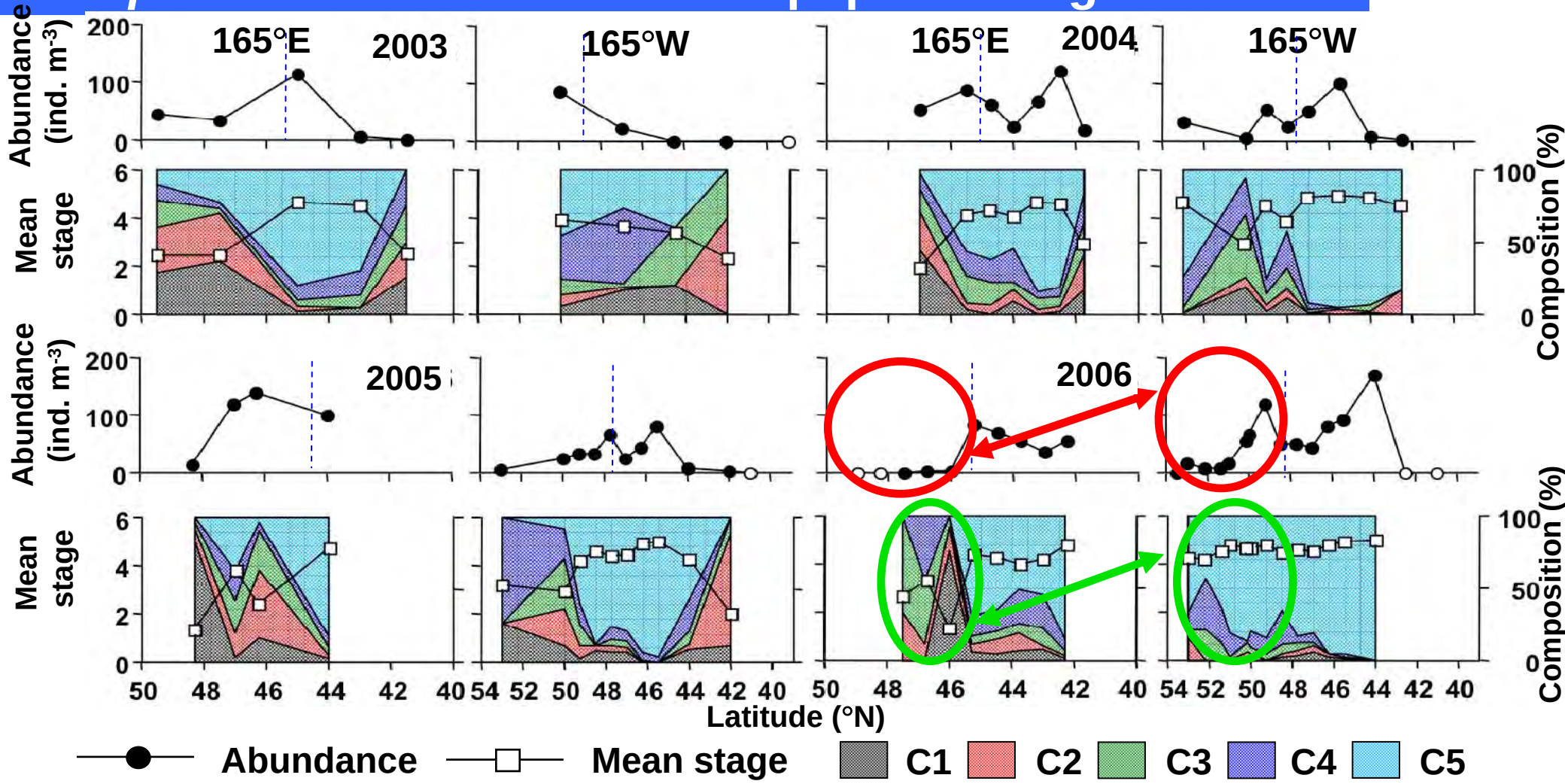
West > East

East-west difference in stage structure

West:C1-C3 < East:C5

East-west difference in generation length : West > East

6. *N. plumchrus* abundance & copepodid stage structure



Significant east-west difference in abundance

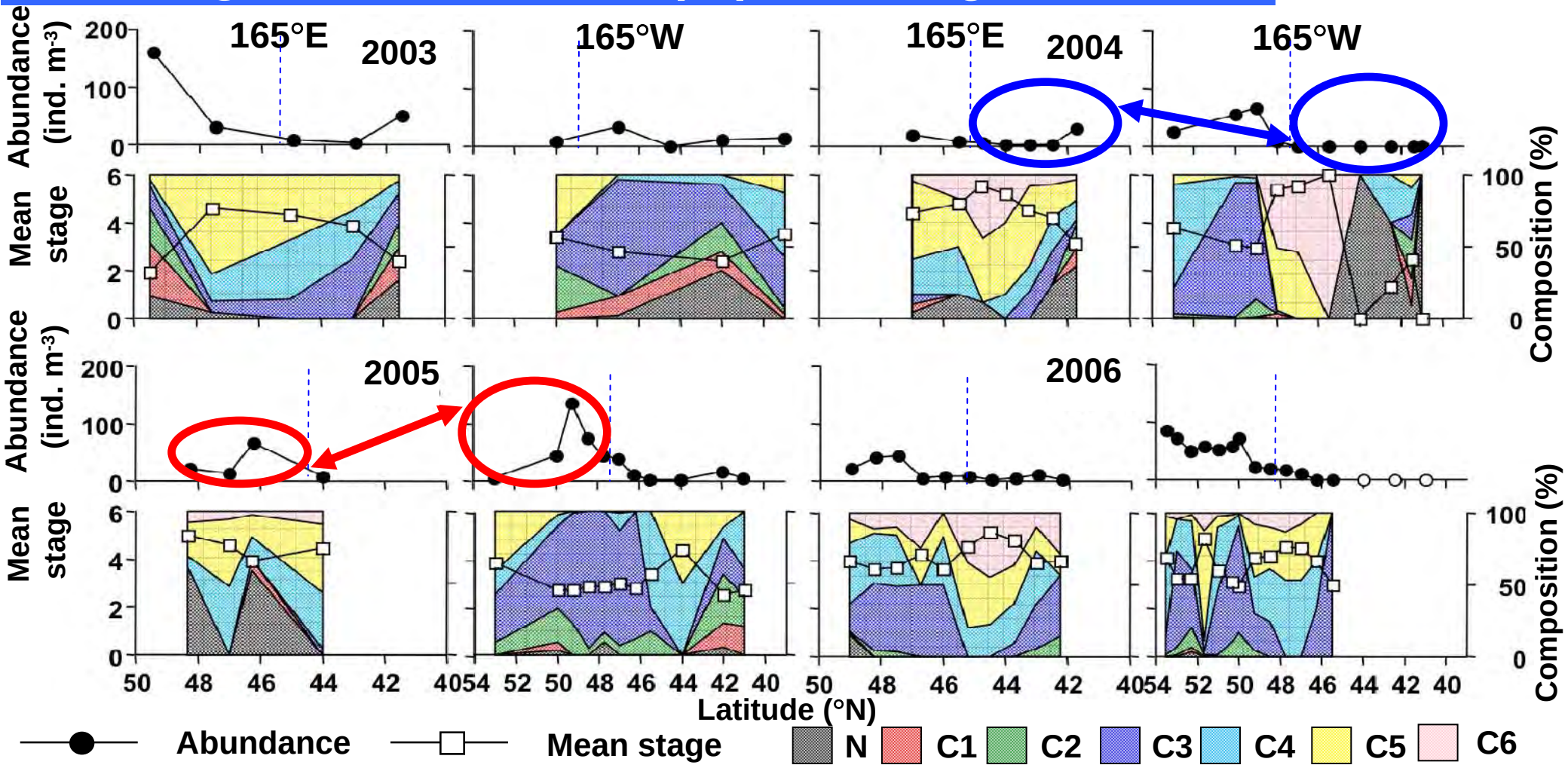
West < East

East-west difference in stage structure

West: C1-C3 < East: C4-C5

Most individuals did not appear in the surface

7. *E. bungii* abundance & copepodid stage structure



Significant east-west difference in abundance

West < East

East-west difference in generation length

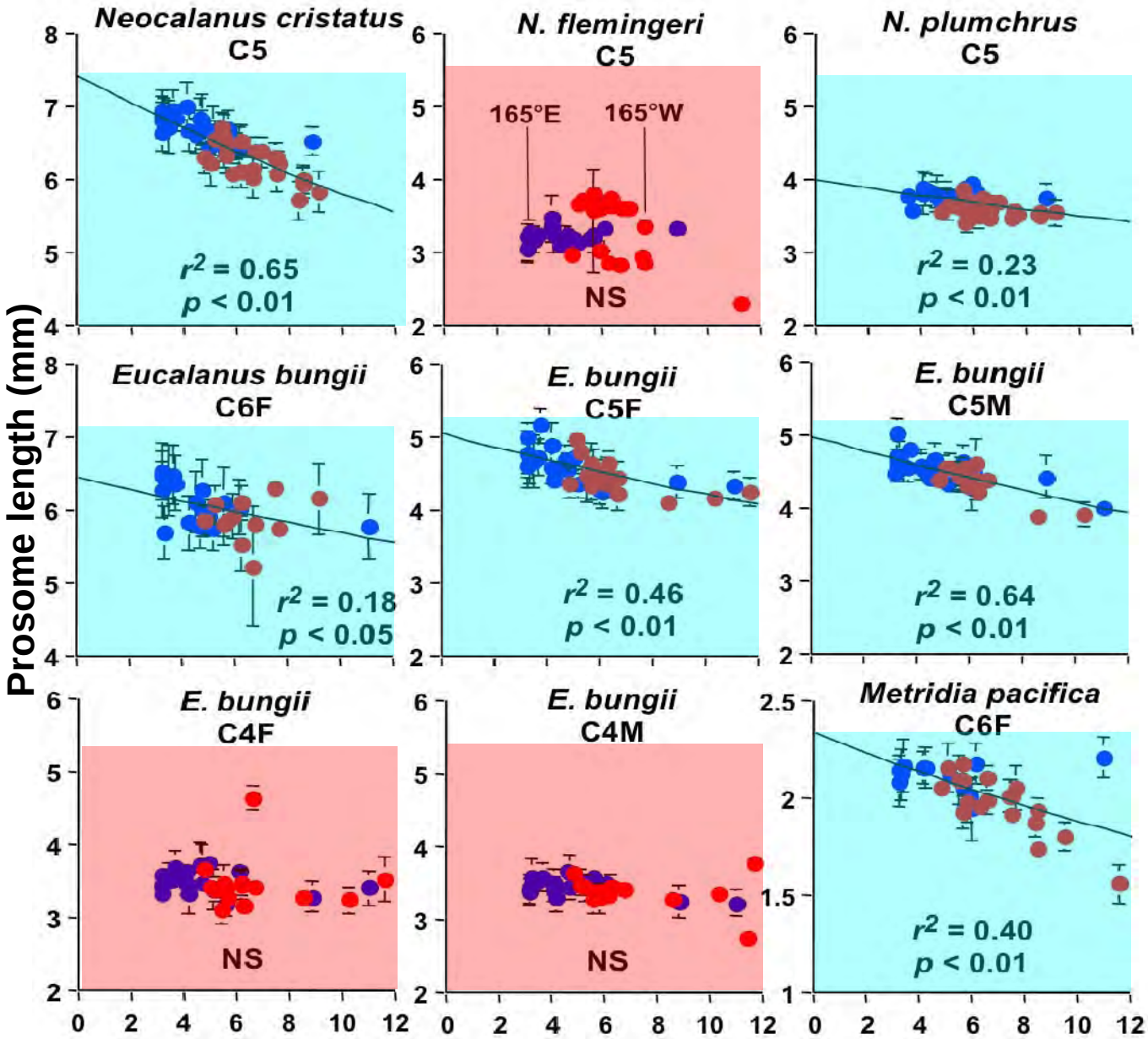
West < East

Significant east-west difference in abundance

West > East

Chl-*a*: West > East

8. Relationship between copepod body size & temperature



Bêlehrádek equation: $PL = a\,(T - a)^{-2.05}$

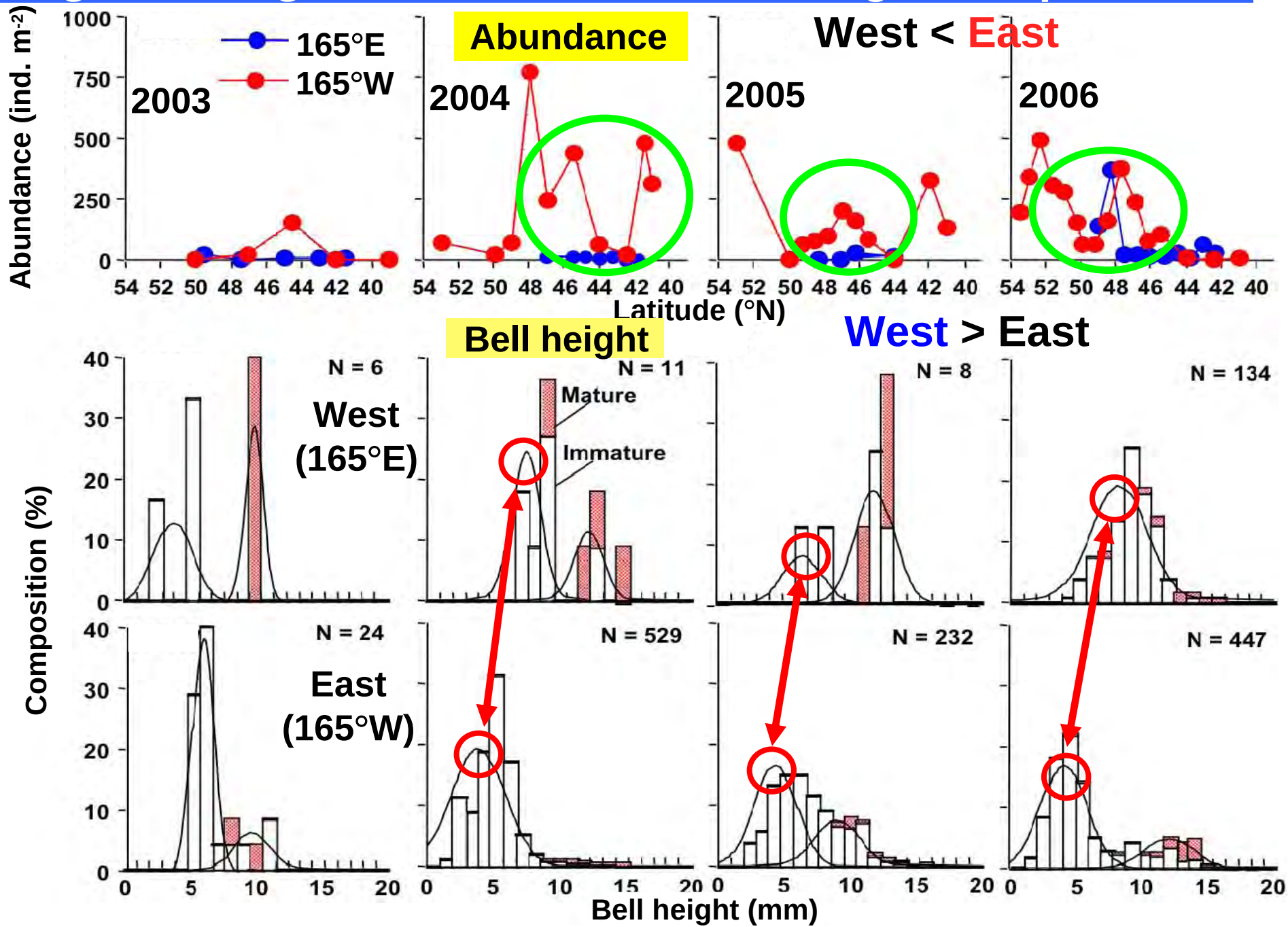
***N. cristatus*,**
N. plumchrus
No east-west difference in the life span
M. pacifica
grows in short period

Temperature is important

East-west difference in the life span
N. flemingeri
West > East
E. bungii
West < East

Temperature in previous year Is more important

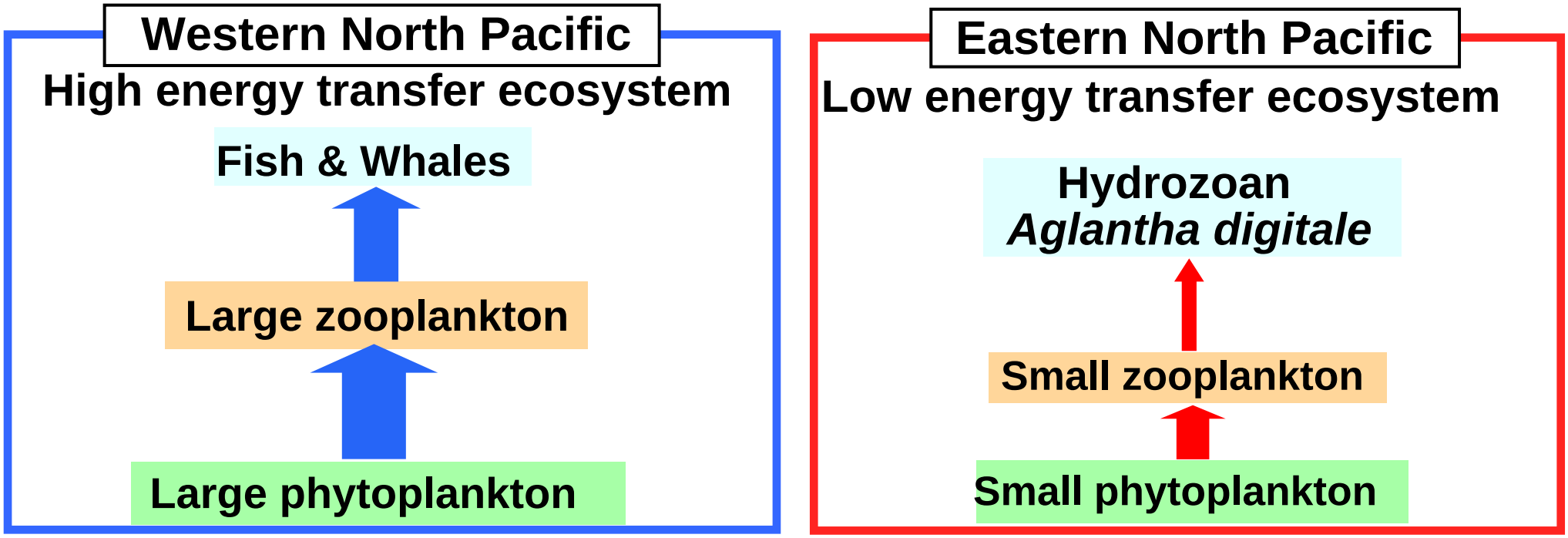
9. *Aglantha digitale* abundance & bell height composition



10. East-west comparison of *A. digitale*

Abundance: West < East

Parsons and Lalli (2002): Hydrozoan dominant mechanism



East-west difference in ecosystem sturucture

Bell height: West > East

Reproductive timing West: July-September < East: Mid-July

This study: West: Before reproduction; East: After reproduction

East-west difference in reprodcuctive timing

11. East-west comparison of zooplankton community

	West	East	Factor
Zooplankton			
Abundance	High	Low	Phytoplankton concentration
Wet mass	No east-west difference		
Abundance			
Copepods	Not large difference varied with spcies		
Hydrozoan	Low	High	Ecosystem structure
Body length			
Copepods	Large	Small	Temperature
Hydrozoan	Large	Small	Reproductive timing

Temperature, phytoplankton concentration and ecosystem structure were important factors to determine east-west differences in zooplankton community

12. My journal article in press

JOURNAL OF PLANKTON RESEARCH VOLUME 32 NUMBER 11 PAGES 1–15 2010

JPR Advance Access published September 1, 2010

East–west comparison of the zooplankton community in the subarctic Pacific during summers of 2003–2006

RUI SAITO[1]*, ATSUSHI YAMAGUCHI[1], SEI-ICHI SAITOH[2], KENSHI KUMA[3] AND ICHIRO IMAI[1]

[1]PLANKTON LABORATORY, GRADUATE SCHOOL OF FISHERIES SCIENCES, HOKKAIDO UNIVERSITY, 3-1-1 MINATO-CHO, HAKODATE, HOKKAIDO 041-8611, JAPAN, [2]SATELLITE FISHERIES AND OCEANOGRAPHY LABORATORY, GRADUATE SCHOOL OF FISHERIES SCIENCES, HOKKAIDO UNIVERSITY, 3-1-1 MINATO-CHO, HAKODATE, HOKKAIDO 041-8611, JAPAN AND [3]MARINE ENVIRONMENTAL SCIENCE LABORATORY, GRADUATE SCHOOL OF FISHERIES SCIENCES, HOKKAIDO UNIVERSITY, 3-1-1 MINATO-CHO, HAKODATE, HOKKAIDO 041-8611, JAPAN

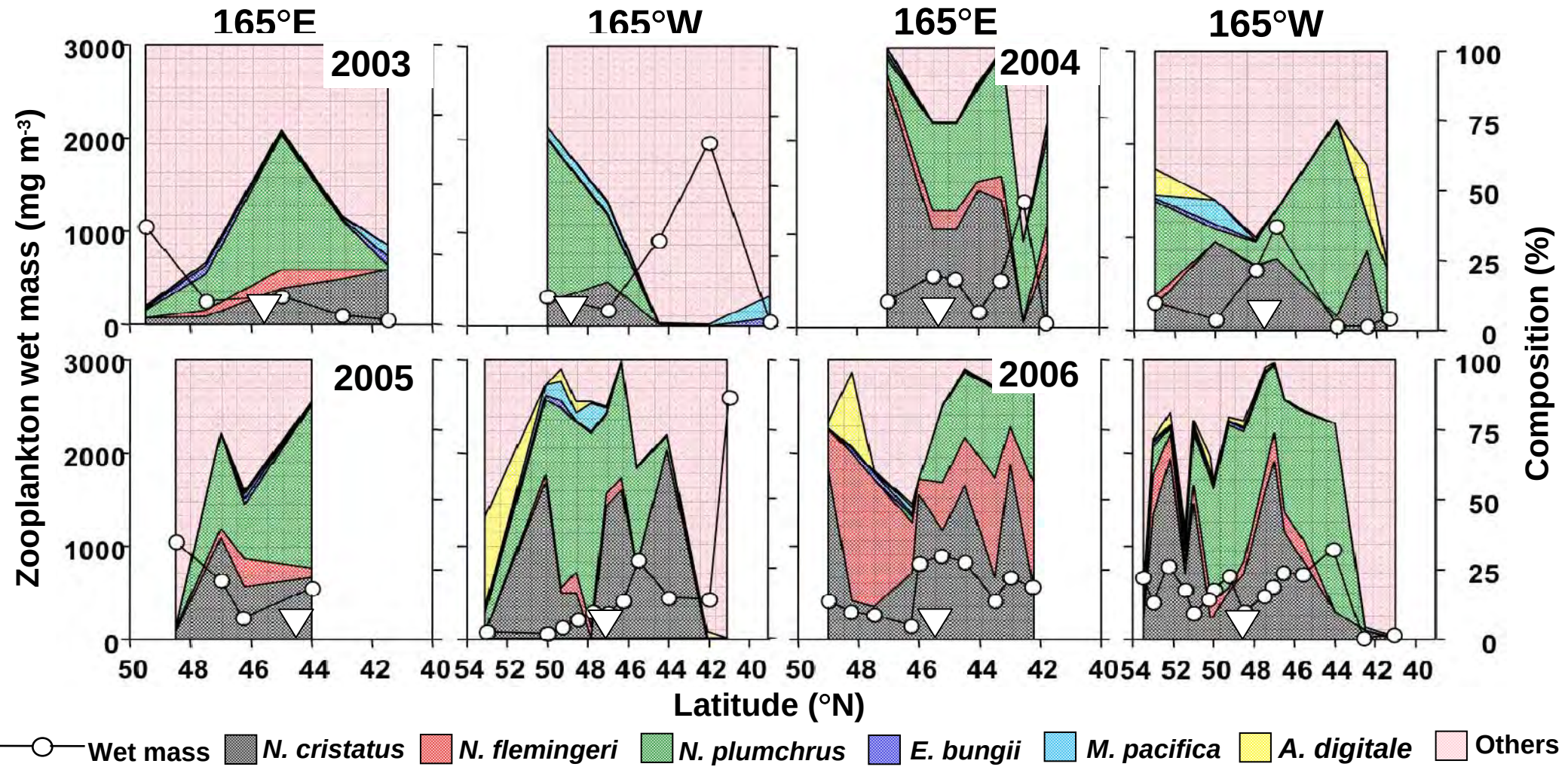
*CORRESPONDING AUTHOR: ruis@fish.hokudai.ac.jp

Received May 12, 2010; accepted in principle July 13, 2010; accepted for publication July 21, 2010

Corresponding editor: Marc J. Gibbons

Thank you for listening my presentation

Zooplankton biomass (wet mass)

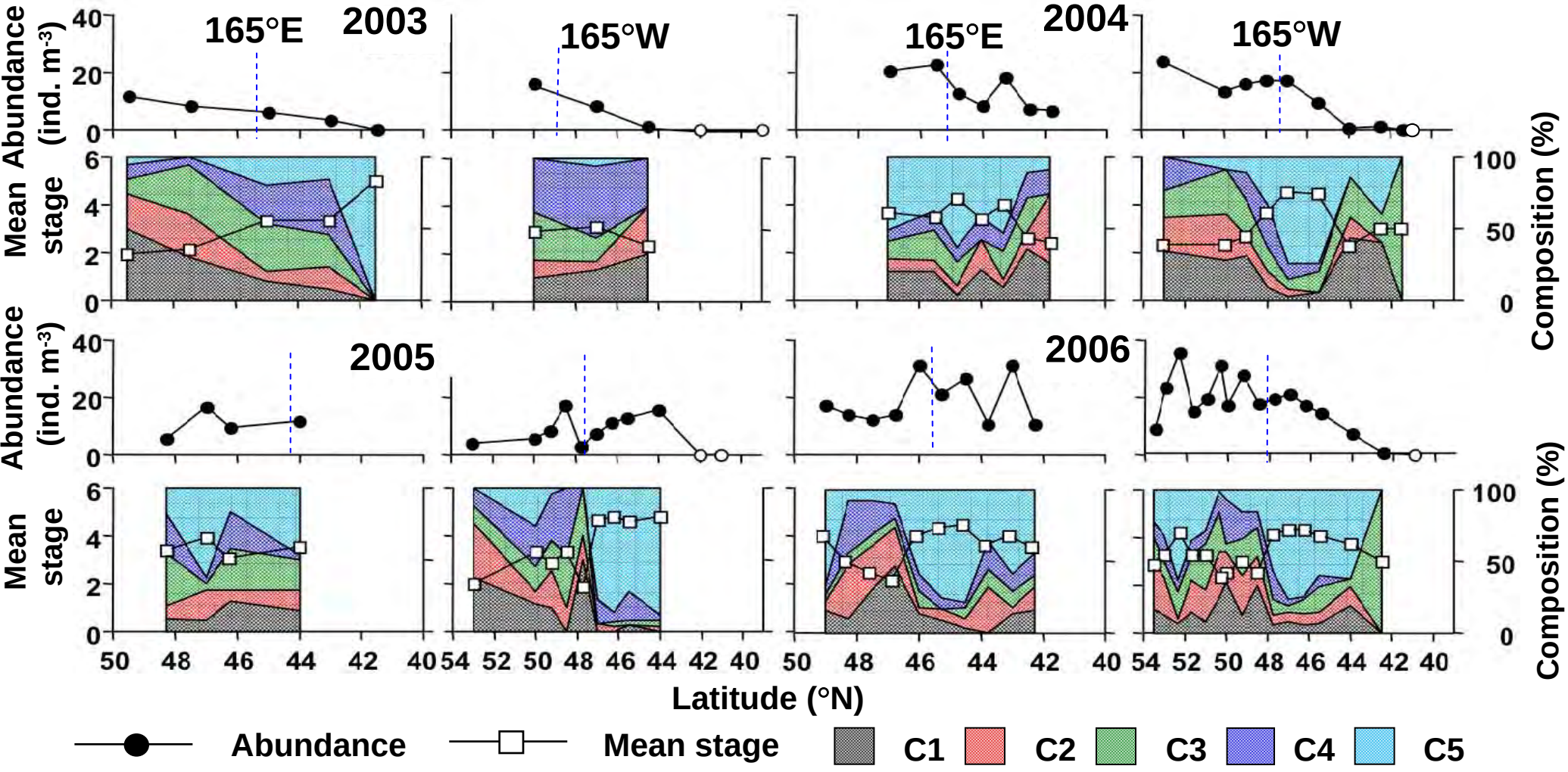


No significant east-west difference

Calanoid copepod *N. cristatus* *N. flemingeri* *N. plumchrus*

Hydrozoan *A. digitale* **were abundant**

N. cristatus abundance & copepodid stage structure



Abundance

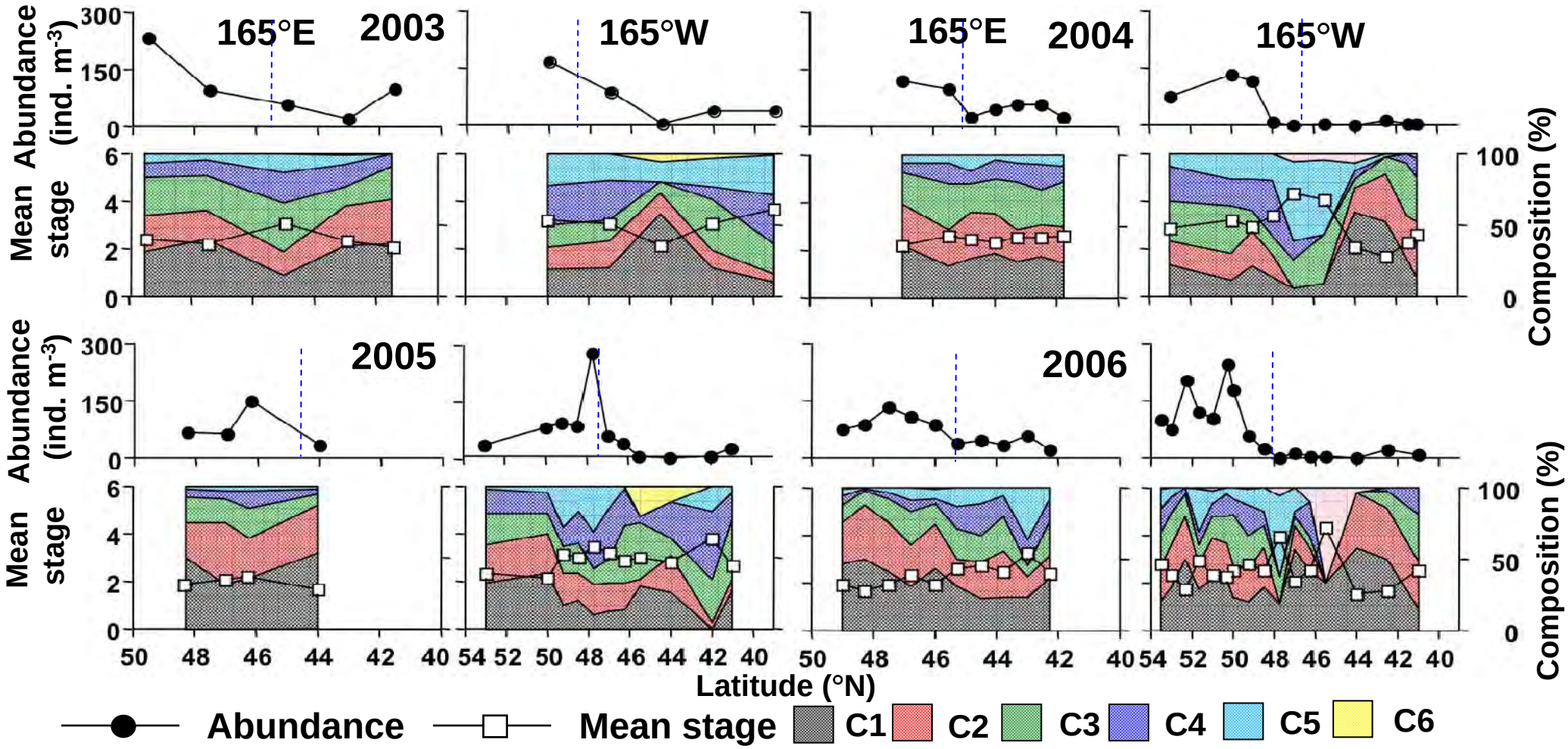
No significant east-west difference

Copepodid stage structure

Subarctic current system: C1-C3

Transitional domain: C5

M. pacifica abundance and copepodid stage structure



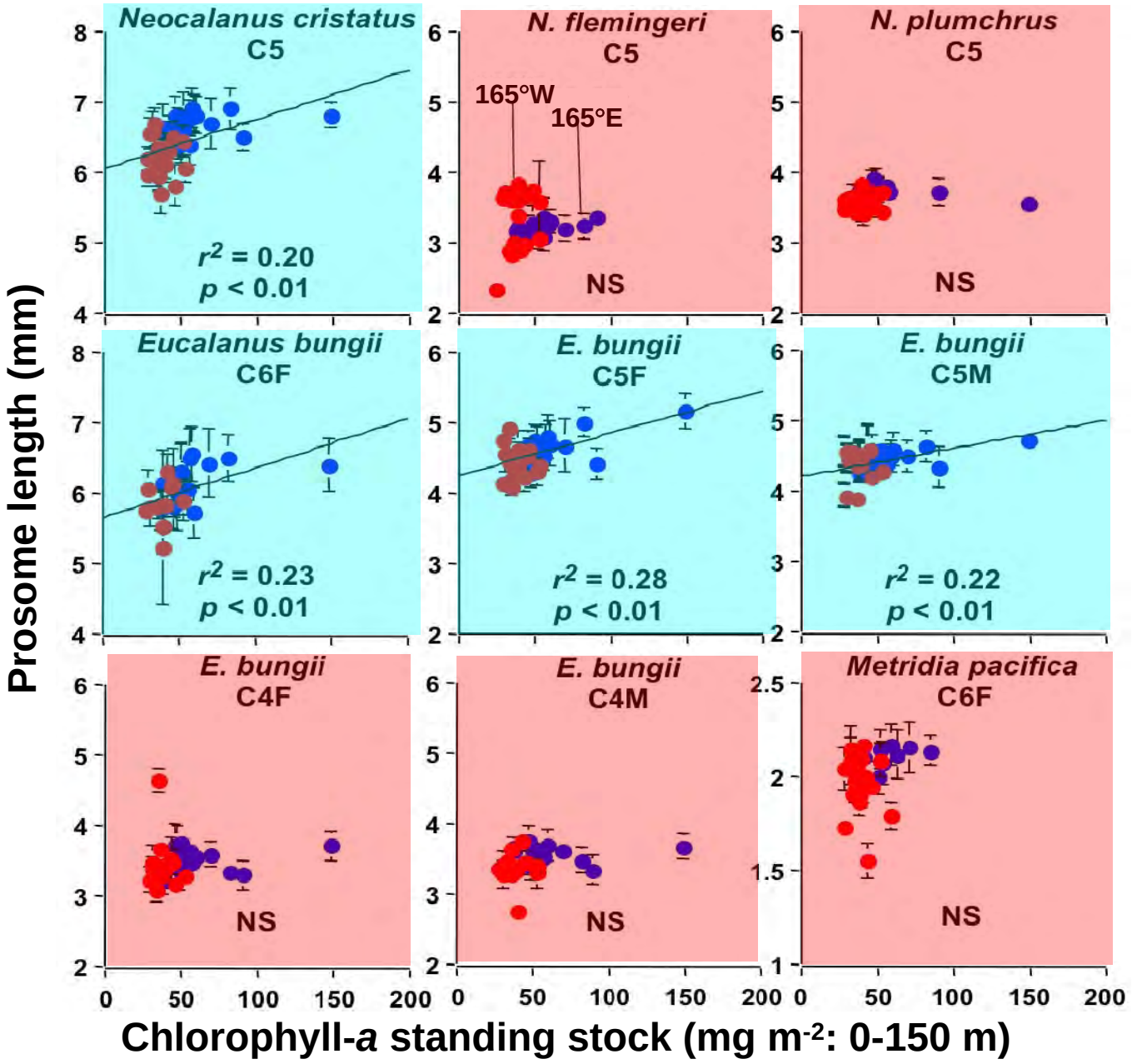
Abundance

No significant east-west difference

Copepodid stage structure

Not clear east-west difference

Relationship between copepodid body size and Chl-*a*



***N. cristatus*-herbivorous**

Phytoplankton concentration is an important factor

N. flemingeri, E. bungii

East-west difference in generation length

N. plumchrus

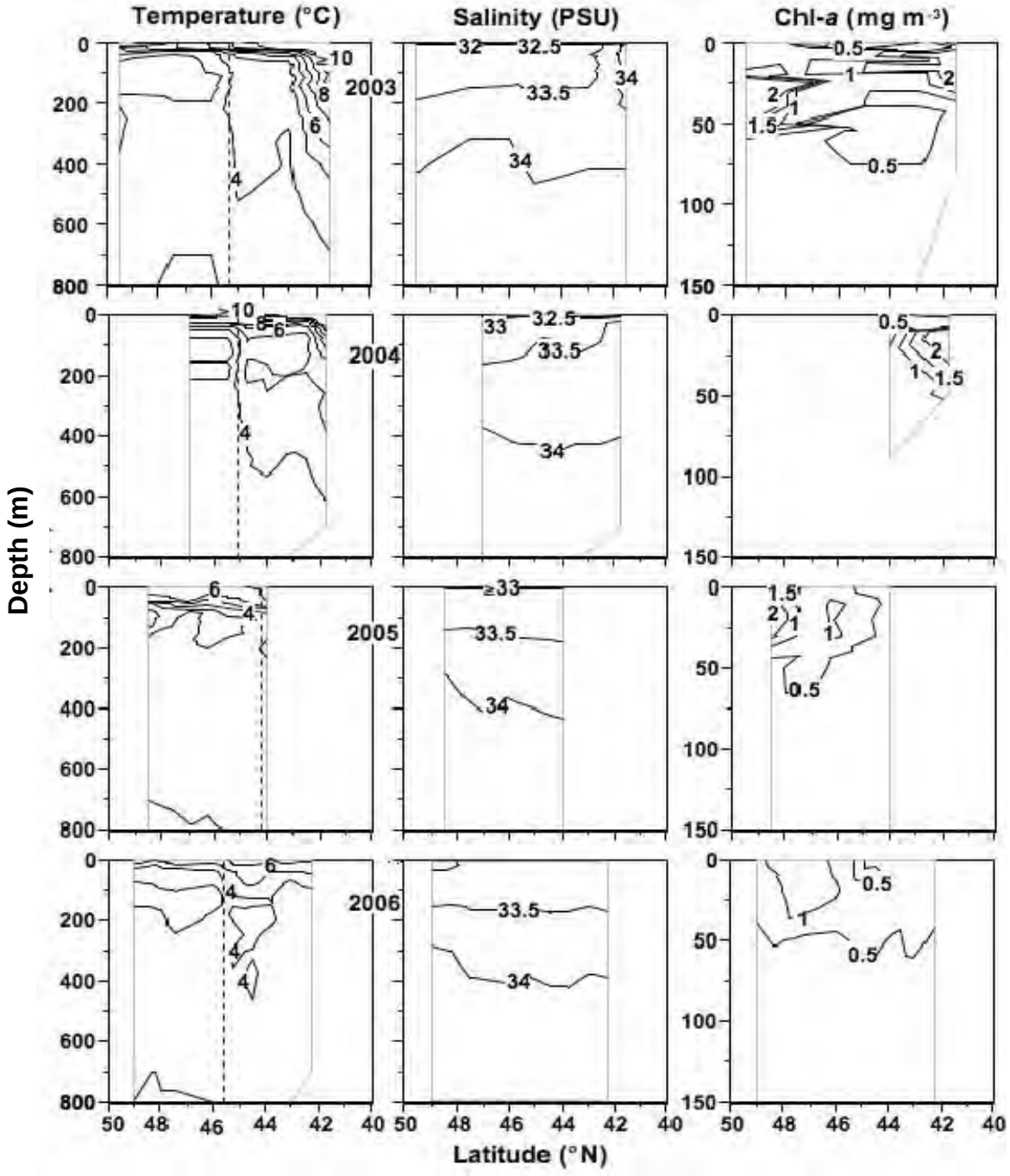
prey on small crustacean

***M. pacifica* C6F**

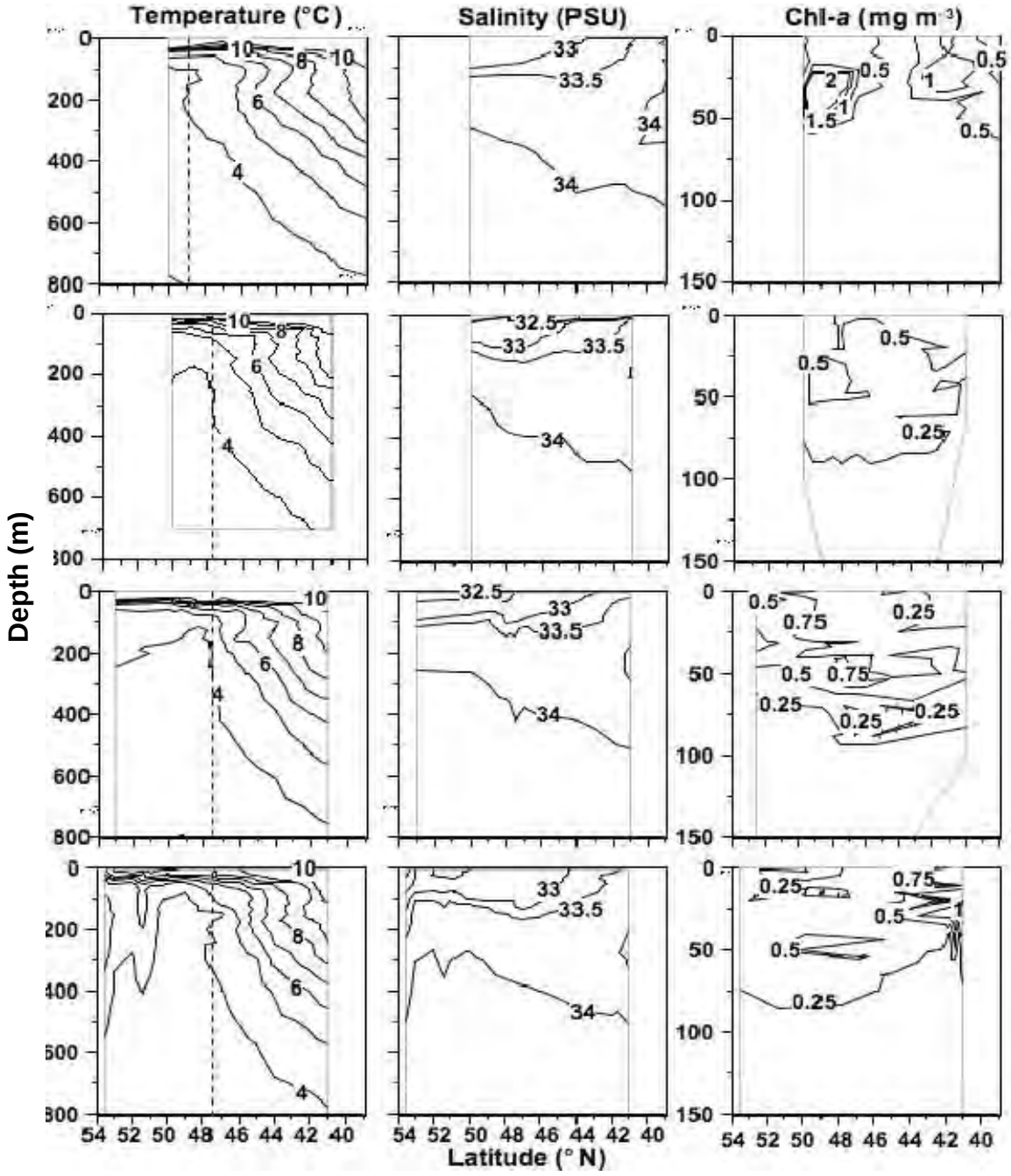
Reproduction > growth

Other factors may be important

Western North Pacific



Eastern North Pacific



M. pacifica day-night difference in abundance