INTERANNUAL VARIABILITY OF ZOOPLANKTON COMMUNITY STRUCTURE BASED ON CONTINUOUS PLANKTON RECORDER IN THE WESTERN SUBARCTIC NORTH PACIFIC DURING 2001-2009

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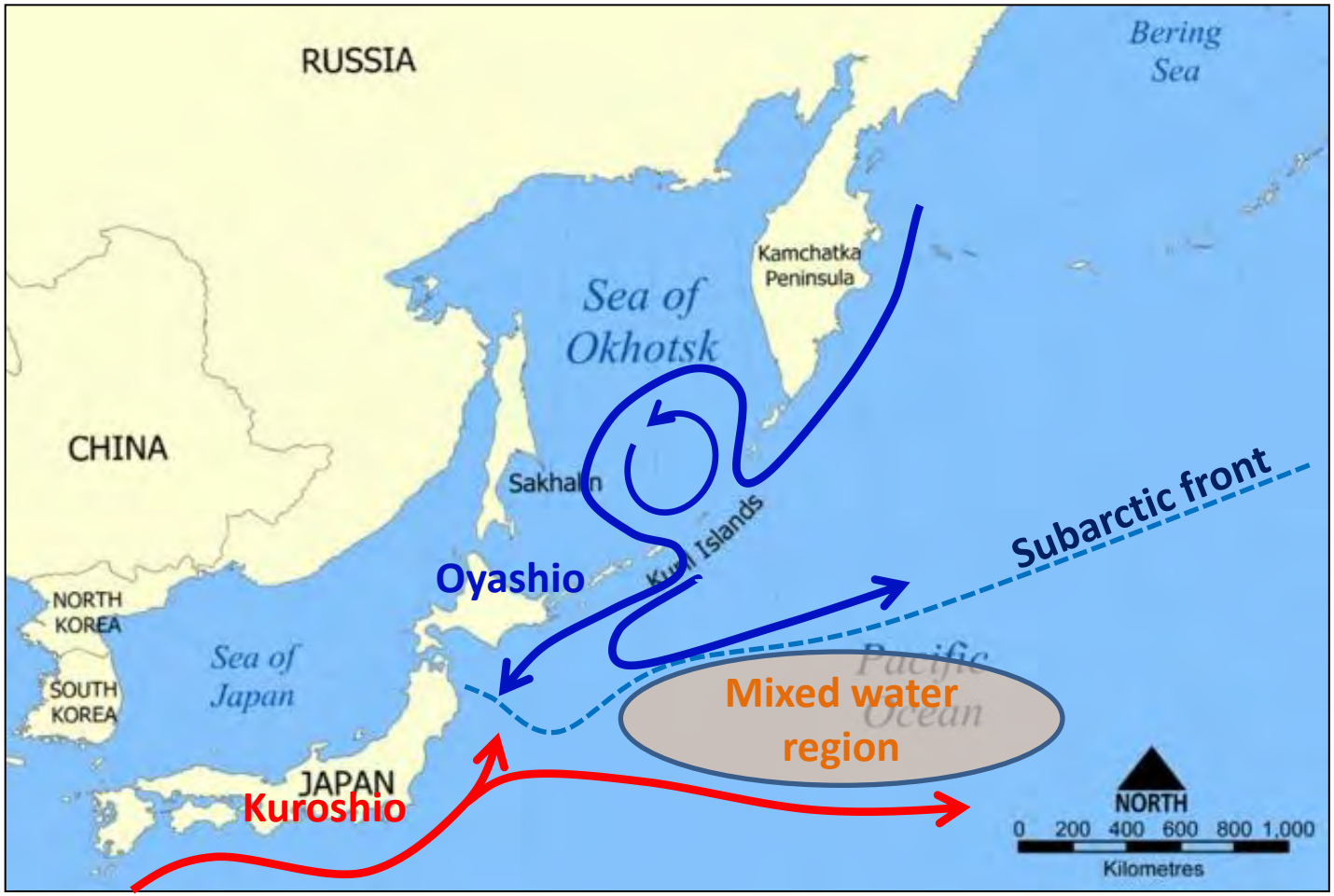
Introduction

Western North Pacific area



OBJECTIVES

To examine Interannul and seasonal variability of zooplankton community structure in Western North Pacific Area during 2001-2009 based on CPR sample

To discuss the differences between the two areas, WEST and EAST in western north pacific, and the possible link between the zooplankton variability and environmental factors such as SST and Chl.a data obtained by satellite

This study is a part of Japanese contribution to the North Pacific CPR (Continuous Plankton Recorder) project.

Study area

Sampling

CPR transect was operated one to three times per year, from Spring to Autumn during **2001-2009**

Zooplankton analysis

Large size mesozooplankton (>2mm)

Temperature and Chl.*a* data

Satellite data

Cf. Chiba et al. session 1.

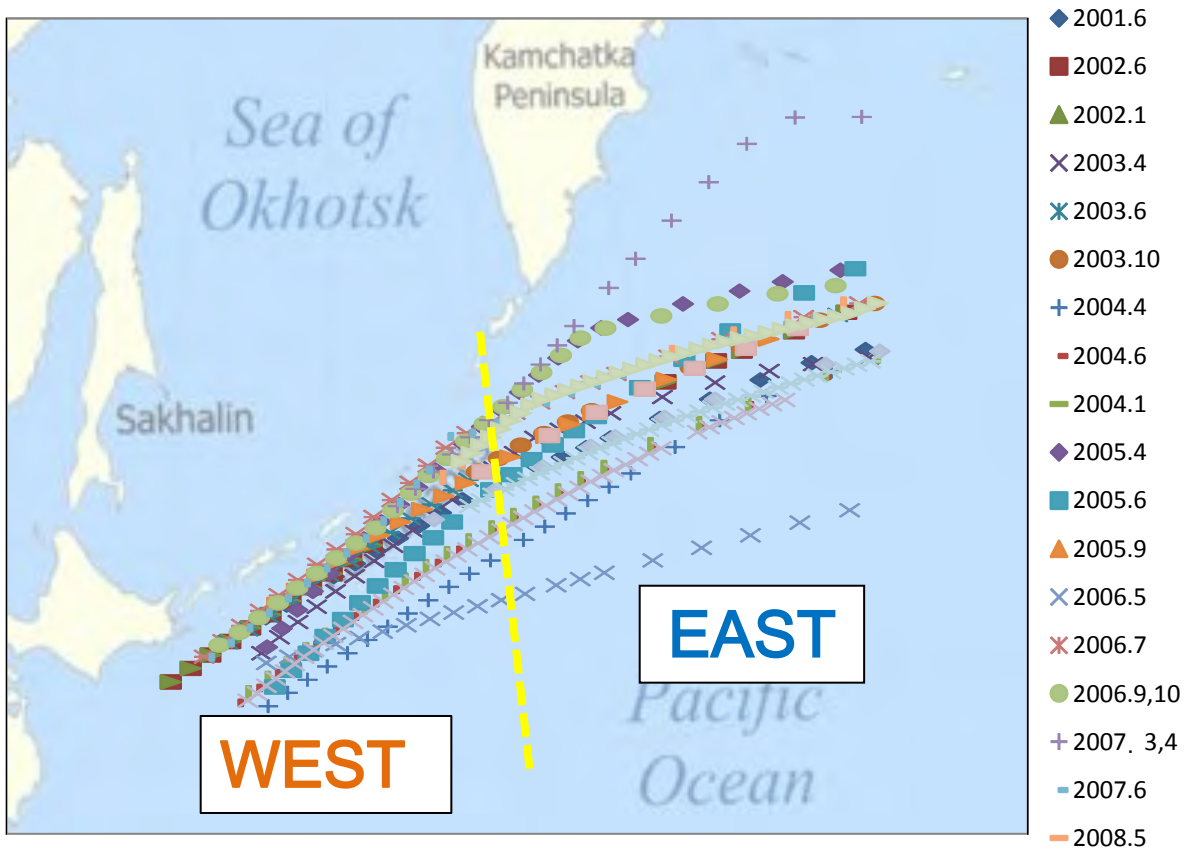


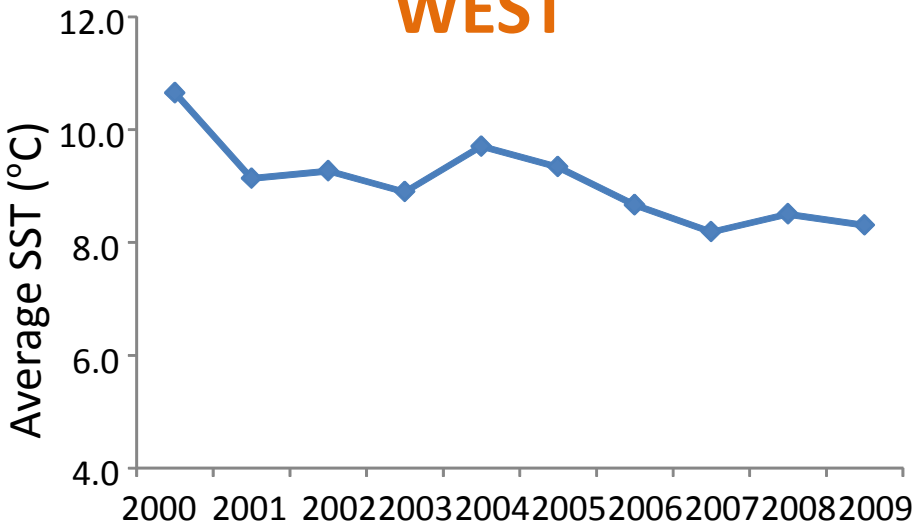
Fig. Sampling transects

Analysis was conducted with WEST and EAST which was divided by 155ºE line

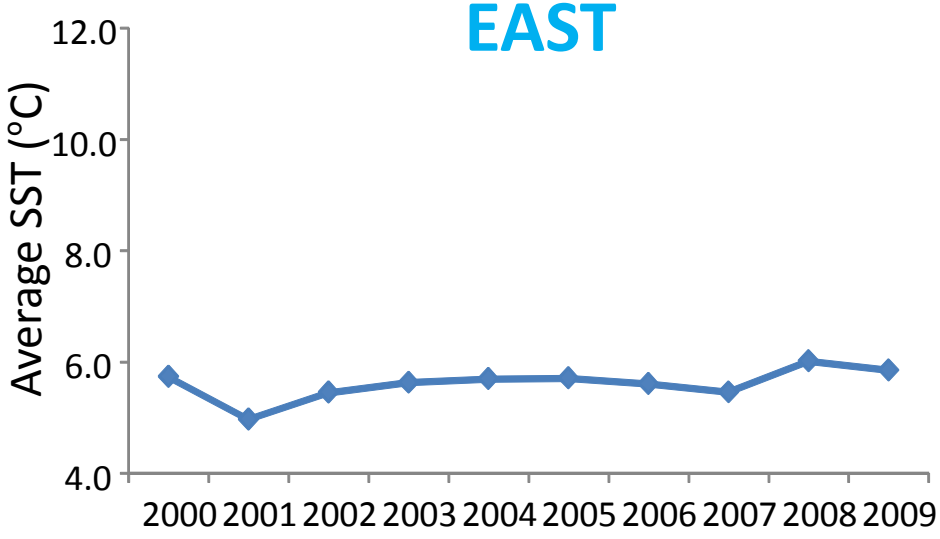
Temperature

Seasonal and Interannual variation of temperature based on the satellite data

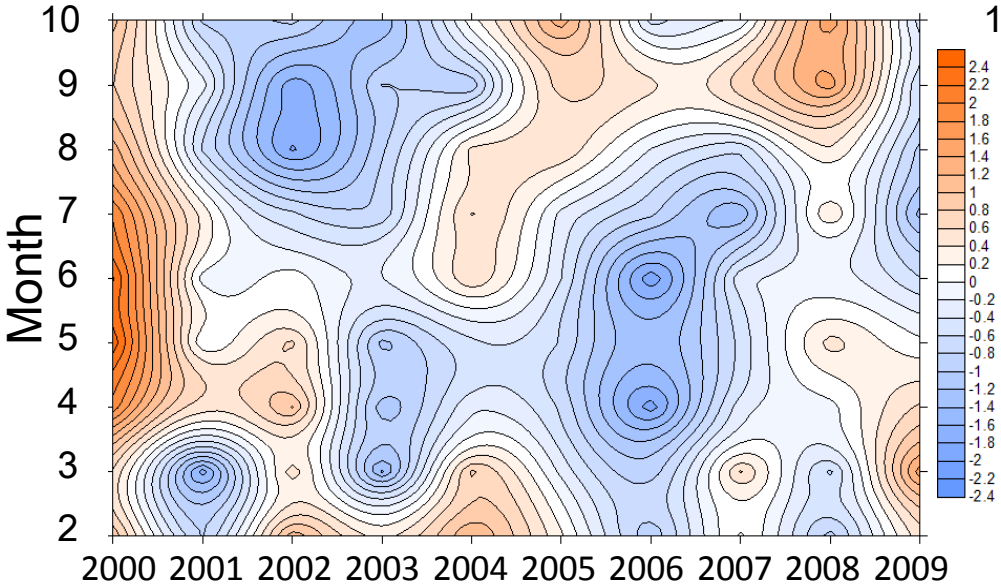
WEST



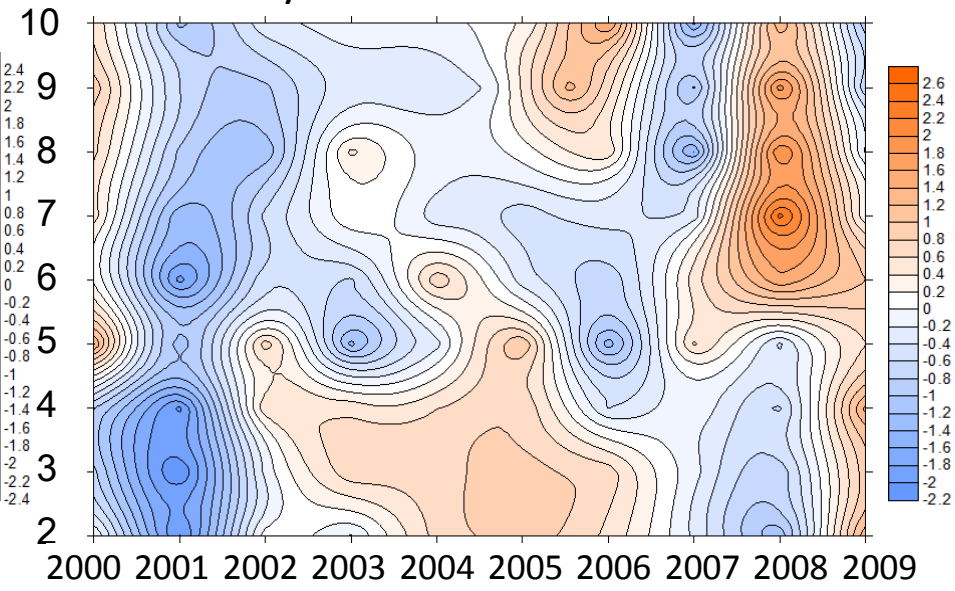
EAST



Monthly Normalized SST in **WEST** area

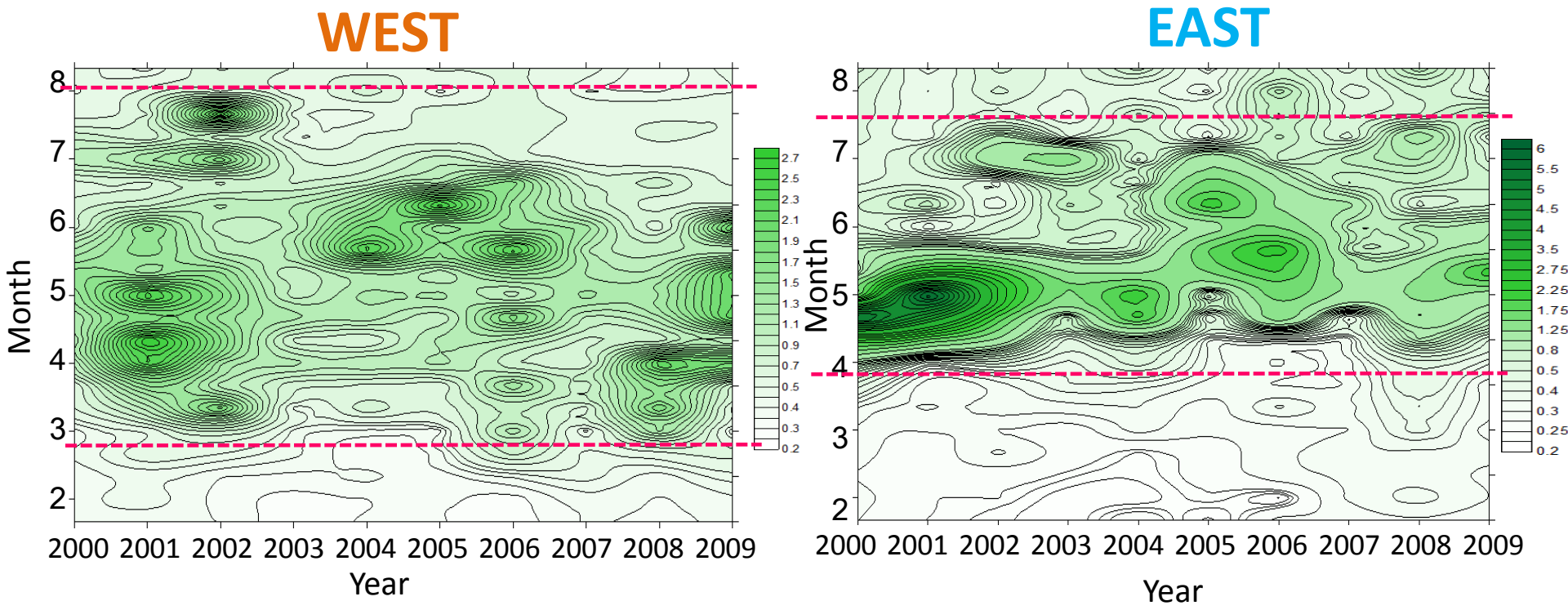


Monthly Normalized SST in **EAST** area



Chl. *a*

Seasonal and Interannual variation of Chl.a based on the satellite ocean color data



Phytoplankton seasonality differs between the two region.

Bloom starts ca. one month earlier in the WEST.

(Detailed information on phytoplankton phenology in this area was already presented in Session 1 by Chiba et al. on 17 Oct.)

Abundant species in all area (Occurrence frequency >4%)

Eucalanus bungii
Neocalanus plumchrus
Neocalanus flemingeri
Neocalanus cristatus
Metridia okhotensis
Metridia pacifica

Cold water species

Calanus pacificus

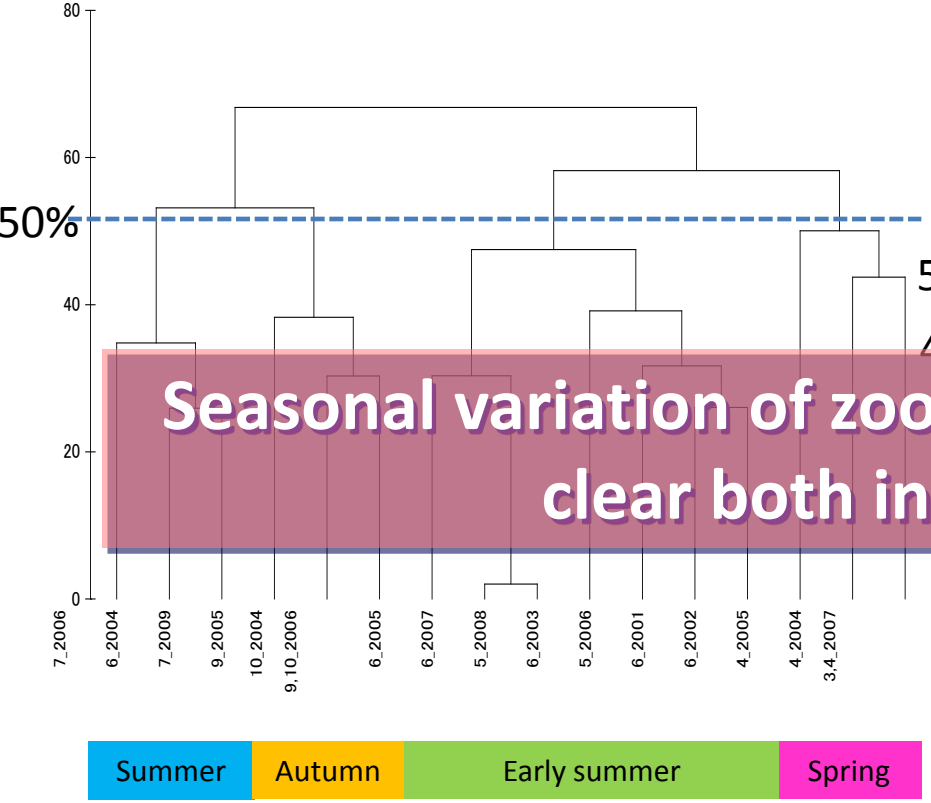
Warm water species

Candacia columbiae
Paraeucheata elongata
Heterorhabdus tanneri

Cluster analysis (with >4% frequent appeared species)

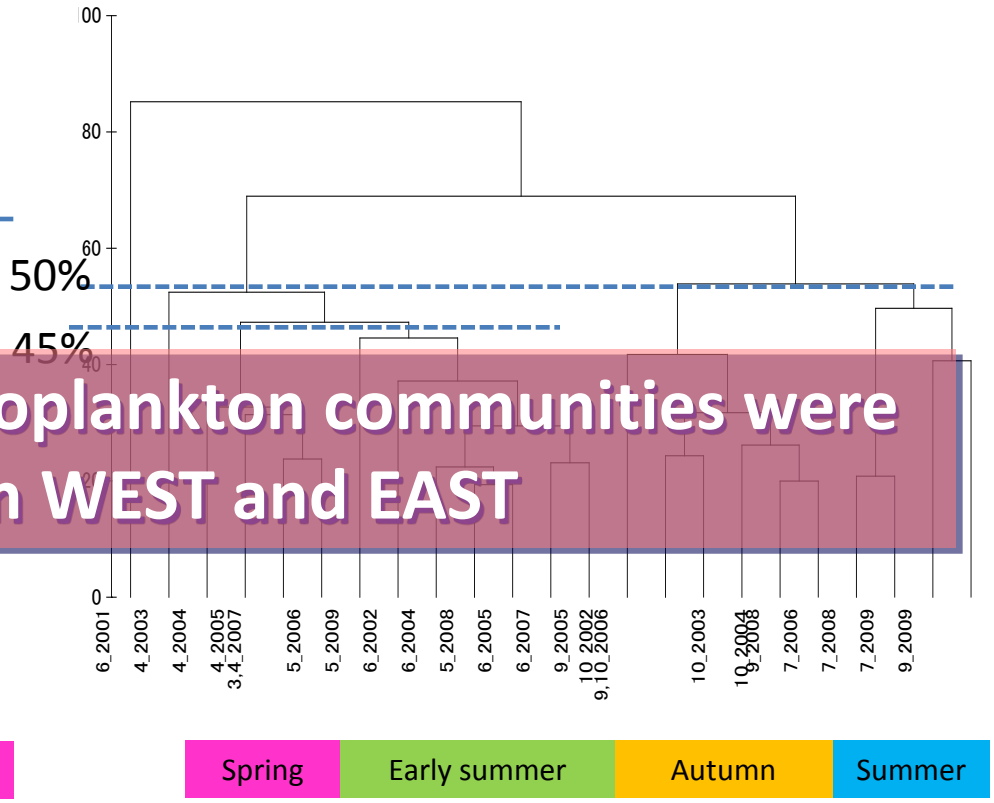
The cluster analysis using the Bray-Curtis dissimilarity index (Bray & Curtis 1957).

WEST



Summer | Autumn | Early summer | Spring

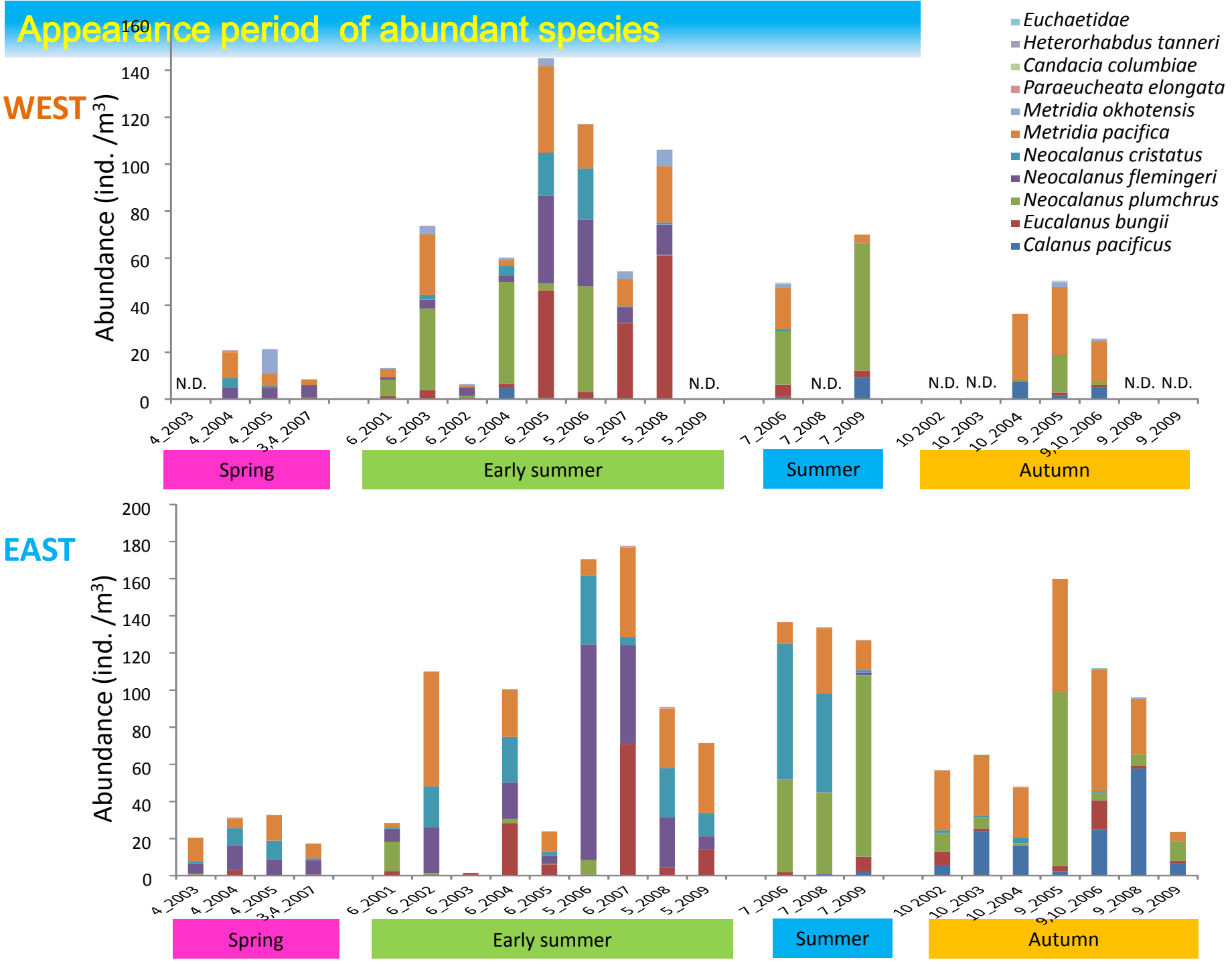
EAST



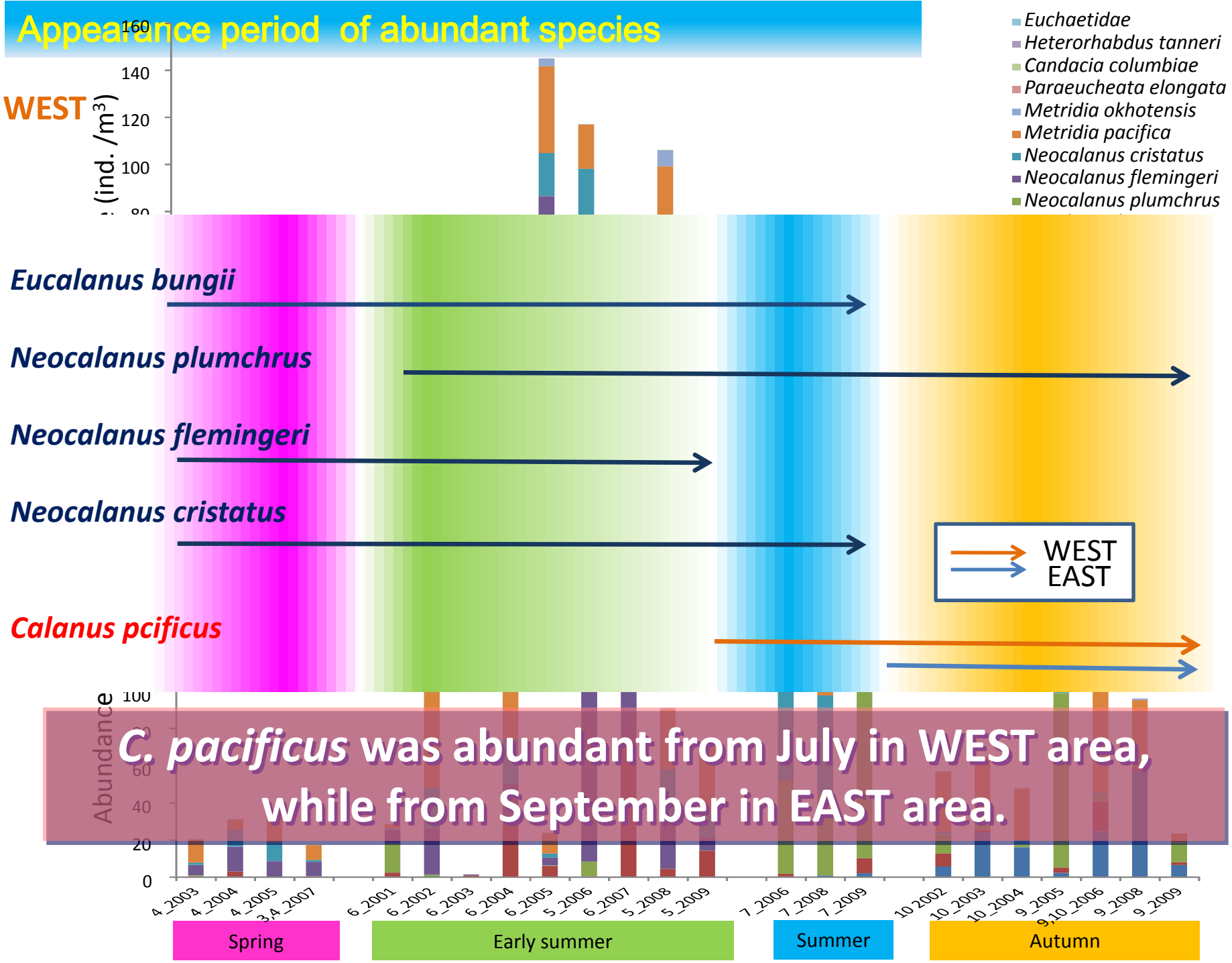
Spring | Early summer | Autumn | Summer

Seasonal variation of zooplankton communities were clear both in WEST and EAST

Appearance period of abundant species



Appearance period of abundant species

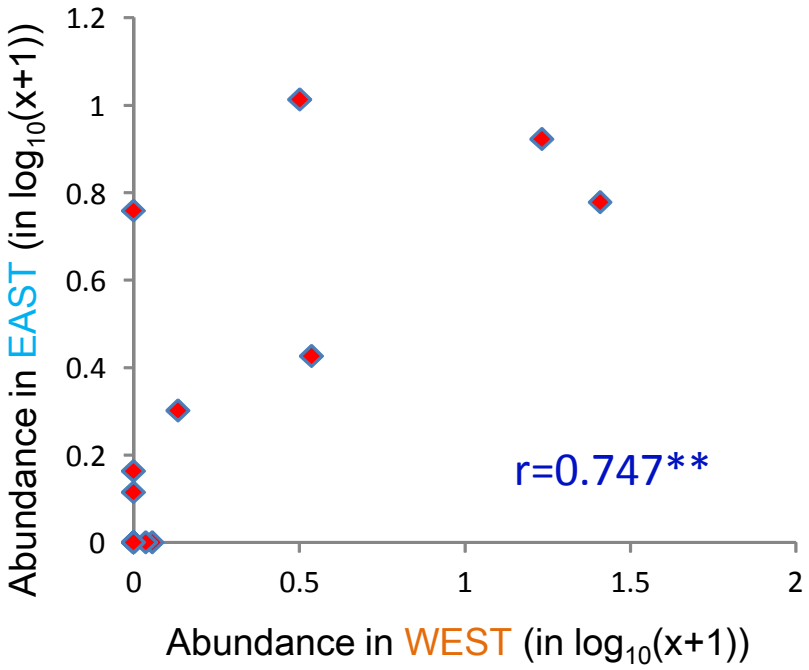


***C. pacificus* was abundant from July in WEST area, while from September in EAST area.**

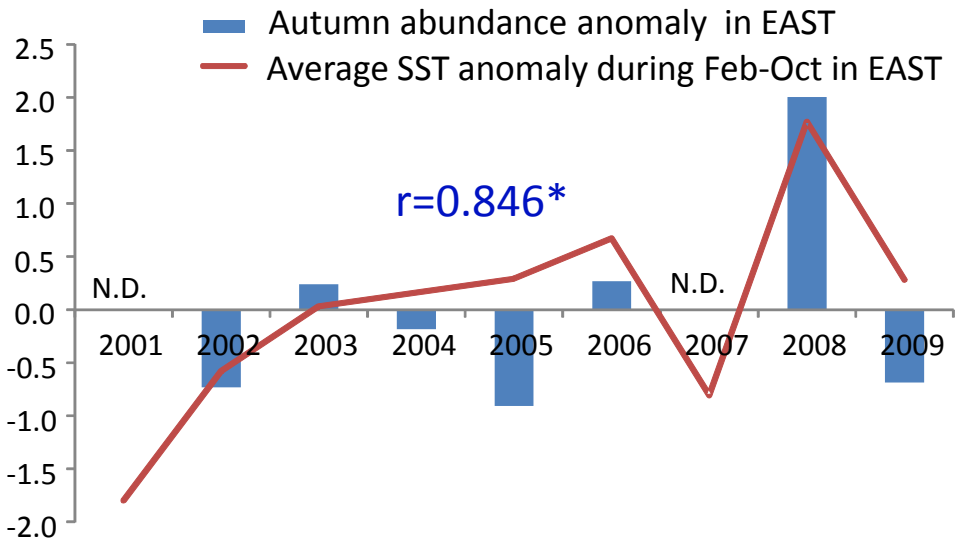
Warm-water species abundance between WEST and EAST

Calanus pacificus

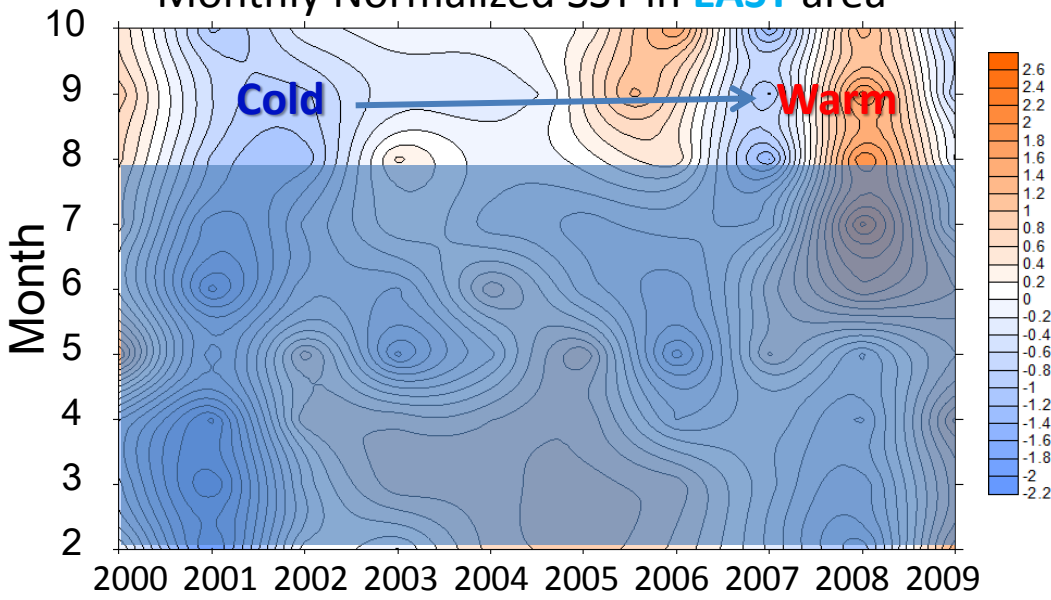
Relationship of abundance between WEST and EAST in Sep and Oct.



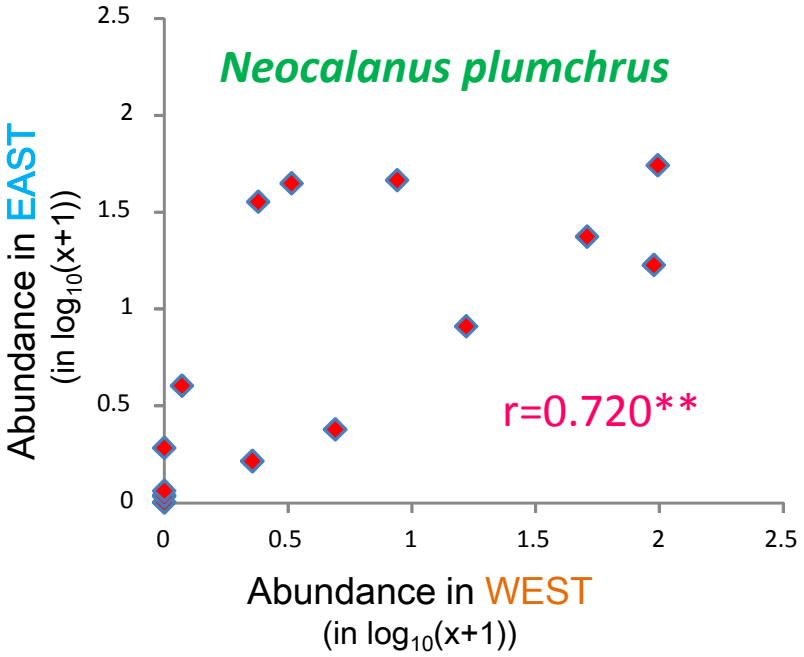
Autumn abundance anomaly in EAST

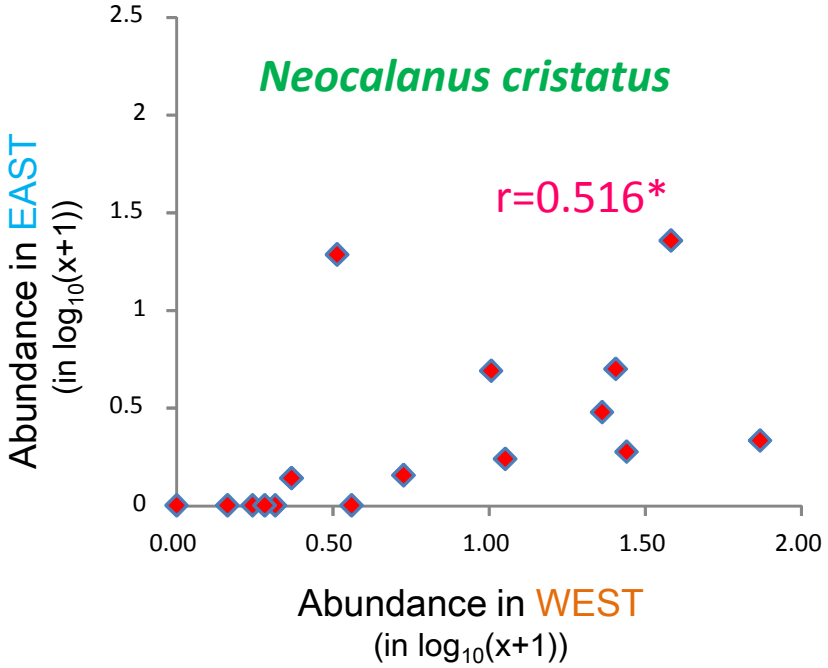


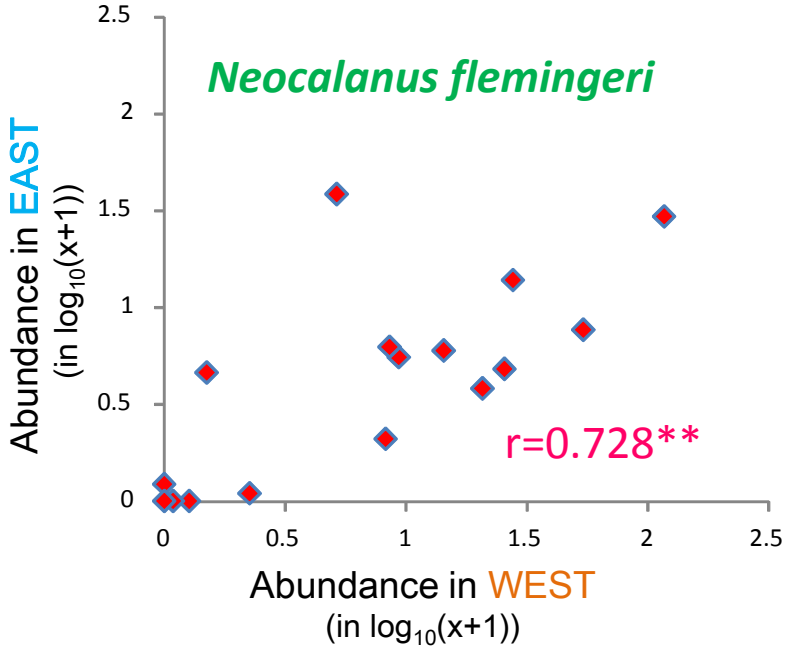
Monthly Normalized SST in EAST area

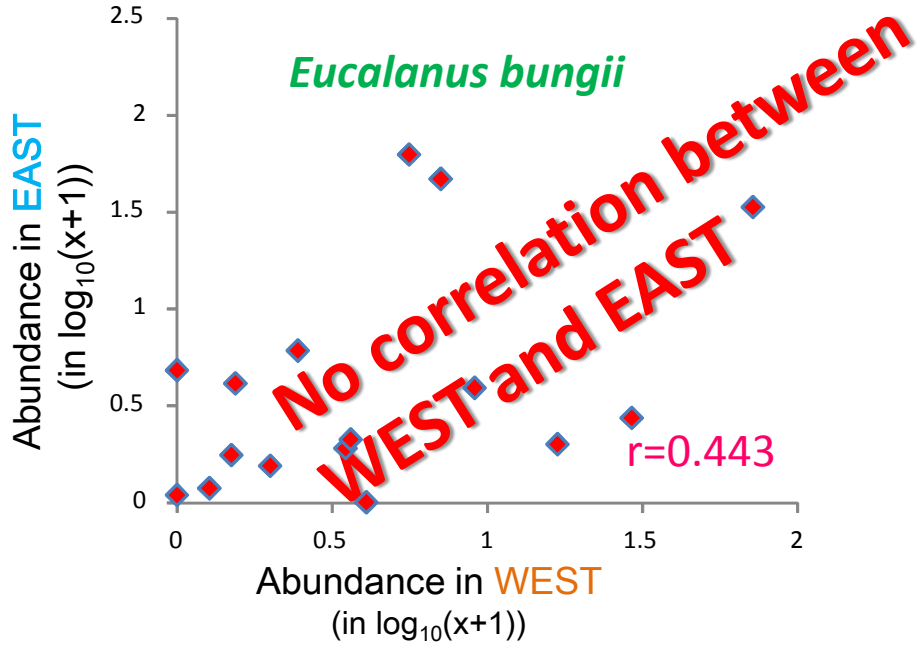


Cold-water species - Relationship of abundance between WEST and EAST

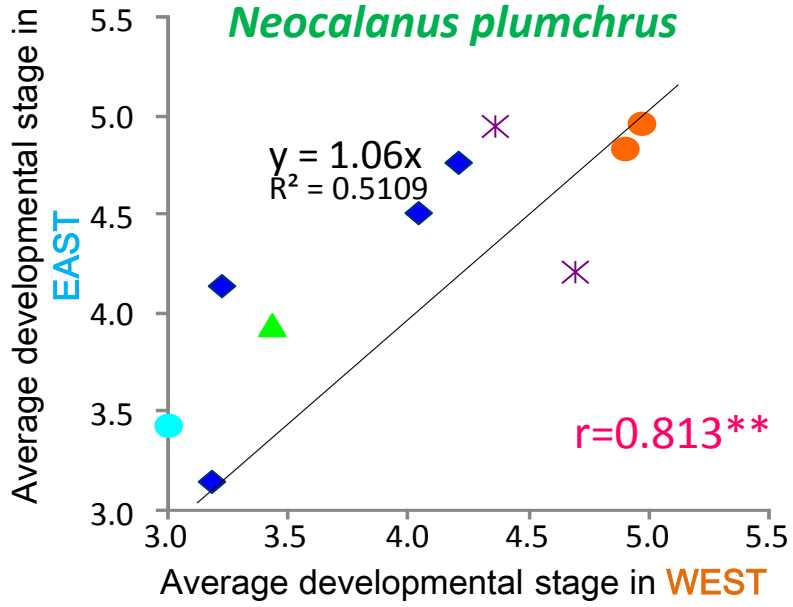


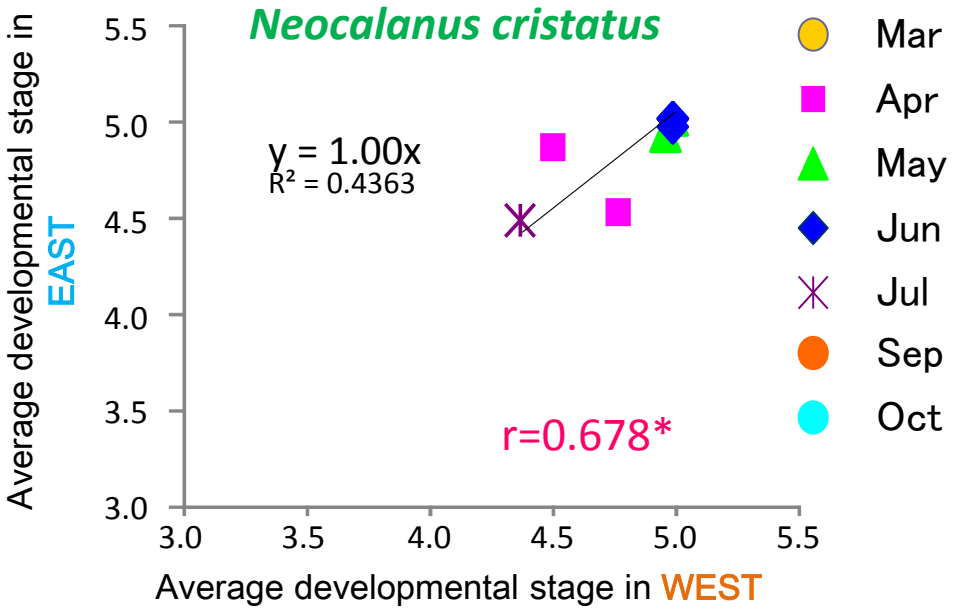


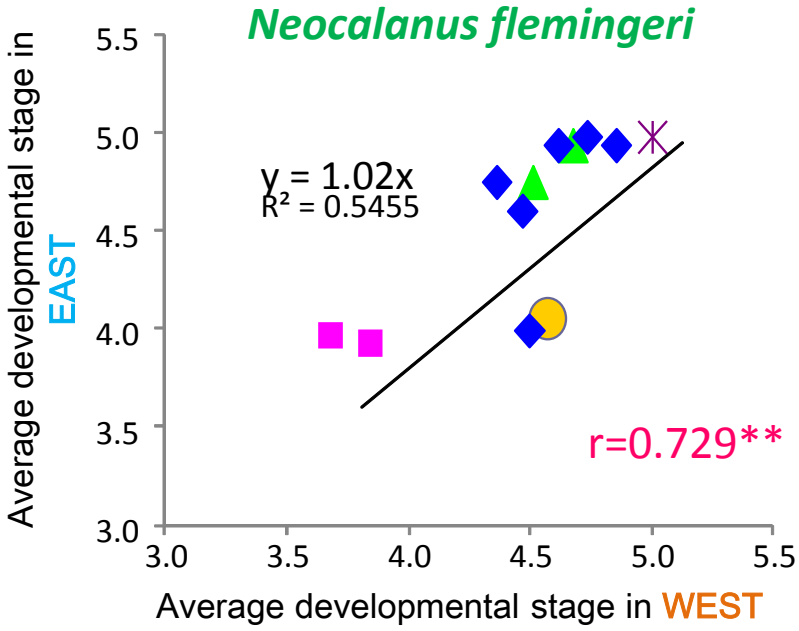


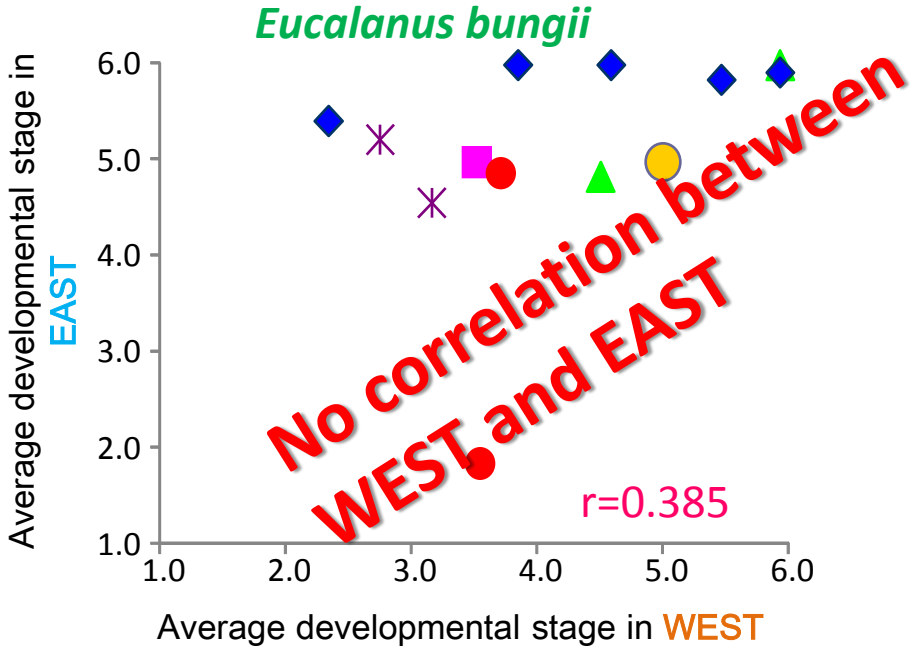


Cold-water species - Relationship of developmental stage between WEST and EAST

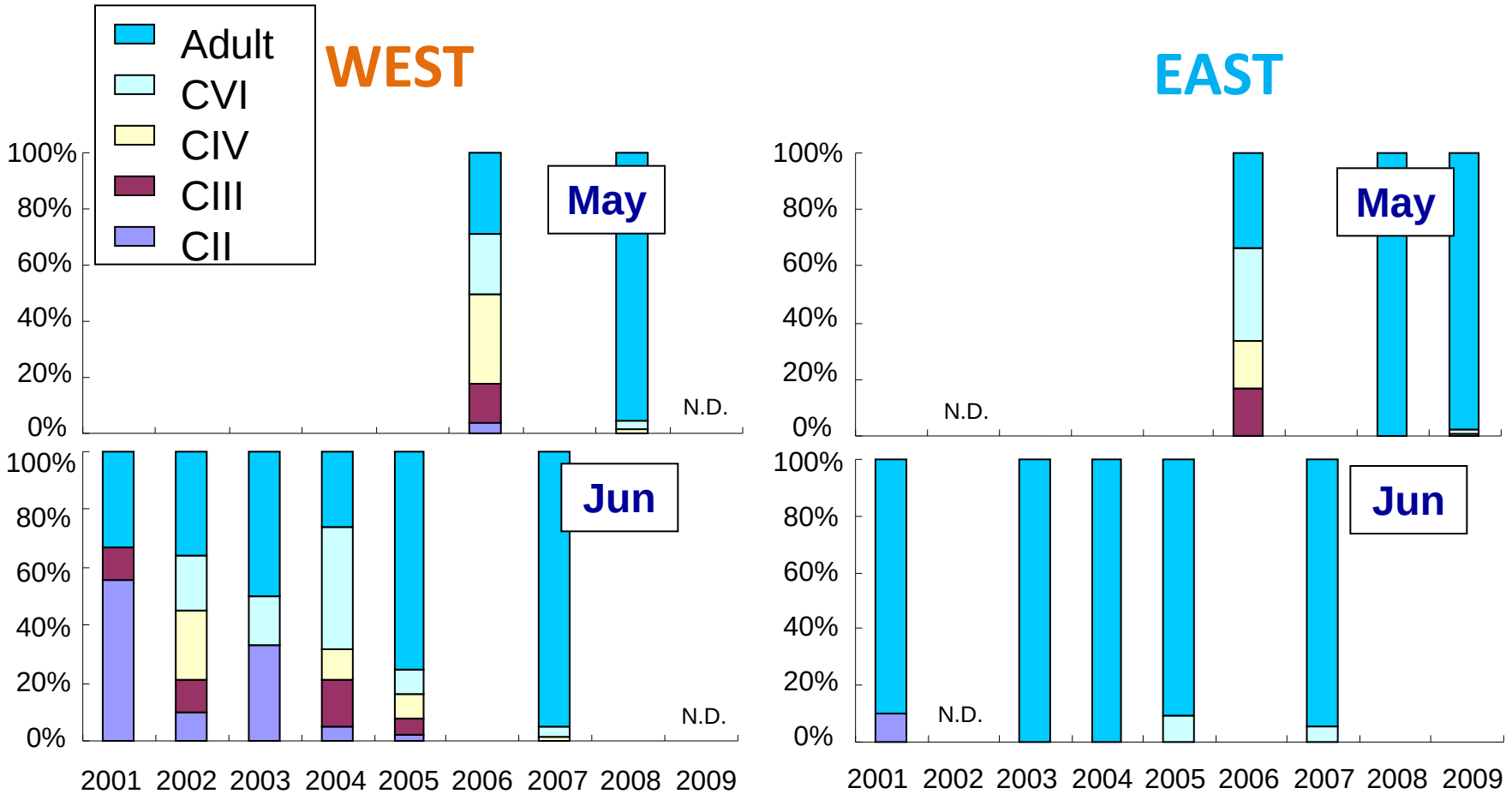




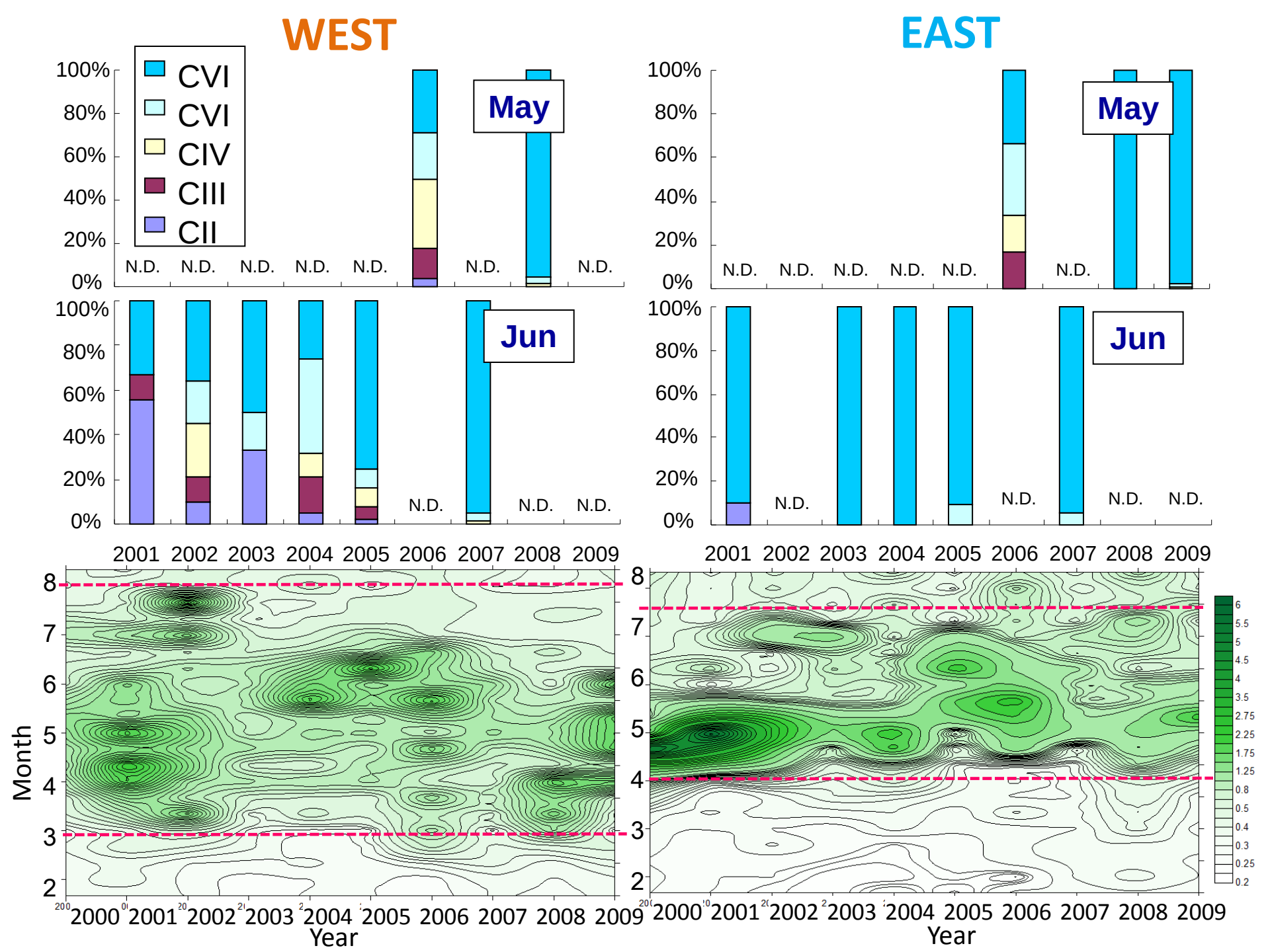




Stage composition of *Eucalanus bungii* in Early sumer season



Percentage of young stages are lower in the EAST than that of the WEST


WEST
EAST
CVI
CVI
CIV
CIII
CII
May
Jun
100%
80%
60%
40%
20%
0%
N.D.
2001 2002 2003 2004 2005 2006 2007 2008 2009
Month
Year
2000 2001 2002 2003 2004 2005 2006 2007 2008 2009

Summary

・*C. pacificus* start to appear from July in WEST and while appear from September in EAST.

・*C. pacificus* was abundant in warm autumn year. This might be related to warm water mass from the Kuroshio current.

・Development timing of *Neocalanus plumchrus* was varied interannually, while that of *N. flemingeri* and *N. cristatus* was not different between years.

・Interannual variation of abundance and average developmental stages of *Neocalanus* species was in a synchronous manner between the WEST and EAST area.

・On the other hand, synchronous abundance variation and development was not observed in *Eucalanus bungii* between the WEST and EAST.

・The differences of abundance and average developmental stages of *E. bungii* between WEST and EAST might be caused by the timing of start and peak of phytoplankton bloom.