

Zooplankton research in China

SUN Song

Institute of Oceanology
Chinese Academy of Sciences
sunsong@ms.qdio.ac.cn



CHINA GLOBEC

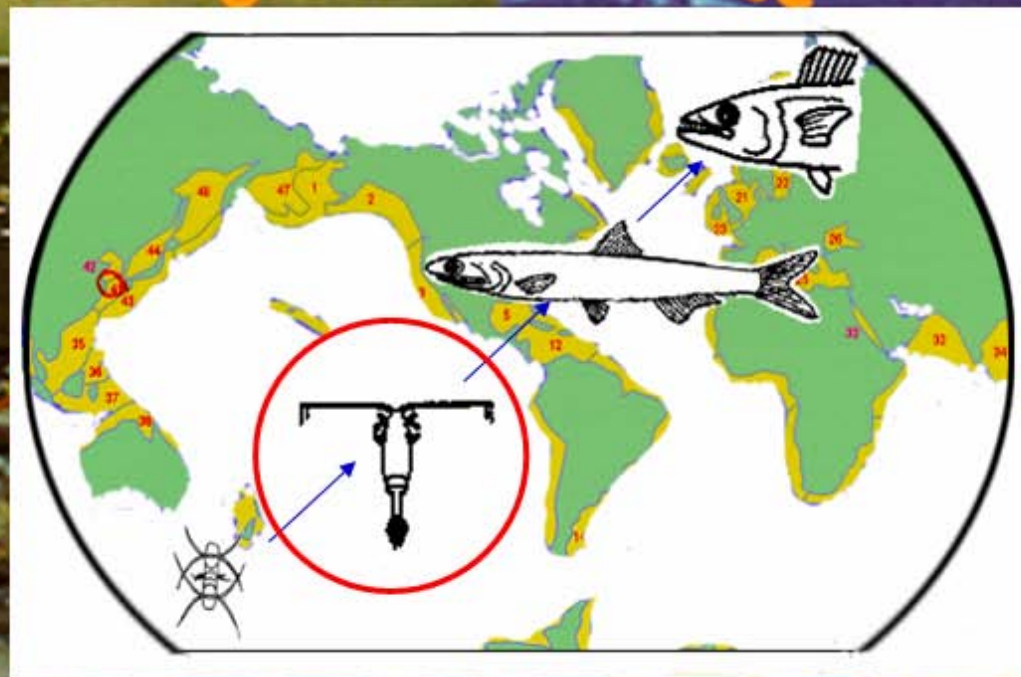
- 1999-2004, 5 years
- 4.5 million US dollar
- 9 institutes and universities, more than 100 scientists
- Yellow sea and east China sea
- Target species: anchovy, *Calanus sinicus*, *Euphausia pacifica* etc.



The scientific objectives of the program

- **Determine the impacts of key physical processes on biological production.**
- **Determine the cycling and regeneration mechanisms of biogenic elements.**
- **Determine the basic production processes and zooplankton role in the ecosystem**
- **Determine the food web trophodynamics and shift in dominant species**

China - GLOBEC



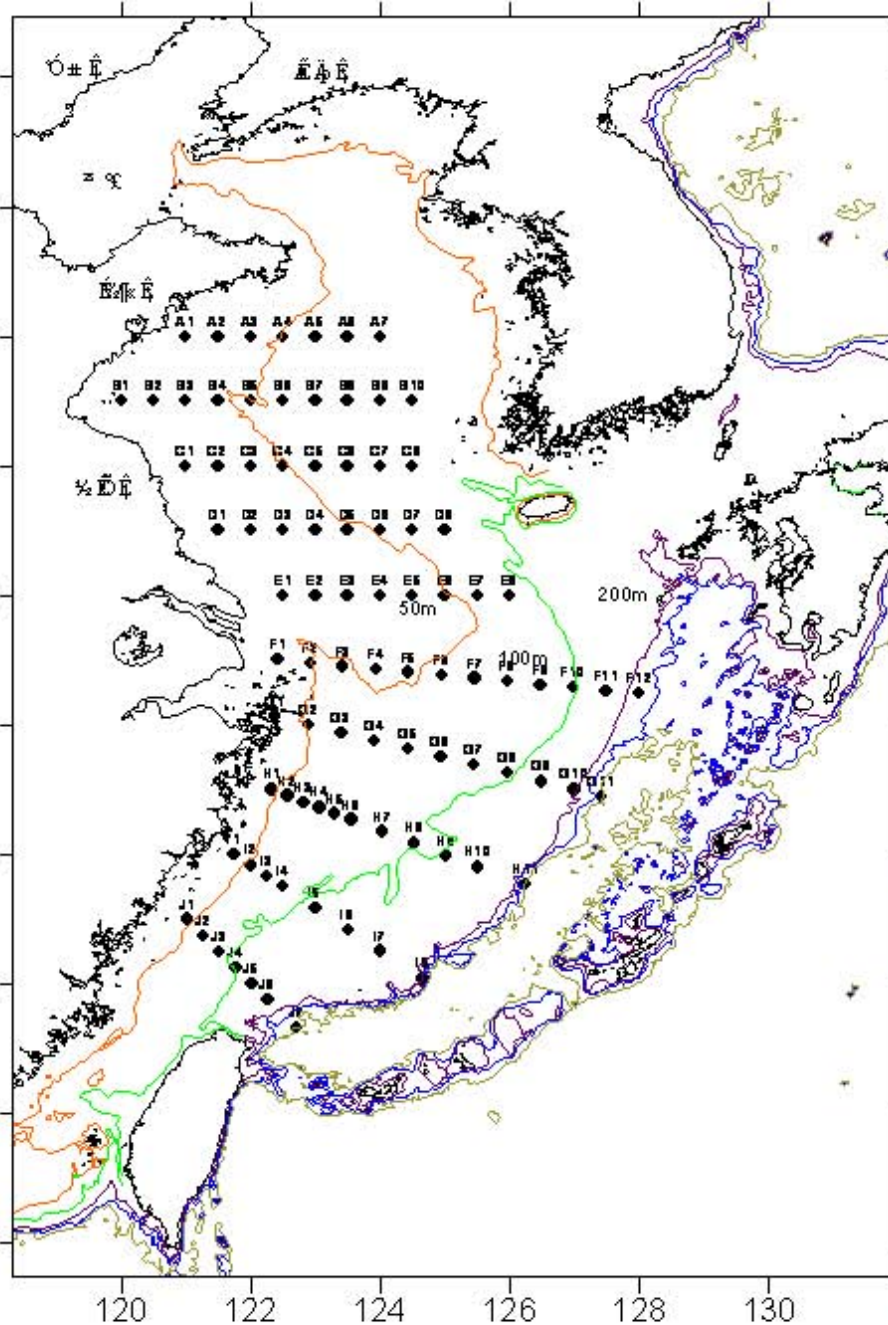
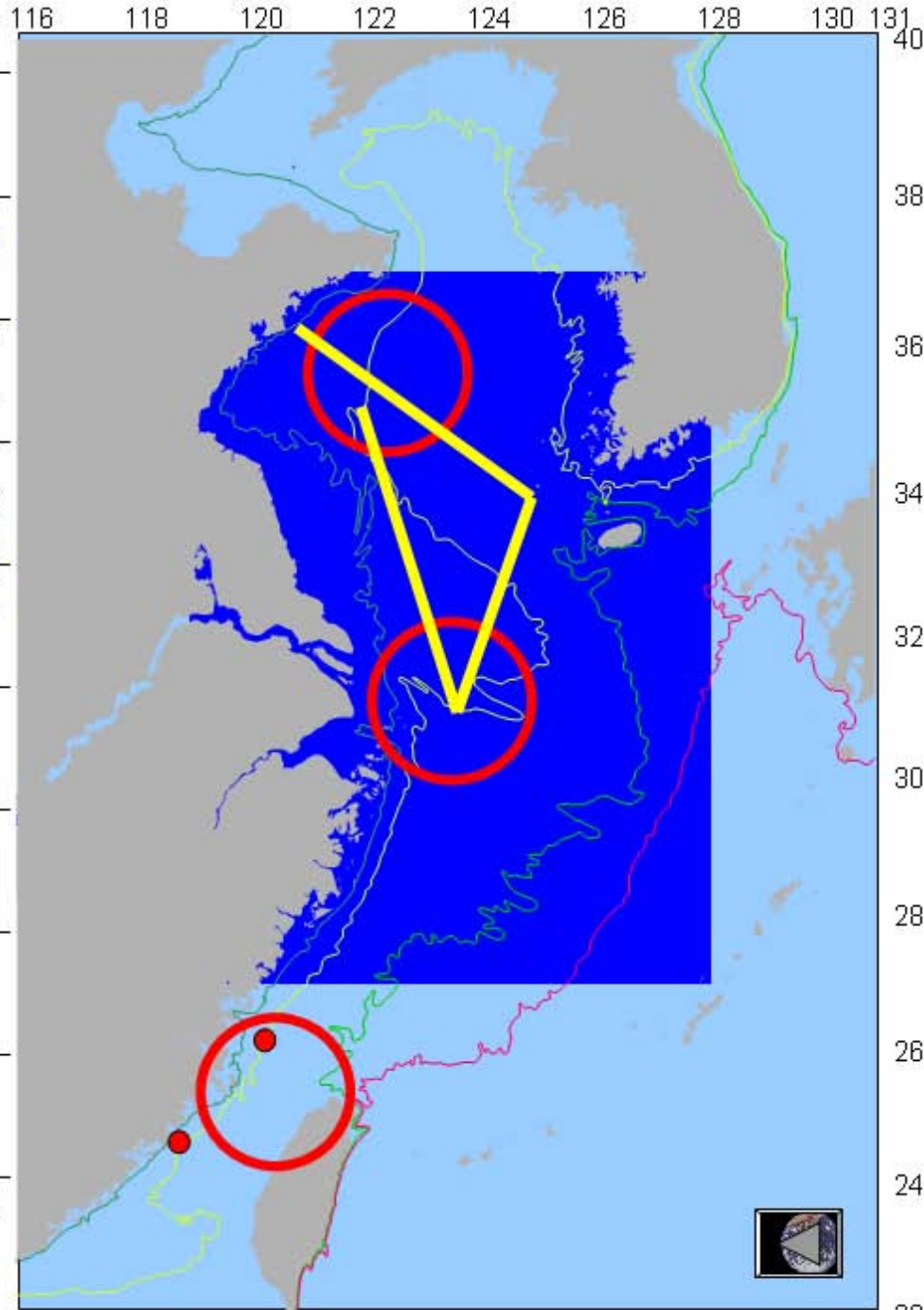
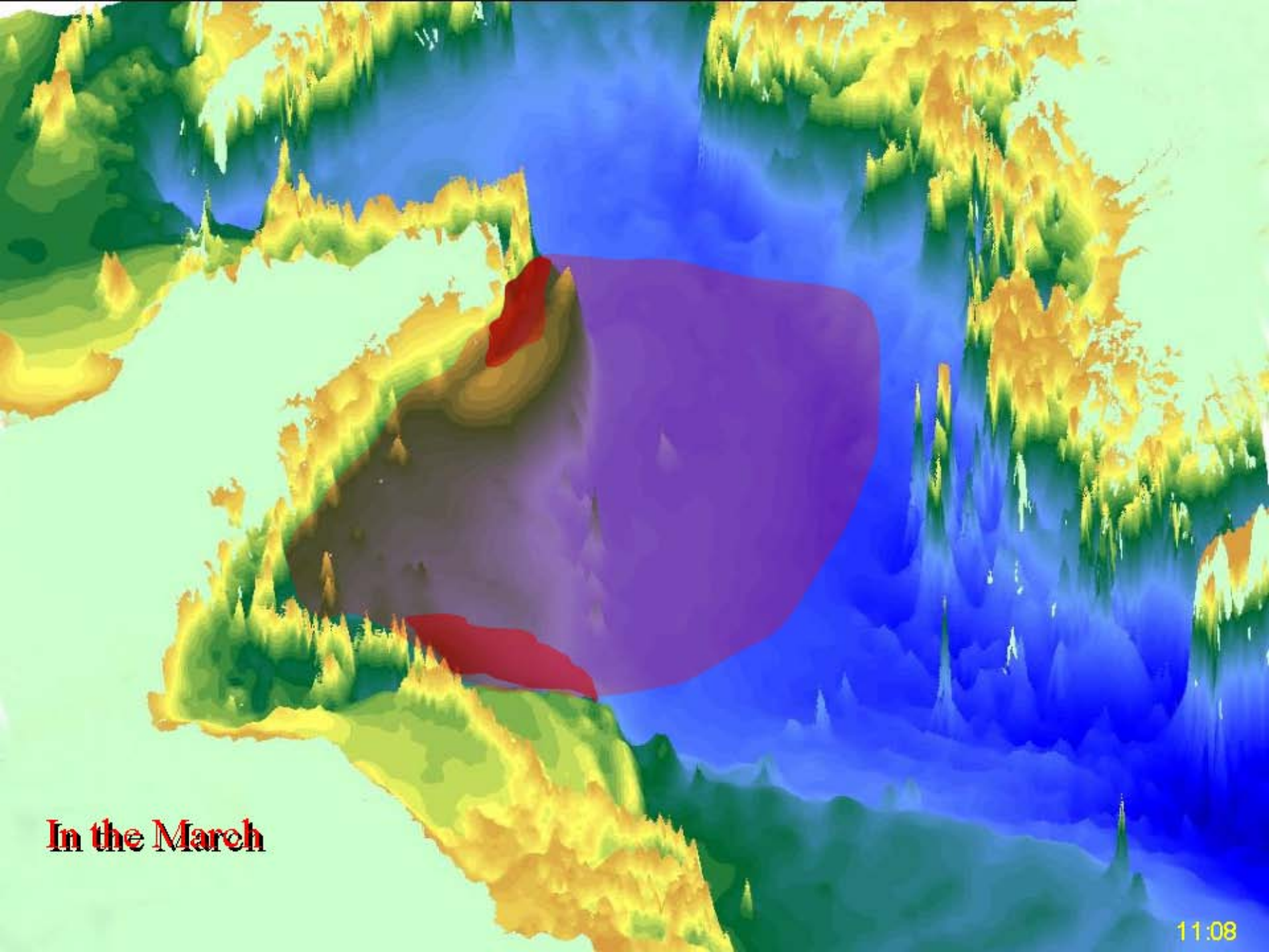


Figure 1. Bathymetric map of the East China Sea.

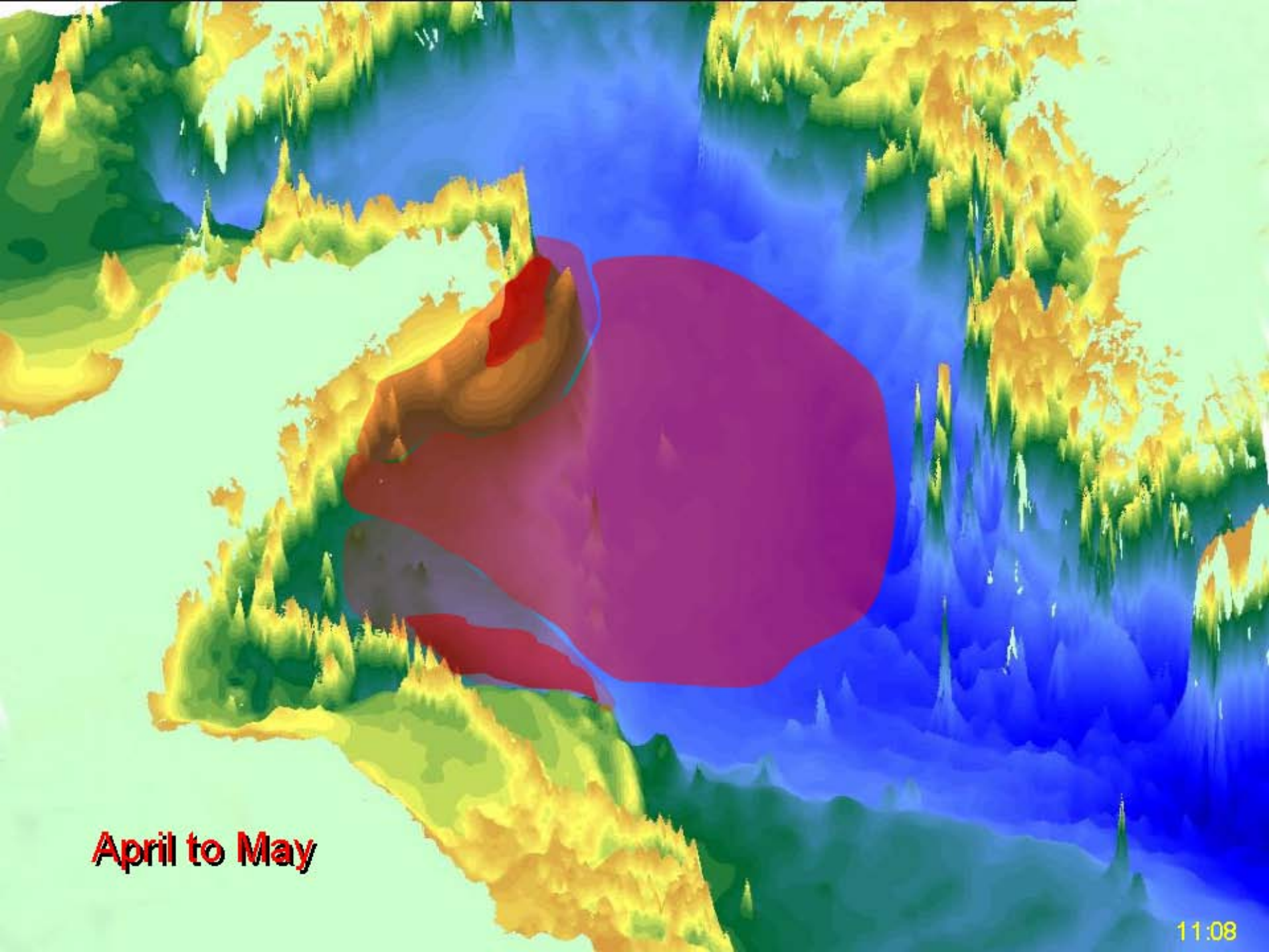




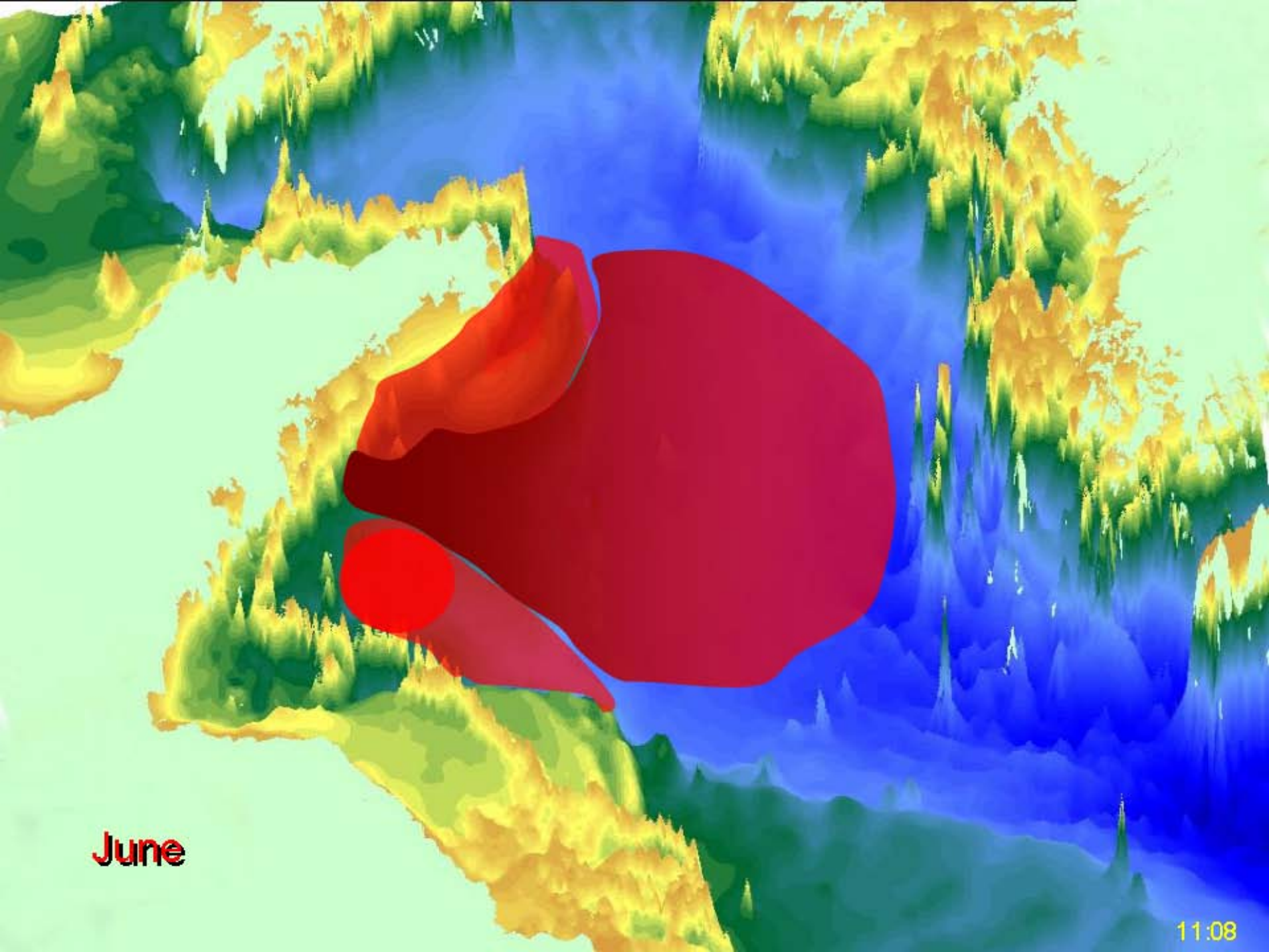
Calanus sinicus is the key species of the zooplankton in the Yellow Sea and East China Sea Ecosystem



In the March



April to May



June



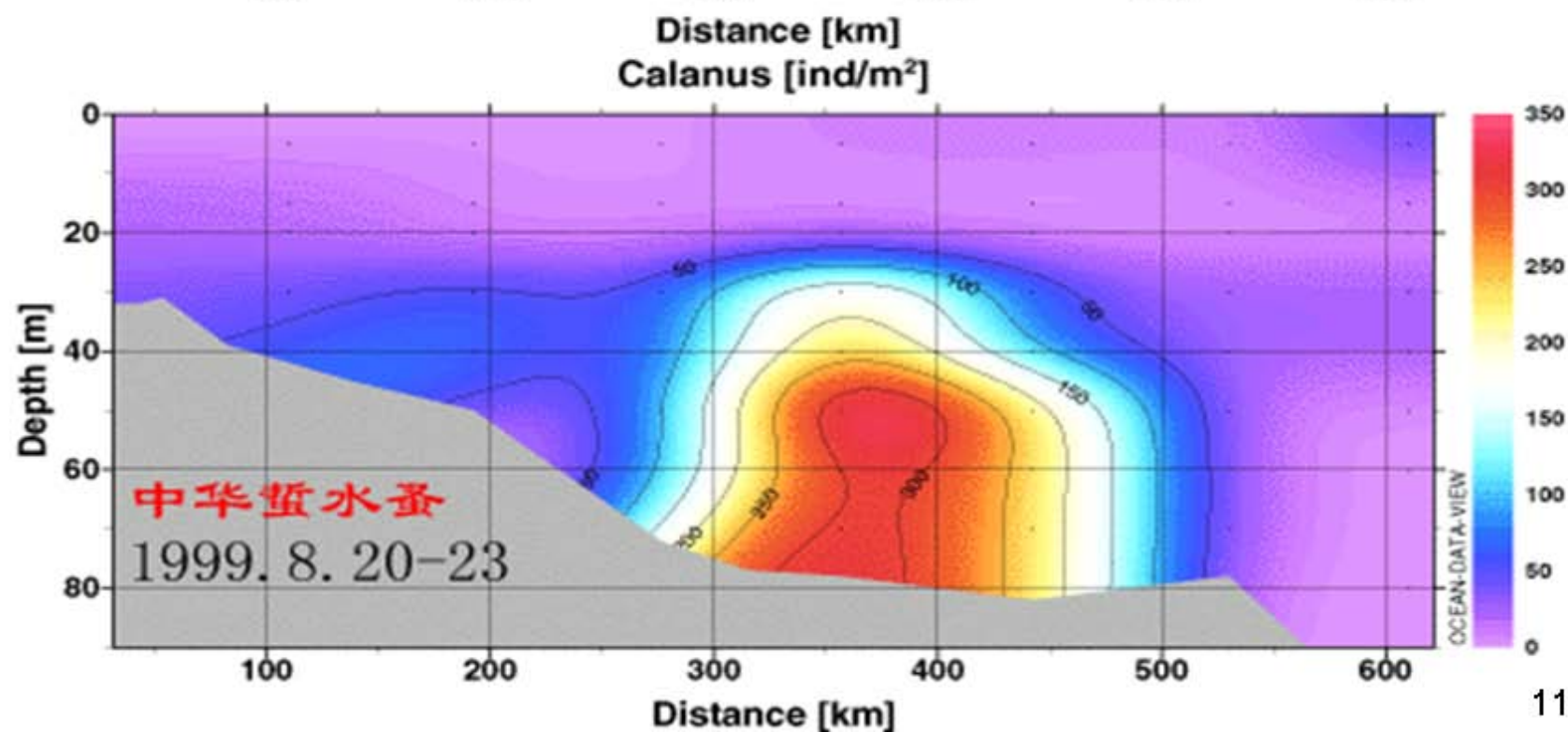
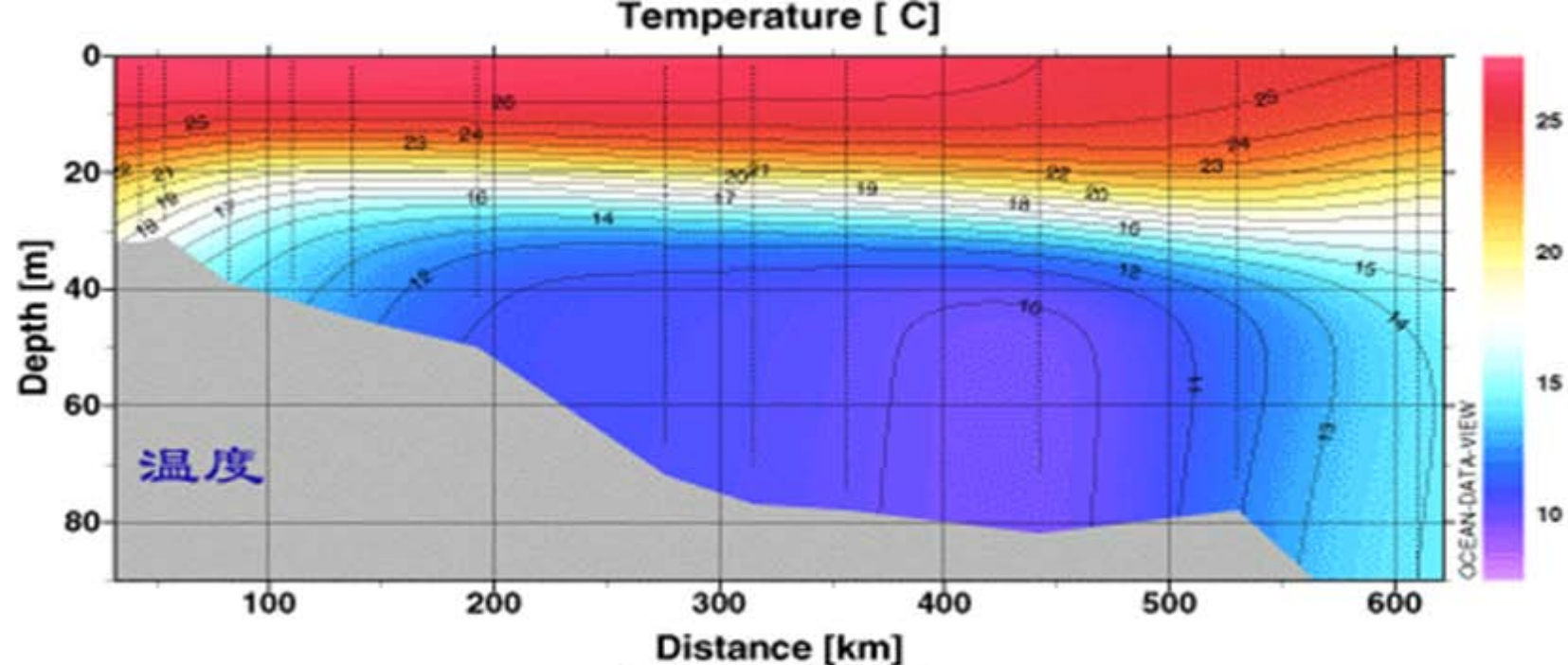
July

In July, when the surface temperature exceed 23°C , the distribute center of the *Calanus sinicus* began to migrate to the central part of the Yellow Sea, where the Cold Water Mass was formed.

A bathymetric map of the Yellow Sea and surrounding regions, including parts of East Asia and the Korean Peninsula. The map uses a color scale where blue represents deep water and yellow/green represents shallow water. A large, irregularly shaped area in the central part of the Yellow Sea is highlighted with concentric circles: a central red circle, a surrounding purple ring, and an outer light purple ring. This indicates the concentration of Calamus sinicus in August.

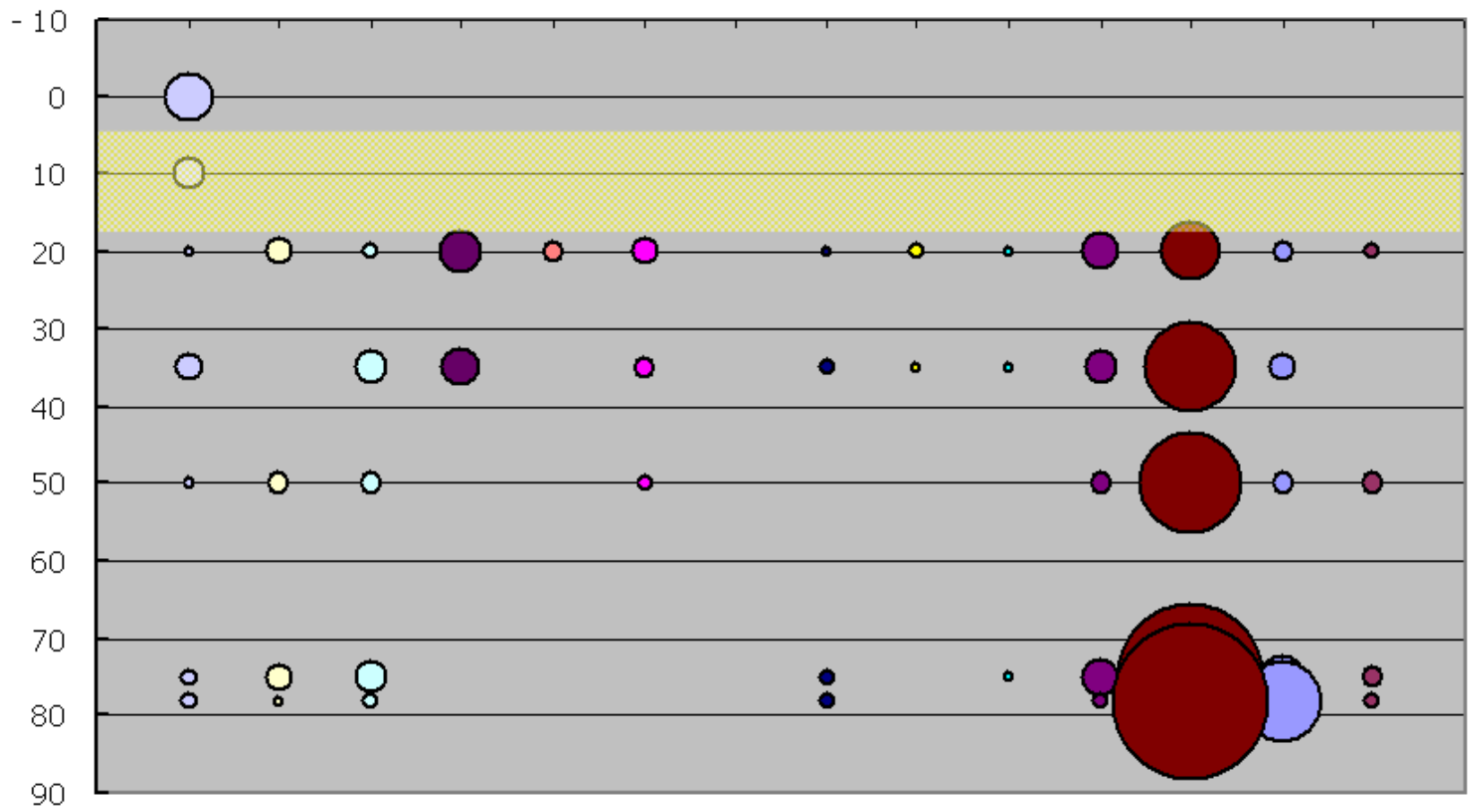
August

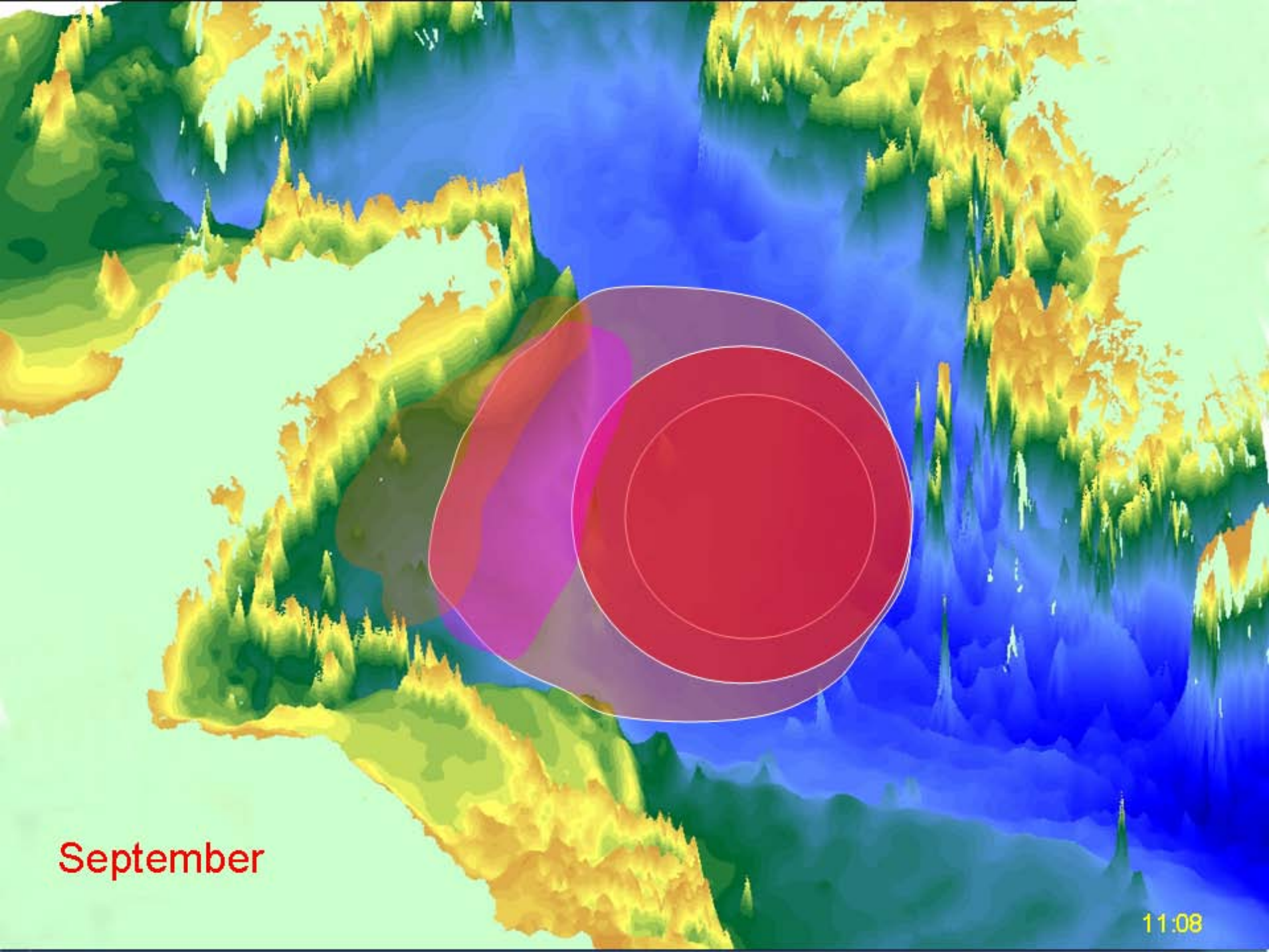
In August, the *Calamus sinicus* concentrate at the central part of the Yellow Sea, most of them stay above the bottom. The dominant stage is C5.



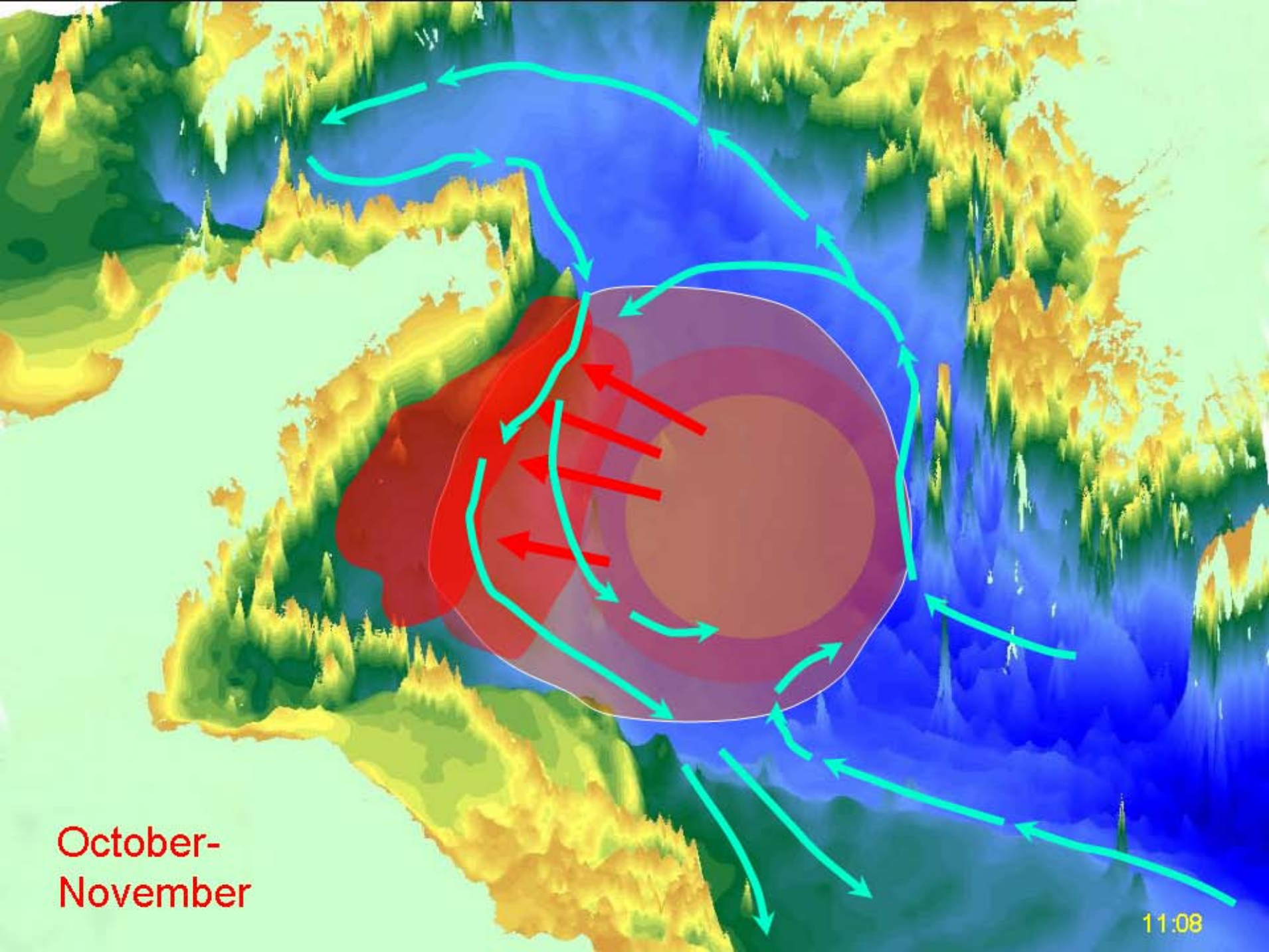
Population composition of the *Calanus sinicus* in the August

Egg N1 N2 N3 N4 N5 N6 C1 C2 C3 C4 C5 ♀ ♂

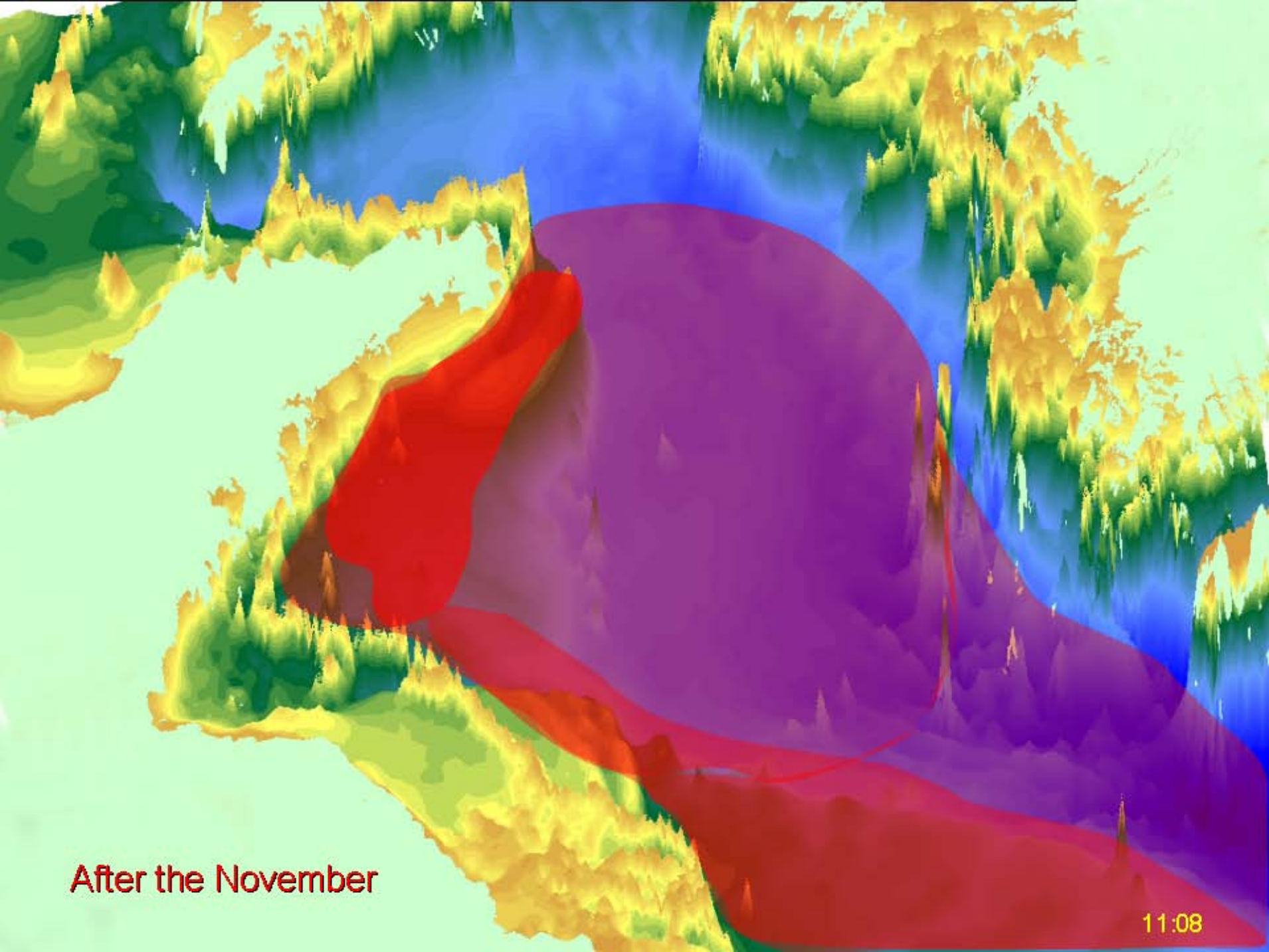




September

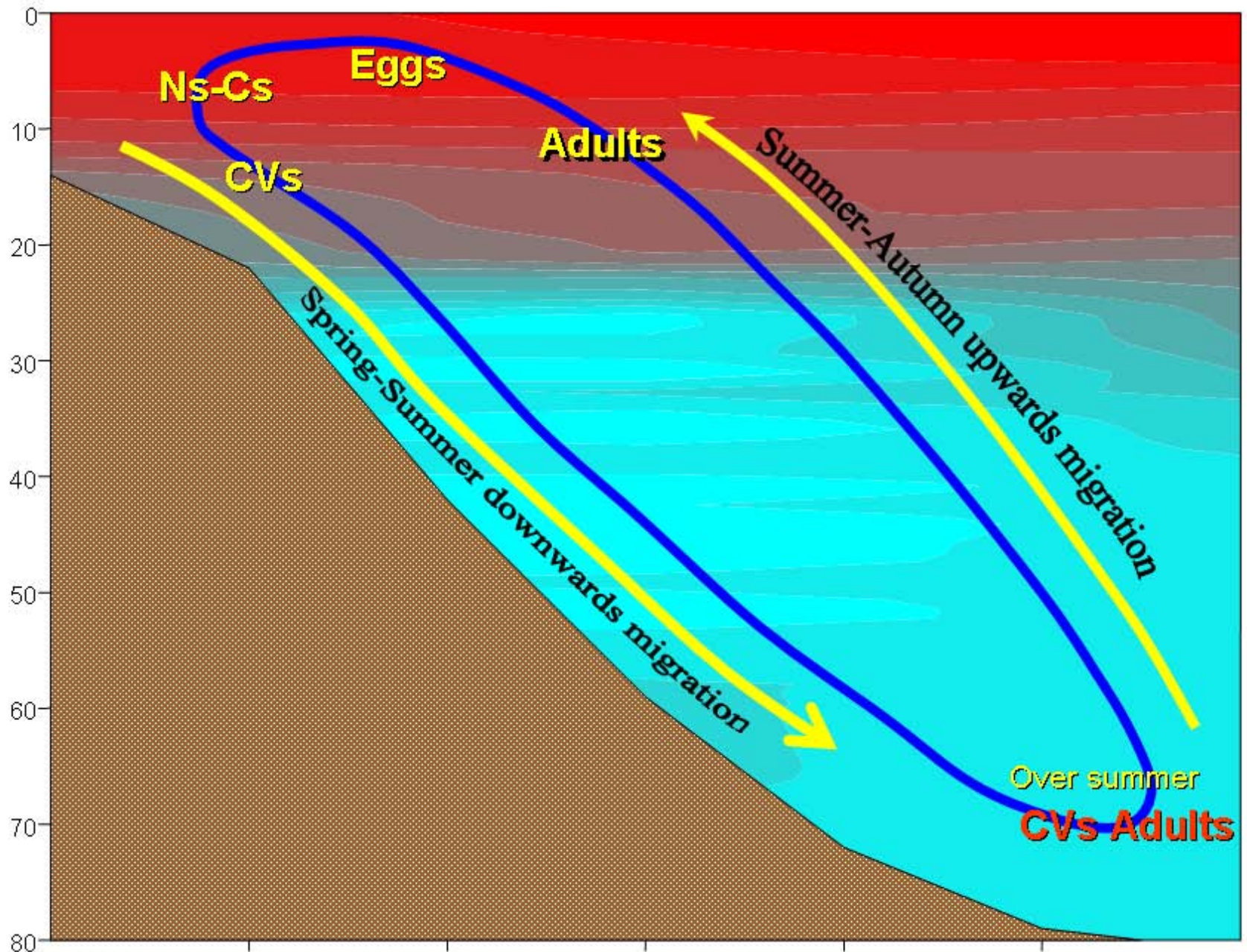


October-
November



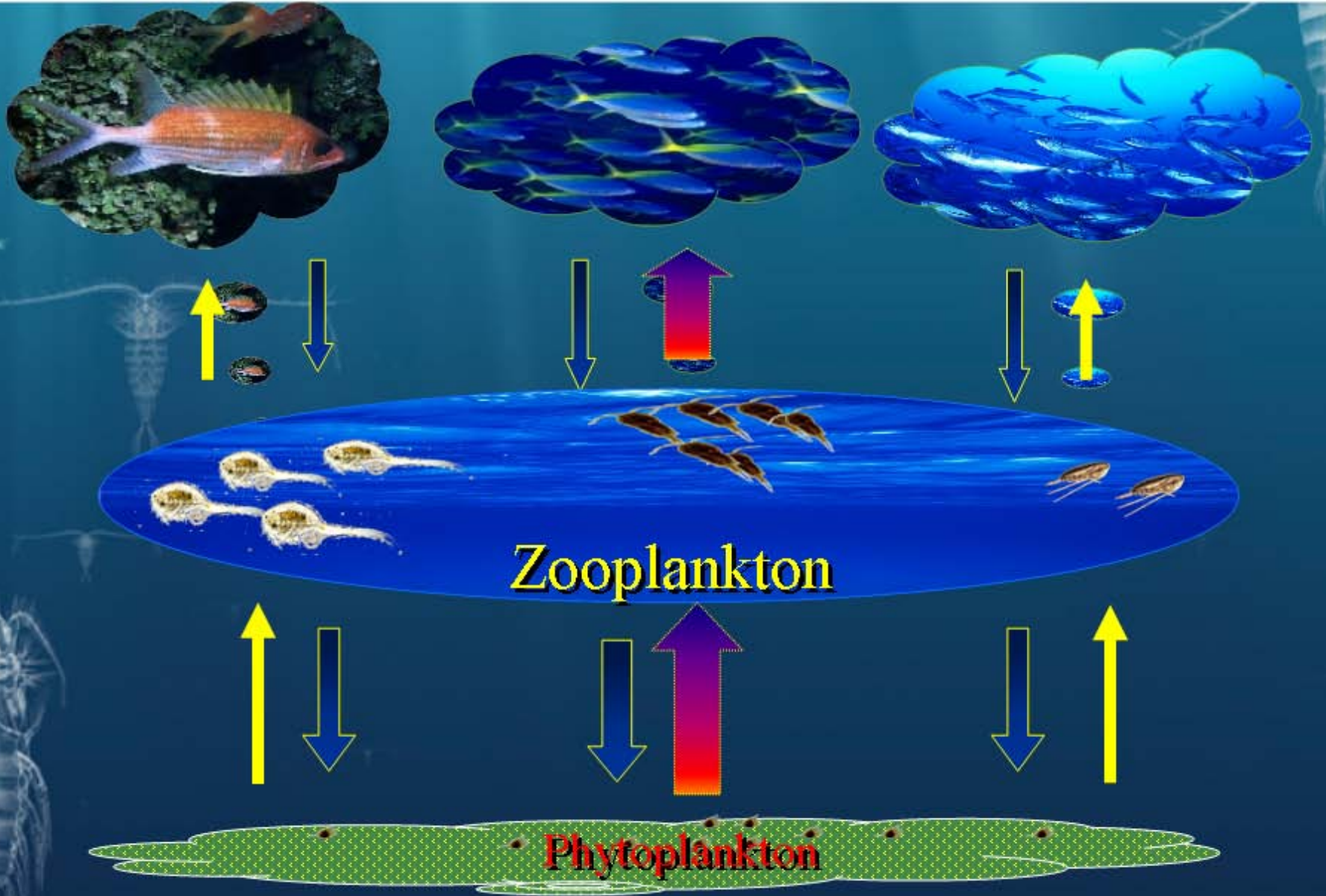
After the November

Climate and *Calanus sinicus* - The general picture

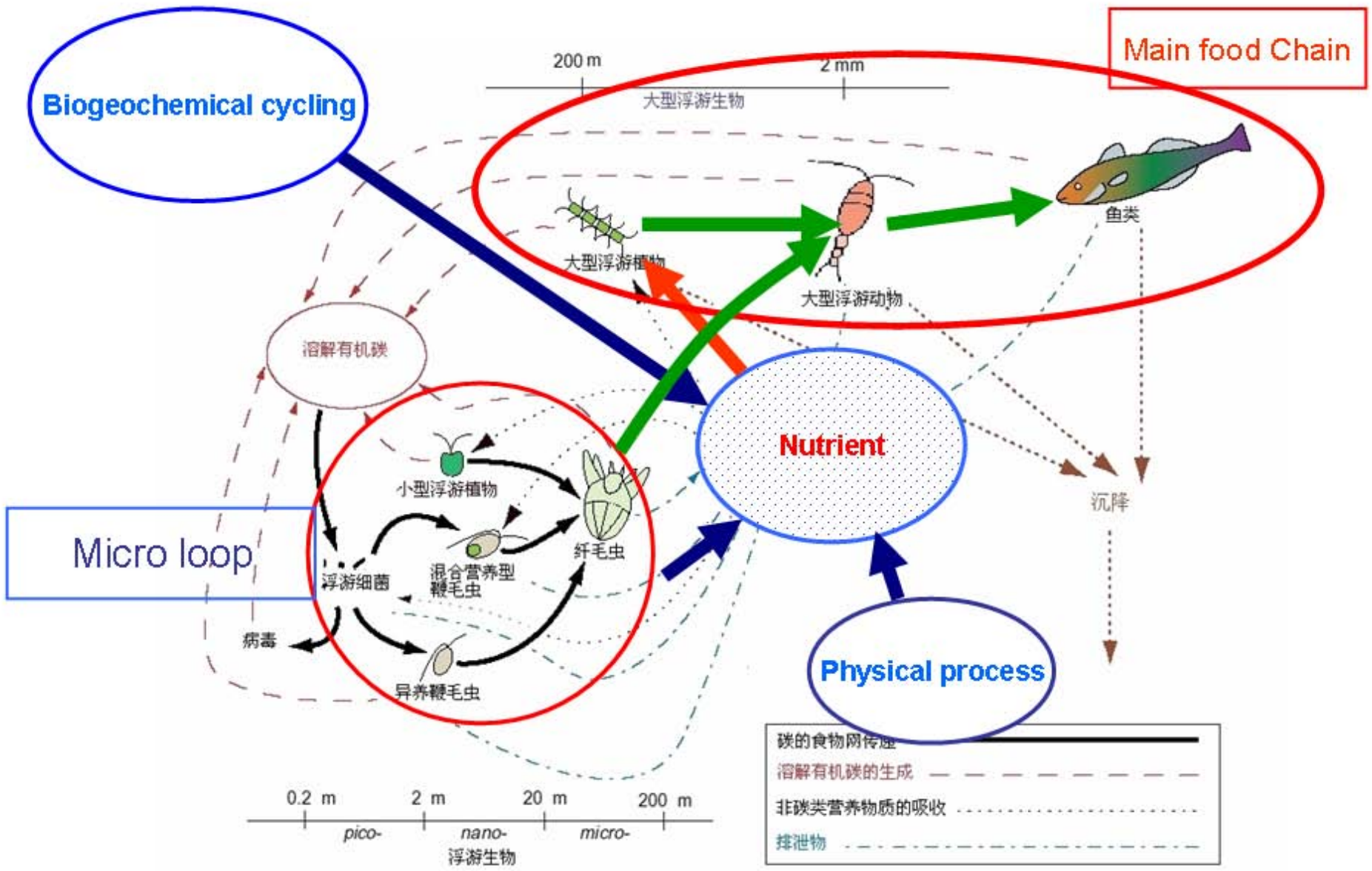


CHINA GLOBEC-IMBER

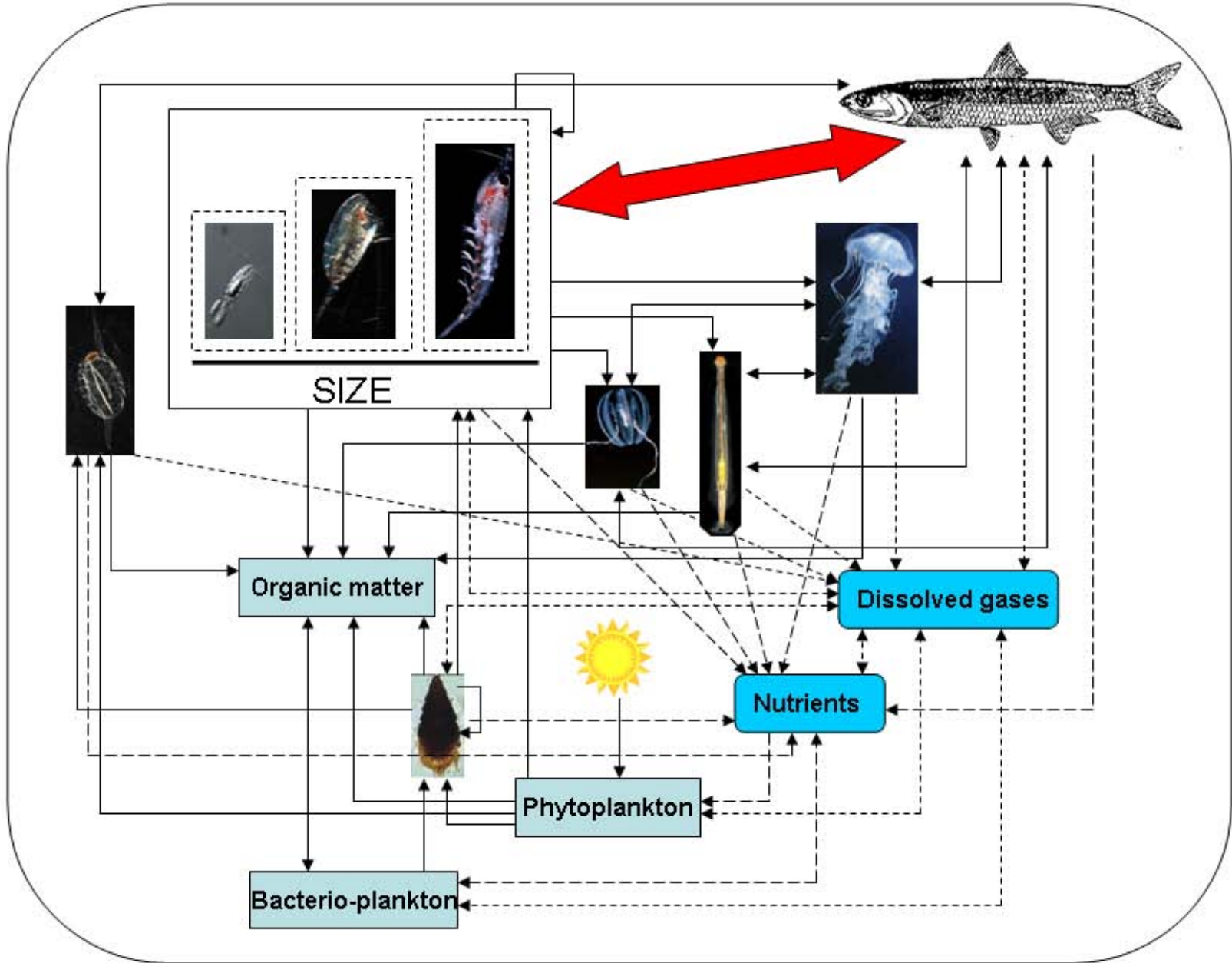
- **From 2006, the second fundamental research project was started: GLOBEC-IMBER project**
- **2005-1010, 5 years.**
- **5 million US dollar**
- **3 institutes and two universities participate.**



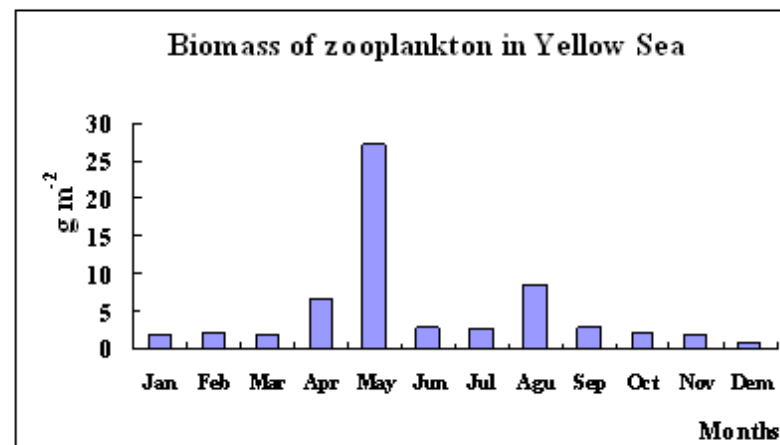
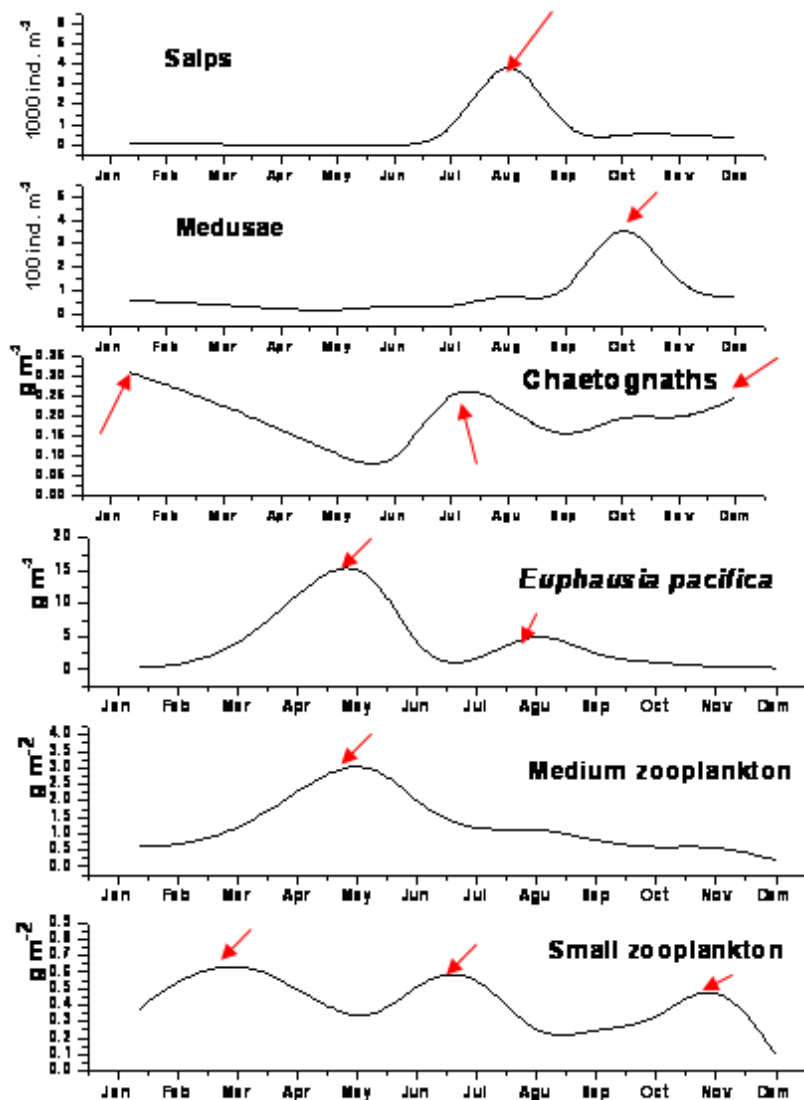
Zooplankton is a keystone function group in the marine ecosystem



Zooplankton play an vital role in the Marine ecosystem

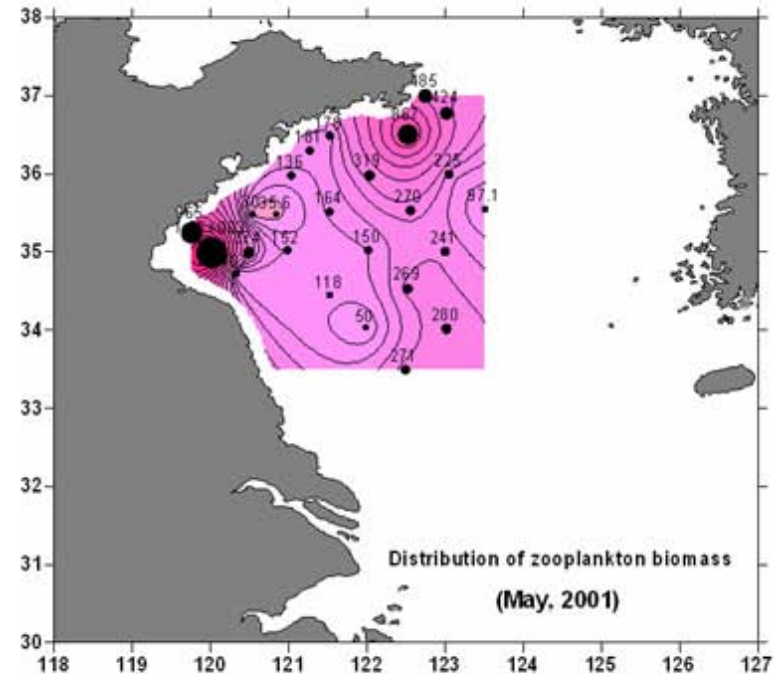
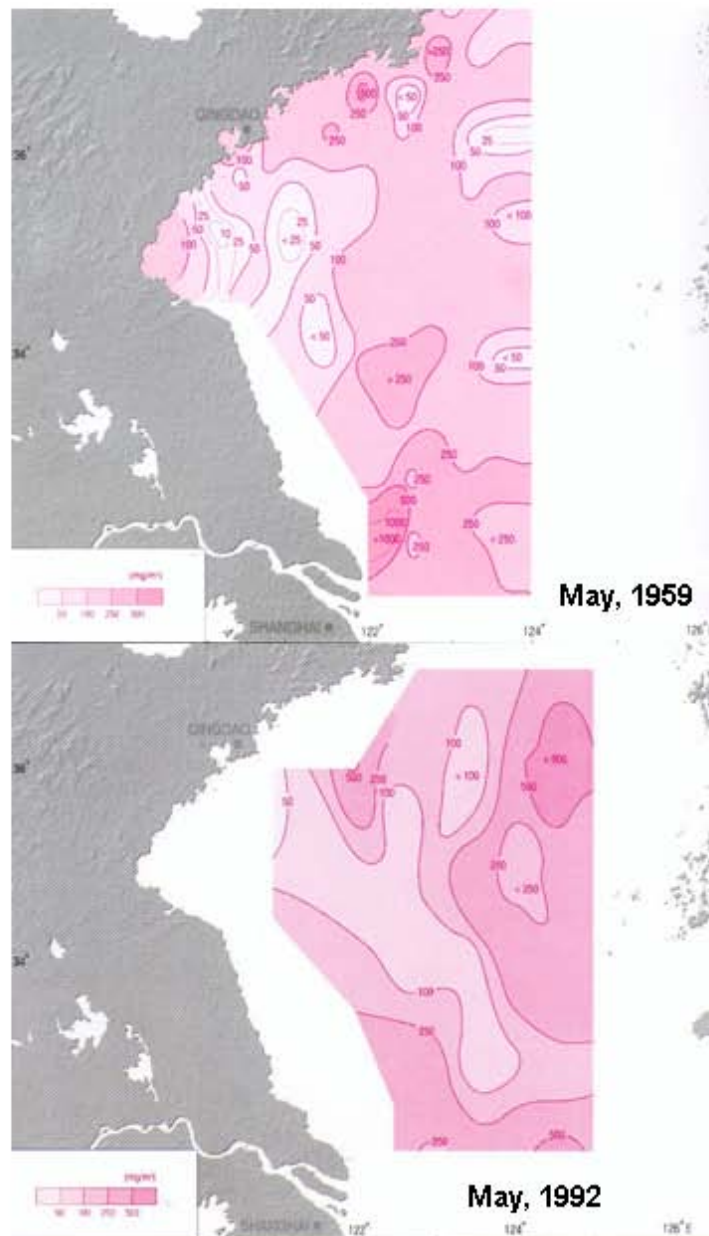


Seasonal variations of zooplankton functional groups

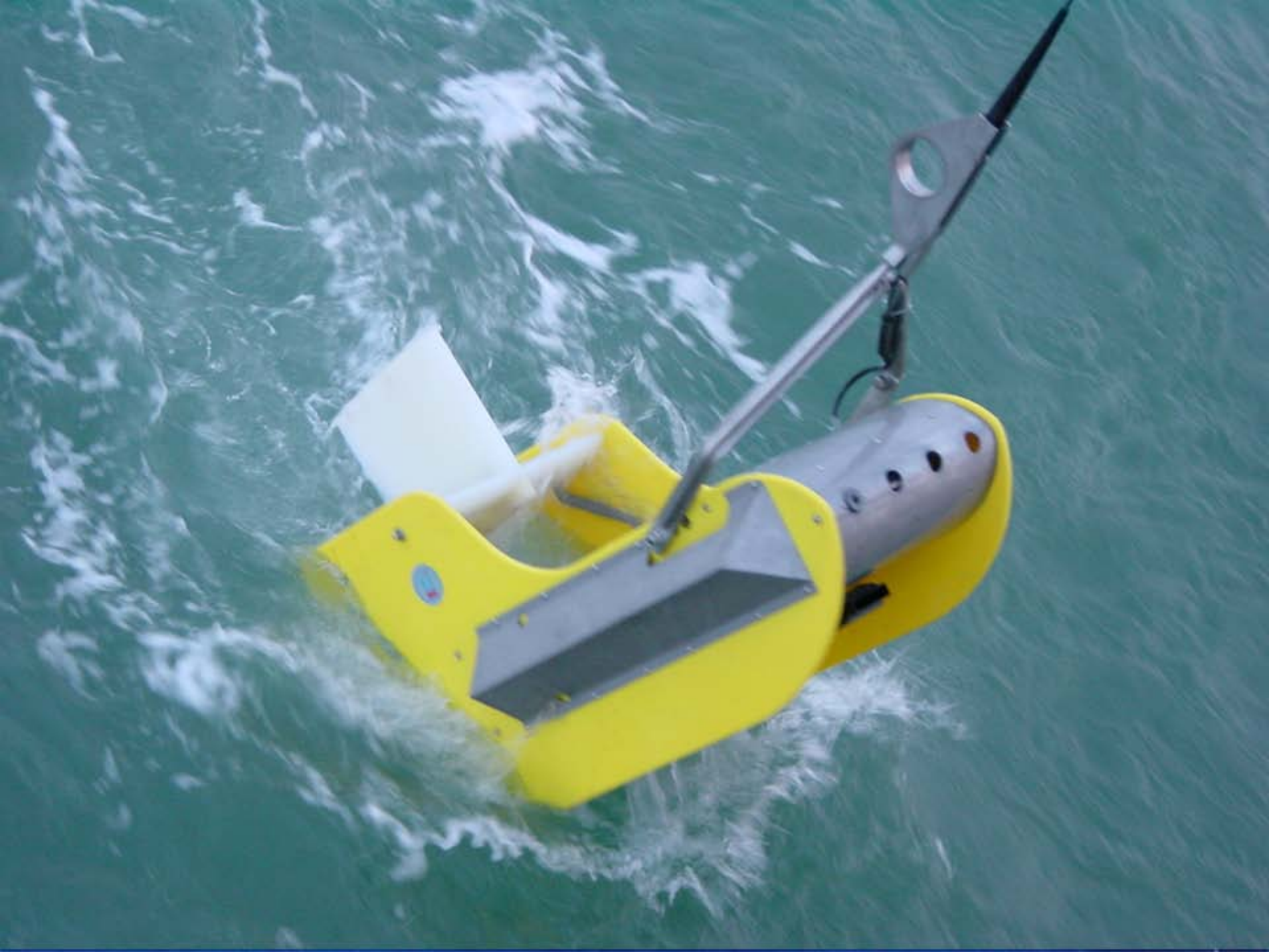




Zooplankton biomass



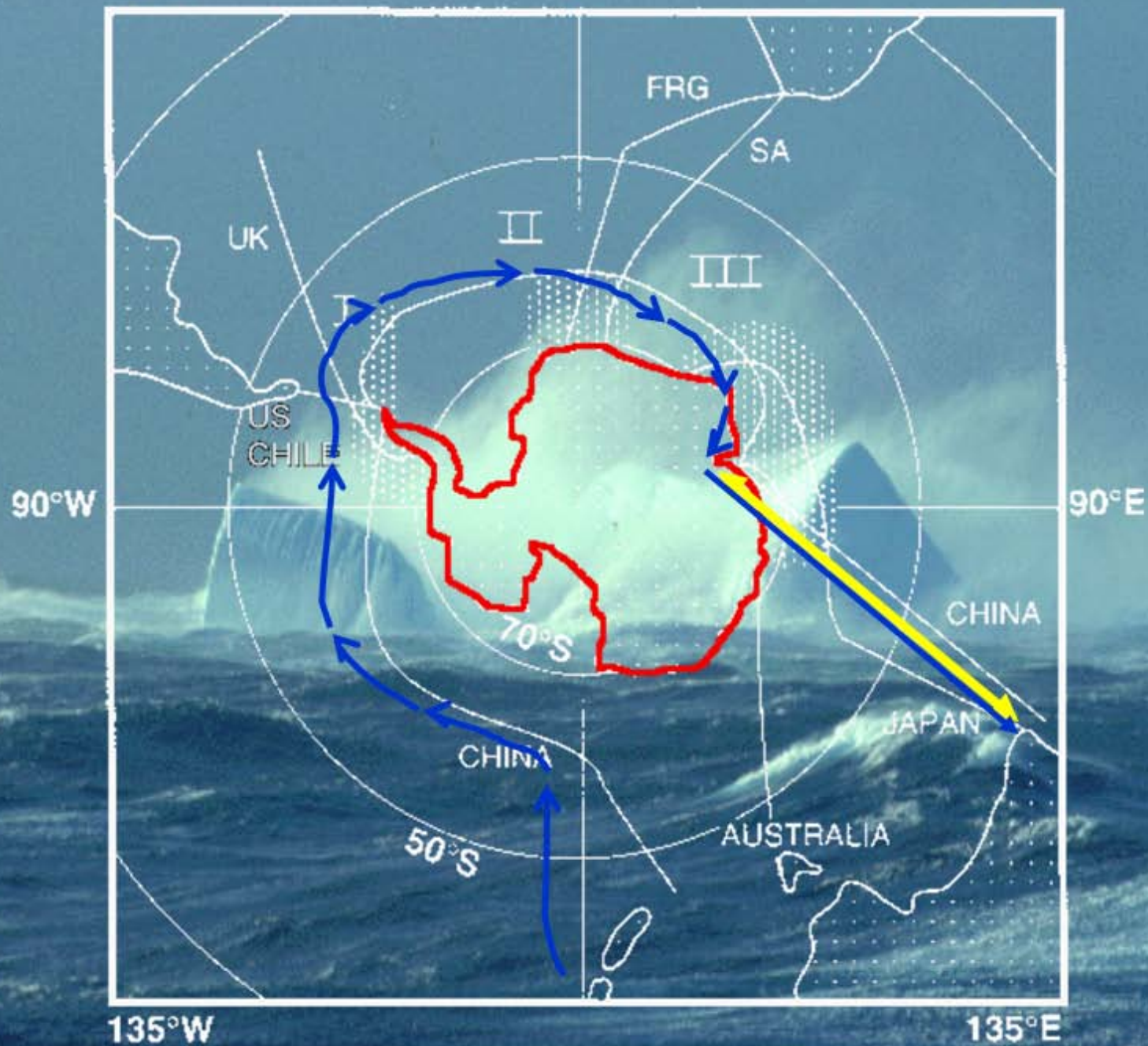
In May, the Zooplankton biomass of 2001 increased more than ten times compare with the 1959, it is similar to 1992



45°W

0°

45°E



135°W

135°E



Main research activities

- **Population dynamics of key species.**
- **Zooplankton functional groups in the food web.**
- **Zooplankton barcoding**
- **Modeling**

A transparent turtle, possibly a glass turtle, is shown against a dark background. The turtle's shell and body are clear, revealing its internal organs, including the heart, lungs, and digestive system. The turtle is positioned in the upper half of the frame, facing right.

Thank you!