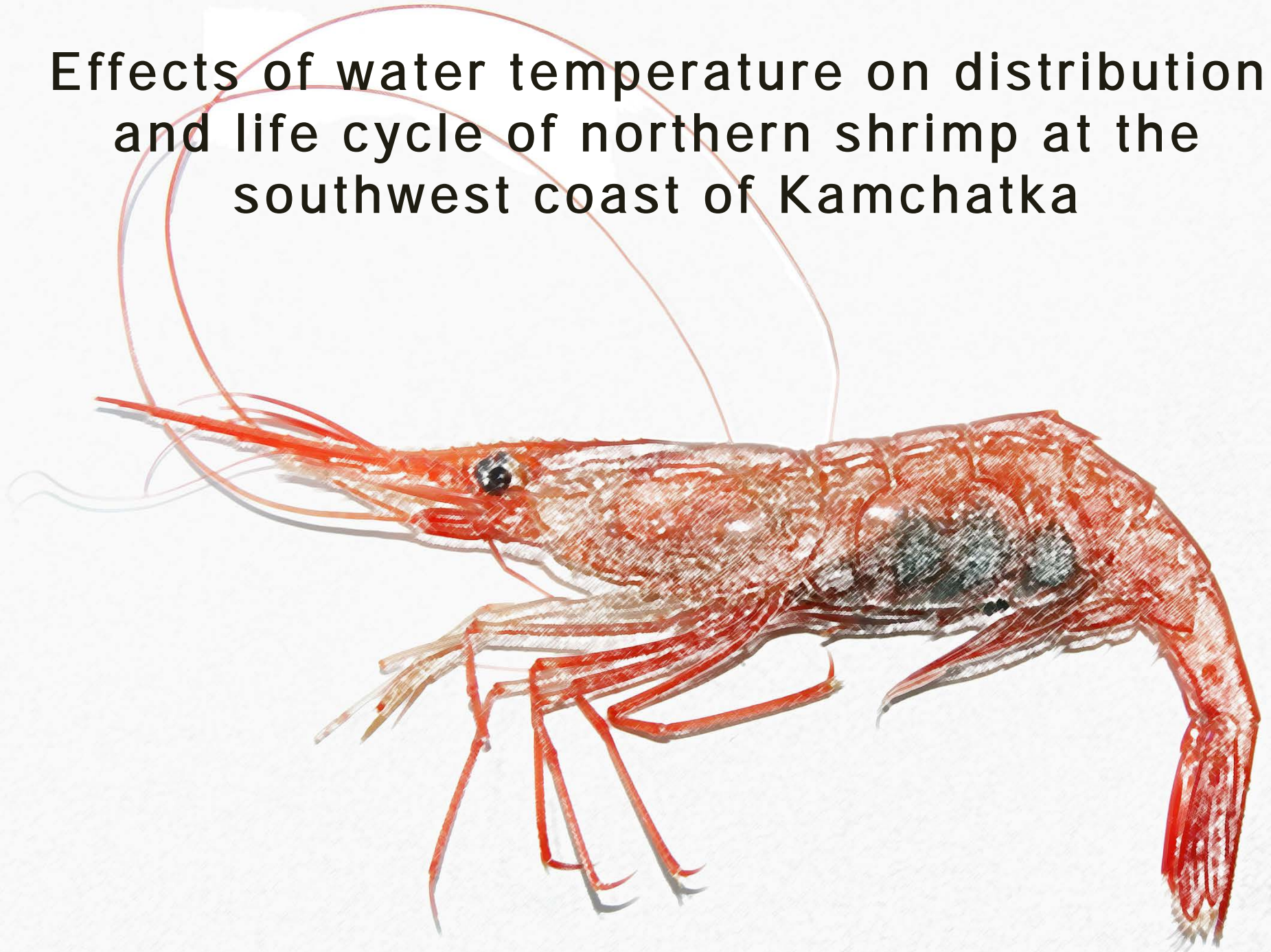
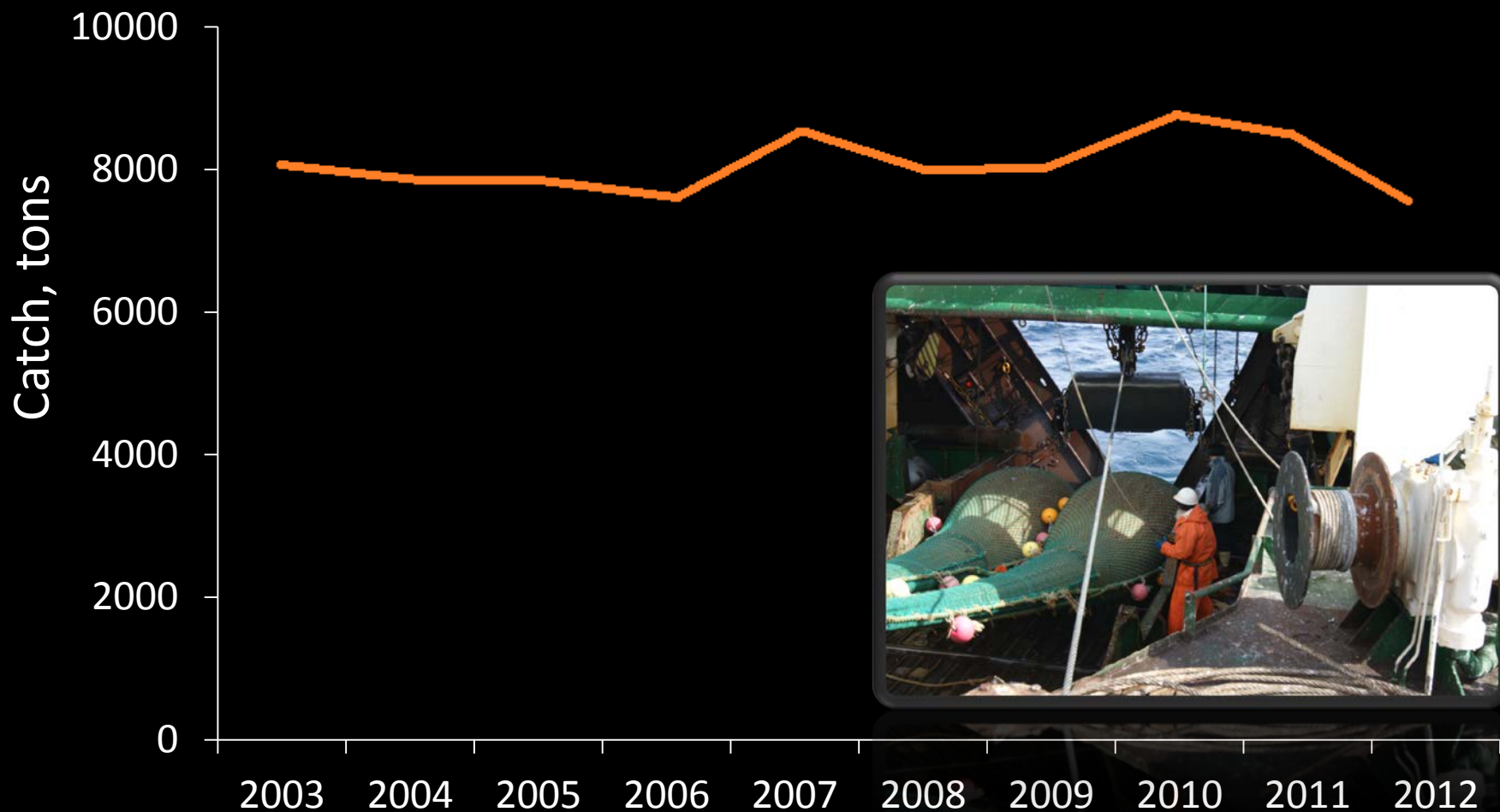


Effects of water temperature on distribution and life cycle of northern shrimp at the southwest coast of Kamchatka



Dynamics catch of pink shrimp in FEseas in 2003-2012 years on the data obtained from IS «Monitoring»



General targets in this work

The background of the slide is a photograph of a ship's deck. In the foreground, a red lifebuoy with reflective white stripes is visible on the left. The deck is dark, and the railing is white. In the background, the sea is visible with whitecaps, and the sky is overcast. The overall scene is somewhat dim and grainy.

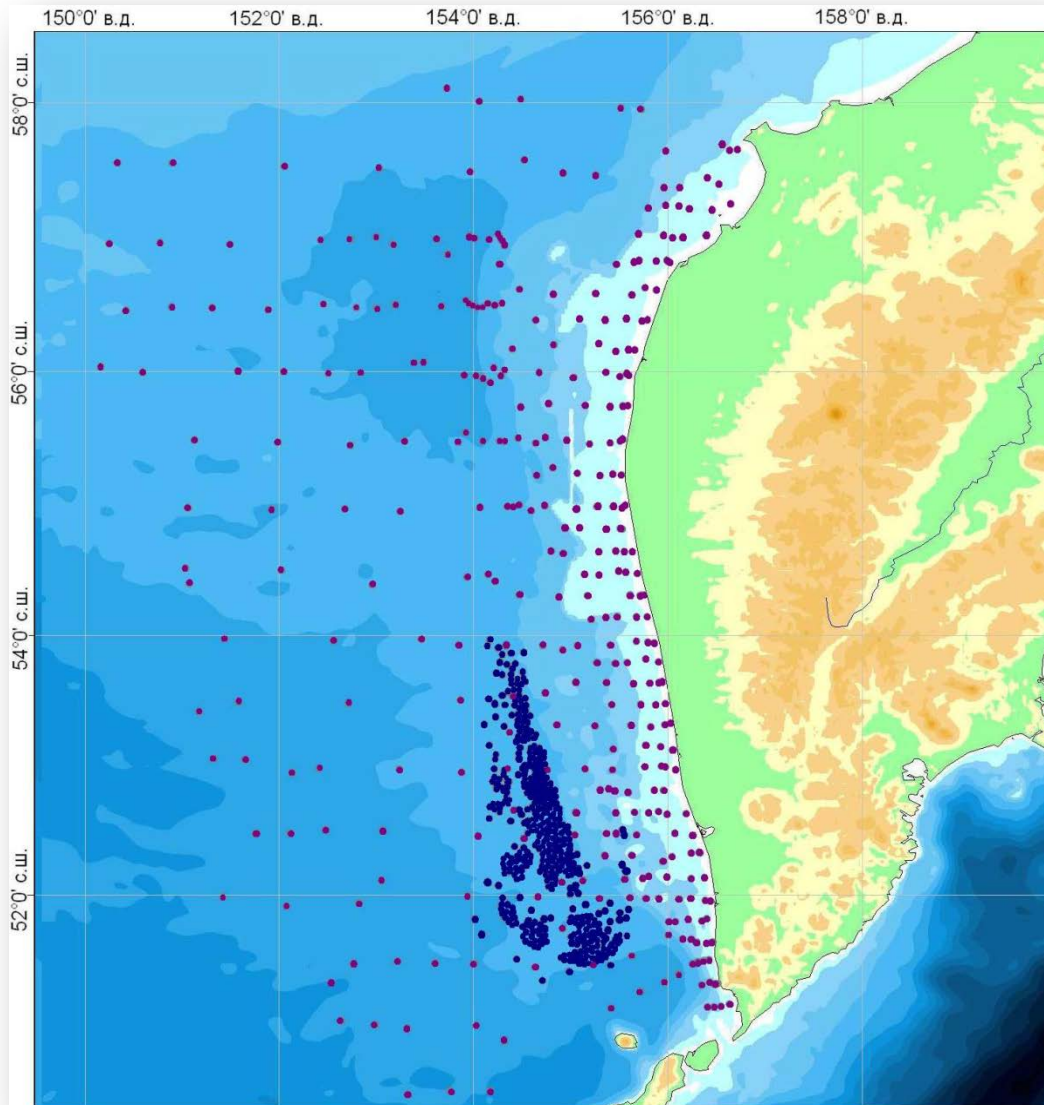
Determine the temperature range for the normal distribution

Determine the existence of dependencies:
temperature-distribution, temperature-life cycle

Role played by temperature in the process of emigration

etc.

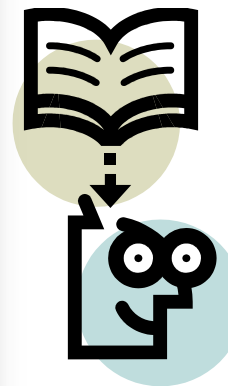
Data that has been use in this work



The data obtained on the fishing vessels

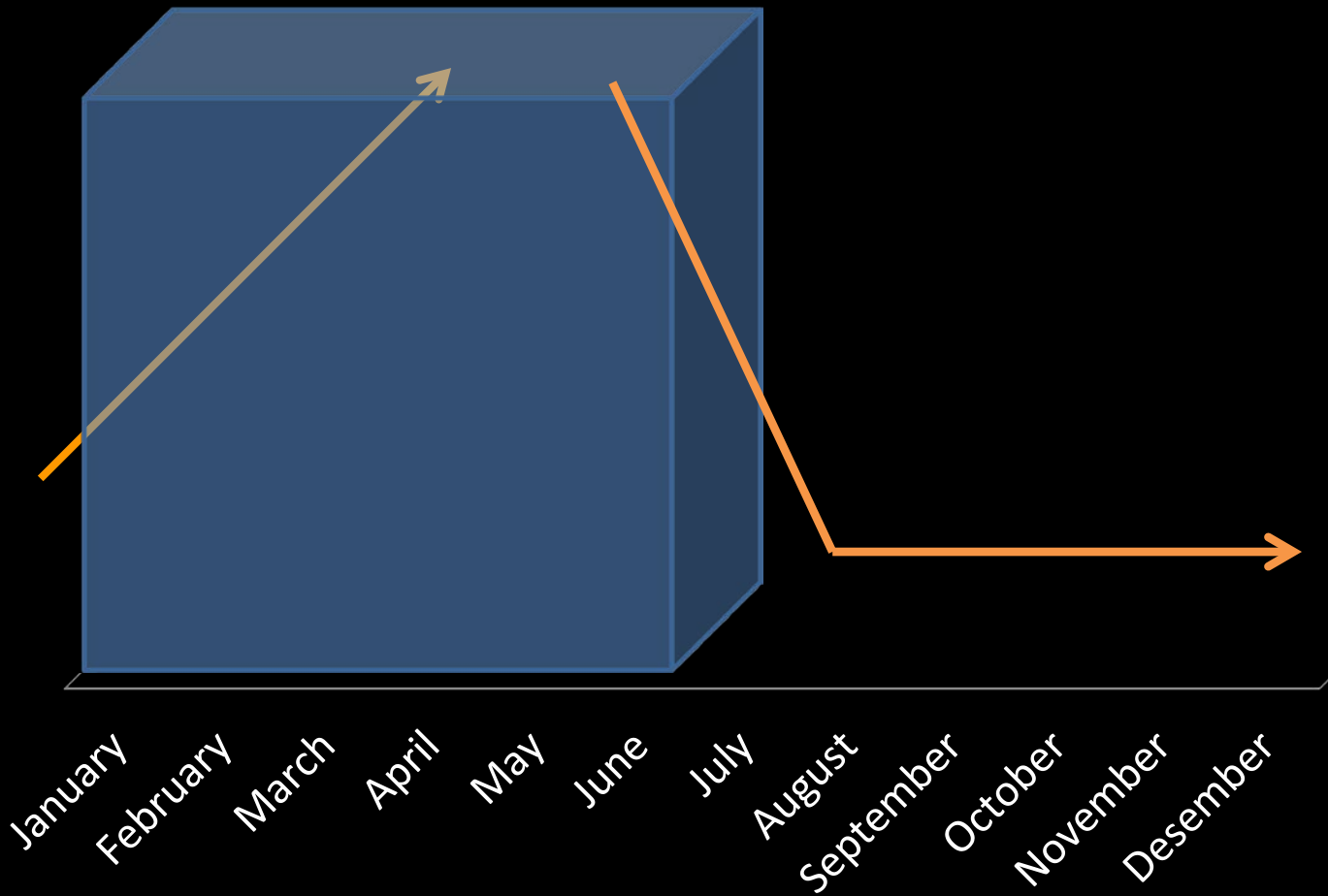


The data obtained during complex scientific trawl surveys

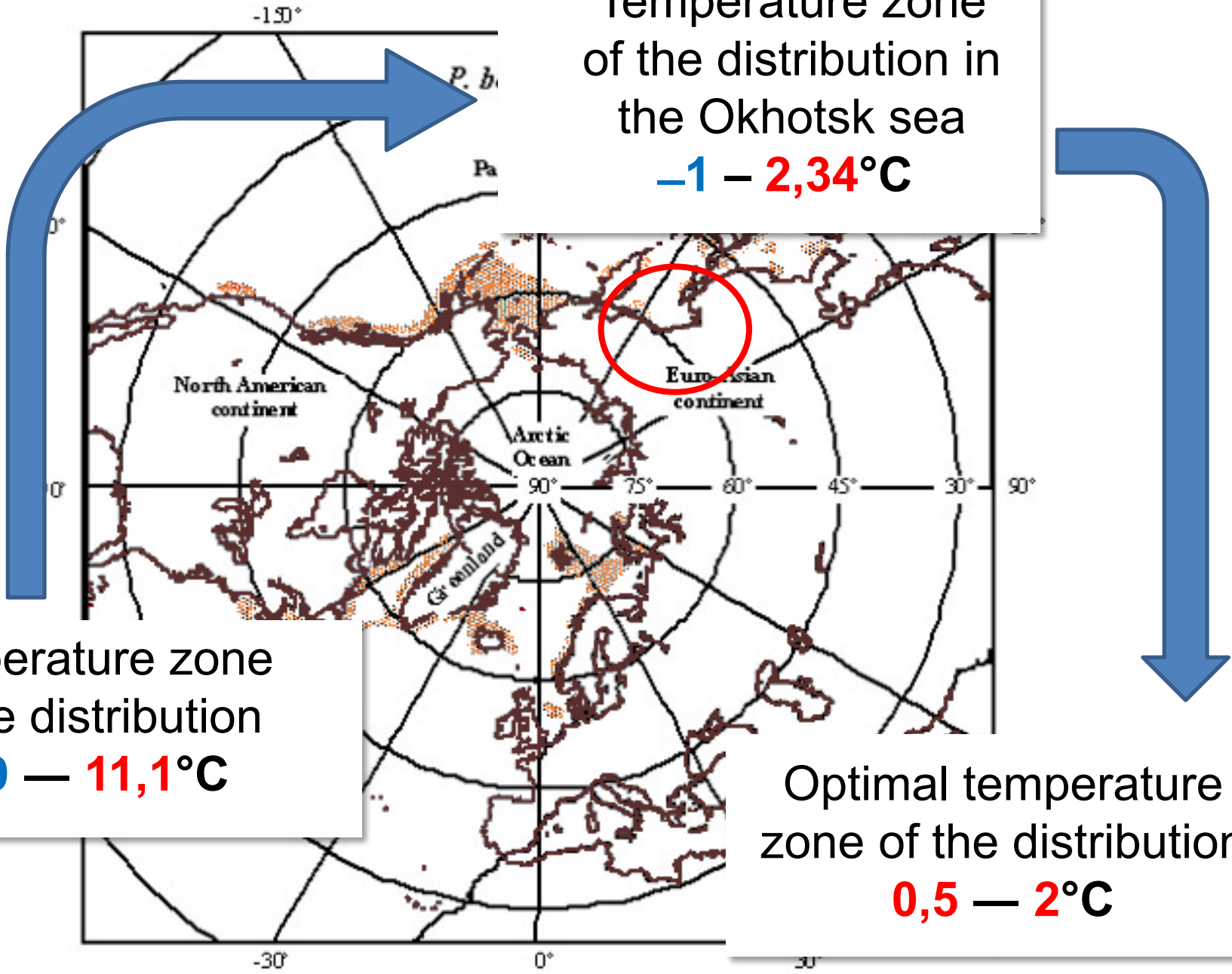


Literature data

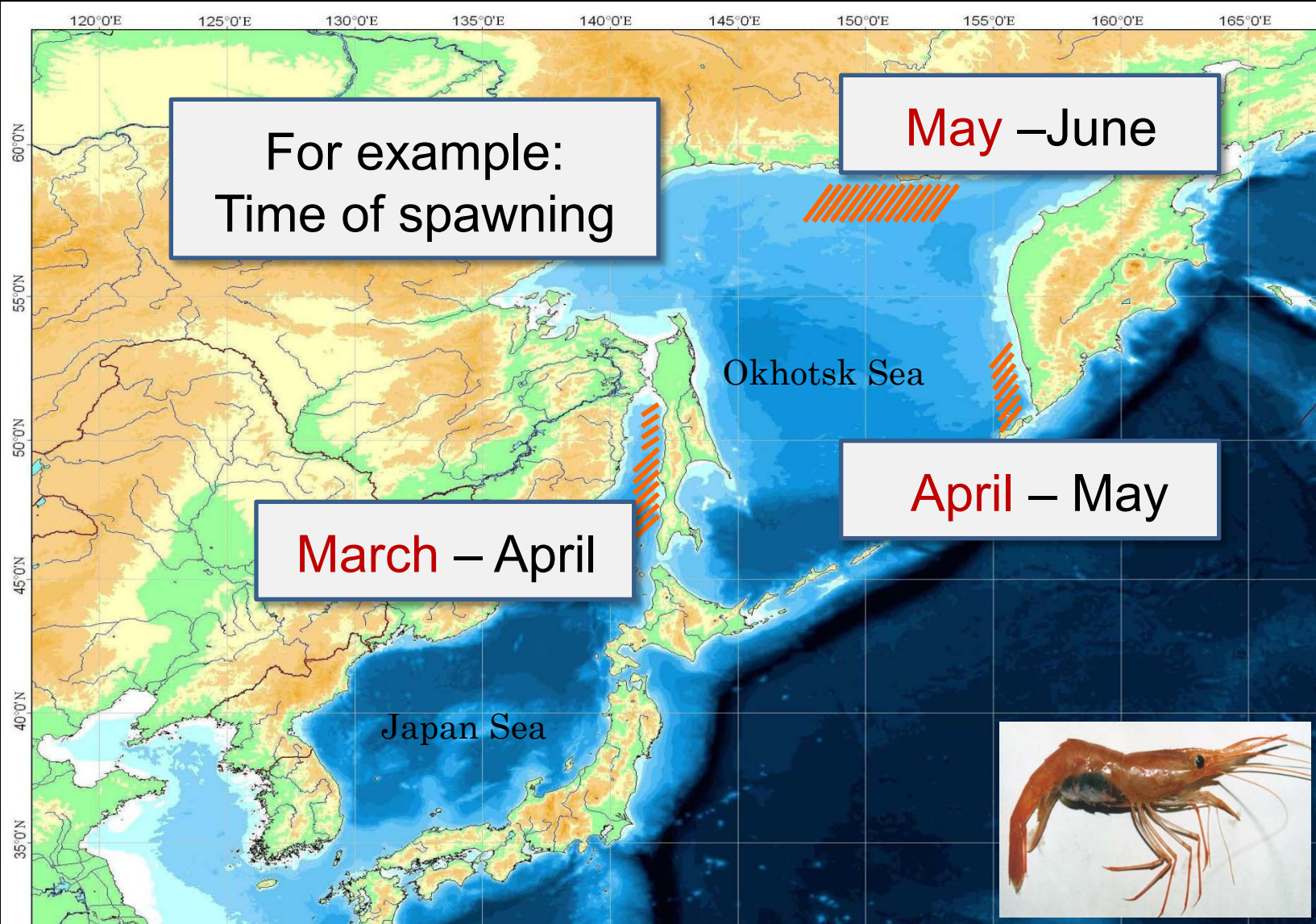
Periods of the our research



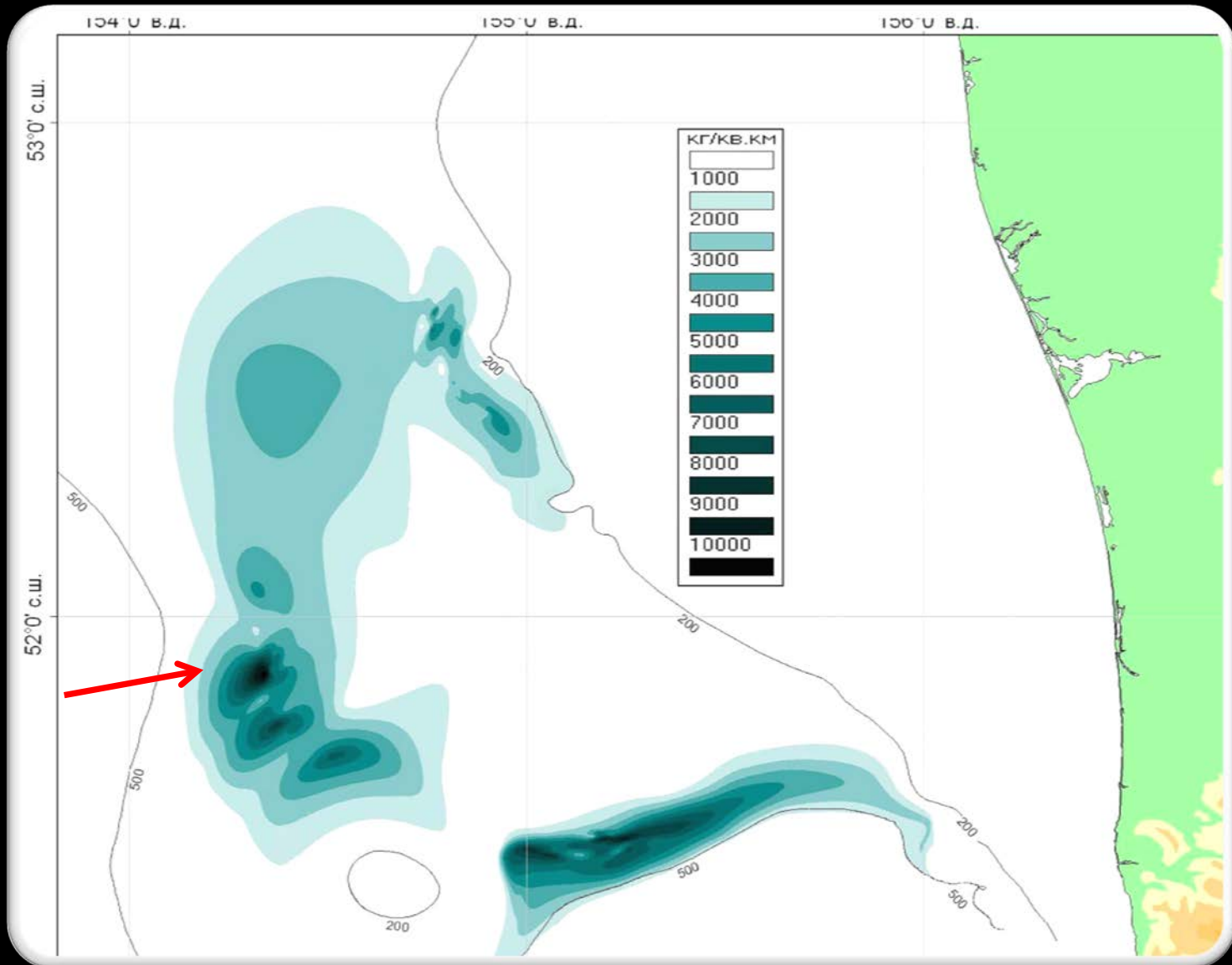
Temperature zone
of the distribution in
the Okhotsk sea
-1 – 2,34°C



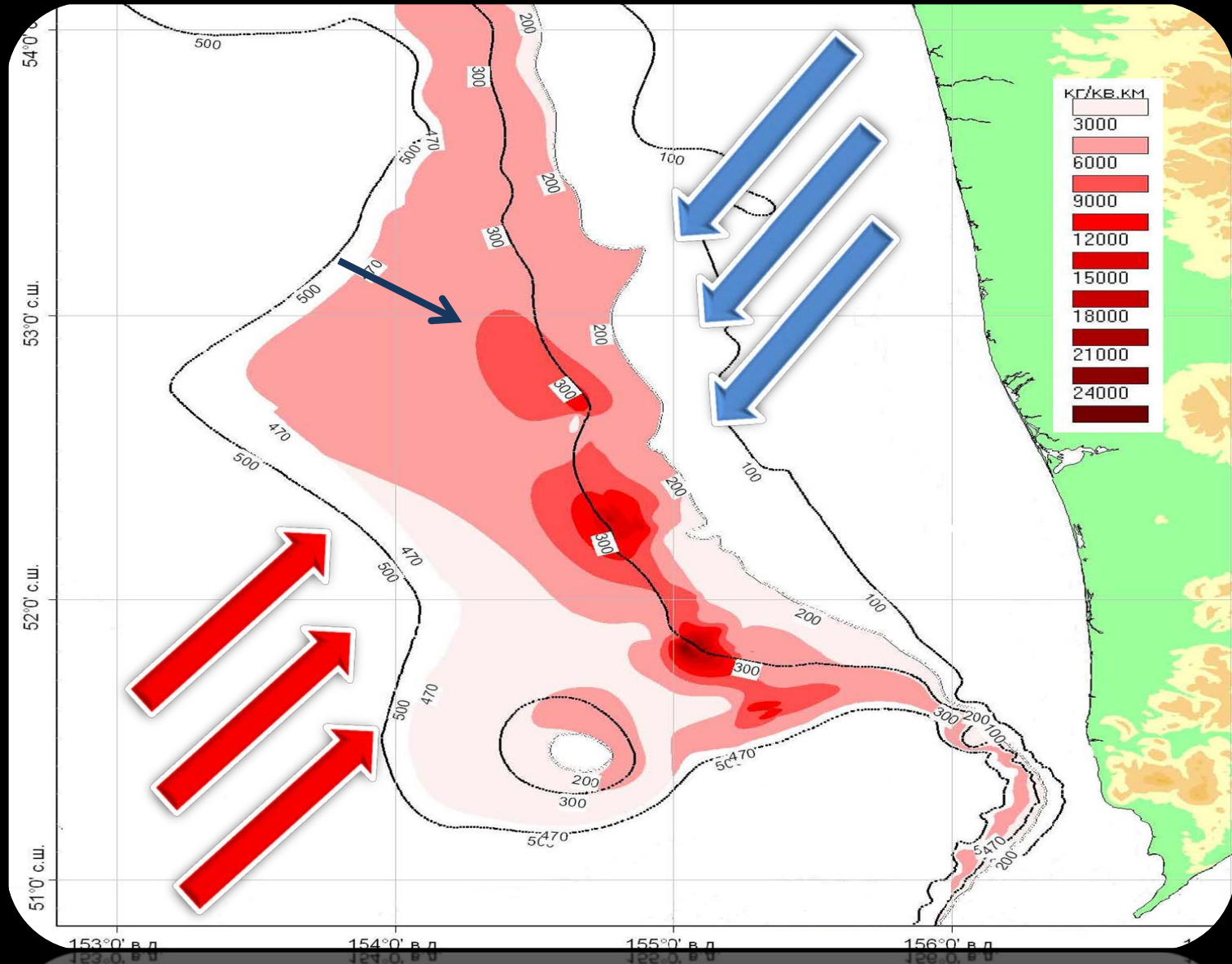
(modified from Bergstrom, 2000)



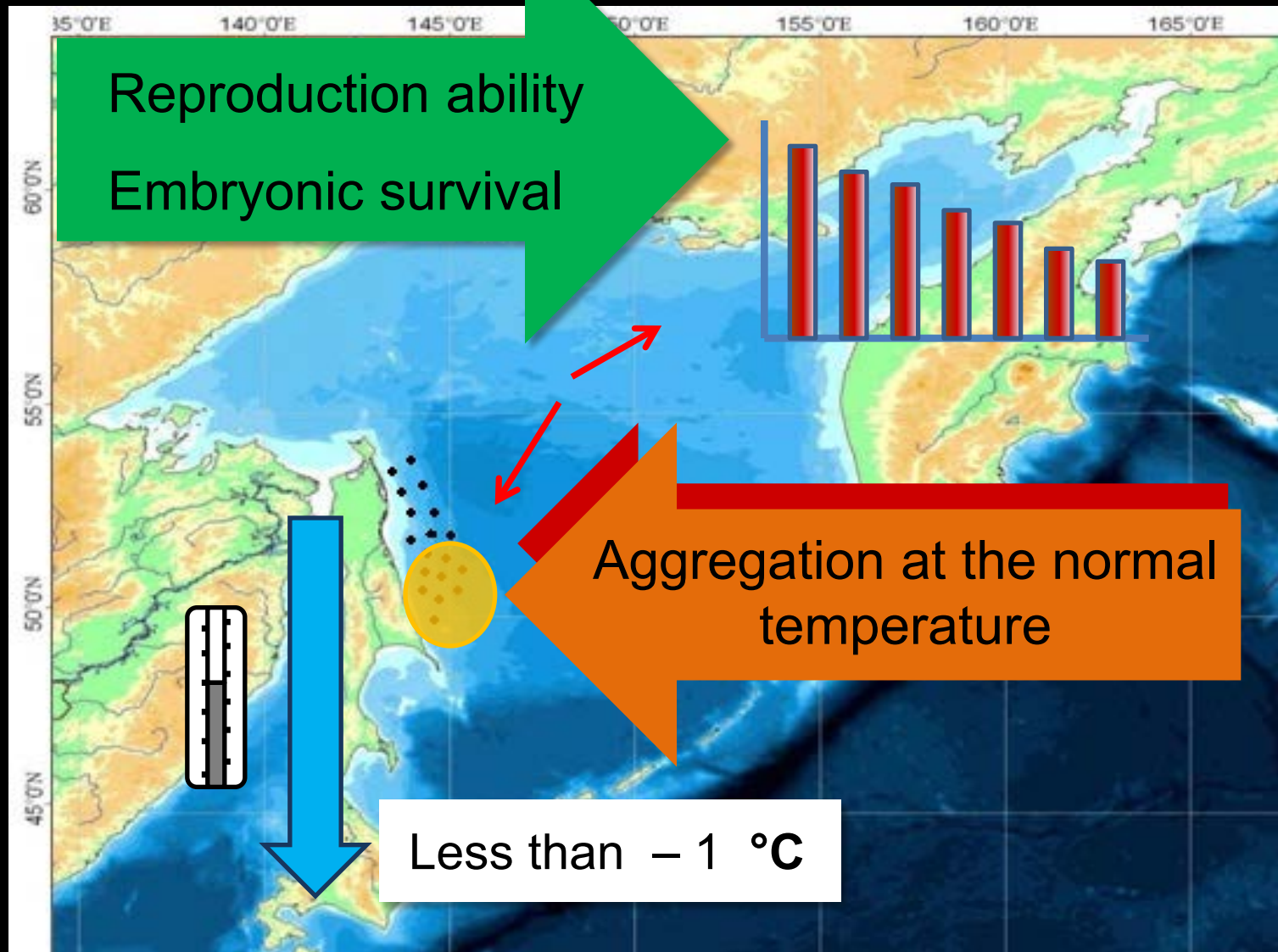
Average annual distribution of the north shrimp in winter at the south-west coast of Kamchatka



Average annual distribution of the north shrimp in spring at the south-west coast of Kamchatka

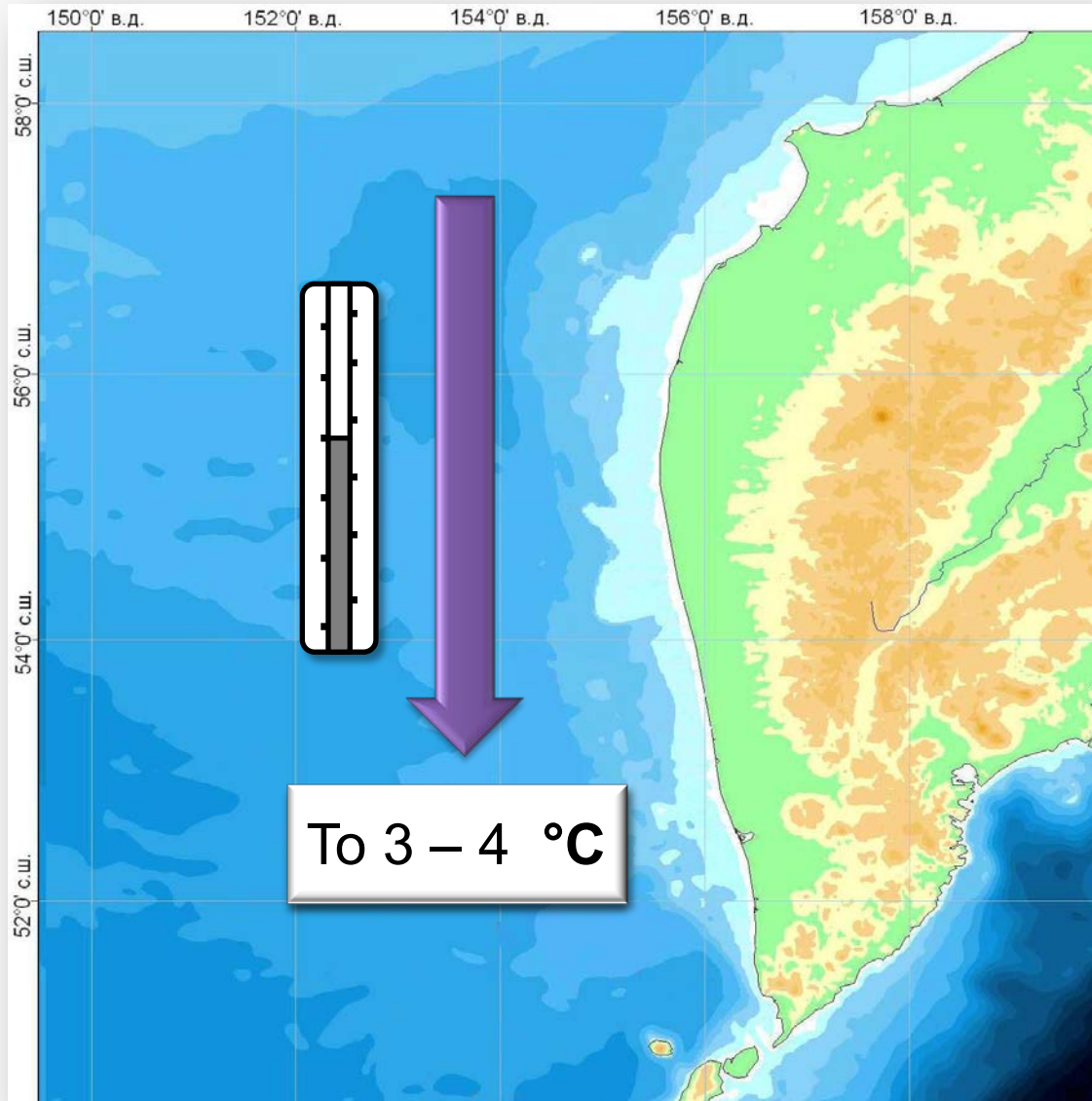


Scheme of result of decrease in temperature



(Berenboim, Serebrov, 1977, Bukin, 2003, Tabunkov, 1982)

Less body size in the 2000-th years at the south-west coast of Kamchatka

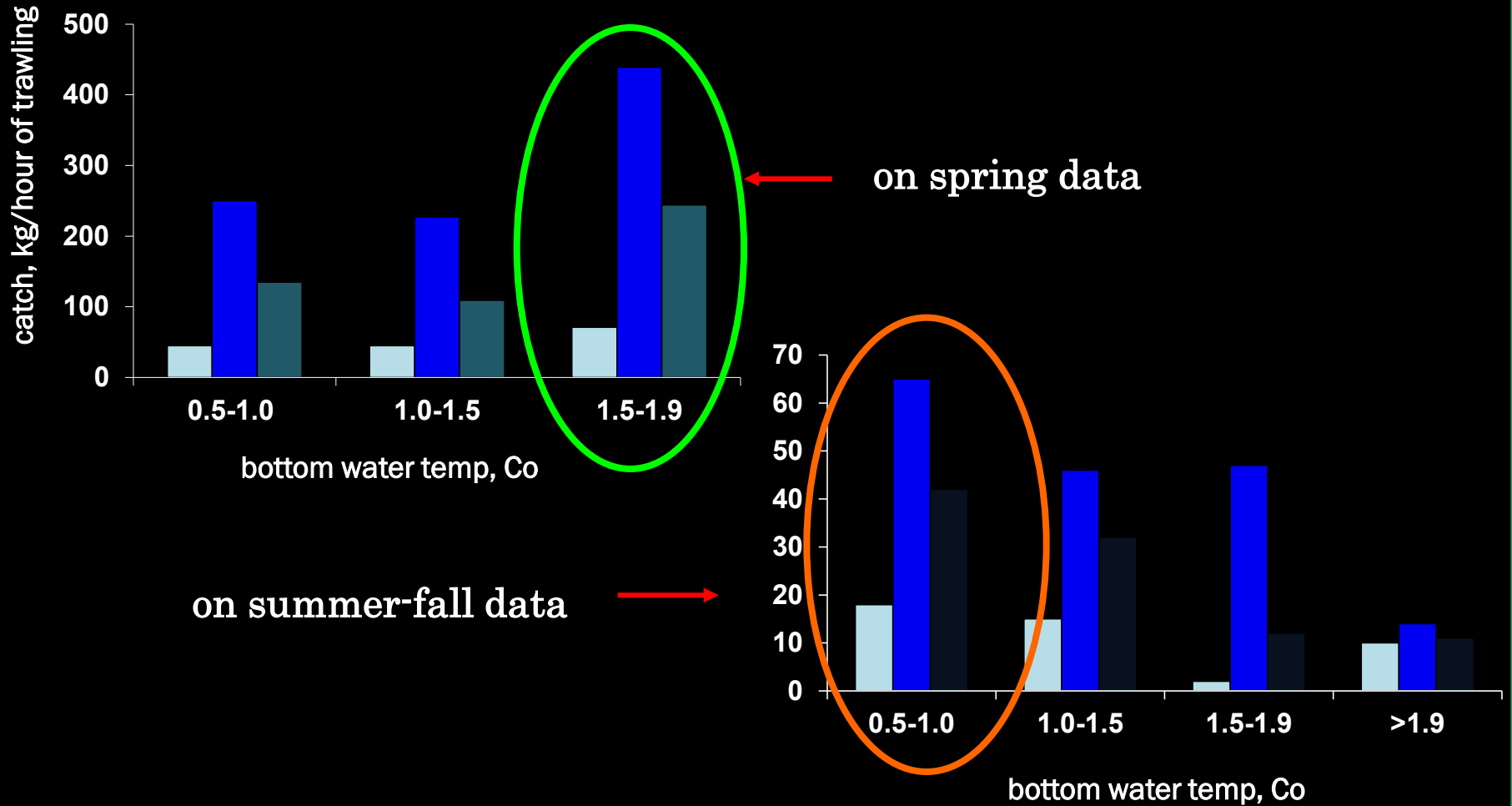


104 mm



99 mm

The catches of pink shrimp in different temperature ranges



Minimal catches

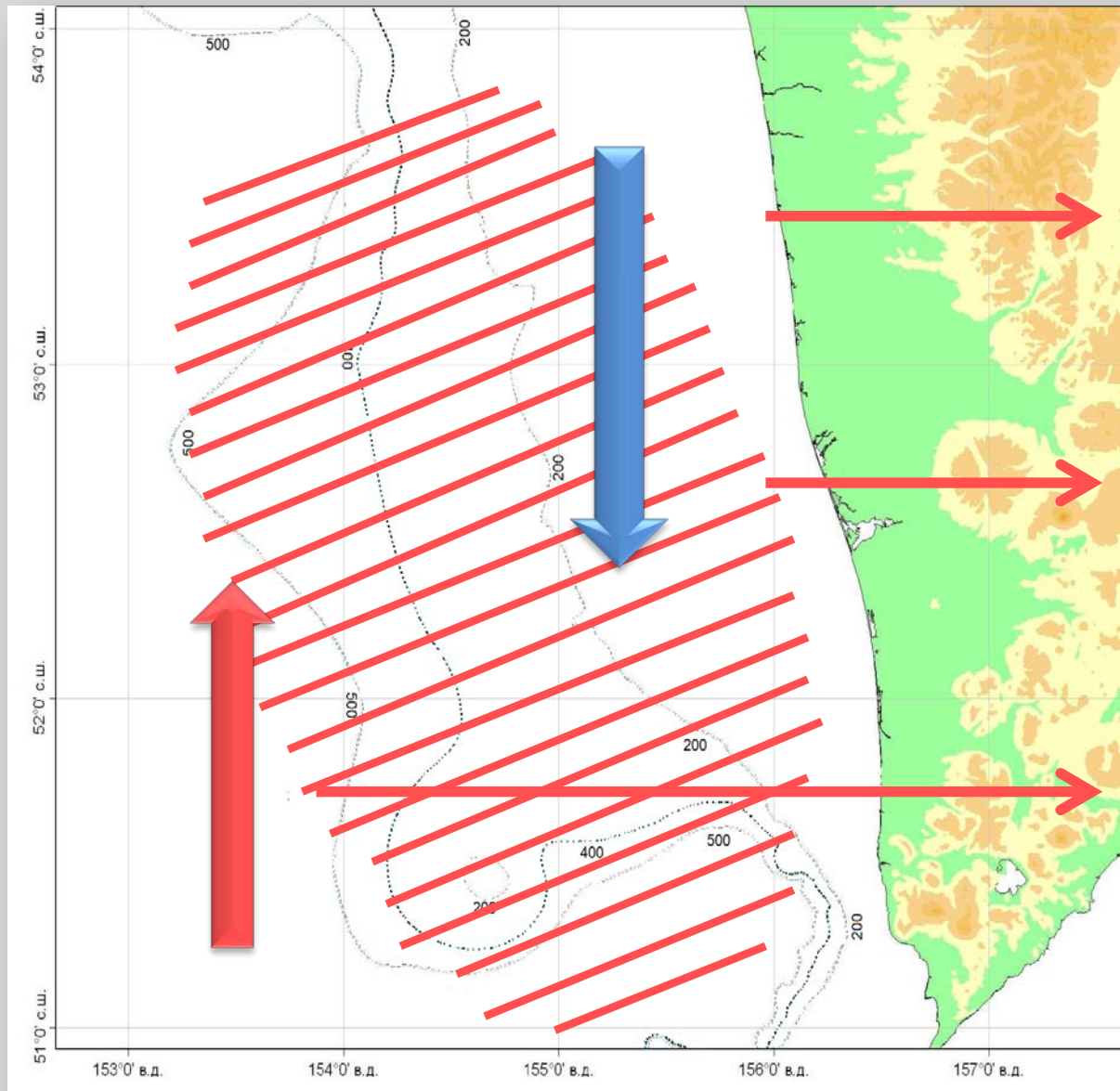


Maximal catches



Average catches

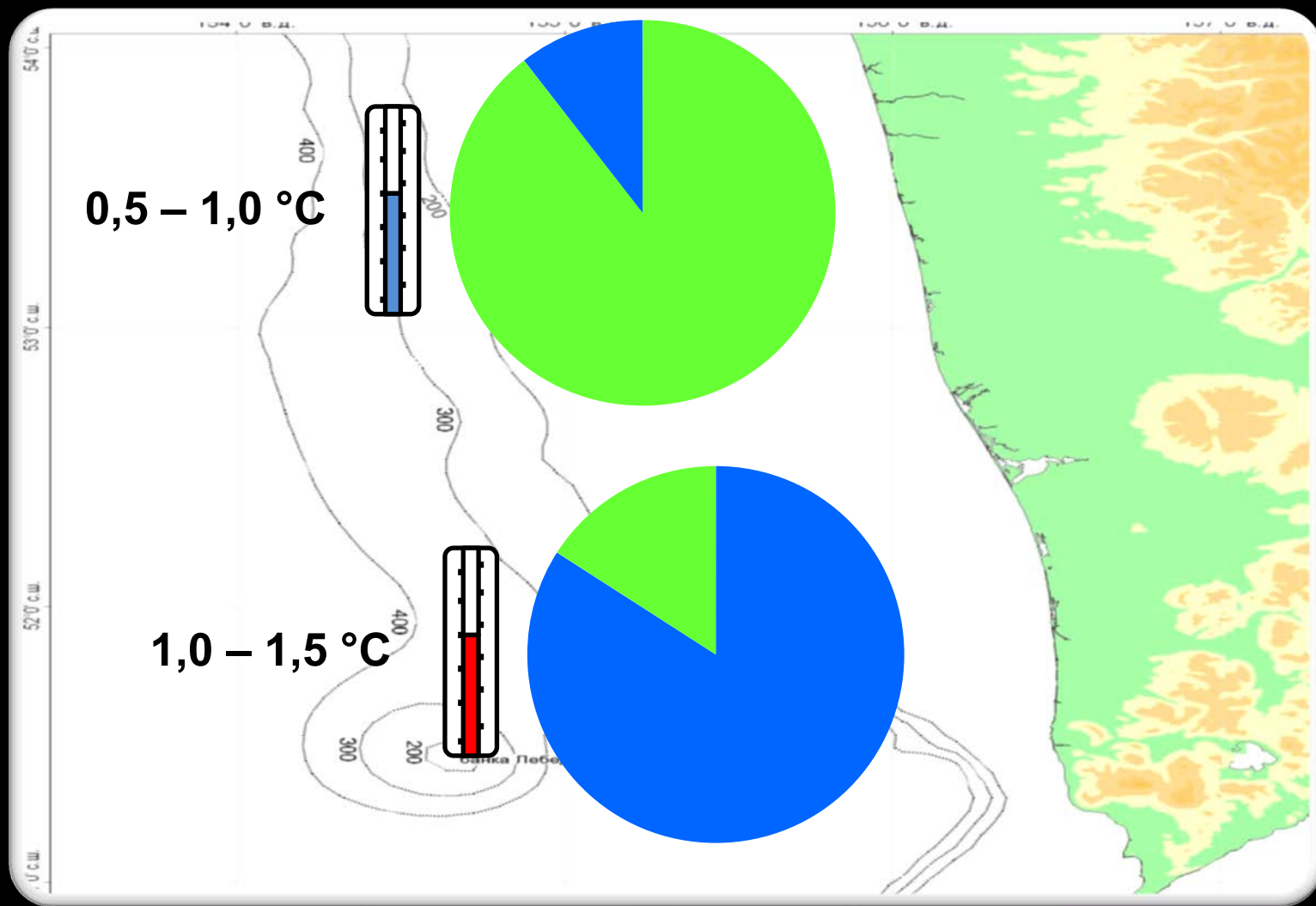
Change of temperature at the south-west coast of Kamchatka



In February
Average temperature
1,7 °C

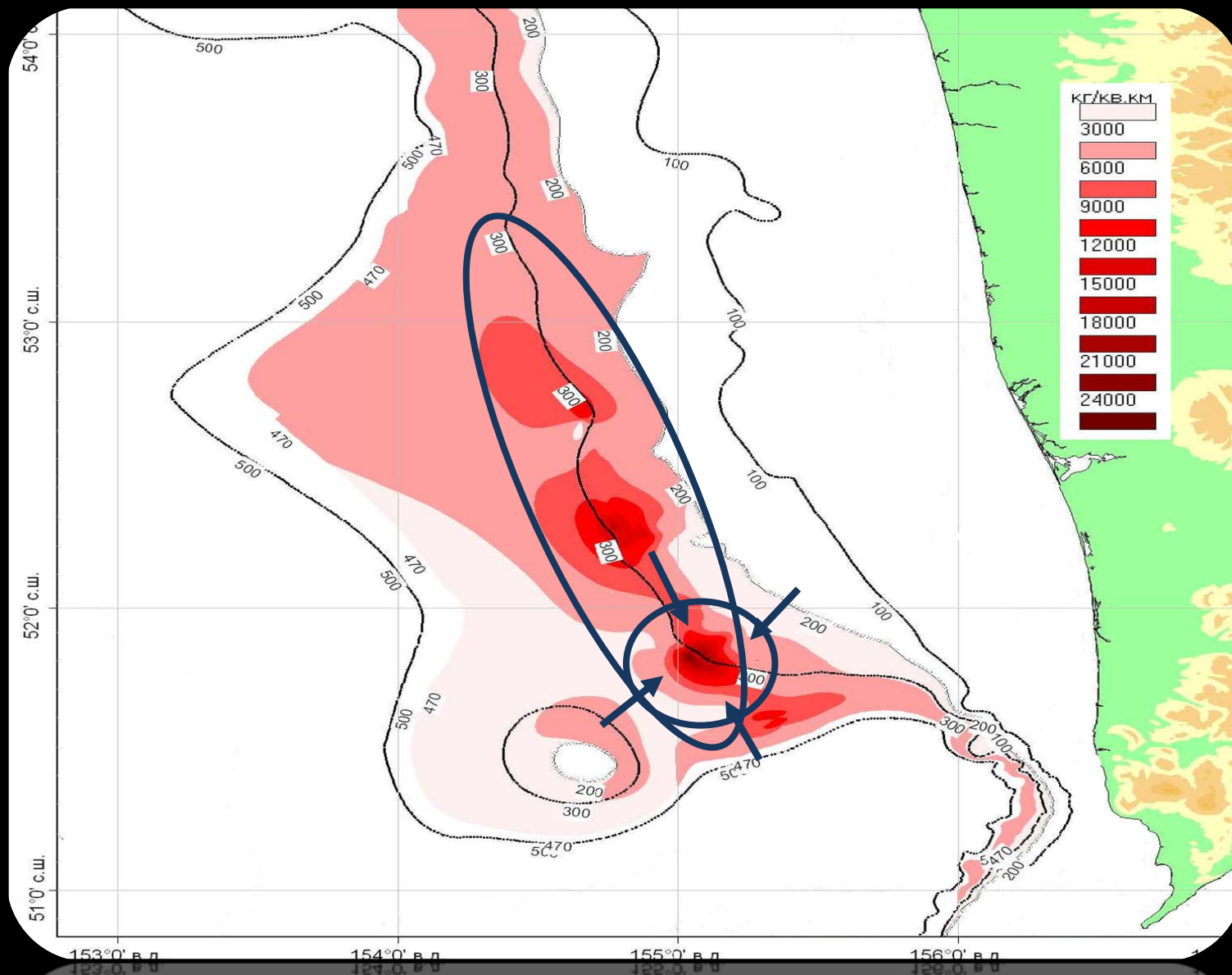
In March
Average temperature
At the depth less than
300 m – **0,7 °C**
more than
400 m – **2 °C**

Scheme of distribution of females with and without external eggs in depends on temperature in April and May



■ Females with eggs ■ Females without eggs

Distribution of north shrimp in may at the south-west coast of Kamchatka





Results

- Optimal diapason of north shrimp distribution on the south-west coast of Kamchatka — $0,5-2^{\circ}\text{C}$
- Expression of the correlation is maximum in spring
- We have figured out the temperature-depth ranges preferable for targeted fishing of north shrimp
- Limited a plot of mass release of larvae

A close-up photograph of two crayfish. The crayfish on the right is in the foreground, showing its large, dark, spherical eyes with a grid-like pattern. The crayfish on the left is slightly behind and to the side. The background is a textured, brownish surface.

Thank you for your attention