The Sakhalin Research Institute Of Fisheries And Oceanography

MONITORING OF TEMPERATURE CONDITIONS IN THE SEA OF OKHOTSK

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and George Novinenko

SakhNIRO's roof

TeraScan station was installed in 1996

1997-2006 SST data set was analyzed

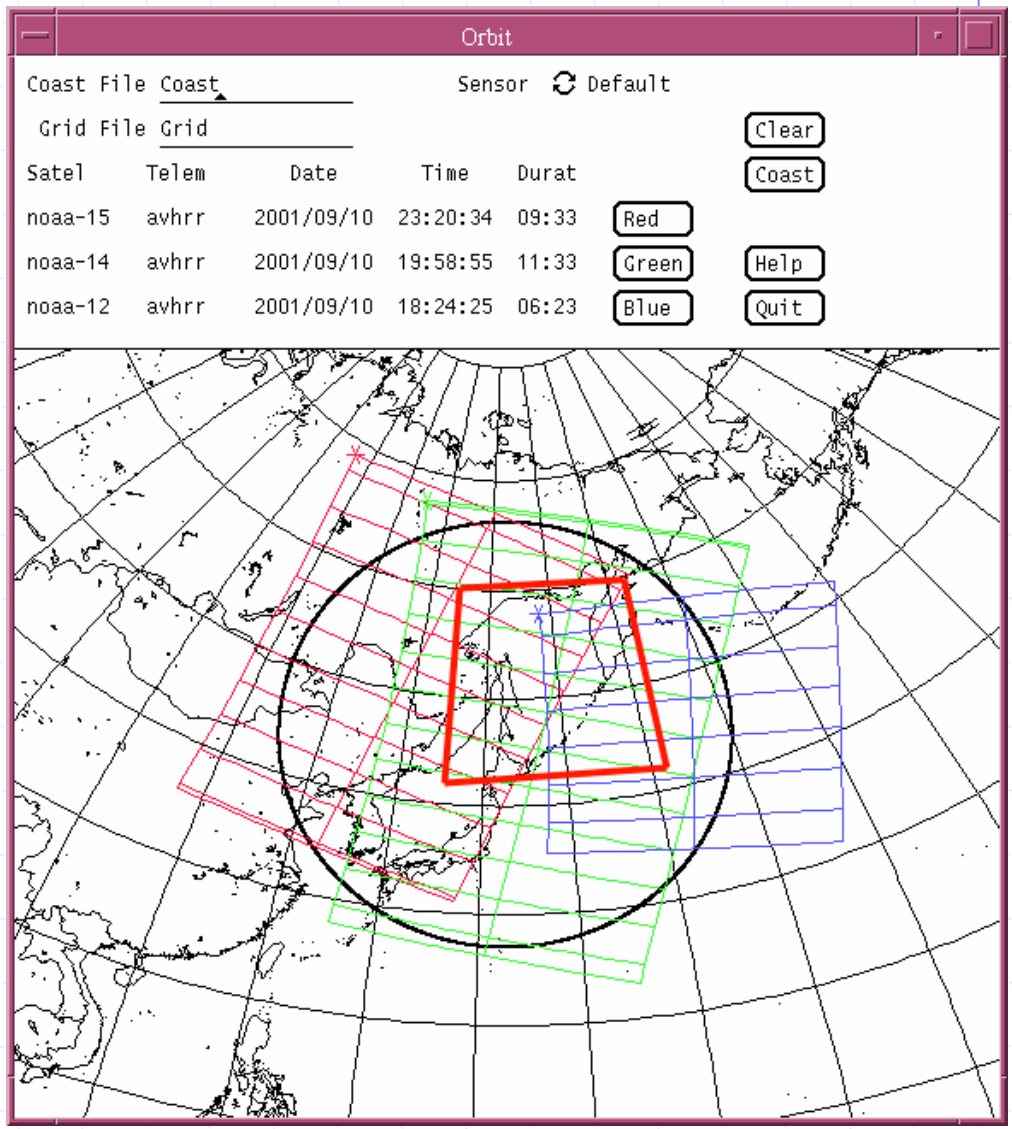
Main goals of the work

- Investigations of multiyear mean SST distributions for different months
- Calculation of semi-month SST differences as index of warming and cooling of Okhotsk Sea surface layer
- Estimation of SST anomalies and their statistical significance (relating standard error)

INITIAL SST DATA

- NOAA 12-18 (1997-2006)
- Area 42-60ºN, 135-163ºE.
- Cloudiness filtration, daily mean SST database formation, space resolution about 1.3 km
- Spatial and time averaging squares 15' x 15'

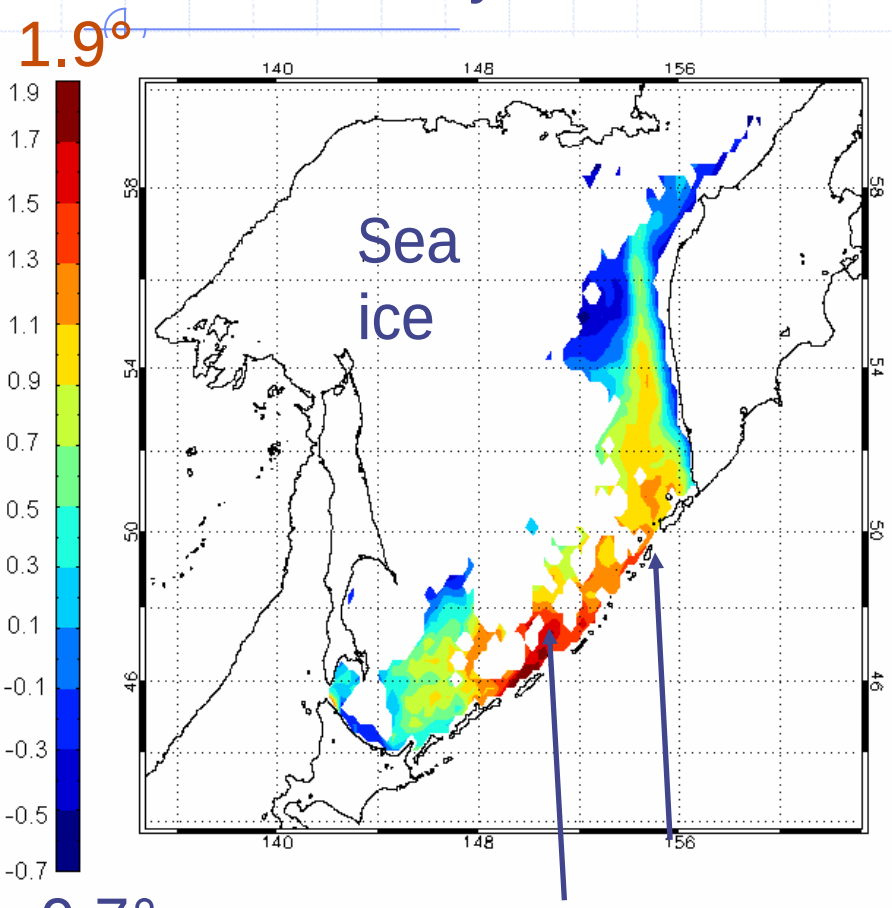
time intervals 10 and 15 days, 1 month

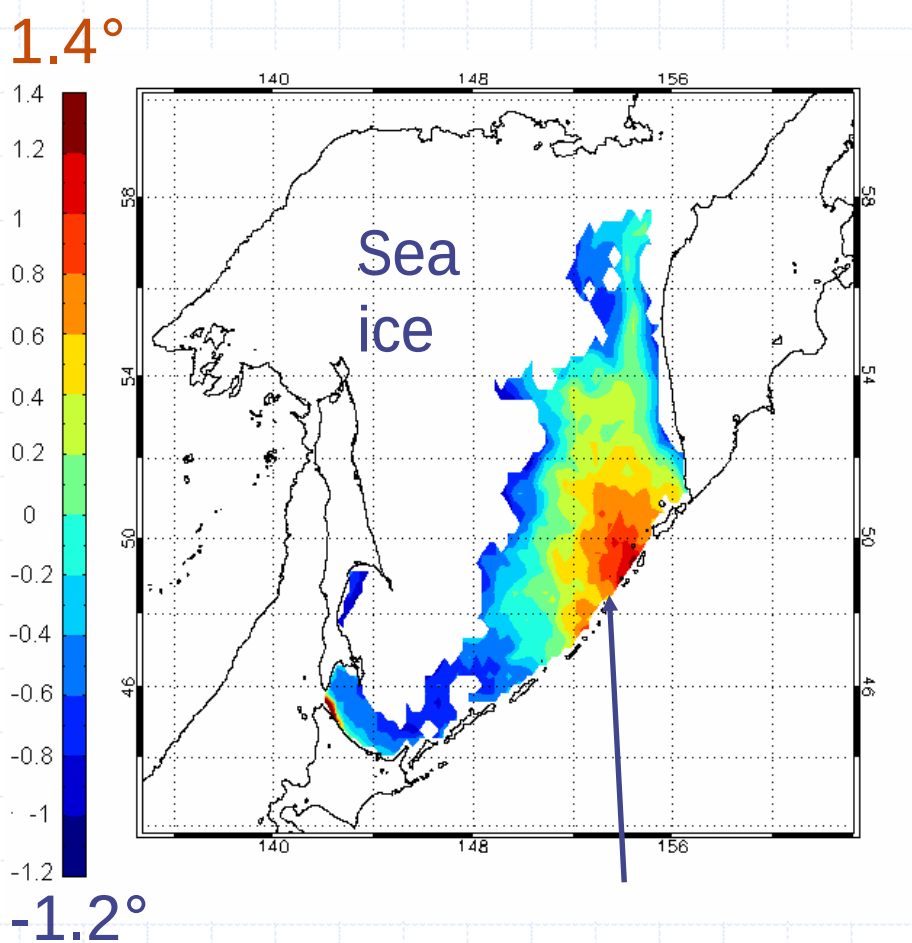


10-year mean SST distributions

January

March

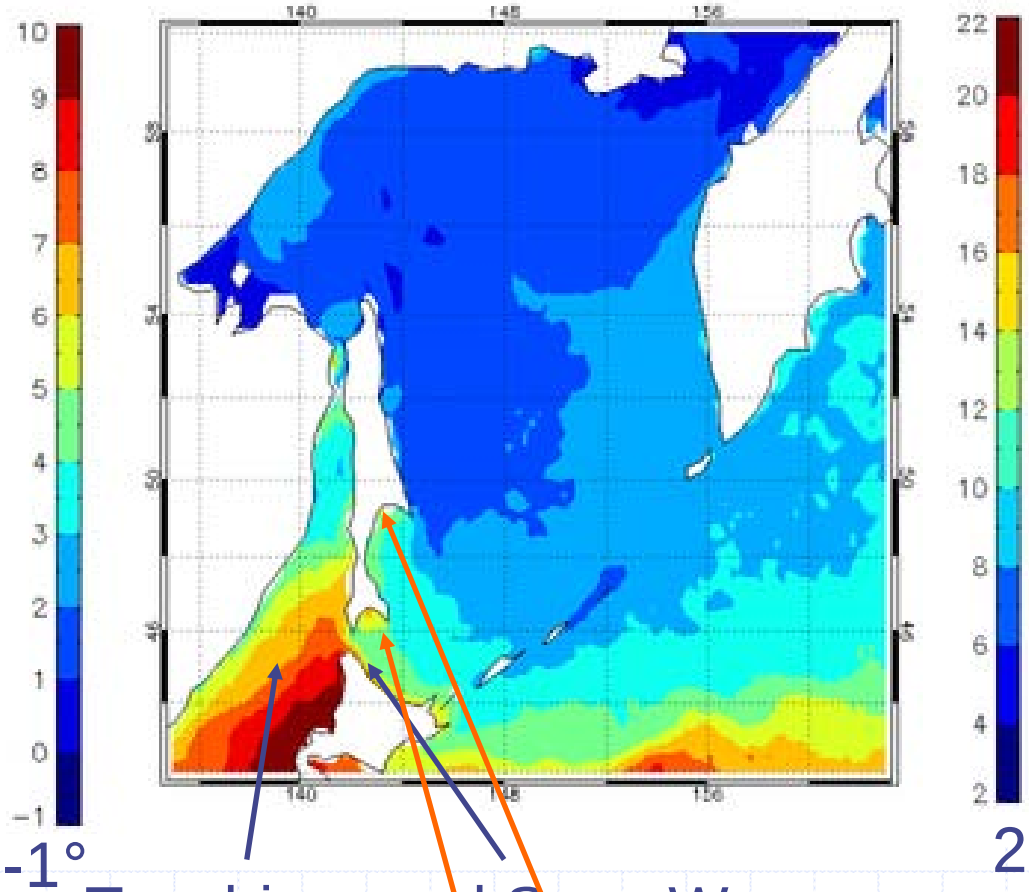


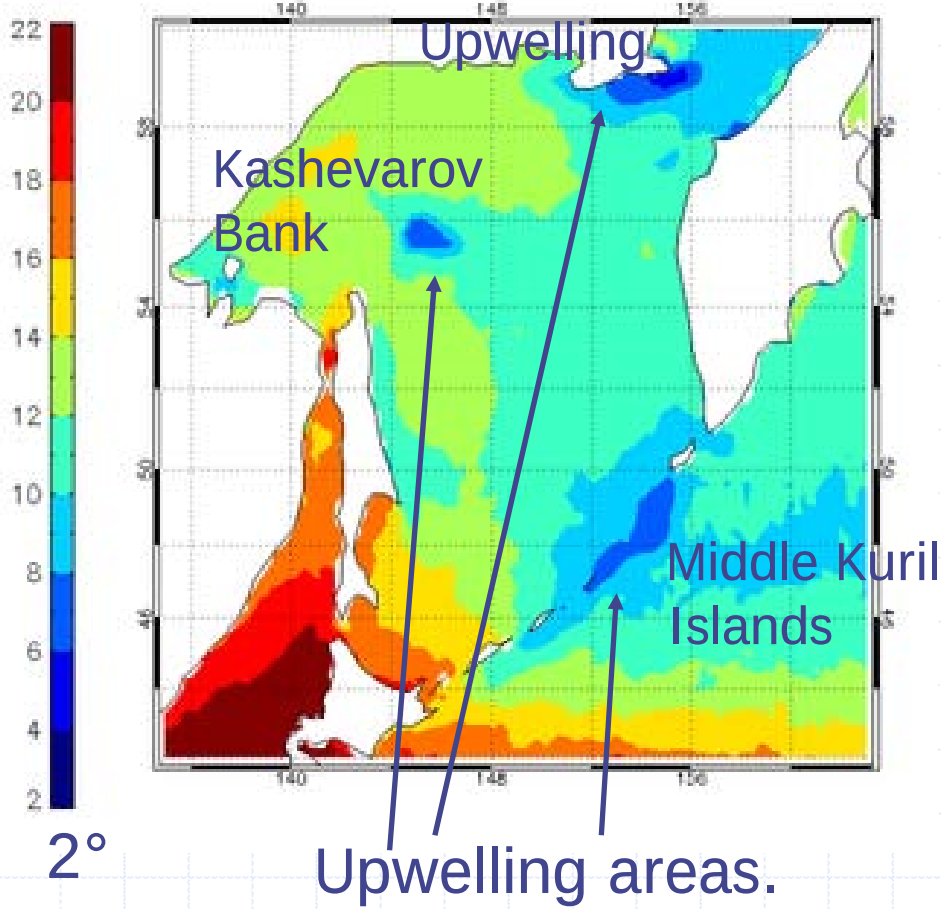


10-year mean SST distributions

May

August



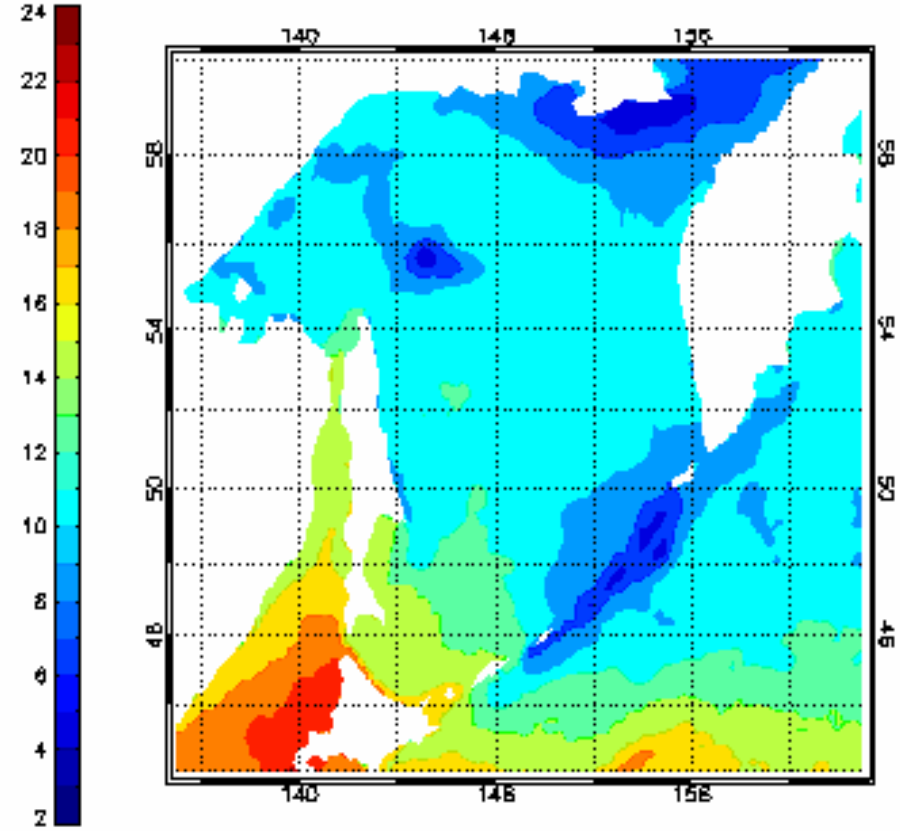


10-year mean SST distributions

September

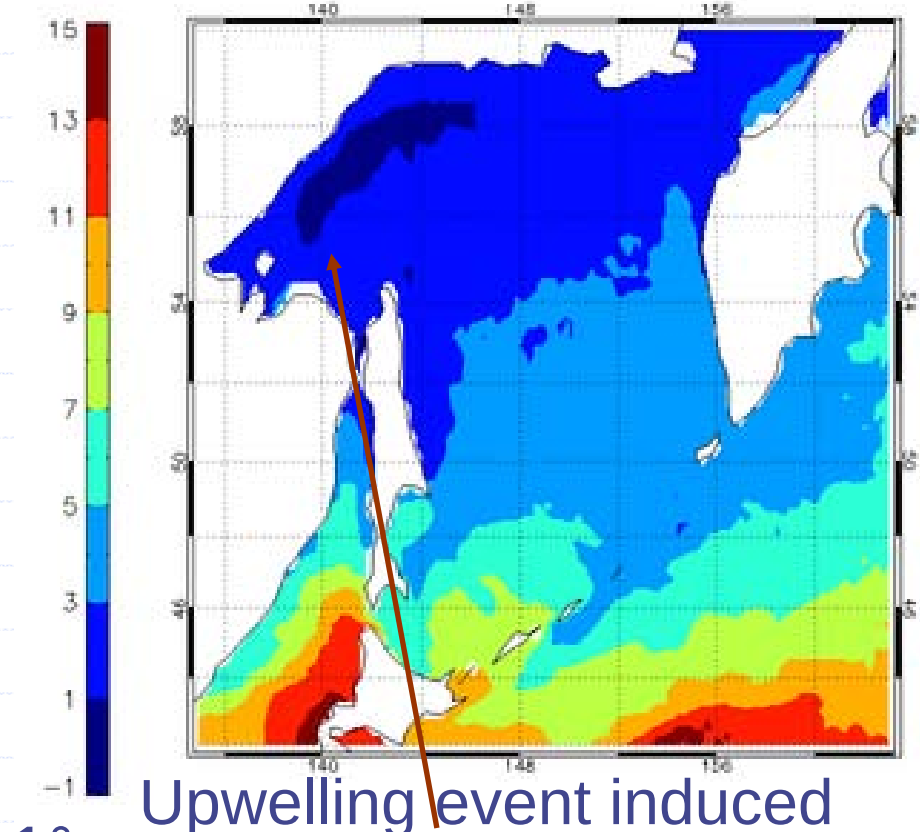
November

24°



2°

15°



-1°

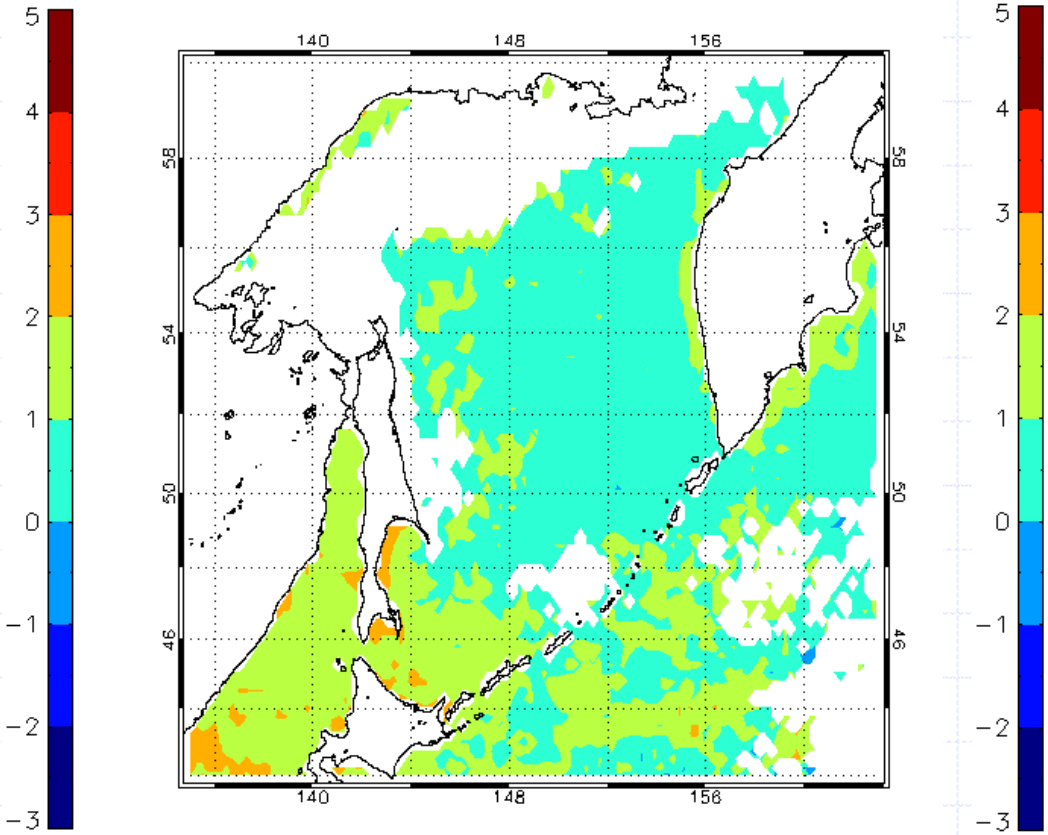
Early cooling in the northern Okhotsk Sea

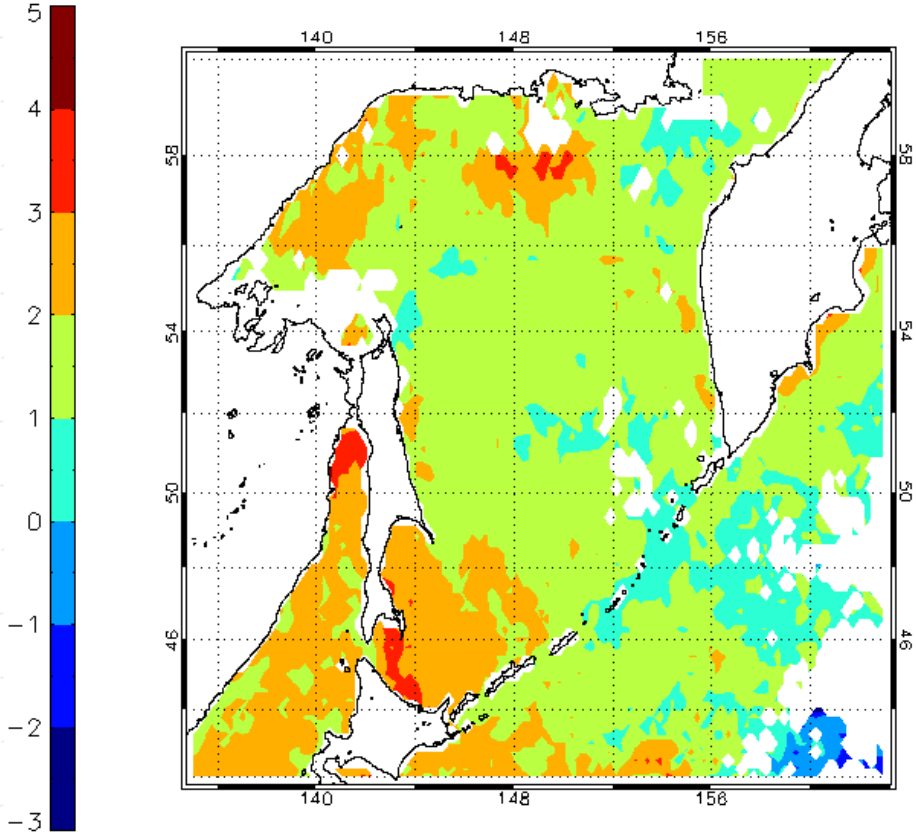
Upwelling event induced by the northwesterly winds. Cold intermediate water in a surface layer

Warming and cooling estimations as semi-month mean SST differences

5° 1-15 May – 16-30 April

16-31 May – 1-15 May



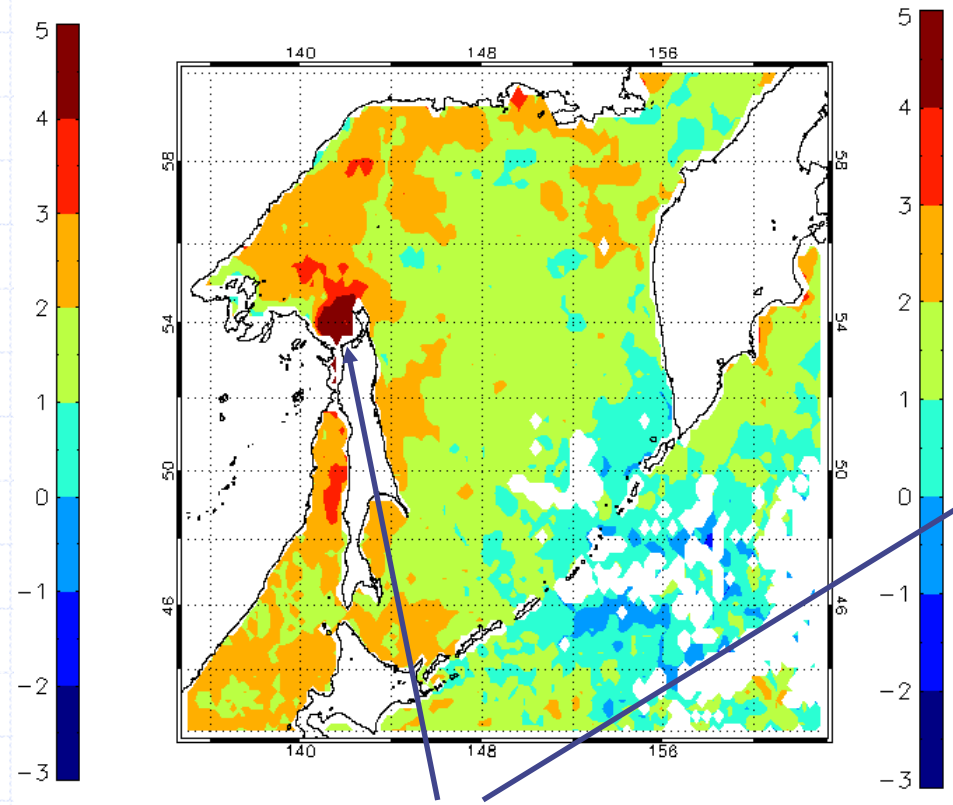


-3° Fast warming in the Tatar Strait and southwestern part of Okhotsk Sea

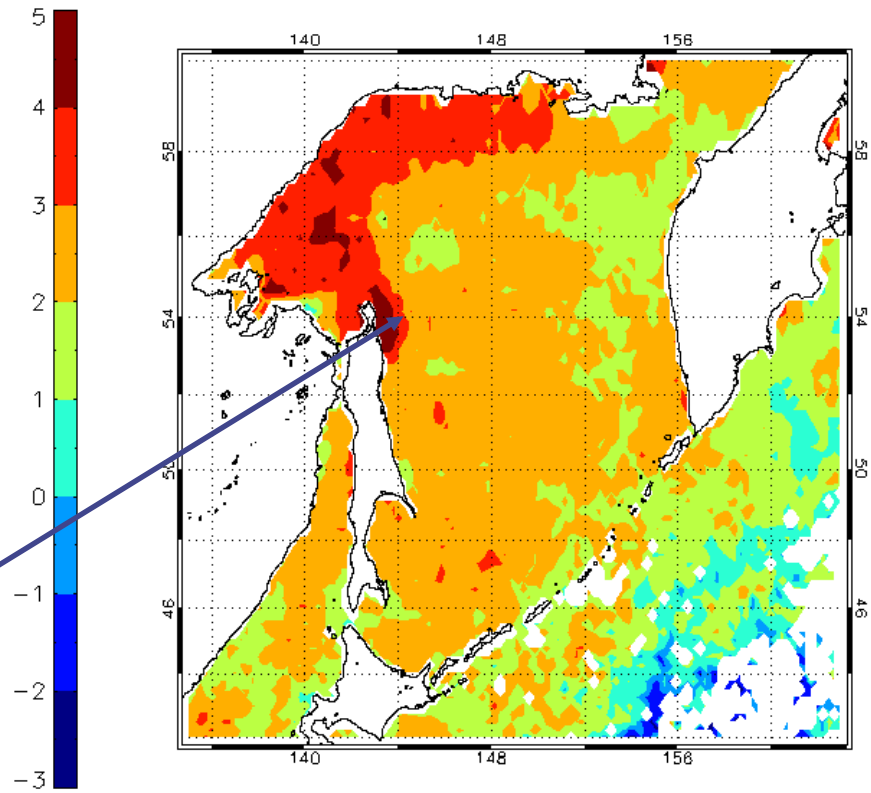
Warming and cooling estimations as semi-month mean SST differences

1-15 June – 16-31 May

16-30 June – 1-15 June



Amour River runoff

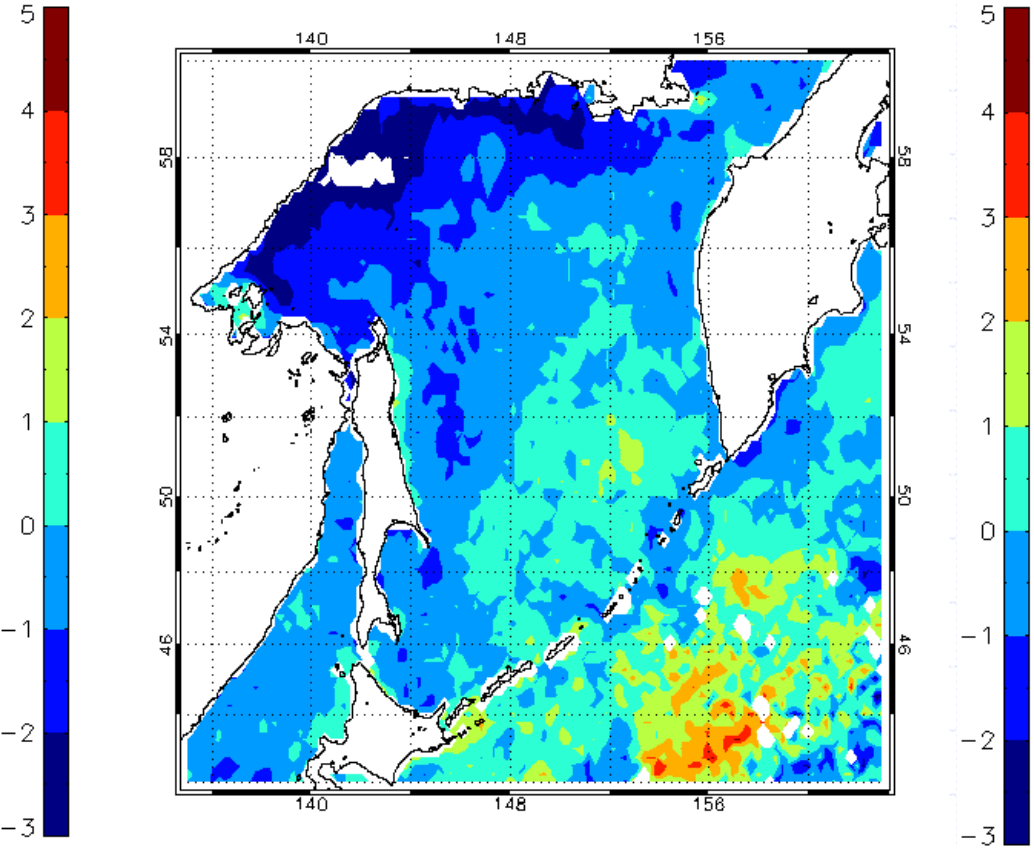


Fast warming in the north-western Okhotsk Sea

Warming and cooling estimations as semi-month mean SST differences

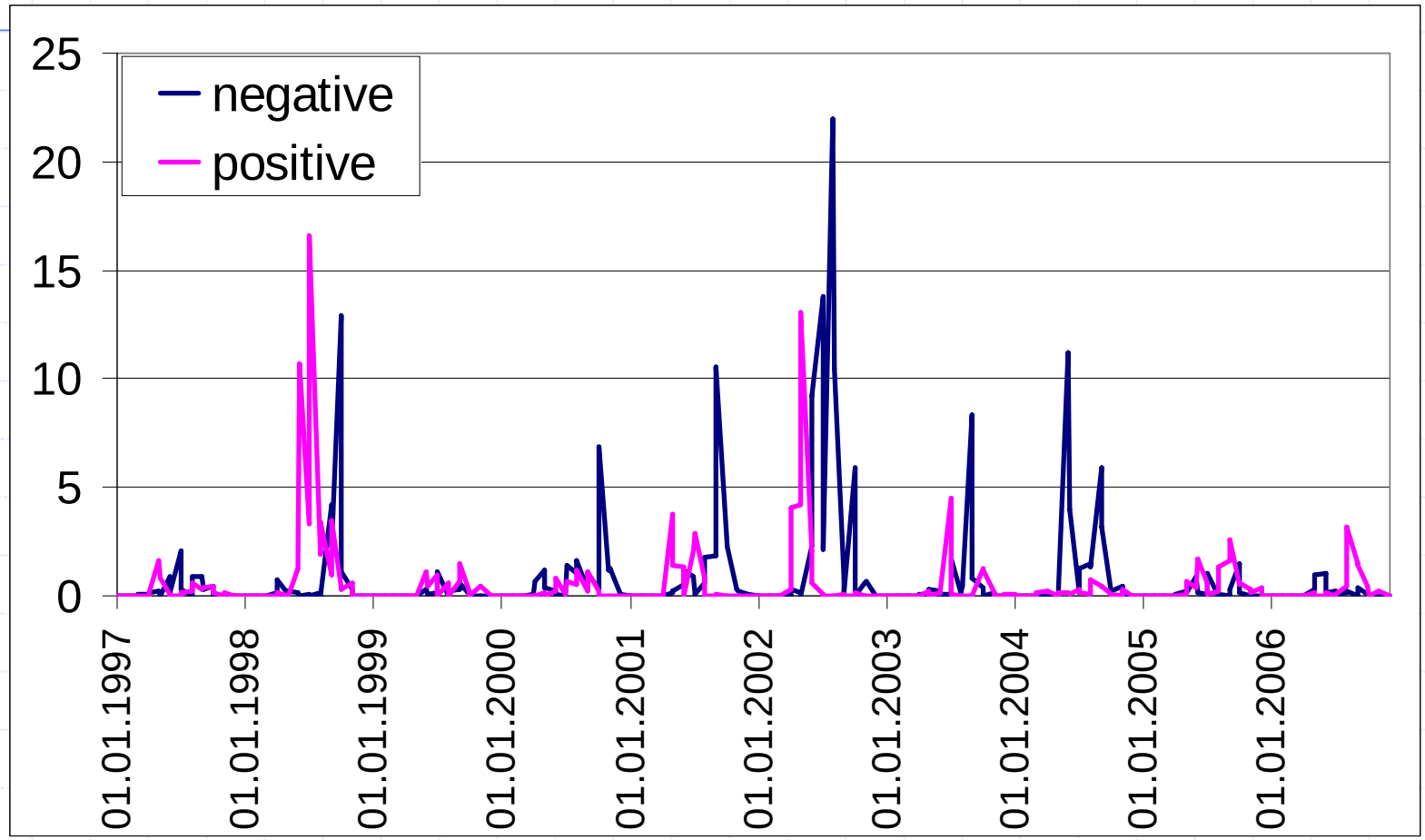
1-15 September – 16-31 August

16-30 September – 1-15 September



Early cooling in the northwestern Okhotsk Sea

|anomalies| > 2σ – relative squares (% to the whole area)

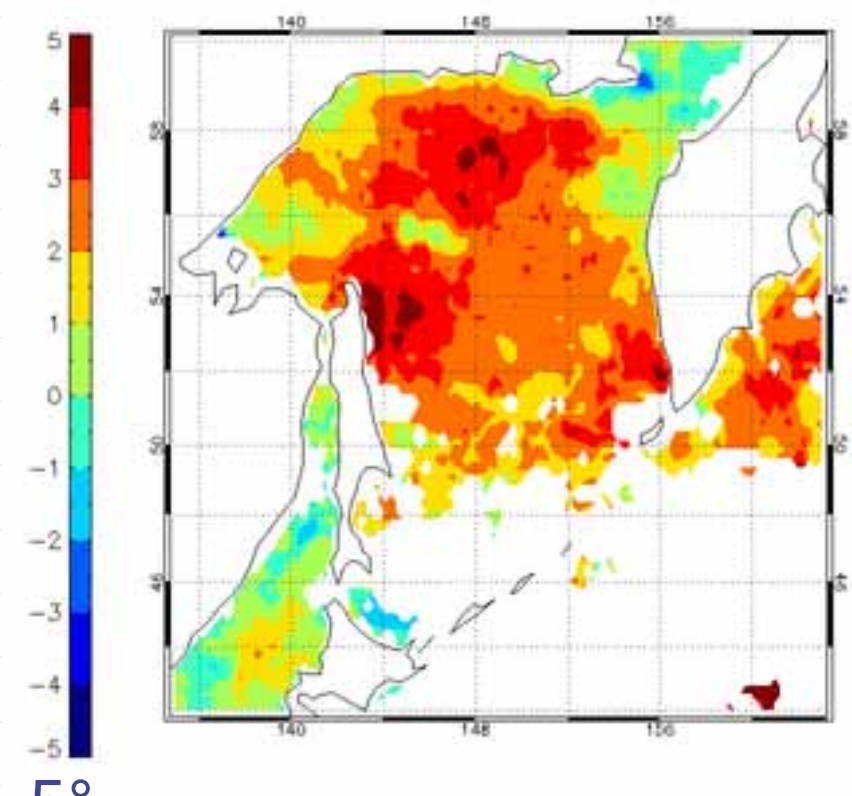


Greatest anomalies were found in 1998 and 2002

SST anomalies in 1998

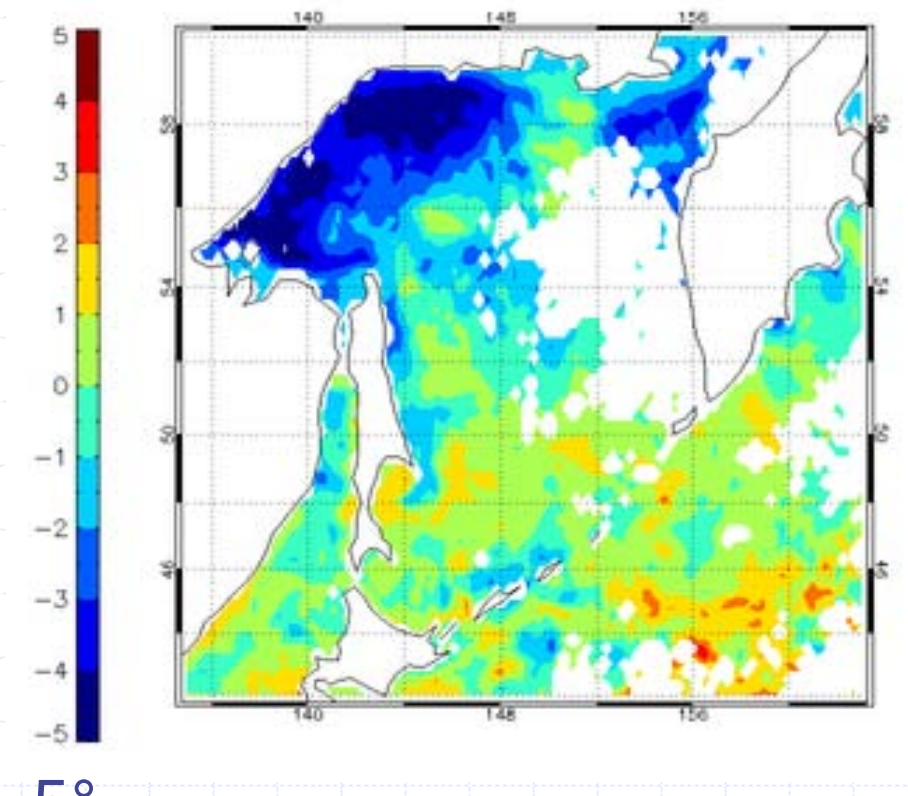
- Small influence of cloudiness in the northern Okhotsk Sea

July 16-31.



Early cooling induced by the northwesterly winds

October 1-15



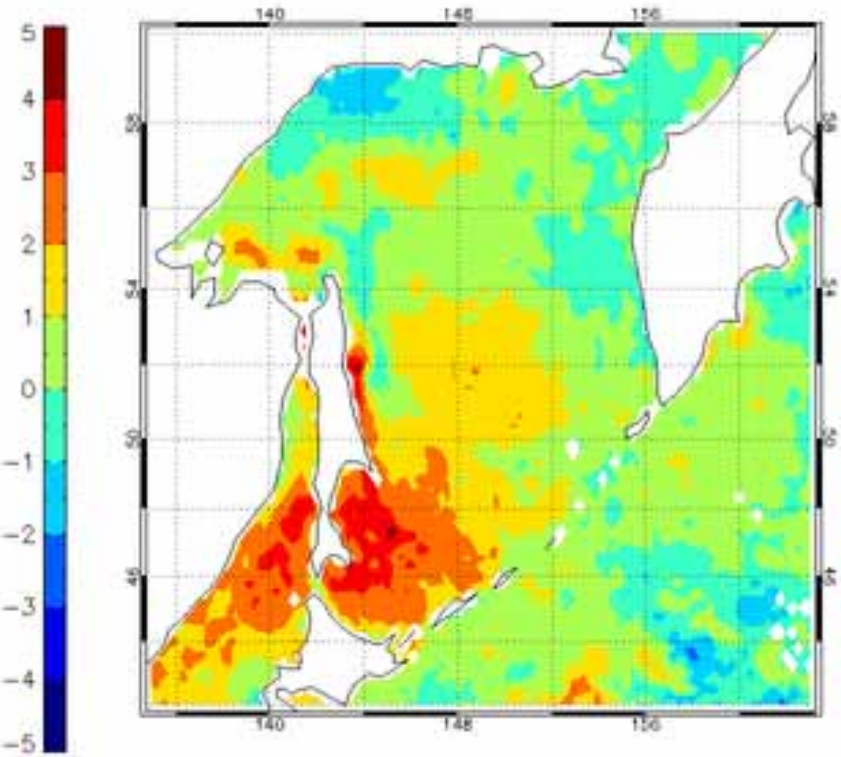
SST anomalies in 2002

Fast warming in the areas adjacent to Sakhalin Island

Maximal number of typhoons in summer 2002

5°

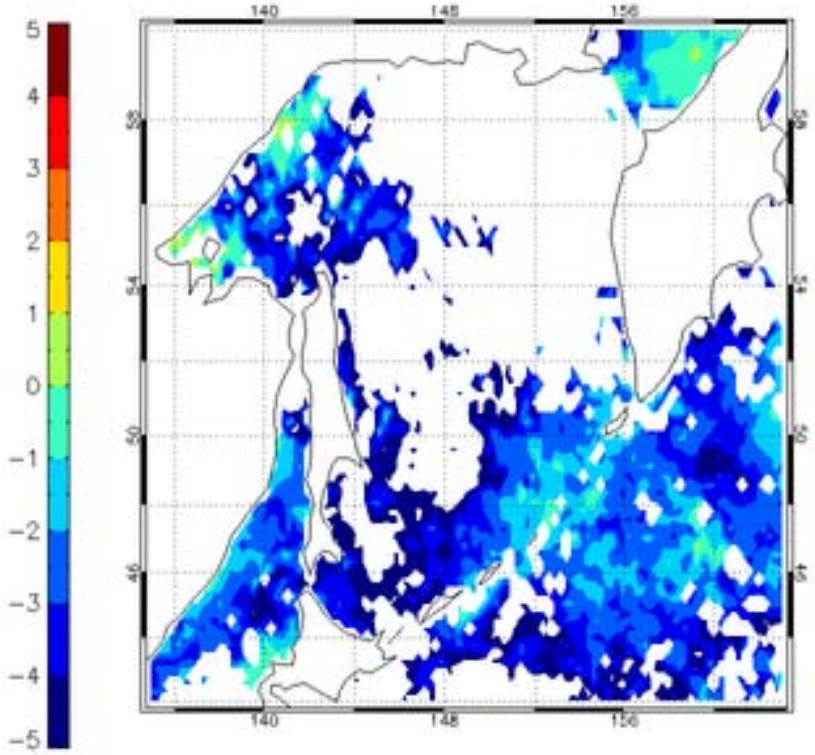
May 1- 15



-5°

5°

August 1- 15



-5°

Conclusion

- 10-year mean SST distributions were calculated for different time intervals (10 and 15 days, 1 month).
- Standard errors σ were calculated for these time intervals to estimate statistical significance of SST anomalies.
- Semi-month mean SST differences were used to describe processes of warming and cooling of the Okhotsk Sea surface layer. The fastest warming was found in southwestern part of Okhotsk Sea in May and in northwestern part in June.
- Fast SST cooling induced by strong northwesterly winds was found in the northwestern part of Okhotsk Sea in autumn.

- The SST anomalies greater than 2σ were observed relatively rarely and occupied square was less then 10% of whole area usually. Negative anomalies prevailed. The most expressed anomalies were observed in 1998 and 2002.
- 10-days SST anomalies were used to monitoring of abiotic conditions in Okhotsk Sea and adjacent areas.

THANK YOU FOR ATTENTION