

**International Conference and Early Career Scientists School on
Environmental Observations, Modeling and Information Systems
ENVIROMIS-2018,**

July 5-11, 2018, Tomsk, Russia

Precipitations in the Selenga River basin during blocking events over Europe and Russian Far East in July

Olga Antokhina¹

Antokhin Pavel¹, Devyatova Elena², Martynova Yuliya^{3,4} and Vladimir Mordvinov²

¹V.E. Zuev Institute of Atmospheric Optics SB RAS, Tomsk

²Institute of Solar-Terrestrial Physics of the Siberian Branch SB RAS, Irkutsk

³Institute of Monitoring of Climatic and Ecological Systems SB RAS, Tomsk

⁴Siberian Regional Hydrometeorological Research Institute, Novosibirsk

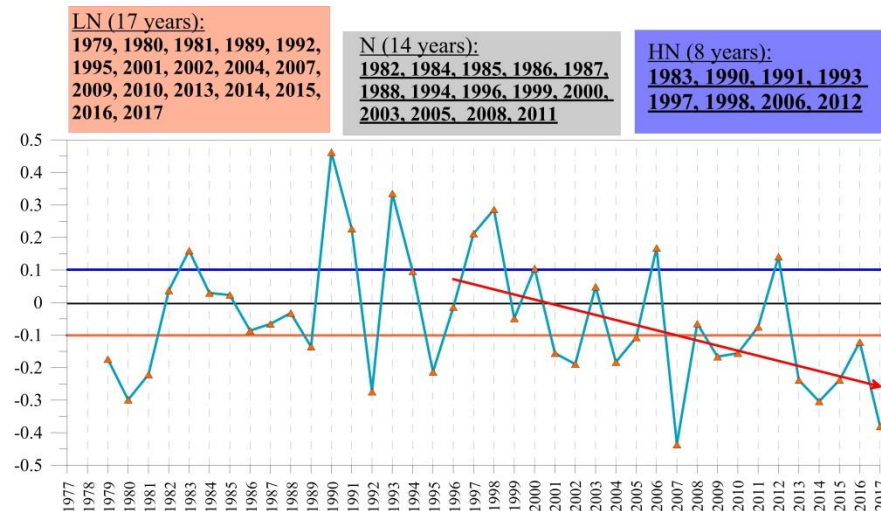
Background study I

Objective – 1996-2017 LOW water period in Lake Baikal basin

1. Fig – Lake Baikal area and Selenge basin (blue)

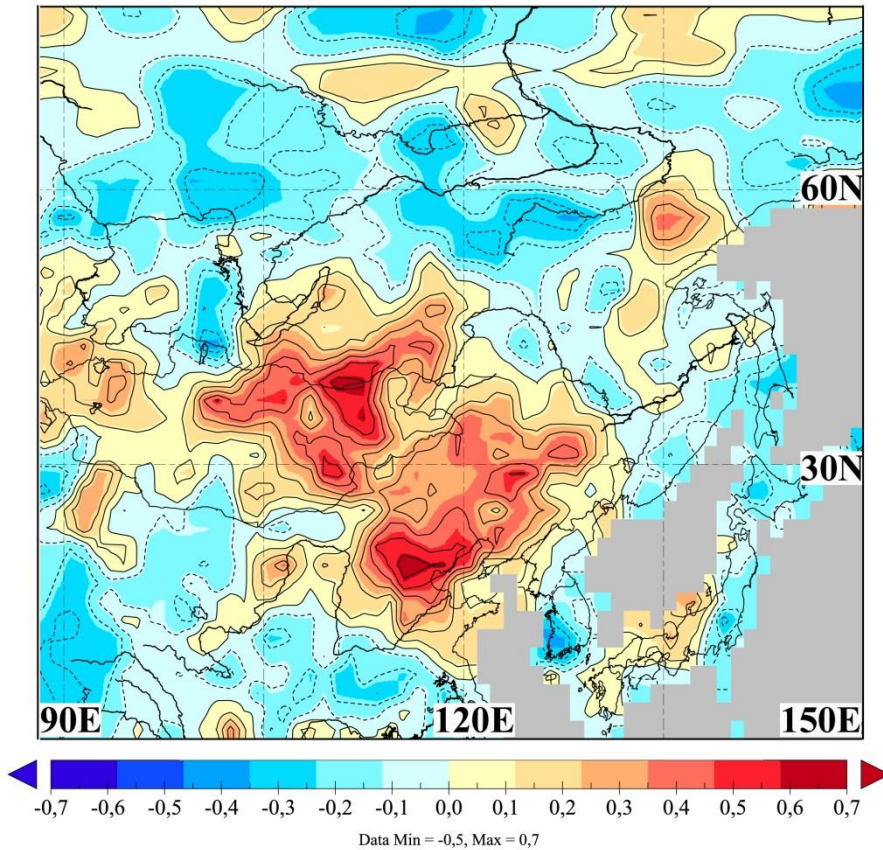


2. Fig – Precipitation anomalies in the Selenga basin (norm 1950-1990, GPCC data)

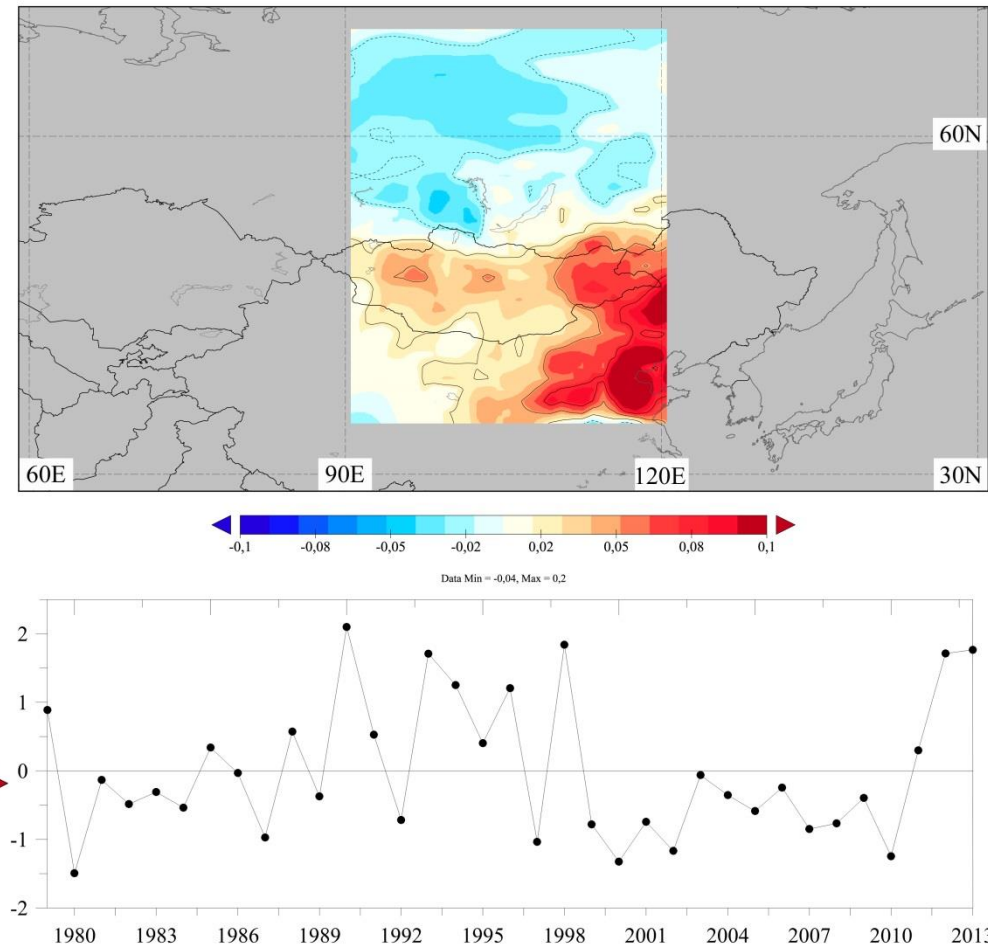


1. Surface temperature , geopotential height 500 hPa - increase
2. Cloud cover, perceptible water, relative humidity, soil moisture– decrease
3. **East Asian summer monsoon transport - decrease**

Background study II



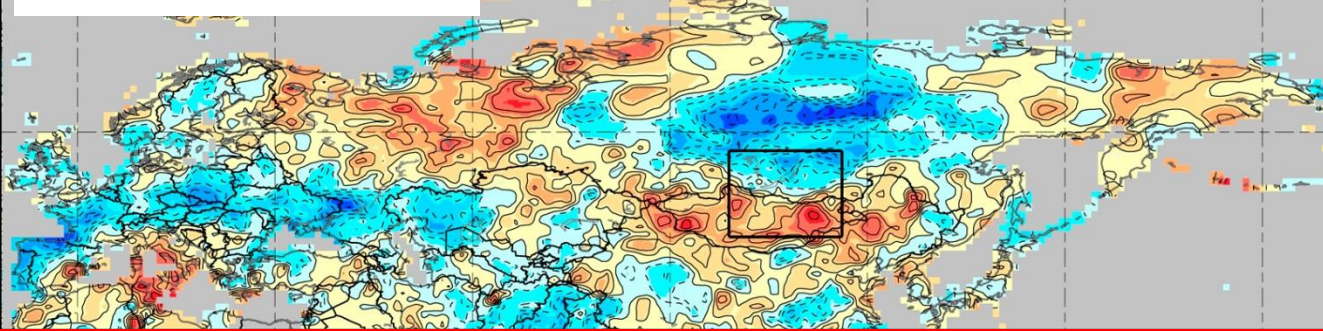
3. Fig – Correlation of Selenga runoff and precipitation in July (GPCC 1979-2013)



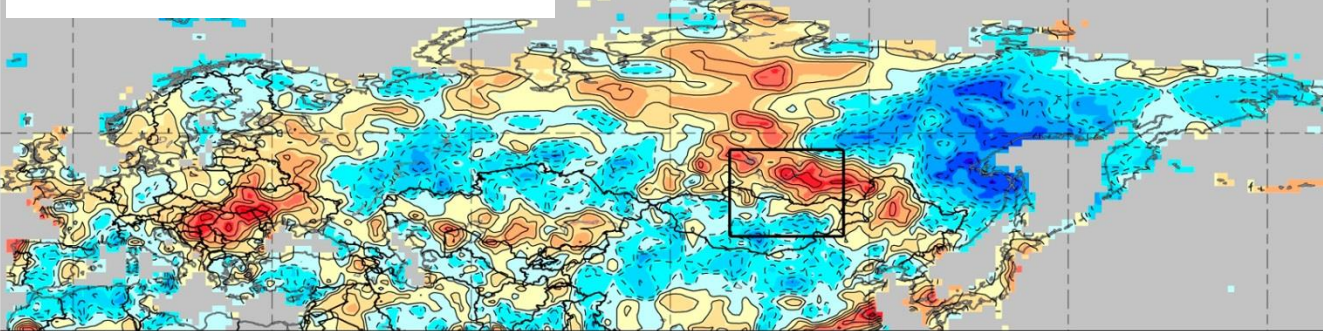
4. Fig – EOF 1 of precipitation in July and long-term variation of PC1 (GPCC 1979-2013)

Background study III

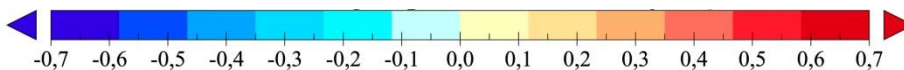
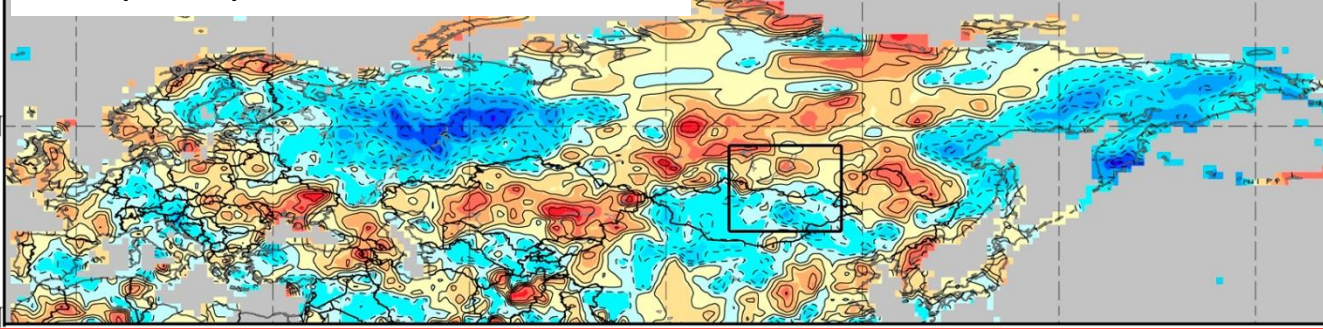
East-Siberia 100-110E



Russian Far East 130-140E



European part of Russia 40-50E



Антонова О.Ю. и др.
 Selenga basin: сы
 precipitation in ющие
Mongolia рчной
 area/drought in тний
 EAST Siberia чая и
 2018, № 1, с. 10-27

Selenga basin:
 precipitation in **East
 Siberia**
**(Transbaikalia)/
 drought in Mongolia**

Selenga basin:
 precipitation in **East
 Siberia**
**(Transbaikalia)/
 drought in Mongolia**

Result «E-RFE» 10/39 July

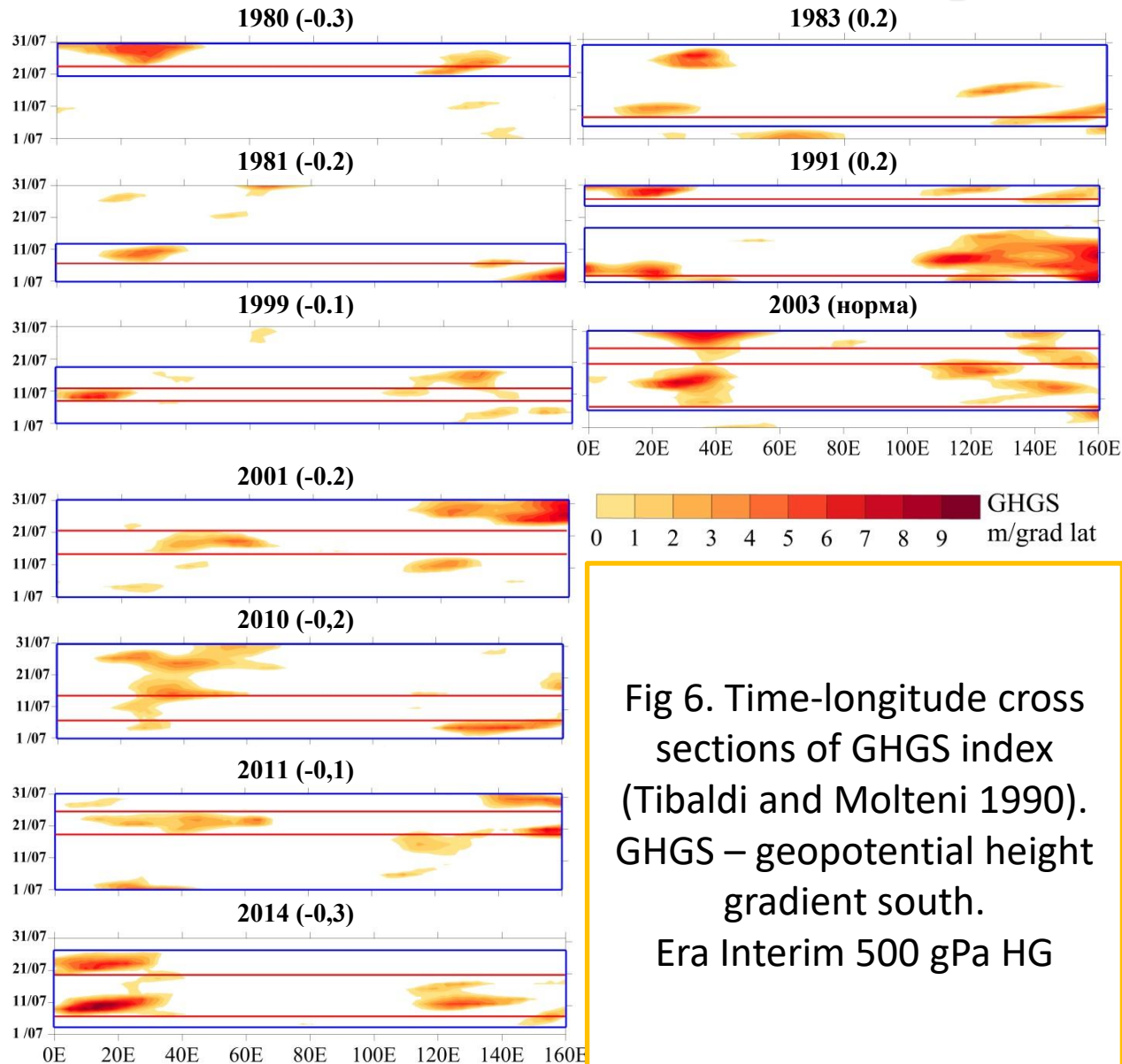
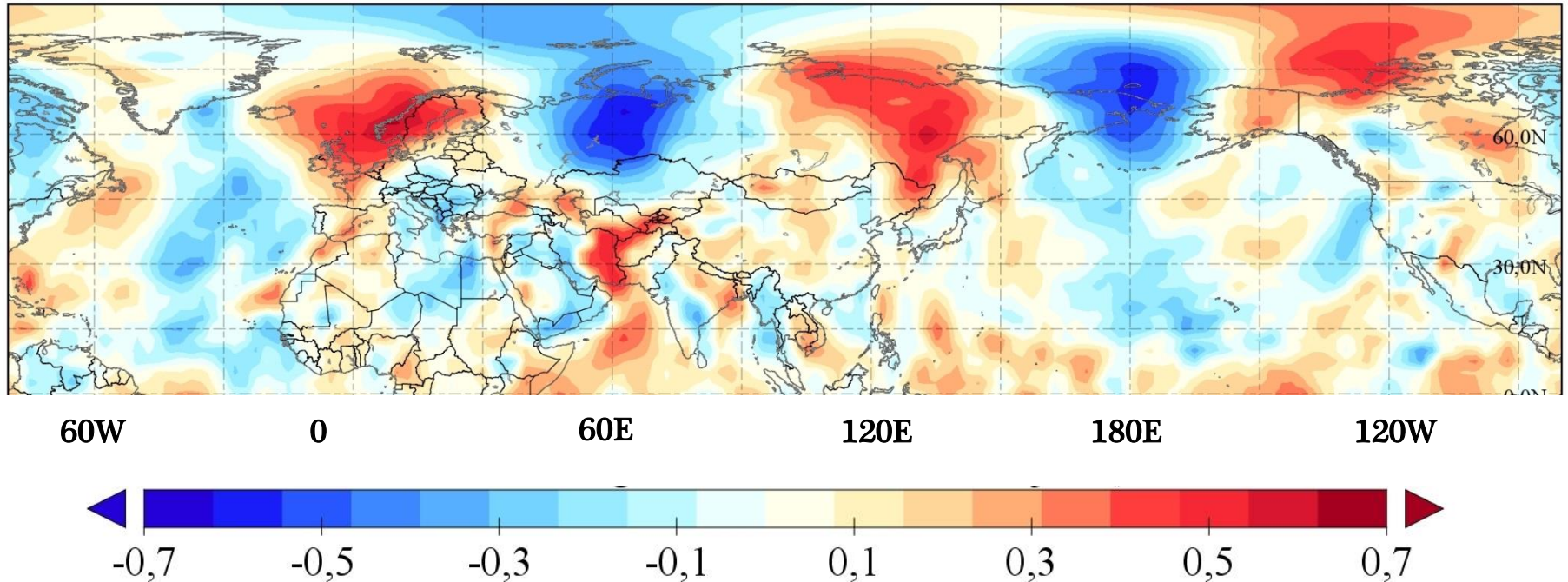
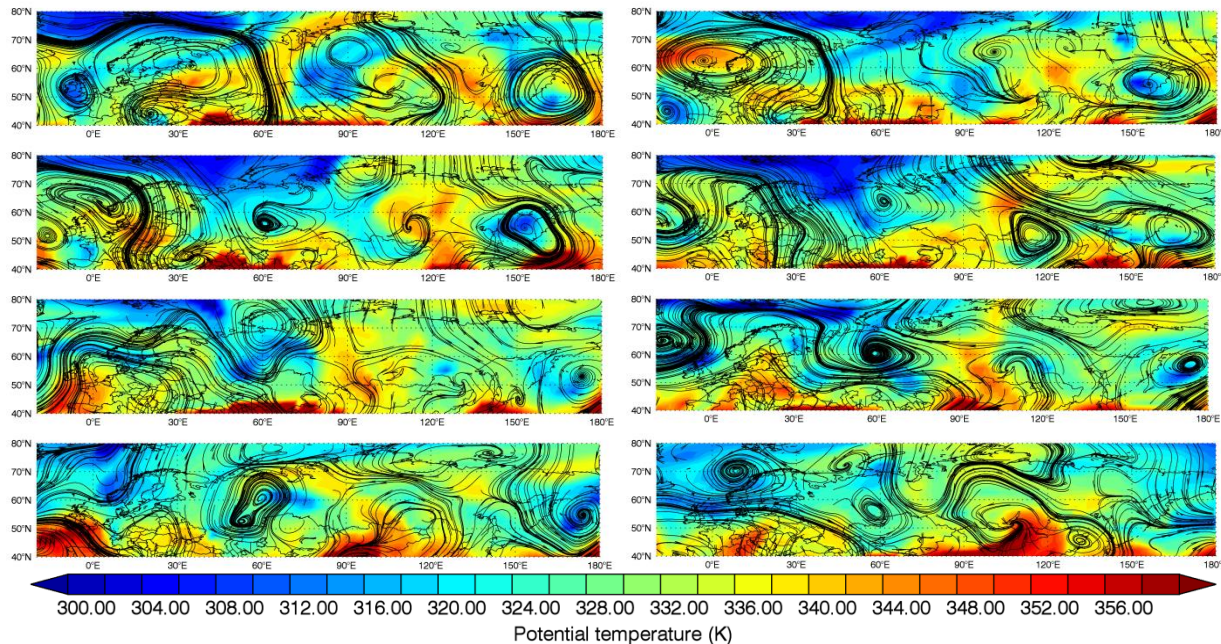
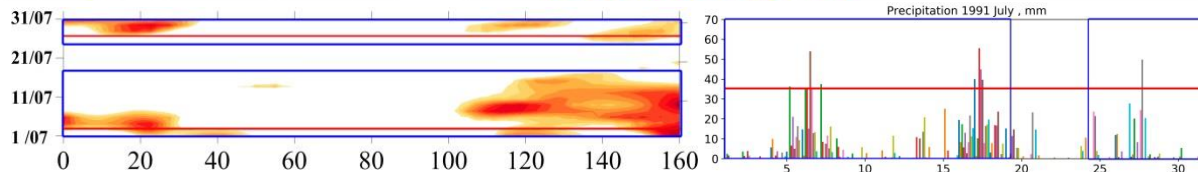
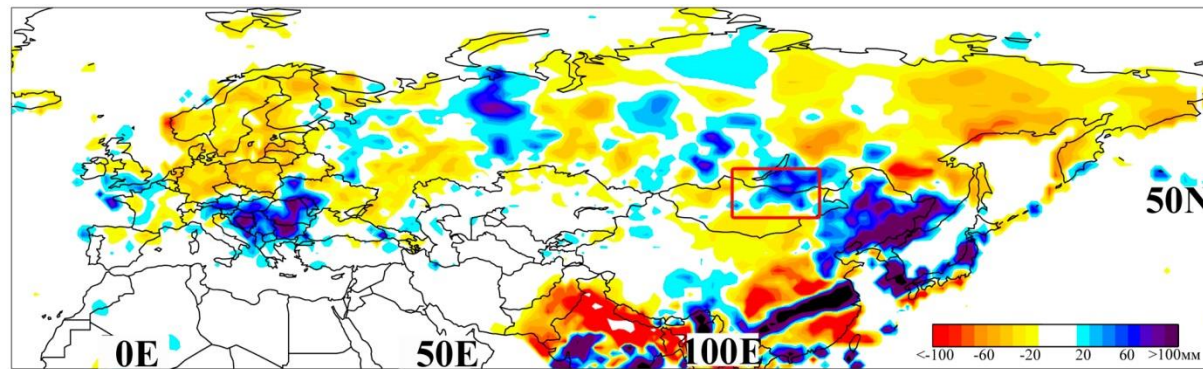


Fig 6. Time-longitude cross sections of GHGS index (Tibaldi and Molteni 1990). GHGS – geopotential height gradient south. Era Interim 500 gPa HG

Correlation of V-component of wind at 850 hPa and frequency of instantaneous blocking over 20-50 E (1979-2015)



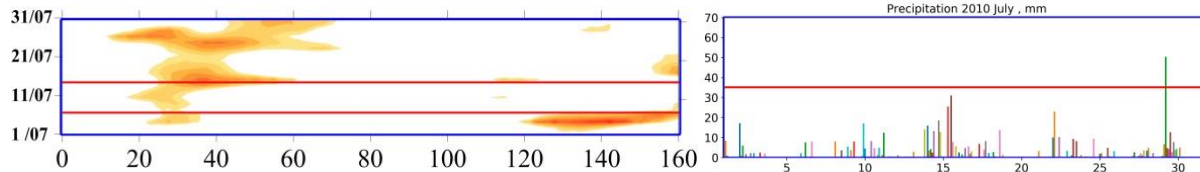
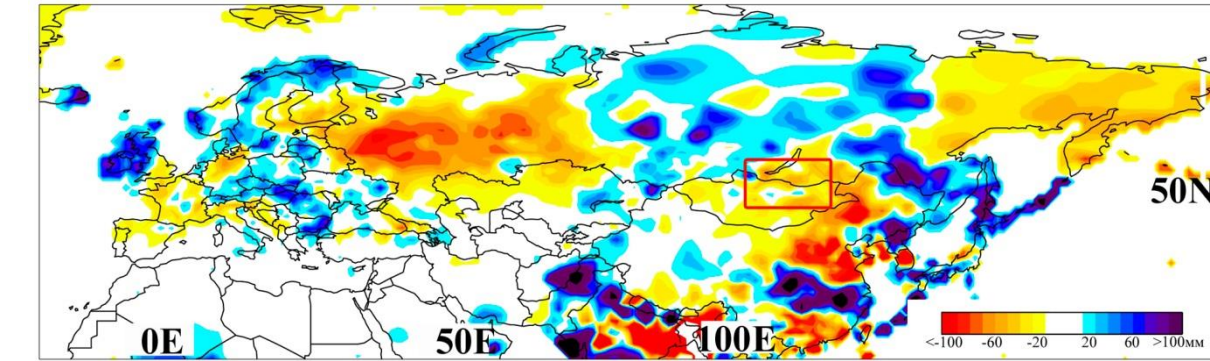
Result: «E-RFE» high precipitation - 1990



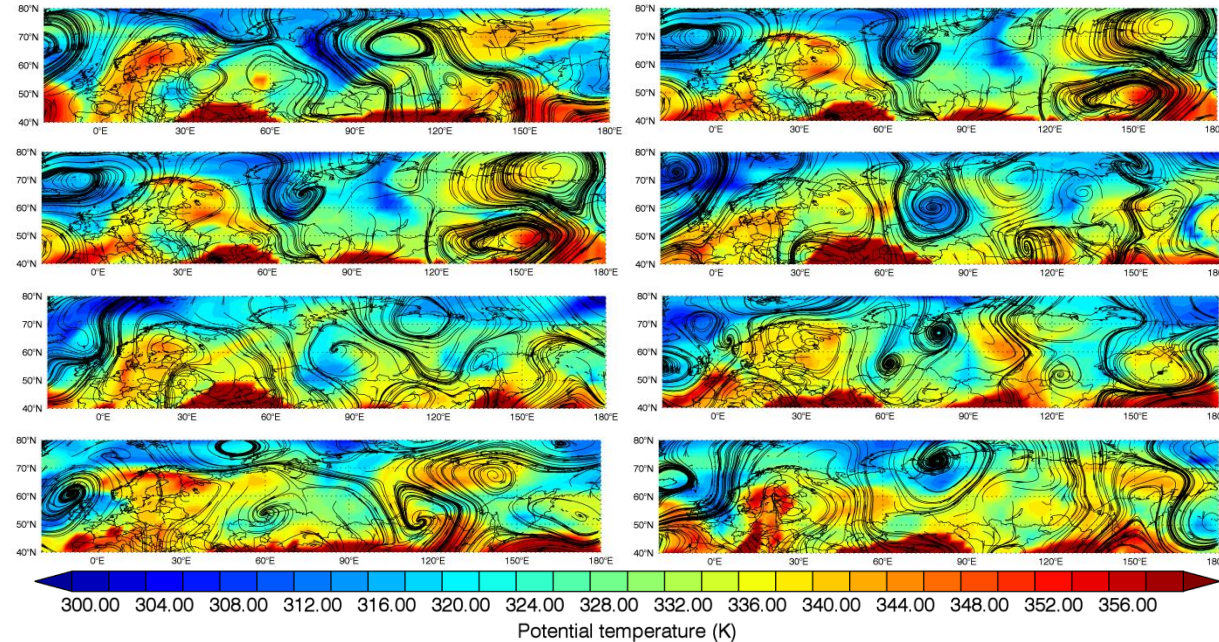
Chance of
precipitation is high

Potential temperature on the
dynamical tropopause and
streamline at 850 hPa

Result: «E-RFE» low precipitation - 2010



**Chance of
precipitation is low**



Potential temperature on the
dynamical tropopause and
streamline at 850 hPa

Conclusion

«E-RFE» blocking events can promote high rainfall in the Selenge basin and long-lasting drought period.

The properties of waveguide and storm-track are important



Thank you for attention!



“Я думаю, что для
внетропических широт Азии
циклоническая природа
муссонов ныне настолько
очевидна, что не нуждается в
новых доказательствах”
С.П.Хромов

“EASM is of hybrid
nature of tropical and subtropical
monsoon with intense impact from
mid-and high latitudes.”

DING YIHUI

