PROAGRO
LECTORIUM

Carbon Sequestration Potential in Arable Soils of Russia

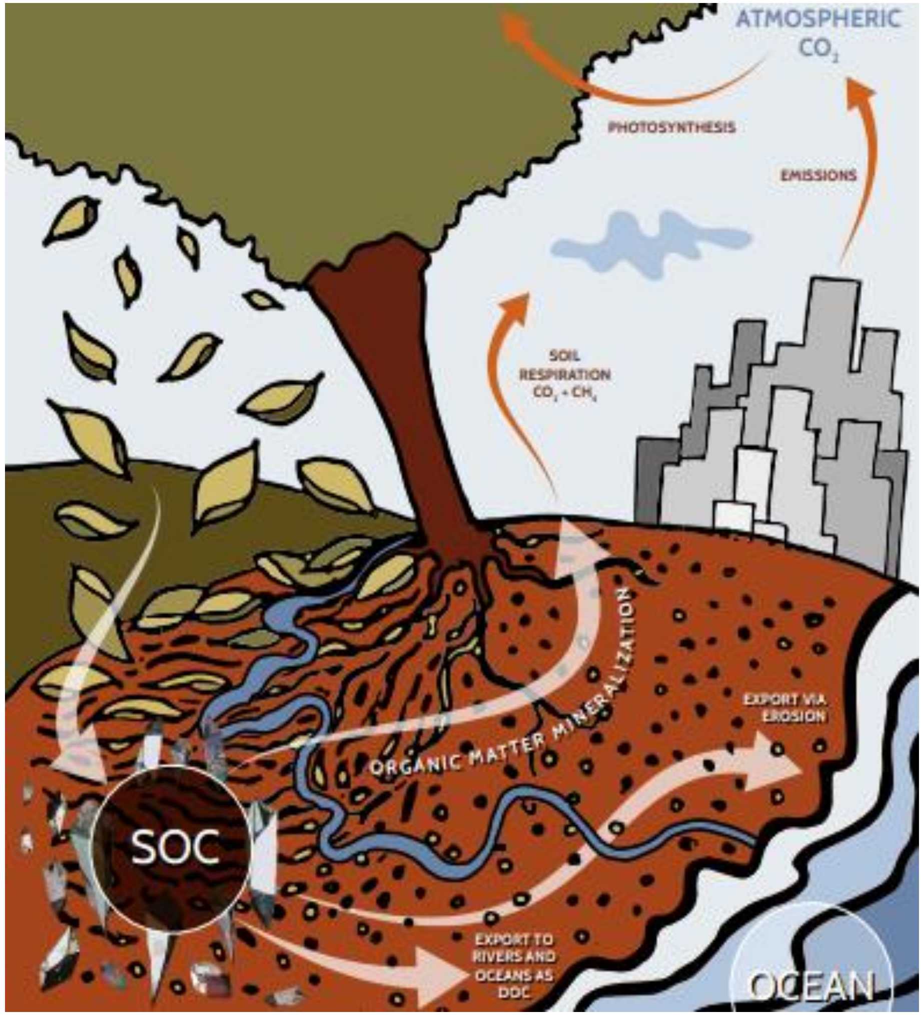
Pavel Krasilnikov

Vladimir Romanenkov

Yulia Meshalkina

Key researchers

- Vladimir Romanenkov
- Irina Ryzhova
- Yulia Makhalina
- Ilshat Husniev
- Igor Ilichev
- Viktoria Dobrovolskaya
- Anna Gorbacheva

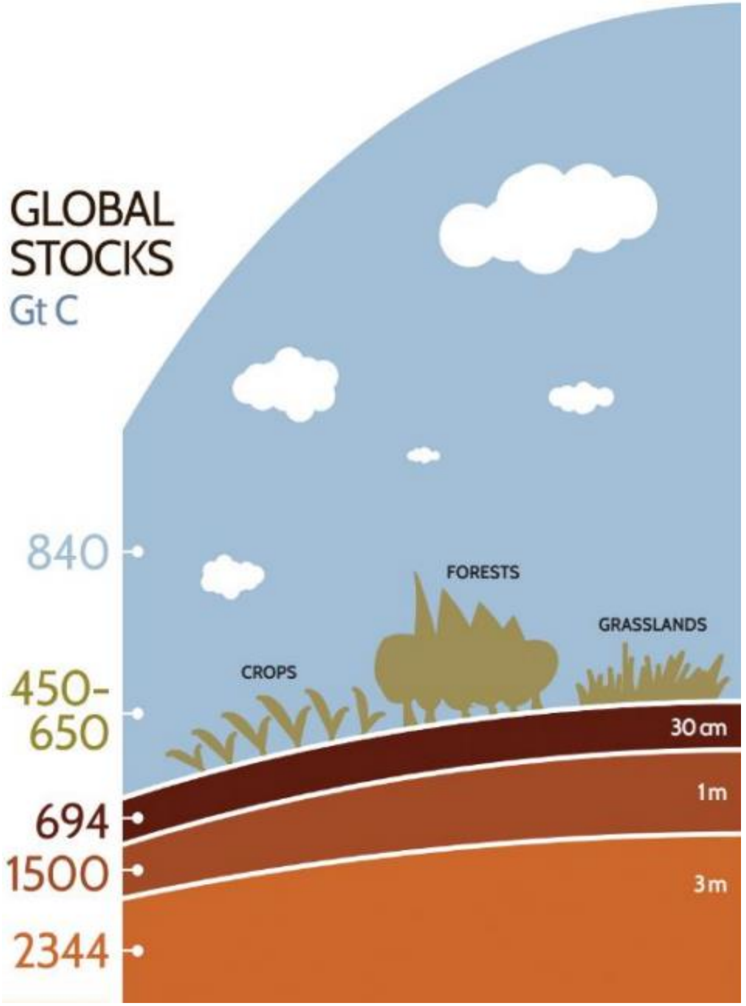


Carbon sequestration

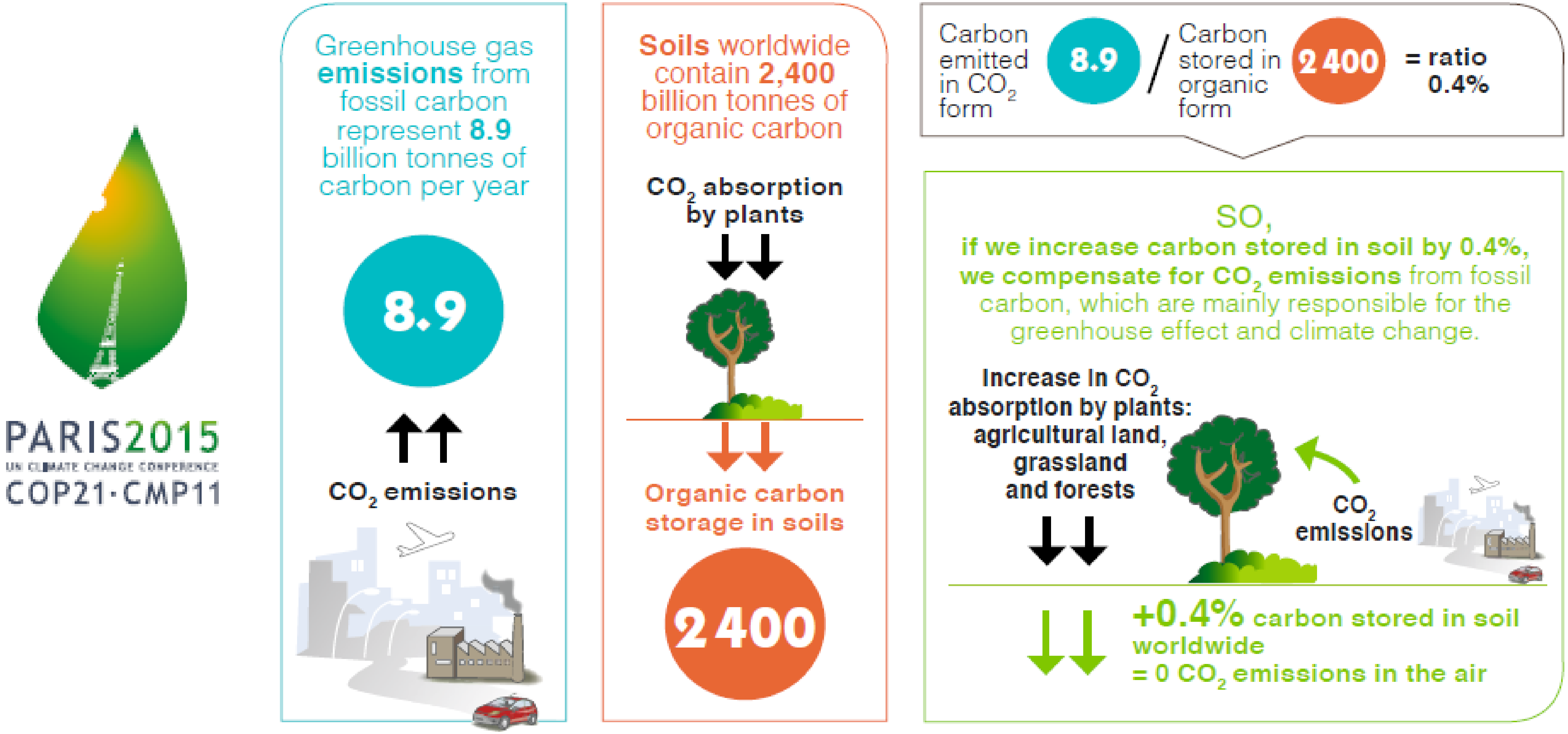
Controlling the growth of CO_2 in the atmosphere is possible through reducing the rate of climate change by regulating the content of organic C in the soil.

Since the Industrial Revolution, the transformation of natural ecosystems for agricultural use has led to the depletion of soil reserves by 135 billion tons, as a result of a reduction in C intake, accelerated mineralization and increased soil erosion.

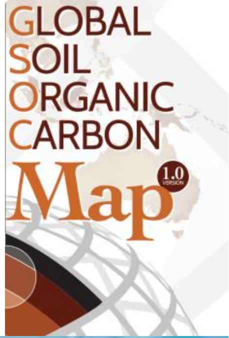
This makes it possible to sequester C in the soil.

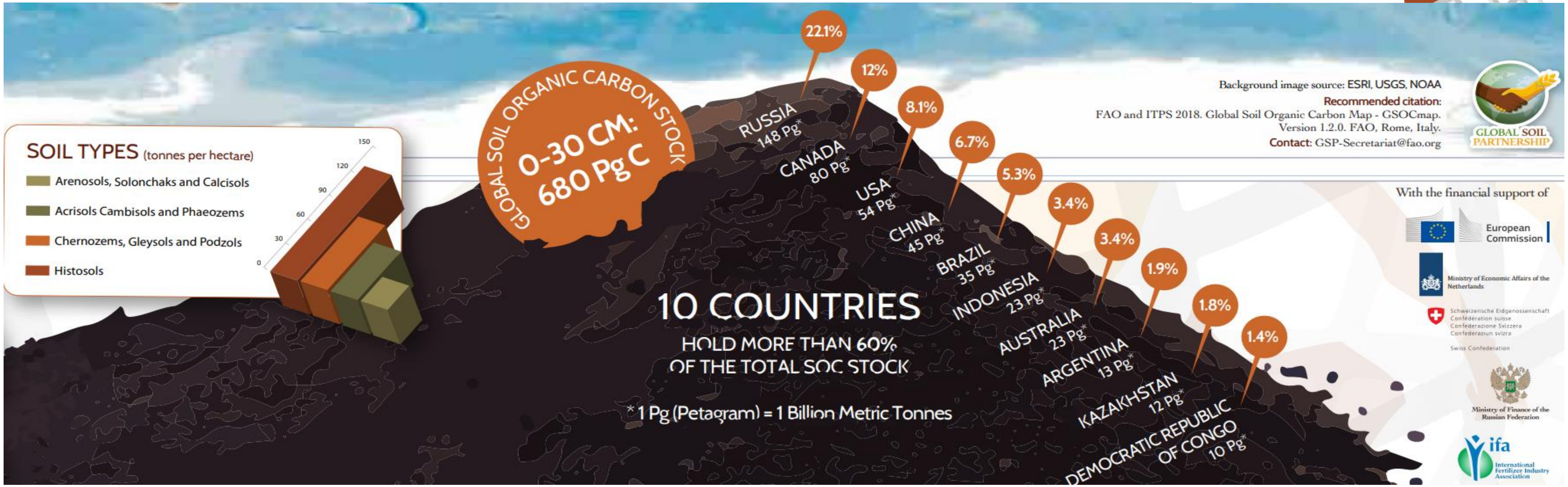


4 per mille Soils for Food Security and Climate

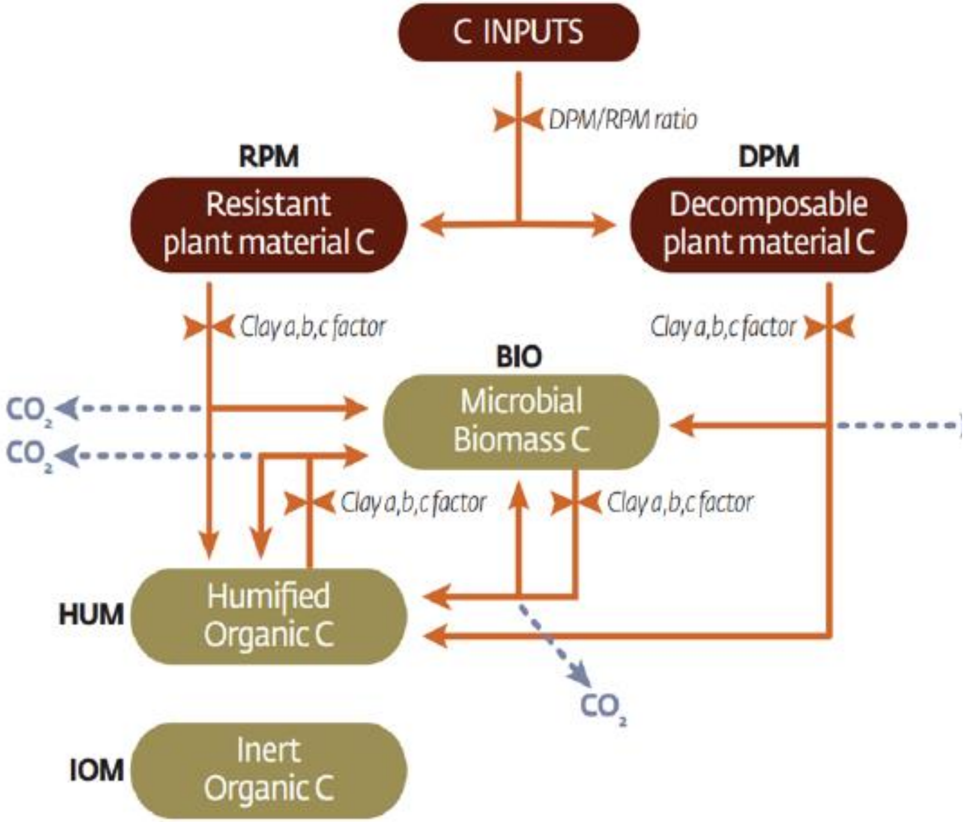


Global soil organic carbon map

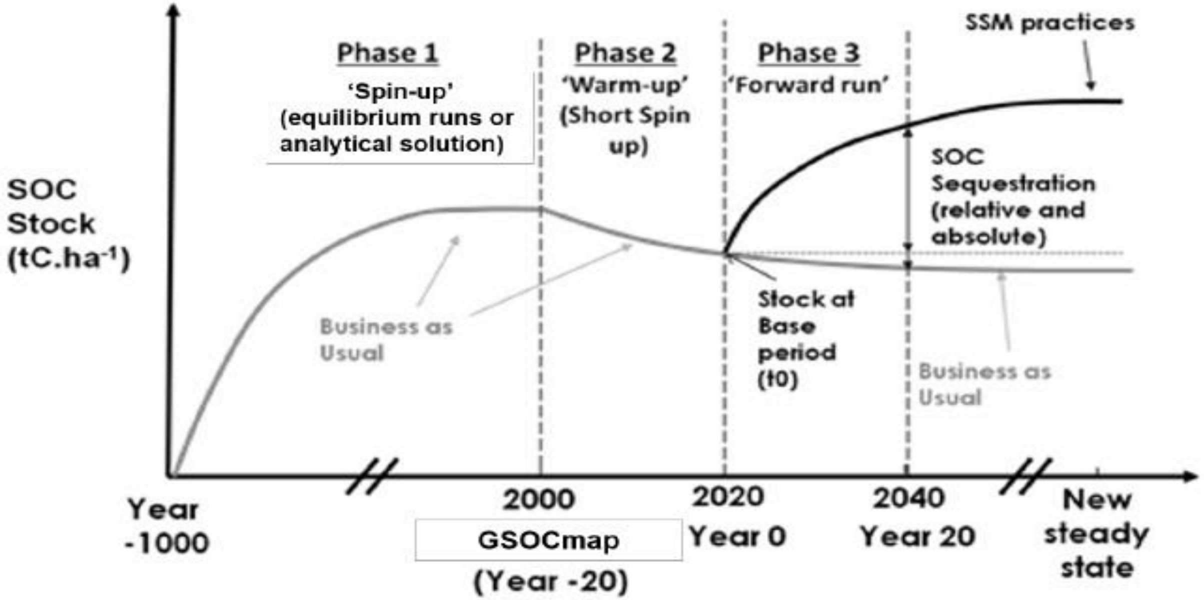


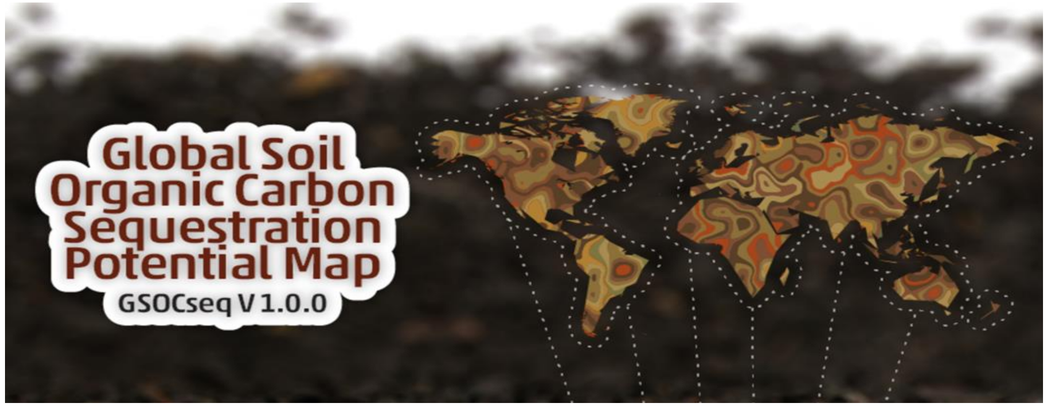


Global Soil Organic Carbon Sequestration Potential Map

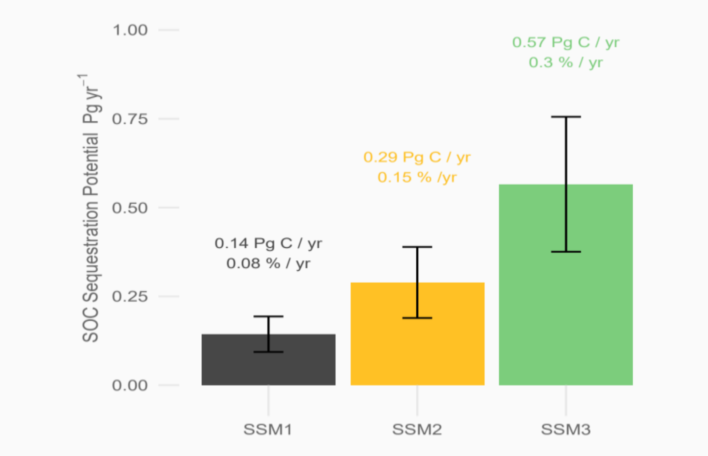


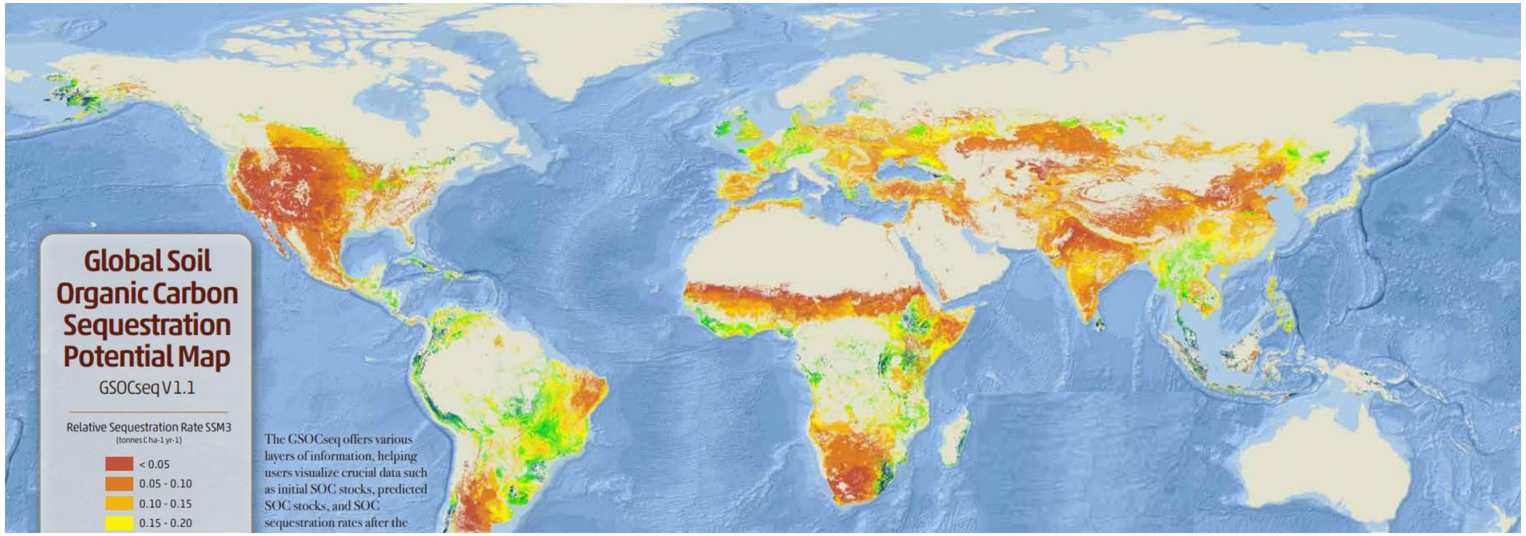
RothC-based soil carbon dynamics modelling



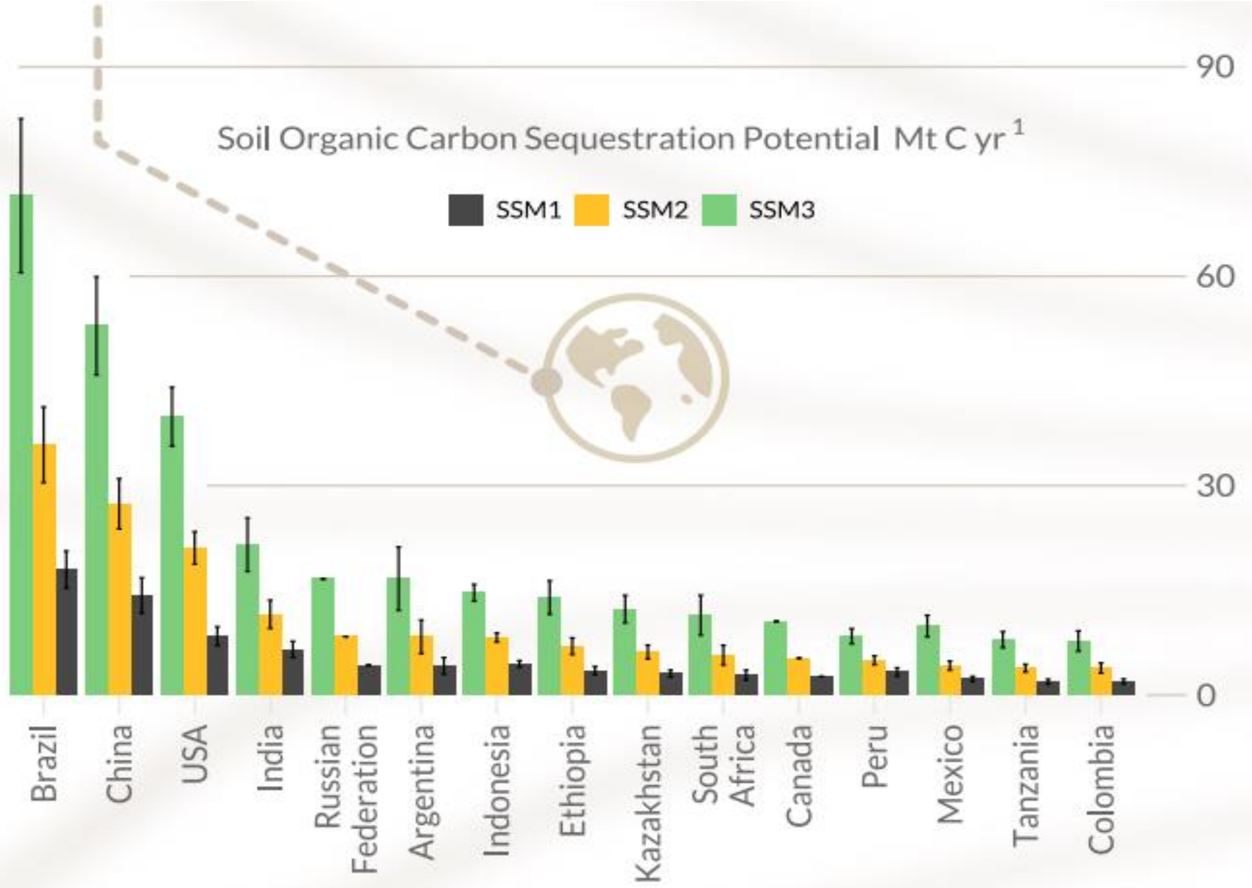


Global Soil Organic Carbon Sequestration Potential Map





Soil Organic Carbon Sequestration Potential Mt C yr



Top 15 countries with the highest total additional yearly SOC sequestration potential under three SSM scenarios (SSM1: +5%; SSM2: +10%; and SSM3: +20% increase in annual C returns to soils).

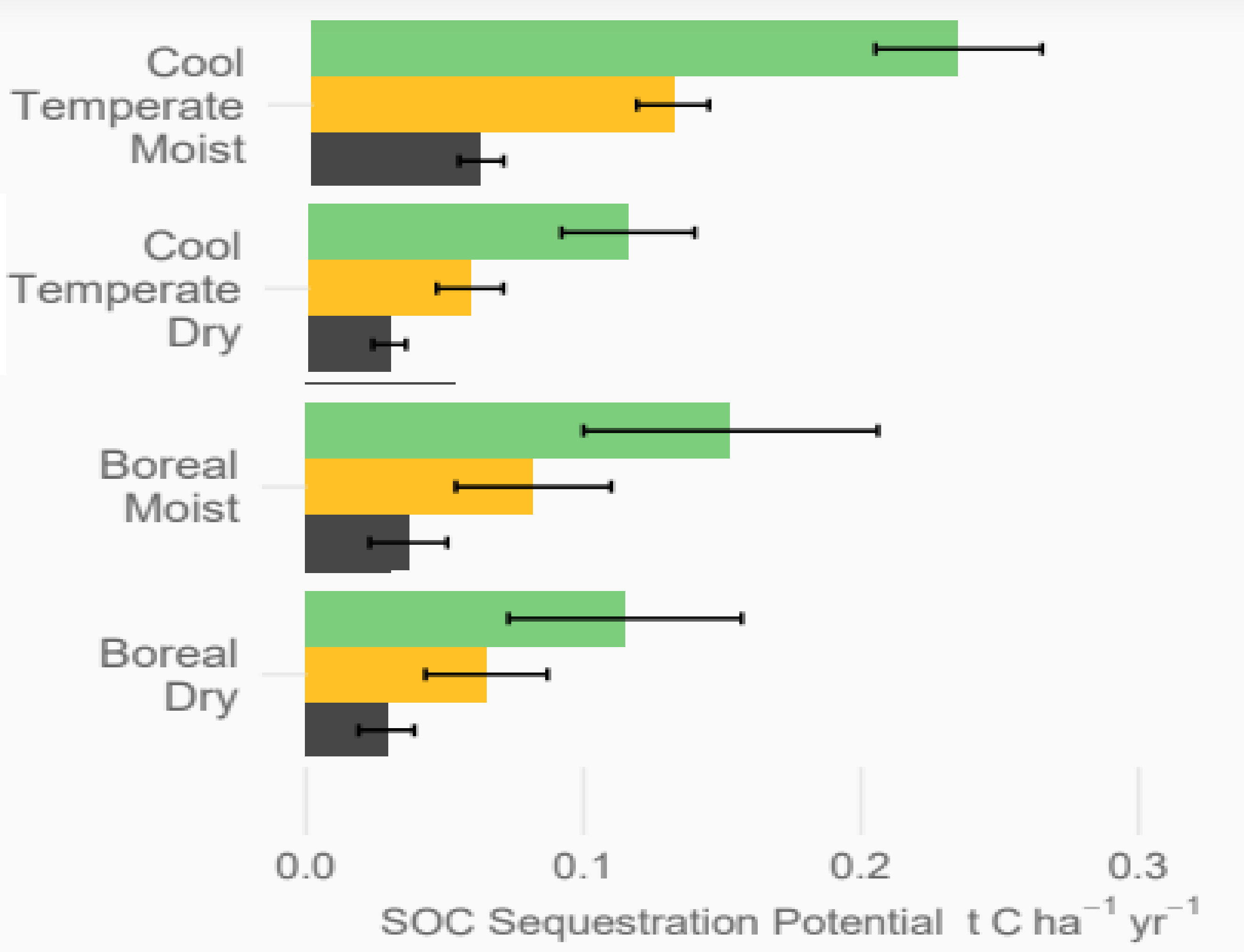
With the financial support of

European Commission

Ministry of Finance of the Russian Federation

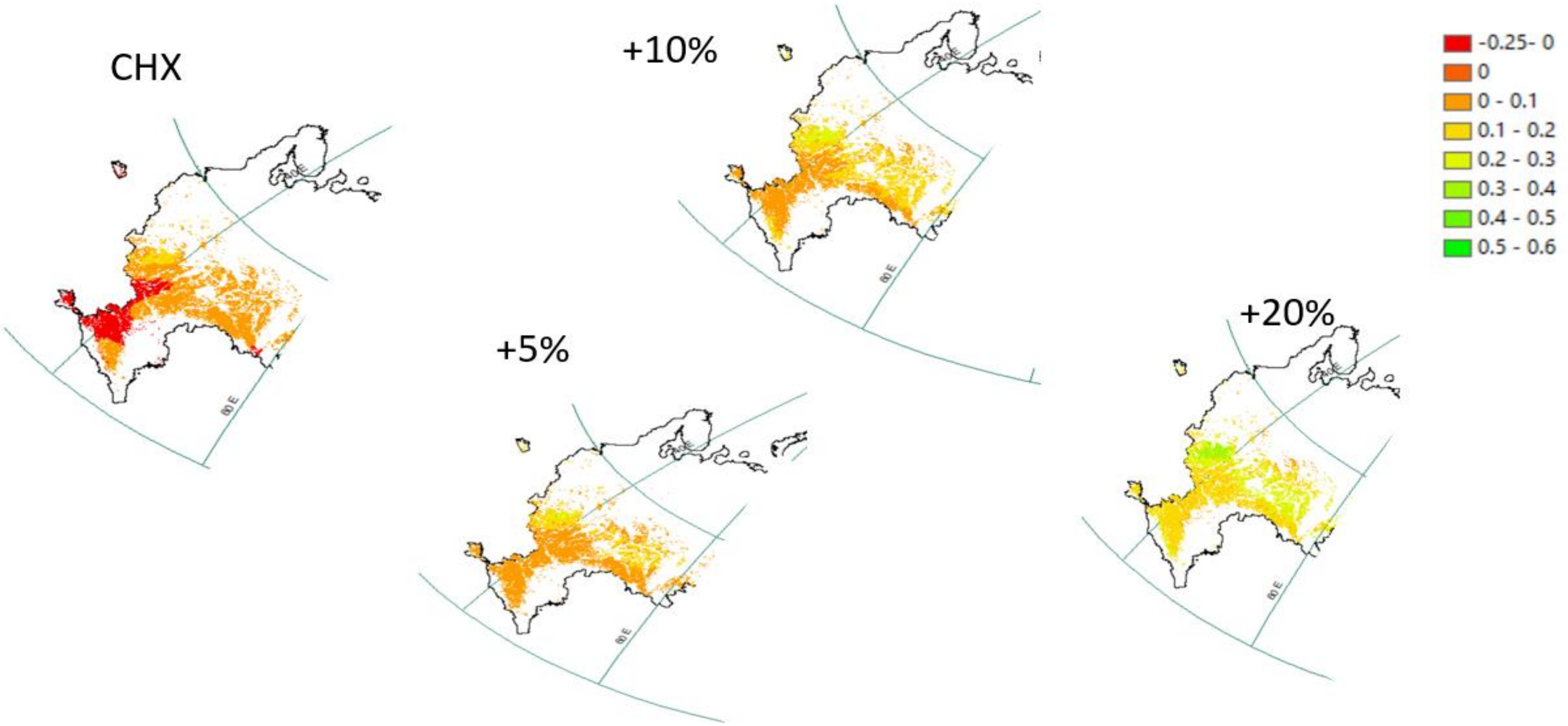
Rural Development Administration

Potential of sequestration of organic carbon in soil by IPCC climate zones for three carbon-saving technologies, t C / ha per year

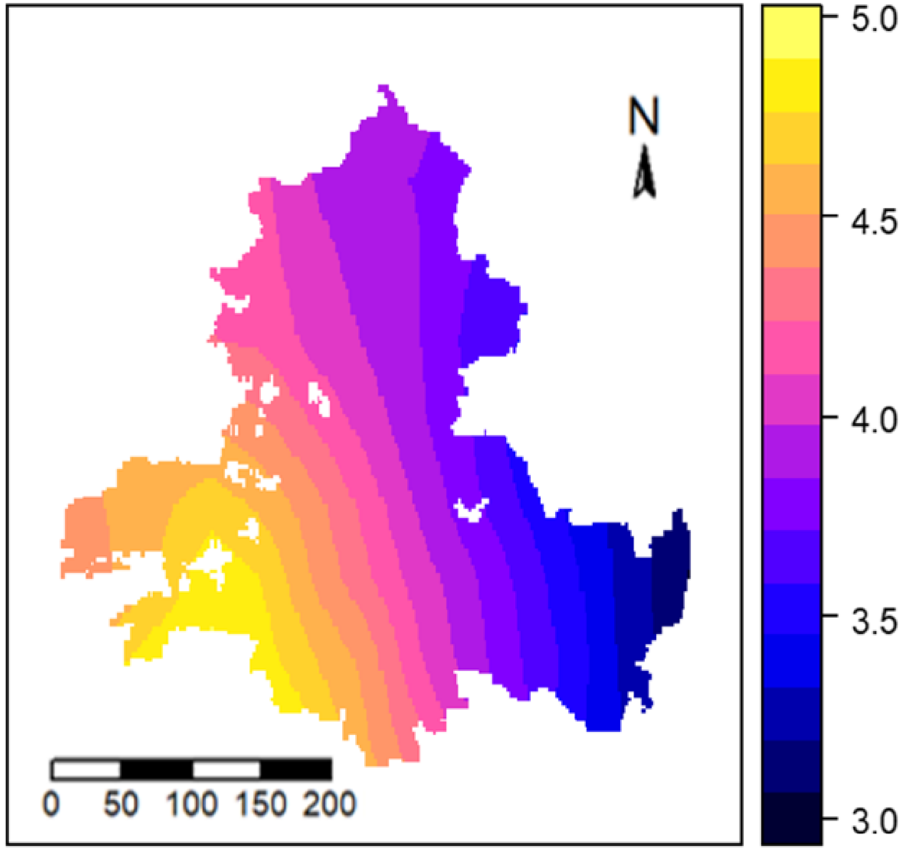


SSM 1-3 –carbon-saving technologies with an additional intake of 5, 10, and 20% C

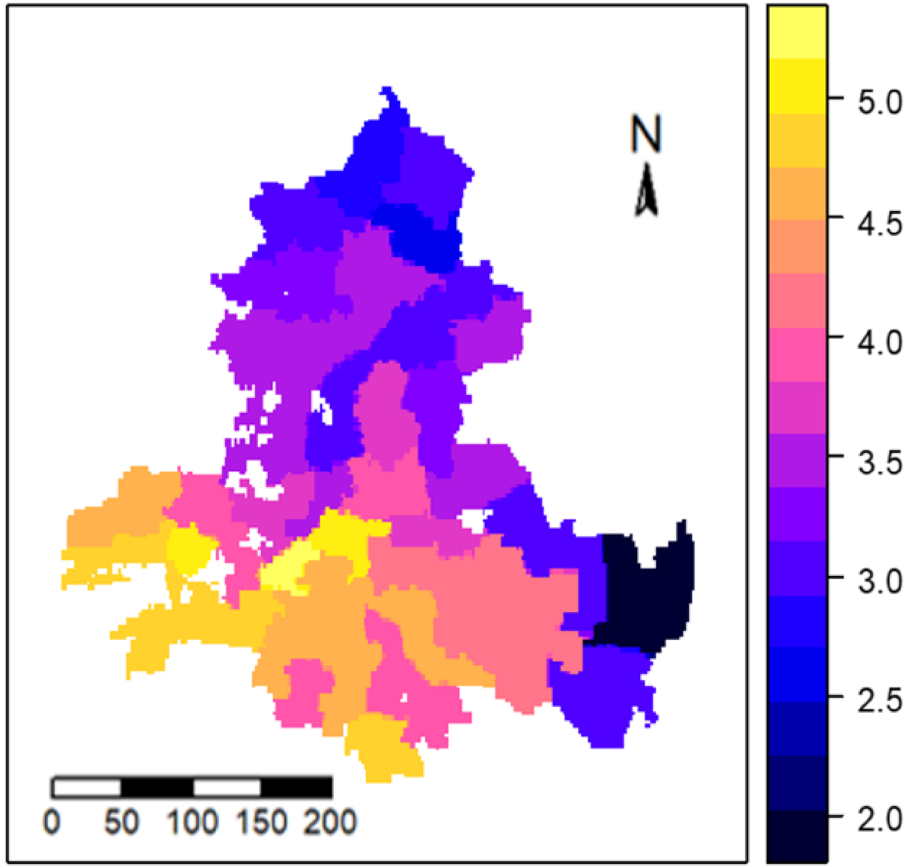
The average absolute rate of sequestration of SOC by arable soils of the European territory of Russia, t C / ha per year



Net primary production of the Rostov region, t C / ha per year



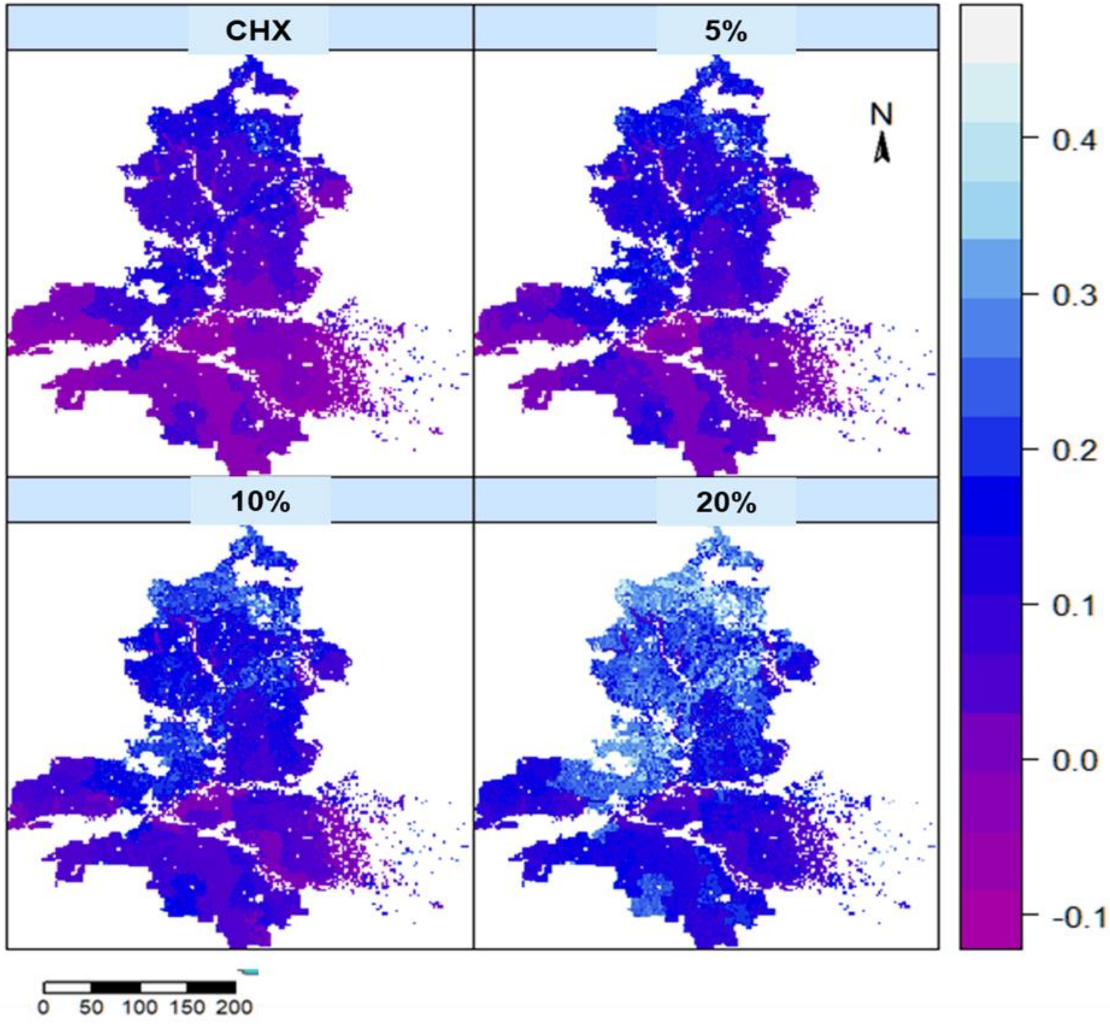
a. Based on meteorological data



b. Based on statistical data

Rate of soil carbon in the Rostov region

Absolute indicators of the sequestration rate of soil carbon in the Rostov region, tons C / ha per year, for four scenarios:
conventional management and carbon-saving technologies with 5%, 10%, and 20% organic C input



The sequence of tested adaptation solutions in the conditions of the future climate

- Optimization of crop growth conditions to maximize the intake of C into the soil with plant residues
- Reduction of C losses from the soil during fallowing
- Optimization of nutrients loss
- Optimal supply of organic and mineral fertilizers
- The use of conservation tillage technologies
- The use of alternative organic fertilizers

PROAGRO
LECTORIUM

Thank you for your attention