Food and Agriculture Organization of the United Nations

Importance of black soils for global food security and ecosystem services

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Global Soil Partnership Secretariat

Black soils – our C-rich treasure

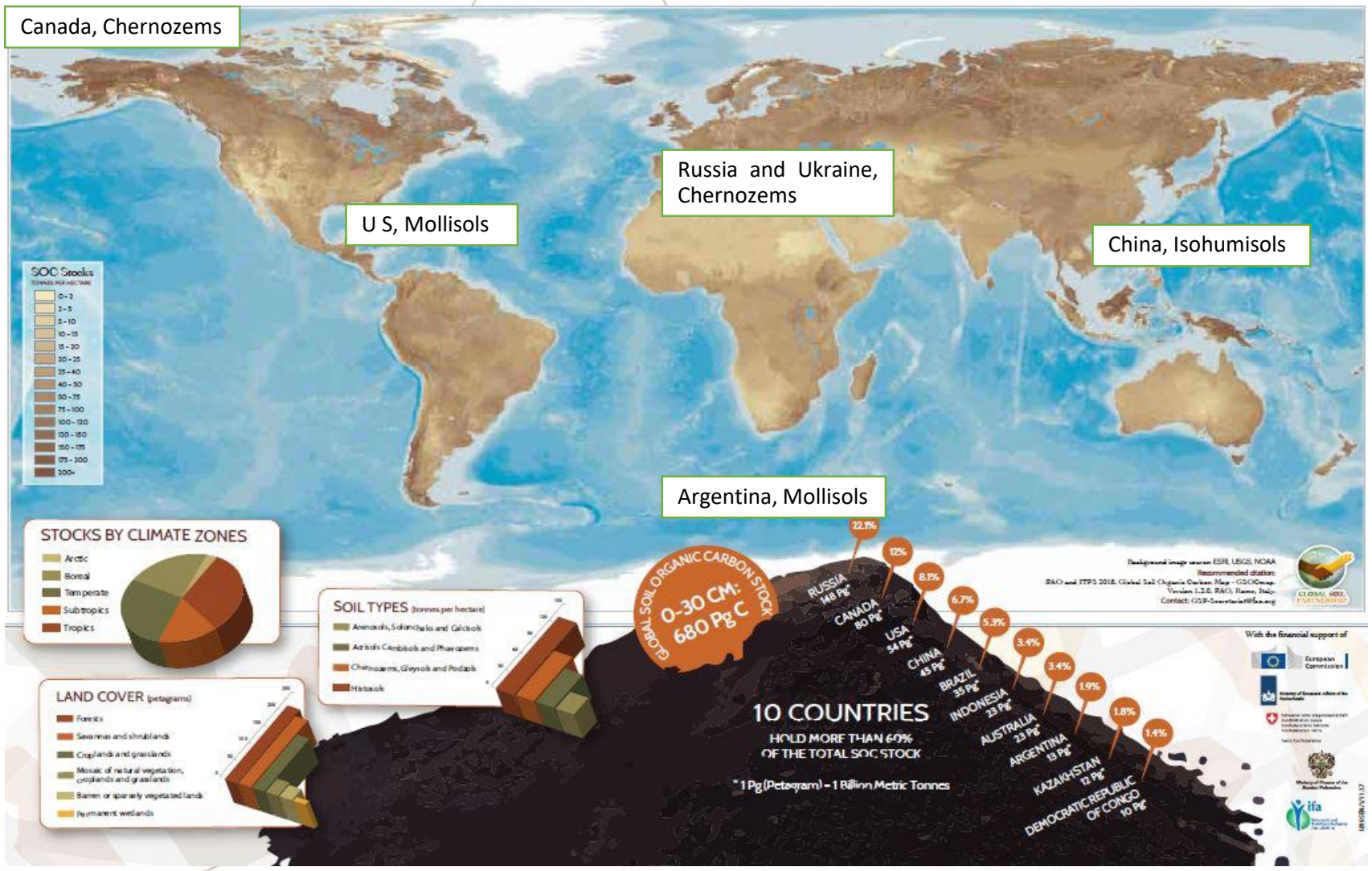
Canada, Chernozems

U S, Mollisols

Russia and Ukraine, Chernozems

China, Isohumisols

Argentina, Mollisols



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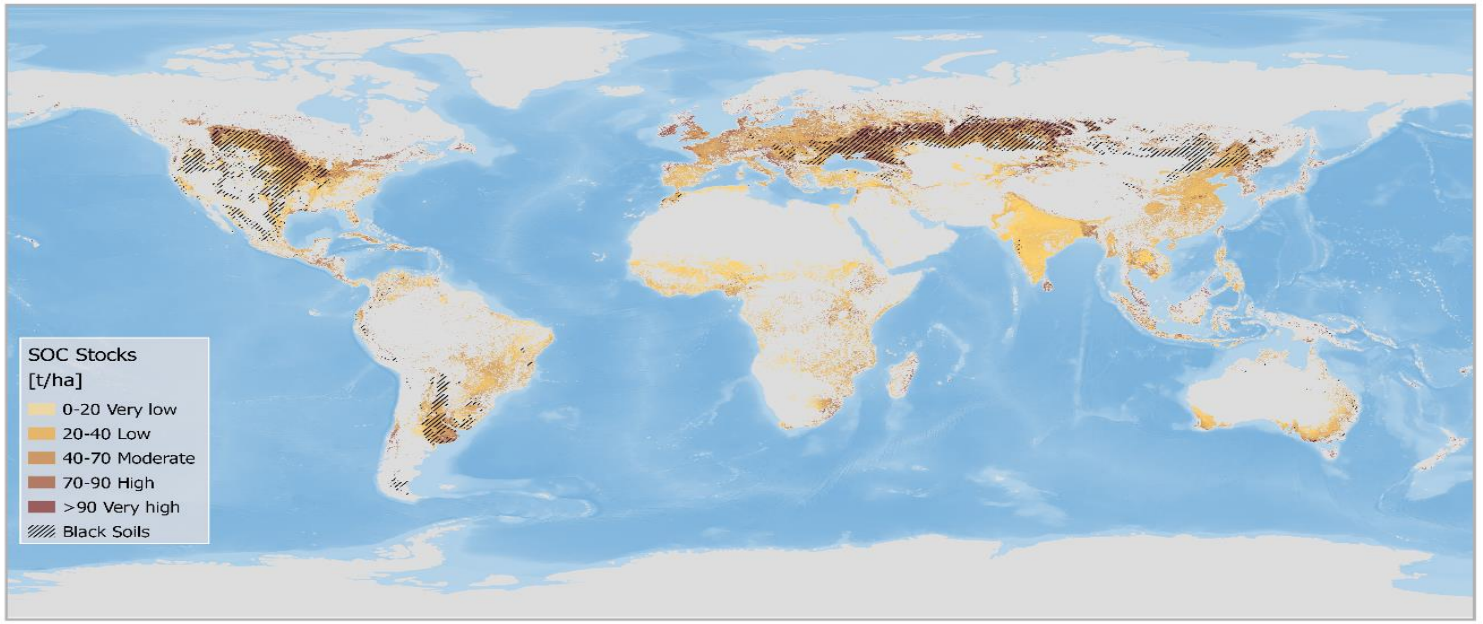
Black soils and food security

19% of global croplands are developed on black soils

62% of world's black soils are croplands

(USGS, 2015; HWSD, 2009)

Black Soils in Croplands



Global Soil Organic Carbon distribution of the first 30 cm. Data taken from the Global Soil Organic Carbon map (GSOCmap V 1.2.0). Cropland mask taken from NASA Making Earth System Data Records for Use in Research Environments (MEaSUREs) Global Food Security Support Analysis Data (GFSAD) Crop Mask 2010 Global 1 km V001. Black soils are defined as Chernozems, Phaeozems and Kastanozems according to the HWSD 1.2.

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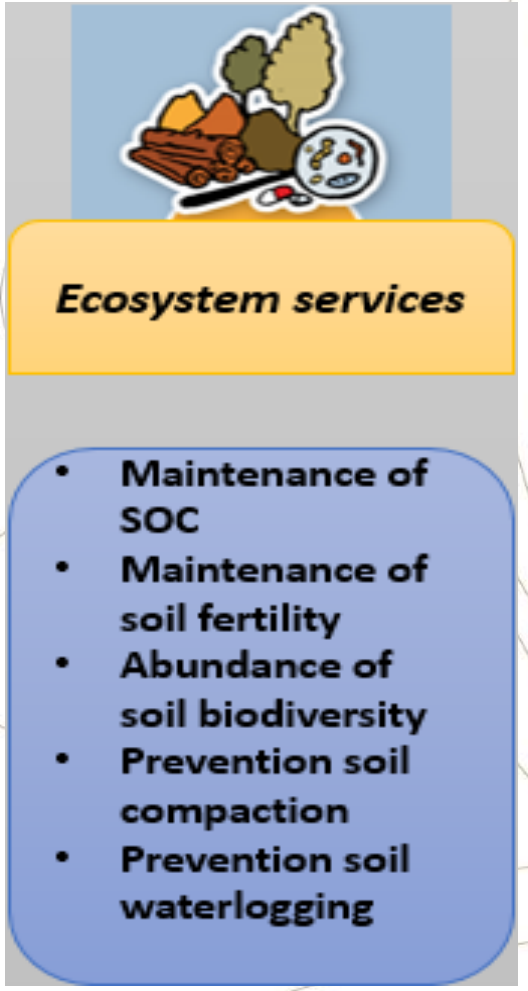
Black soils and food security

Black soils are often recognized as inherently productive and fertile soils.

- Russia Federation: 60-70% of agricultural lands are soils with Chernozemic horizons;
- Black soils in northeast China account for 103 million ha and produce 1/3 of China's commodity grain and 1/5 of China's total grain.
- United States: 196 million ha of black soils, 36.9% of them are devoted to livestock and crops.
- Argentina: 84 million ha of black soils most of them are used for agriculture.

Ecosystem services provided by black soils

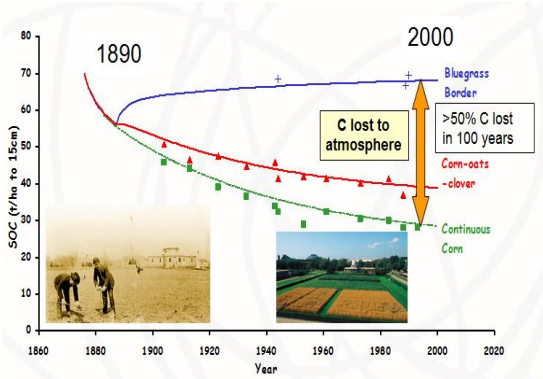


- Black Soils provide abundant nutrients for crops´ growth and organic carbon as well as good physical properties.
- They regulate water supply in the field and help to mitigate floods and droughts, and ensure water quality.
- They are a reserve of components such as sugar, amino acids and carboxylic acids, which are natural resources for growth of soil microbial community.

And contribute to human well-being

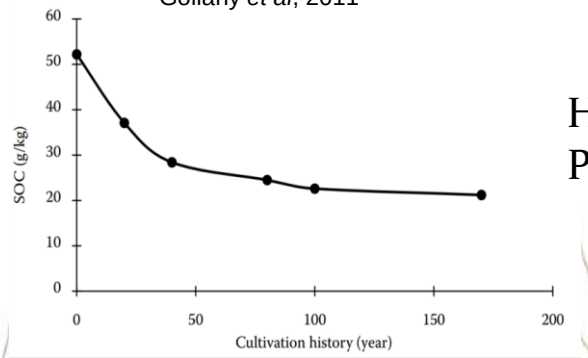
- Many nutritious foods are produced in black soils all over the world, such as cereals, beans, meats etc. .
- Hundreds of years of farming in black soils have shaped local cultures with the symbol of black soils. People associate Black Soils with healthy living and positive aspects to enhance the value of their personality, products and culture.
- The aesthetic and recreational values of Black Soils also offer opportunities to increase farmers' income.

But black soils are at risk



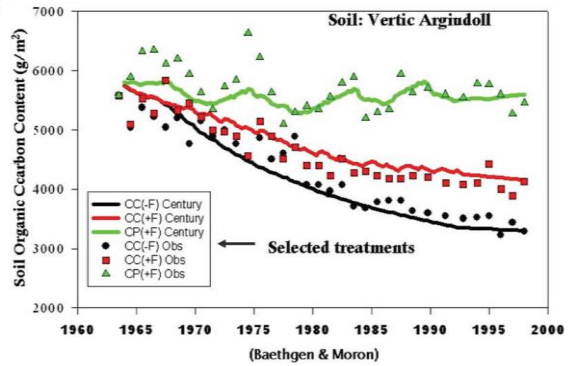
Illinois, USA

Gollany *et al*, 2011



Heilongjiang Province , China

Ren *et al*, 2018



Uruguay

Liu, Xiaobing, *et al*, 2012.

- Black soils are extensively and intensively farmed (cereal, pasture, range and forage system).
- According to various estimates, black soils have lost over 20-50% of SOC, and this trend is still ongoing in most black soil countries.
- The significant decrease of SOC in black soils contributes to climate change through greenhouse gas emissions from soils especially CO_2.

But black soils are at risk

Black soils remain very sensitive to anthropogenic intervention. They are prone to severe degradation not only on SOC loss, but also on:

Soil erosion

Salinization or sodification

Loss of stable aggregates

Soil compaction

Soil biodiversity losses

Soil nutrient imbalance

Anthropogenic soil acidity

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International Network of Black Soils (INBS)

- Considering the great importance of black soils and their risk of **severe degradation**, it has become crucial to promote their conservation and sustainable use,

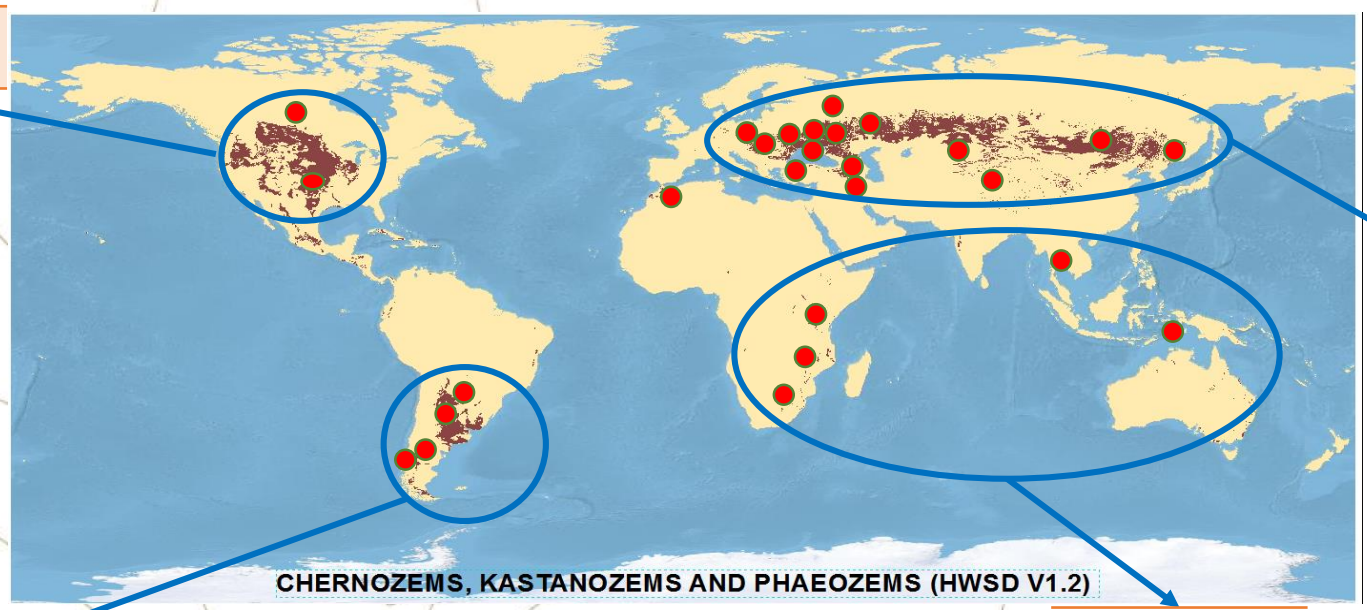
- And to unlock their potential in the longer term to support **food security** while protecting the environment and **mitigating climate change**.

On the basis of recommendation of the FAO's Global Soil Partnership (GSP) on the UN's Sustainable Development Goals (SDG) and the discussions and decisions from the Global Symposium on Soil Organic Carbon, the International Network of Black Soil (INBS) has been launched in Rome in March 2017.

International Network of Black Soils (INBS)

Canada

USA



Argentina

Brazil

Uruguay

Colombia

Chile

Indonesia

Morocco

Zambia

South Africa

Thailand

Mozambique

EU

Hungary

Russia

Slovak Republic

Poland

Bulgaria

Armenia

Moldova

Georgia

Ukraine

Turkey

Iraq

Syria

Kazakhstan

Kyrgyzstan

Mongolia

Nepal

China

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Strategic Objectives of INBS

1. Provide a platform for countries with black soils to discuss common issues related to the **conservation and sustainable management** of these soils;
2. Develop a **report on the global status, current production and challenges** in black soils;
3. Foster **collaboration** among these countries towards promoting the sustainable use and management of black soils and **identify relevant research gaps**;
4. Serve as a platform to incorporate real **local challenges for knowledge sharing** and technical cooperation on black soil management;
5. Develop **governance guidelines** aiming at improved black soils protection and sustainable soil productivity;

Progress of INBS

INBS members have reached a consensus about a definition of black soils and have signed the "Harbin Declaration" on black soils in order to facilitate **monitoring, mapping and sustainable management of black soils**.

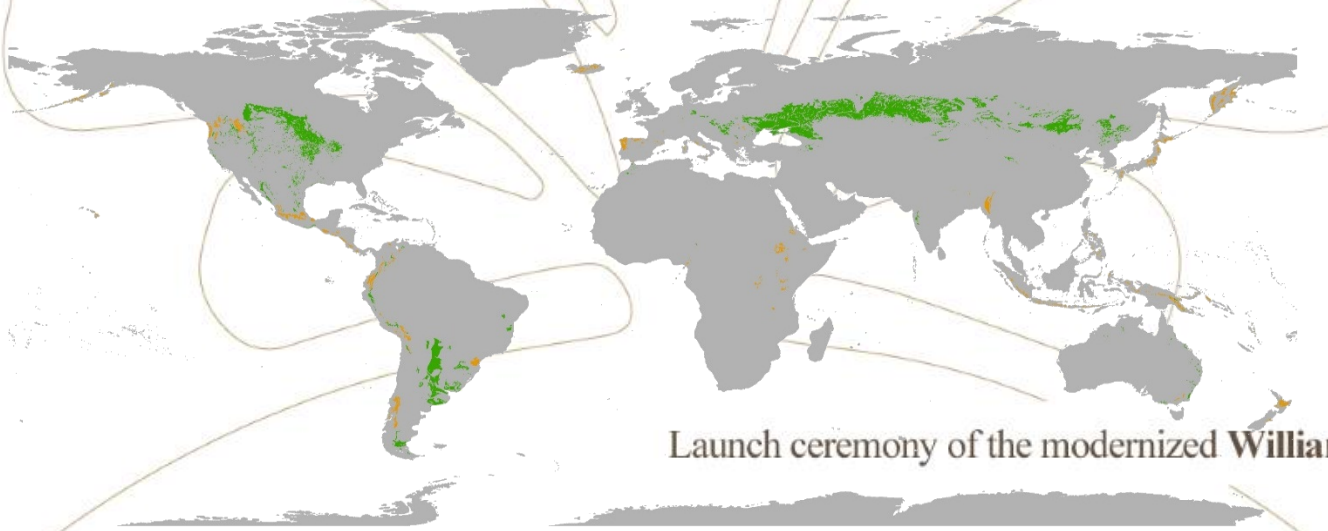
"Protect black soils, invest in the future"

More information:

http://www.fao.org/global-soil-partnership/intergovernmental-technical-panel-soils/gsoc17-implementation/internationalnetworkblacksoils/en/

Progress of INBS

- ✓ Call for countries to join the network according to the endorsed definition of INBS.
- ✓ Support the activities of INBS:
  - the report of the Global Status of Black Soils;
  - the Global Black Soil Distribution Map (GBSmap)
  - the International Black Soil Monitoring Network (IBSMN)



Let us together protect this black treasure for our future generations

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Launch ceremony

of the modernized

Williams Soil-Agronomic Museum

at the Russian State Agrarian University
Moscow Timiryazev Agricultural Academy

20 May 2021

Thank you for your attention

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