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GLOBAL SOIL PARTNERSHIP

Promoting Sustainable Soil Management for all

The Global Maps of the Global Soil Partnership: from bottom to top

Dr Natalia Rodríguez Eugenio
On behalf of the Intergovernmental Technical Panel on Soils (ITPS)

GLASGOW22 22ND WORLD CONGRESS OF SOIL SCIENCE

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GSP - area of work: Soil Data and Information

INSII INTERNATIONAL NETWORK OF SOIL INFORMATION INSTITUTIONS

Soil Data is essential for…

- Global challenges, e.g. Earth-System **Models**
- National and regional data-driven **policy-making**
- Field operations, e.g. to optimize **fertilizer** and **pesticide applications**

However…

Soil Data is…

- **Not harmonized**
- **Not updated** regularly
- **Fragmented** among and within Institutions

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Soil data starts in the labs

- Soil maps = soil properties data and classification
- Soil labs worldwide provide different results for the same soil sample

High uncertainty!

- Soil data has to be:
  - Reliable
  - Replicable
  - Harmonised

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GLOSOLAN
GLOBAL SOIL LABORATORY NETWORK

The main goals of GLOSOLAN:

-to strengthen the performance of laboratories [...] towards the development of standards.

- harmonize the soil analyses to make soil information comparable and interpretable across laboratories, countries and regions.

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GSP - area of work: Soil Data and Information

INSII
INTERNATIONAL NETWORK OF SOIL INFORMATION INSTITUTIONS

Global Data Products	System Development	Capacity Development	Capacity Development	Publications
4 36 Map Layers	7 National Soil Information Systems (TCP)	60 Training Workshops	1200+ National Experts	12 Key Publications
Country Driven	Digital Transformation	DSM, Product Oriented	Large Expert Network	Technical, Scientific

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GloSIS: Country-driven Global Data Products

Of the countries, by the countries, for the countries!

GSOCmap *V1.0 (2017) >> V1.5 (2019) >> V.1.5 (2020) >> V1.6 (2022)*
Global Soil Organic Carbon Map

GSOCseq *V1.0 (2021) >> v1.1 (2022)*
Global Soil Organic Carbon Sequestration Potential Map

GSASmap *V1.0 (October 2021)*
Global Salt Affected Soils Map

GBSmap *V1.0 (May 2022 by INBS)*
Global Black Soil Distribution Map

GSERmap
Global Soil Erosion Map
PHASE I | PHASE II

GSNmap
Global Soil Nutrient Map
PHASE I | PHASE II

Kick-off | Technical Development | Capacity Development | Production | Launch

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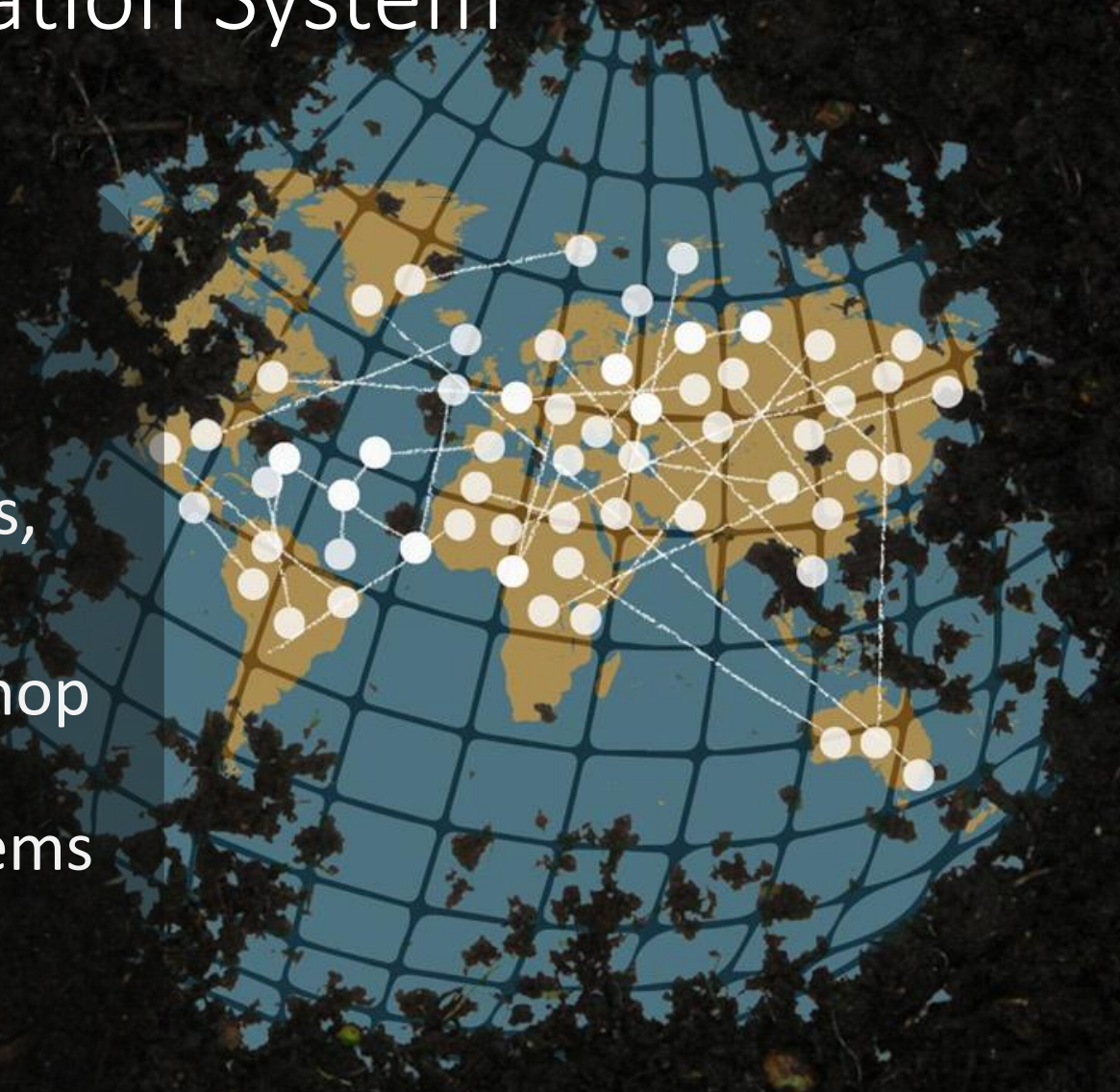
GloSIS – Global Soil Information System

- Under development
- System of Systems
- It’s federated and populated by country driven global data products, national soil information systems
- GloSIS Discovery Hub –One-stop-Shop for soil information and data converging National/Regional Systems



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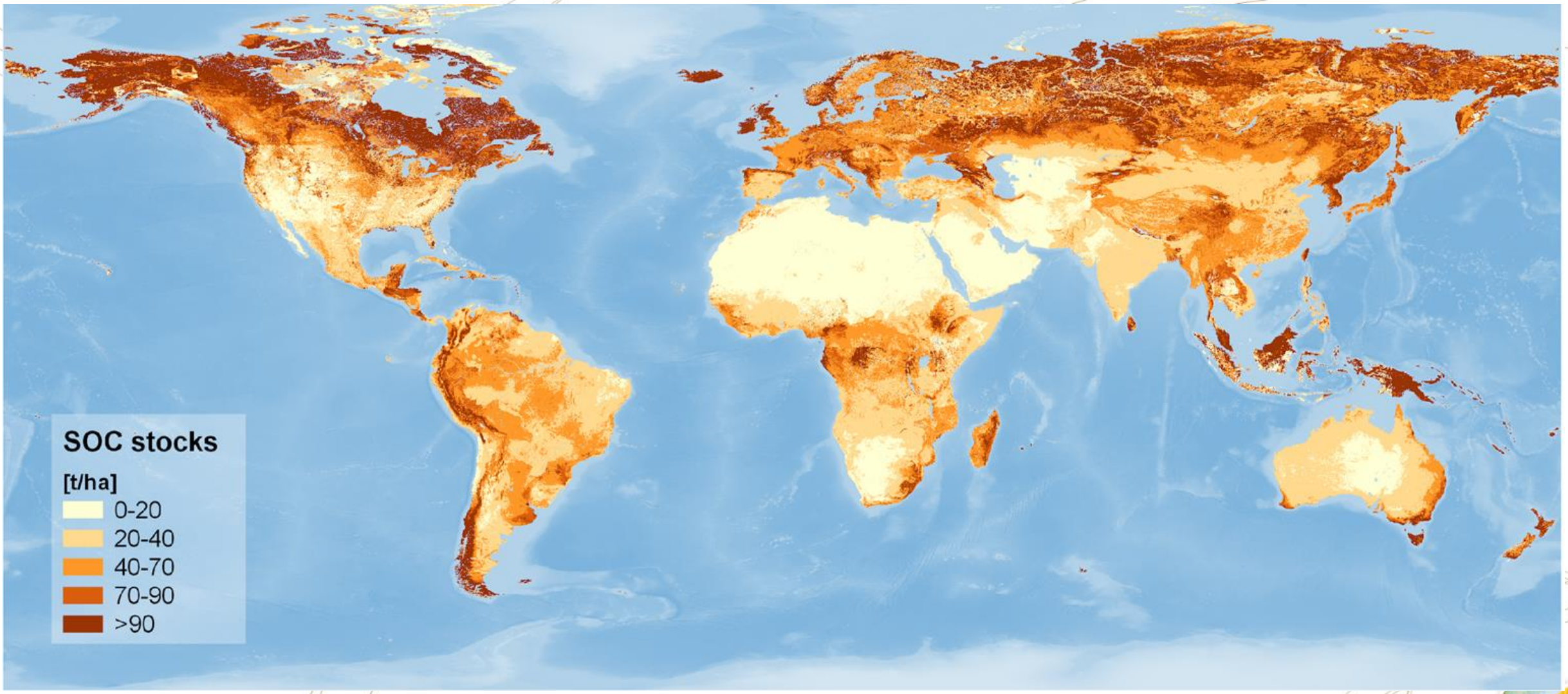
GSOCmap v1.6 - 2022



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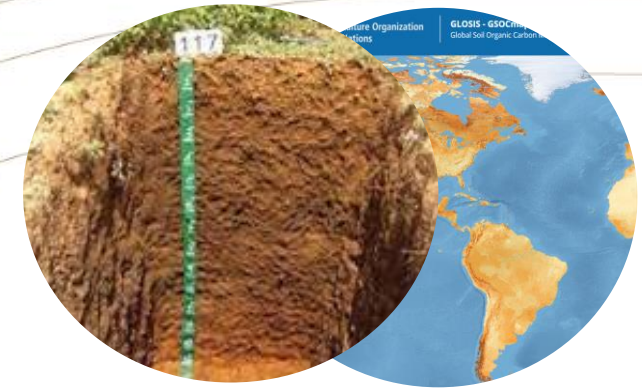
GSOCmap



WSD Launch v1.0 (2017)	GSOCmap v.1.5 (2019) GSOCmap v.1.6 (2022)	GSOCmap v.2.0 (TBD)
Following a unique **country-driven** process supported by an extensive **capacity development** program the Global Soil Organic Carbon Map (GSOCmap) was launched during World Soil Day (WSD) 2017	Throughout the years the GSOCmap has been **constantly updated** and **improved**. Several national trainings and the **ongoing** remote **technical support** offered by the GSP have been essential for countries in creating and/or updating their national SOC map	An **update to version 2.0** which will aim at improving and harmonizing the original approach alongside the inclusion of SOC maps at **target depth of 1 m** is underway

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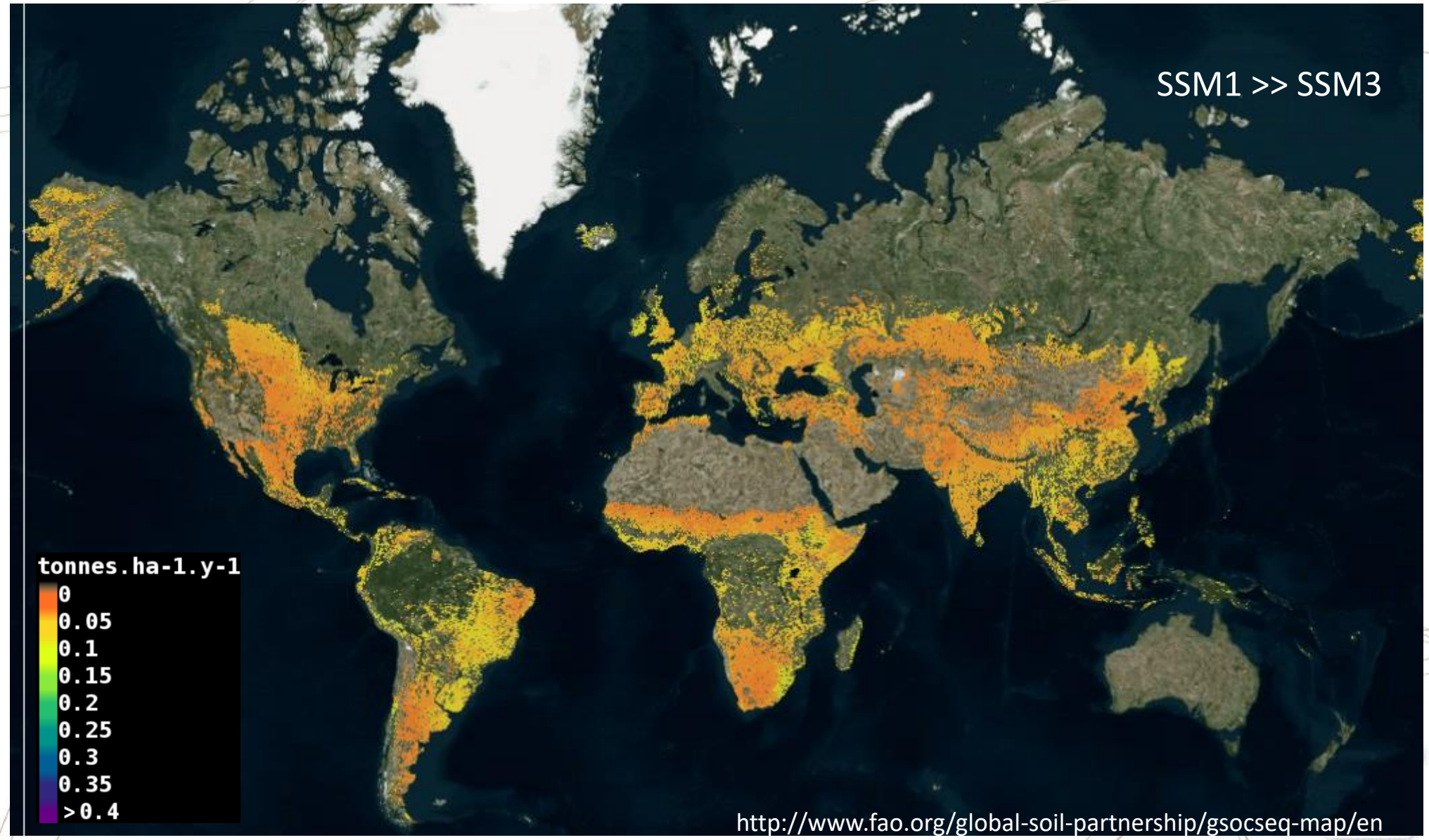
GSOCseq – Global Soil Organic Carbon Sequestration Potential Map

GSOCseq v1.1

- SOC sequestration (tC/ha/yr)
- 4 Scenarios SSM1-2-3 & BAU
- Agricultural lands (croplands + grazing lands)
- 20-year period
- Depth: 0-30 cm
- 1 x 1 km

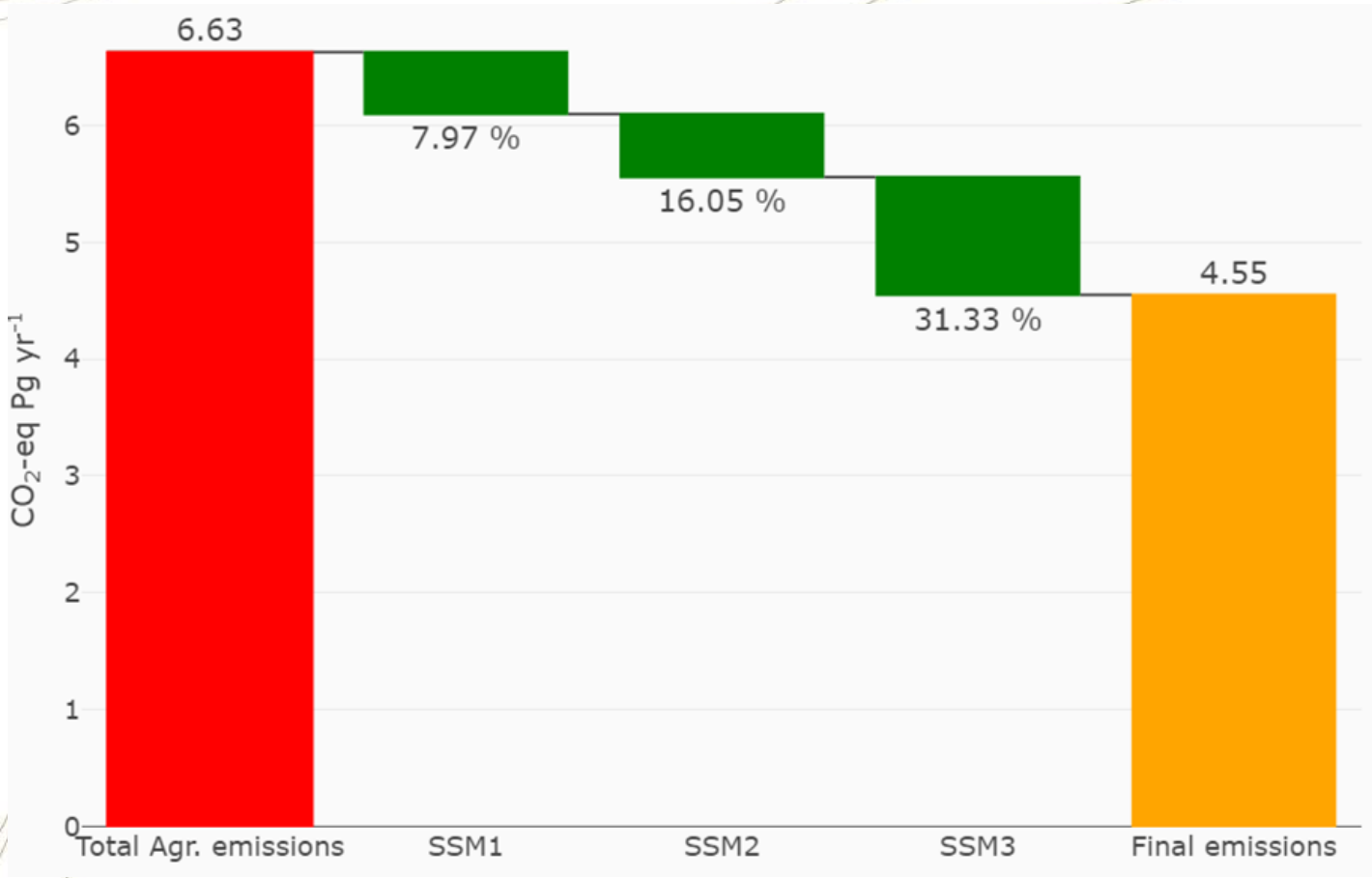


http://www.fao.org/global-soil-partnership/gsocseq-map/en

Potential uses - Mitigation Potential*

*Excluding blank countries

Agricultural soils play an important role in mitigating GHG emissions: yearly agricultural global emissions could be cut by 31 %



*Total Agricultural Emissions from FAOSTAT (2019)

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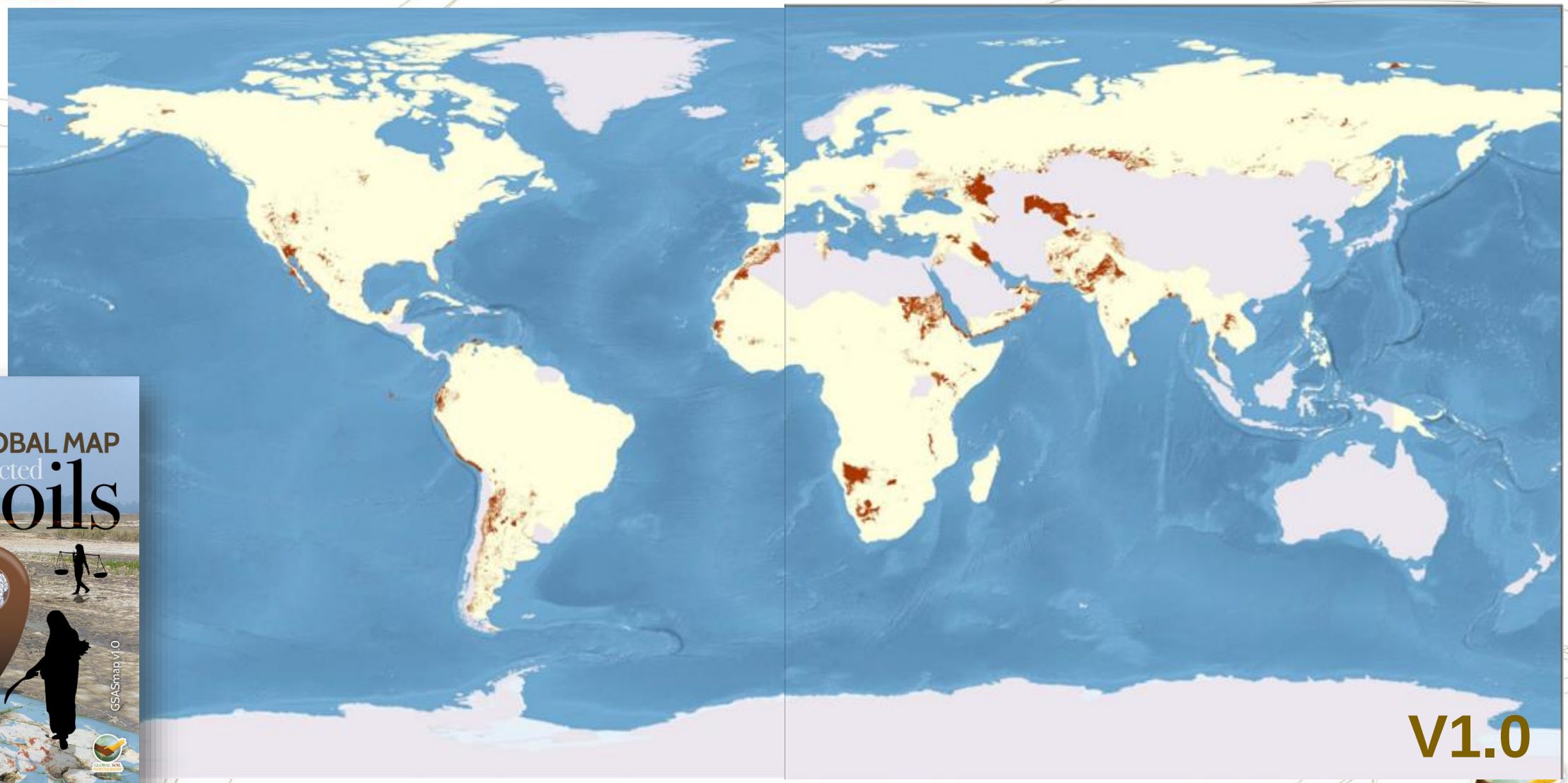
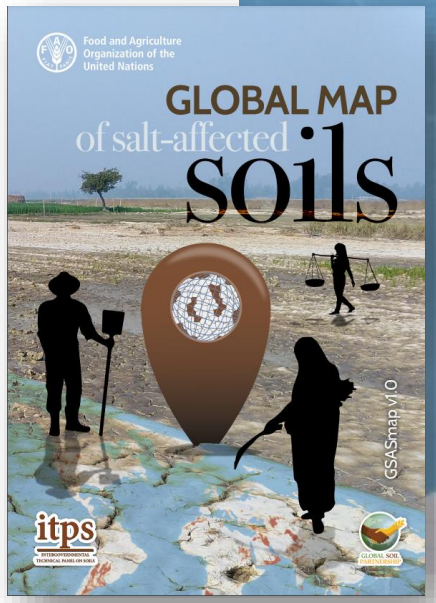
GSASmap – Global Salt Affected Soils Map





fao.org/global-soil-partnership/gsasmap

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GSASmap – Global Salt Affected Soils Map

The GSASmap represents the spatial distribution of SAS with ECe>2 dS/m, ESP>15% and pH > 8.2 at two depth intervals (0-30 cm and 30-100 cm). With the current information from 118 countries covering 85% of global land area, it shows that more than 424 million hectares of topsoil (0-30 cm) and 833 million hectares of subsoil (30-100 cm) are salt-affected:

- 85% of salt-affected topsoils are saline, 10% are sodic and 5% are saline-sodic
- 62% of salt-affected subsoils are saline, 24% are sodic and 14% are saline-sodic.

These estimates based on the submitted data show that more than 3% of global topsoils and more than 6% of global subsoils are affected by salinity or sodicity. More than two thirds of global SAS are found in arid and semi-arid climatic zones:

- 37% of SAS are located in arid deserts
- 27% of SAS are distributed in arid steppe (half in cold arid steppe and half in hot arid steppe)

V1.0

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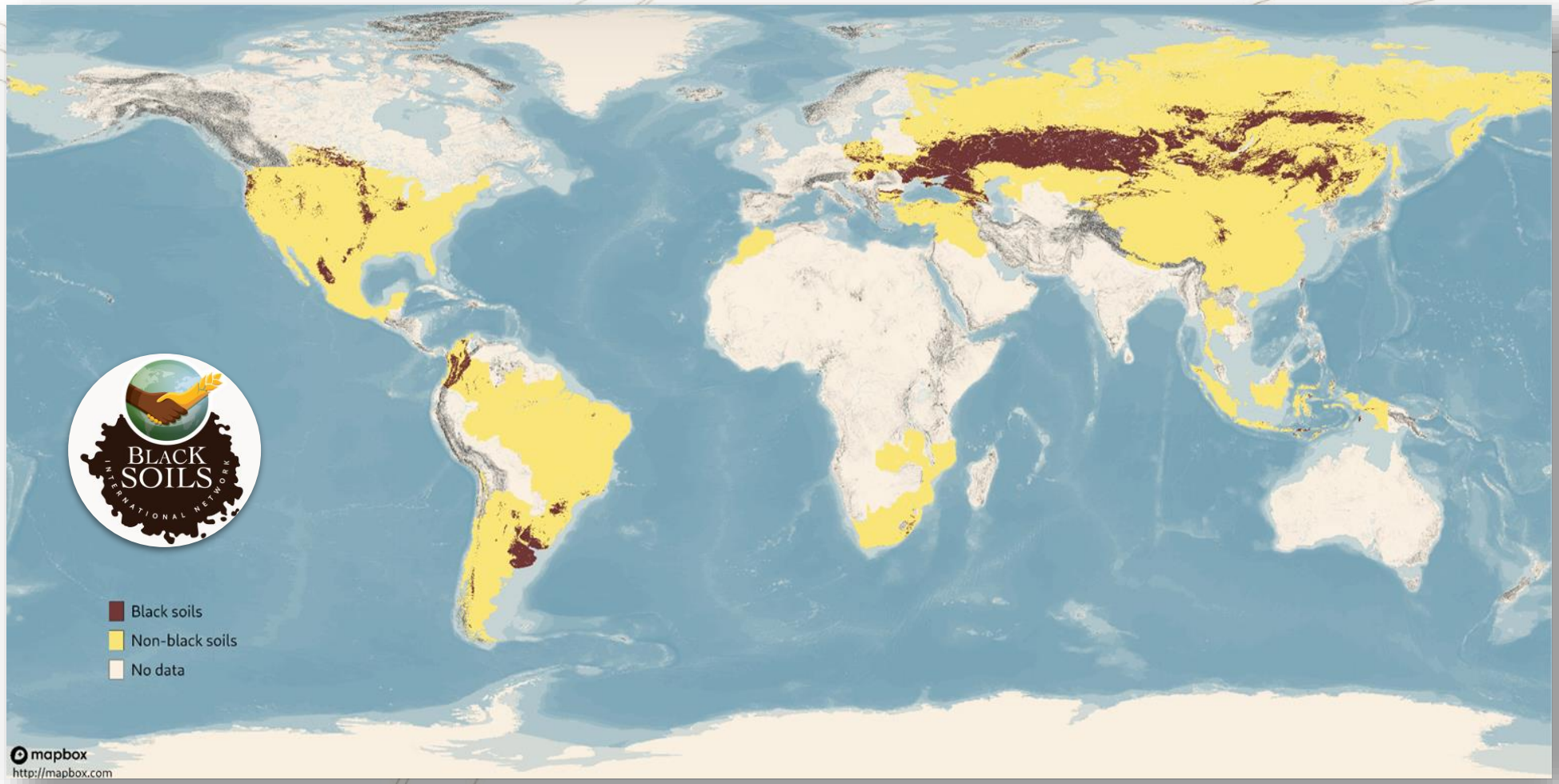
Global Black Soil Distribution Map v.1.0



V1.0 Coverage:
INBS Countries (32)

V1.1 Coverage:
Global (INSII) - soon

More Information, Statistics & Data Access:
fao.org/global-soil-partnership/GBSmap/

GBSmap Dashboard

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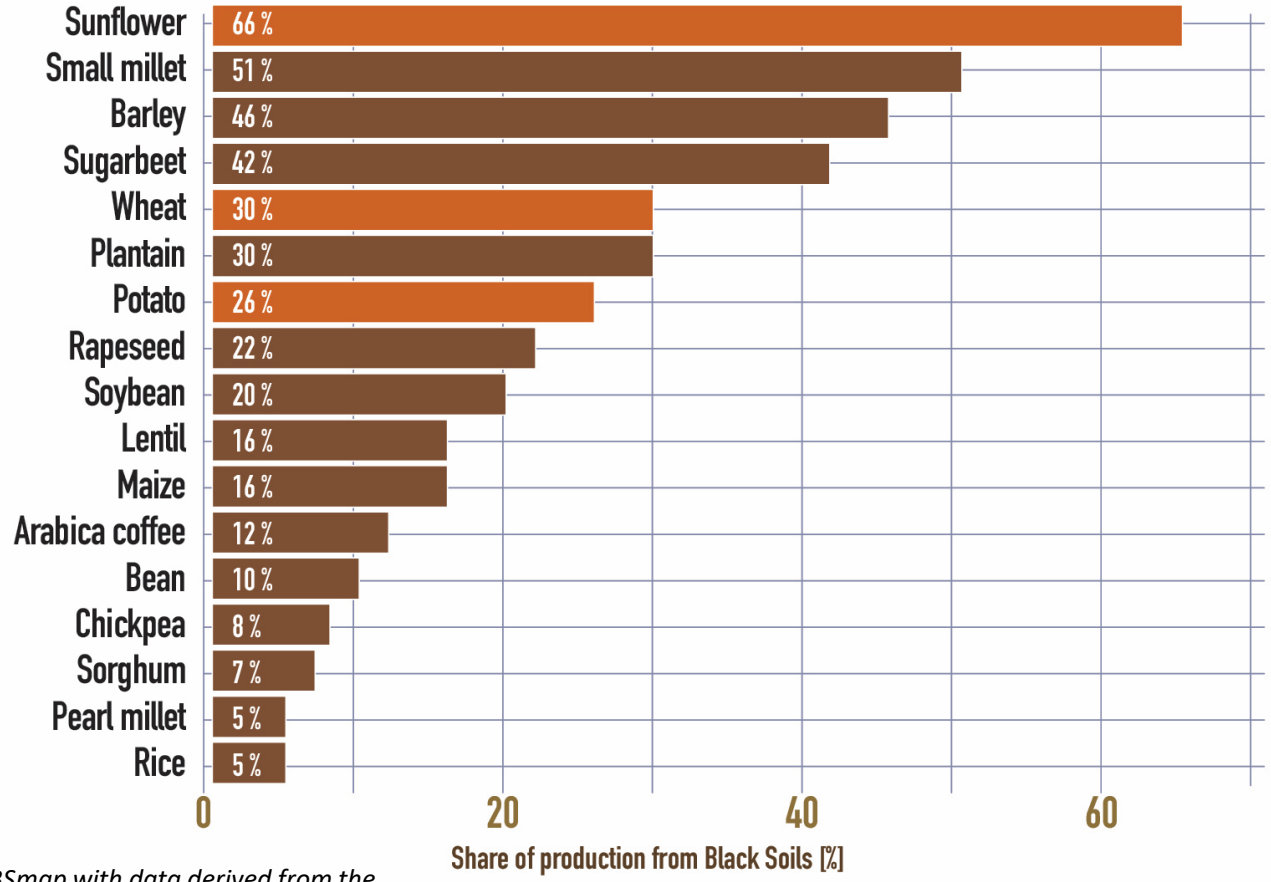
Global Black Soil Distribution Map v.1.0

A significant percentage of oilseed, cereals, and tuber crops are cultivated in black soils, which are essential to food security and the global economy



V1.0 Coverage:
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Global (INSII) - soon

More Information, Statistics & Data Access: fao.org/global-soil-partnership/GBSmap/

GBSmap Dashboard

The shares were derived by intersecting the GBSmap with data derived from the "Global Spatially-Disaggregated Crop Production Statistics Data for 2010 Version 2.0", (International Food Policy Research Institute, 2019). The results for crop shares under 5 percent and for aggregated crop types were excluded from the analysis.

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The year ahead: Country Driven Data Products

GSERmap Global Soil Erosion Map

- GSERmap Working Group (GSERmap WG)
- GSERmap Country Guidelines and Technical Specifications (INSII Endorsement)

I II **2-Phase Approach**

- **PHASE I** – National Soil Erosion Factor Databases/Data Repositories ***(2022)***
- **PHASE II** – National Soil Erosion Modelling ***(2023)***

GSNmap Global Soil Nutrient & Nutrient Budget Maps

- GSNmap Working Group (GSNmap WG)
- GSNmap Concept Note (INSII Endorsement)

I II **2-Phase Approach**

- **PHASE I** – Individual nutrient maps (macro, micro nutrients, associated factors) ***(2022)***
- **PHASE II** – Nutrient Budgets ***(2023)***

GSOCseq, GSOCmap, GSASmap, GBSmap Updates (2022-2023)

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Thank you for your attention

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