Food and Agriculture Organization of the United Nations

7th Meeting of the International Network of Soil Information Institutions (INSII)

09-10-11 November 2021

Online meeting

GSOCmap 2.0

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INTERNATIONAL NETWORK OF SOIL INFORMATION INSTITUTIONS

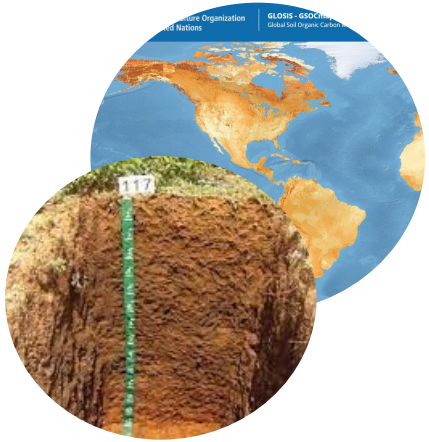
GLOBAL SOIL PARTNERSHIP

Content

- Background
- GSOCmap v1.6
- The importance of the GSOCmap today
- GSOCmap v.2.0: Key-word harmonization
  - Mapping methods
  - Uncertainty estimation
  - Temporal
- GSOCmap v.2.0: Going deeper
- Discussion

http://54.229.242.119/GSOCmap/

GSOCmap: Background



WSD Launch (2017)

GSOCmap v.1.5 (2019)
GSOCmap v.1.6 (coming soon)

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

GSOCmap v1.6

GSOCmap v1.0

- 2017
- 71 National Maps
- 1 Million Ground Data

GSOCmap v1.2

- 2018
- 75 National Maps
- 1 Million Ground Data

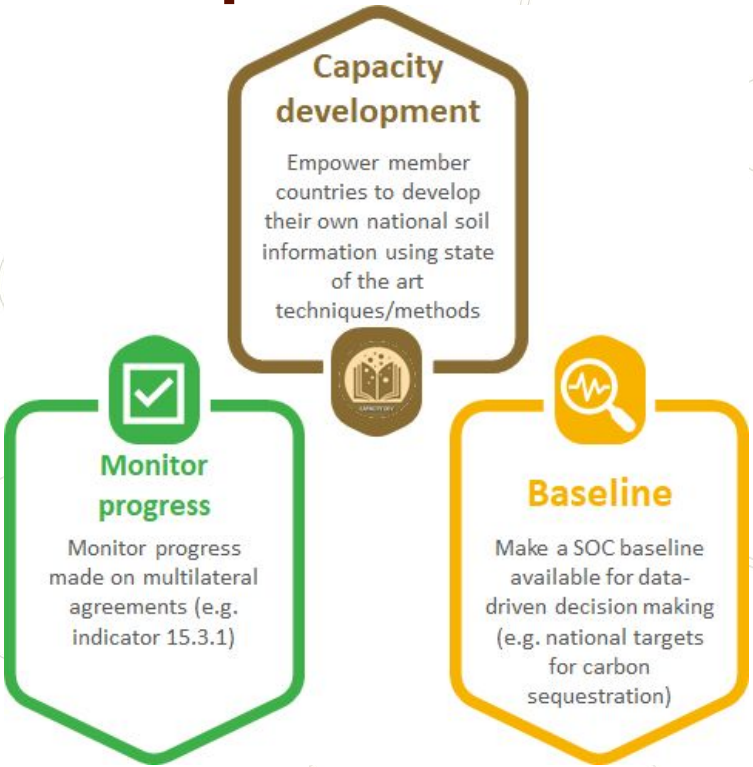
GSOCmap v1.5

- 2019
- 85 National Submissions
- 1.1 Million Ground Data

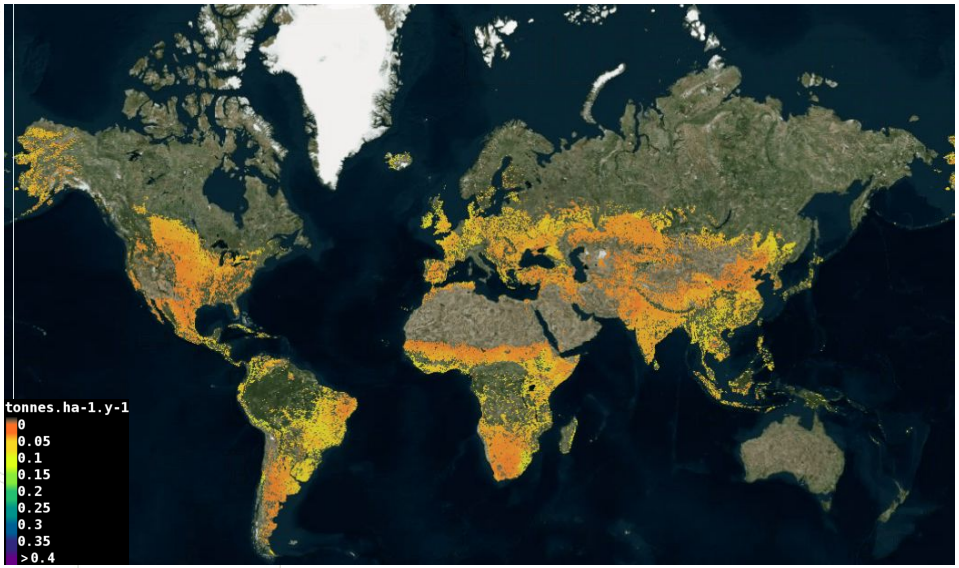
GSOCmap v1.6
Coming soon

- Update postponed to prioritize the launch of the GSOCseq
- Several new SOC maps were submitted alongside the the national SOCseq maps

The importance of the GSOCmap today



A recent example: The GSOCmap serves an input data to draw understand the ability of soils to sequester carbon as SOC and mitigate climate change.



GSOCmap v.2.0: *Harmonized mapping methods*

Exclude

Conventional upscaling[20]	Class-matching	Derive average SOC stocks per hectare per "class": soil type for which a national map exists, or combination with other spatial covariates, e.g. land use category, climate type, biome, etc. This approach is used in the absence of spatial coordinates of the source data.
	Geomatching	Point locations with spatial referencing are overlaid with GIS layers of important covariates. Upscaling is based on averaged SOC values per mapping unit.
Digital soil mapping[21] (all methods require geomatching)	Data mining	Multiple regression, classification tree, artificial neural network
	Geostatistics	Regression kriging, kriging with external drift
	Knowledge-based systems	Fuzzy inference system, decision tree, Bayesian belief networks

Update/Extend

GSOCmap v.2.0: *Harmonized uncertainty estimation*

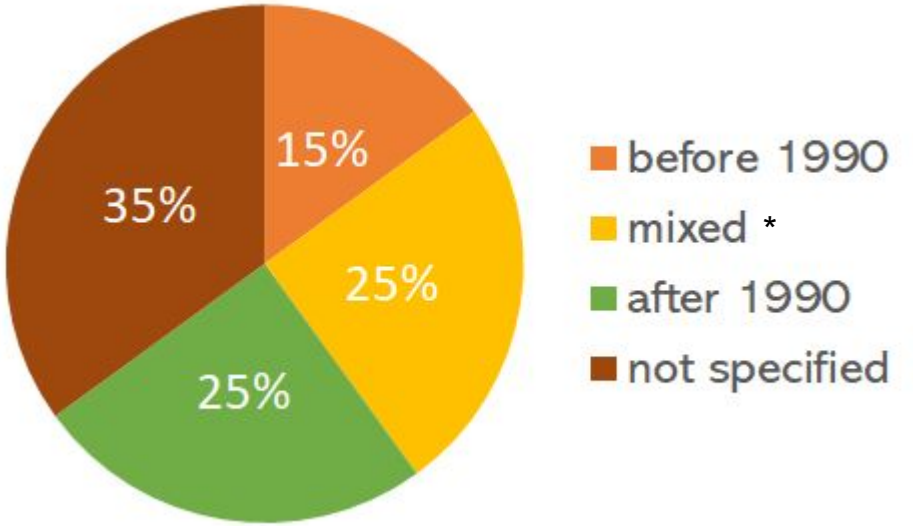
- In the GSOCmap v1.5 most countries did NOT provide an uncertainty layer alongside the national SOC map
- Different approaches were used depending on the methodology:
  - confidence intervals for the SOC values
  - standard deviation from regression kriging
  - standard deviation from an ensemble of different DSM models
  - expert knowledge in percentage (conventional upscaling)
- National maps that relied on conventional upscaling methods were not provided with quantitative uncertainty estimations
- Harmonized mapping approaches with automatic mechanisms to estimate and generate uncertainty layers should be prioritized

GSOCmap v.2.0: *Temporal Harmonization*

- 40 % of the input soil profile data used for the GSOCmap v1.5 was sampled more than 30 years ago

➢ Update National databases through new sampling campaigns

➢ Develop a methodology to update the legacy data through the use of models



*Temporal distribution of the GSOCseq v1.5. *mixed data indicates National maps based on both data from before and after 1990.*

GSOCmap v.2.0: Going deeper

- The current version of the GSOCmap covers a depth of 0-30 cm
- Subsoil SOC stocks represent an important carbon pool in soils
- Current national inventory reporting do not consider the SOC stocks depths deeper than 30 cm
- Depending on the data availability countries should be supported in generating and sharing National Layers at a target depth of 1 m

Discussion

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