

Proposal for the Establishment of IUSS Working Group on

“GlobalSoilMap”

(Linked to IUSS Division I and II)

Background

Soil survey is as old as civilization itself (Montgomery 2007) and has benefited humankind by mapping land resources for food production and other uses and promoting sustainable soil management of these precious soil resources. In recent decades, however, it has been realised that soils, as a natural resource, are at the nexus of most of the key challenges facing humankind (McBratney et al. 2014). This has therefore increased the urgency for higher quality, more consistent, and more relevant soil information across the world (Hempel et al. 2014).

GlobalSoilMap (GSM) was established in 2010 in response to these challenges related to the evolving demands for soil information (GlobalSoilMap Science Committee 2014). GSM is a global consortium of soil science institutions that aim to tackle a very ambitious challenge: producing a consistent soil property information system at 100-m resolution for the whole world (Sanchez et al. 2009).

GlobalSoilMap Achievements

Great progress has been made since the GlobalSoilMap establishment. A major achievement for the consortium is the development of the GlobalSoilMap Technical Specifications. These specifications are unique in the sense that they provide guidance for the production of a harmonised, worldwide soil space–time information system, and they have been developed by multiple parties, in a collaborative and inclusive fashion. A testament to this achievement, the Technical Specifications of GlobalSoilMap, has been adopted under Pillar 4 of the United Nations-FAO Global Soil Partnership initiative as the guiding methodology to produce fine-resolution soil property maps. Following agreement on the specifications, several countries have actually started producing and delivering the first generation of their GlobalSoilMap products. Such countries include Australia (<http://www.clw.csiro.au/aclep/soilandlandscapegrid/index.html>), Canada, and the USA (<http://157.182.4.221/arcgis/rest/services/globalSoilMap>).

To support the production and delivery of the GlobalSoilMap products, the consortium has also been generating important new methods and protocols in different scientific fields: global digital soil mapping methods, legacy data curation and use, and also soil information standards (SoilML, Simmons et al. 2013) and federated soil data infrastructures.

These efforts have resulted in the: (i) publication of many peer-reviewed articles documenting the innovative implementation of the Technical Specification; (ii) organization of GlobalSoilMap international workshops in various countries around the world; and (iii) the creation of many training material and events to upskill the soil science community across the globe to these new approaches.

Rationale for the Working Group Establishment

During the last meeting in Ottawa, Canada, 12–14 November 2015, GlobalSoilMap consortium, through participating countries and institutions, emphasized the current achievements and the need for worldwide recognition of its role as a scientific leader for the production of first state of the art high resolution soil property maps. The participating countries and institutions unanimously agreed to seek the establishment of the GlobalSoilMap working group under the International Union of Soil

Science (IUSS). The successful generation and delivery of high resolution soil property maps would require coordinated efforts from all nations, institutions, and individuals. The GlobalSoilMap consortium believes that the IUSS would be able to provide a forum to encourage such participation and contribution in an open and democratic fashion warranted by such undertaking.

The role of the WG will be to:

- support the development and production of global soil property grids and space–time information system based on “bottom-up” approaches by building capacities within participating nations
- develop global digital soil mapping methods
- develop approaches that rescue, harmonise, and curate the existing amount of legacy soil data that has been collected by soil scientists worldwide over the last 100 years
- coordinate the collaborative development of specifications for global digital soil mapping coverages
- develop applications of global digital soil mapping for solving global challenges
- develop training programs to build capacities for using digital soil mapping as a platform to combine soil data and knowledge
- coordinate the organisation of the GlobalSoilMap Workshop, which takes place every two years.

The request to establish a Working Group at IUSS is a reflection of the maturity the GlobalSoilMap initiative has reached during the 5 years of its existence and an indication that this effort should continue to the next level, which would require the support of all international organizations such as IUSS and beyond.

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Past Events

International Workshop on GlobalSoilMap Oceania Node, IICALRD, Bogor, Indonesia, 7–9 February 2011.

GlobalSoilMap Workshop, European Commission, Joint Research Center (JRC), ISPRA, Italy, 20–24 June 2011.

GlobalSoilMap Meeting, North America Node, North Dakota State University, Fargo, North Dakota, USA, 25–26 October 2011.

Global Soil Partnership/GlobalSoilMap International Conference, Nanjing, China, 8–11 February 2012.

GlobalSoilMap Meeting North America Node, West Virginia University, Morgantown, WV, USA, 9–10 May 2012.

GlobalSoilMap and Soil Information Uncertainty Workshop, United States Department of Agriculture, Natural Resources Conservation Service, National Soil Survey Center, Lincoln, Nebraska, USA, 27–29 August 2012.

GlobalSoilMap Conference, French national Institute for Agricultural Research (INRA), Orleans, France, 7–9 October 2013.

GlobalSoilMap Consortium Meeting, IUSS, 20th World Congress of Soil Scientists, Jeju, South Korea, 8–13 June 2014.

GlobalSoilMap Consortium Meeting, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada, 12–14 November 2015.

References

GlobalSoilMap Science Committee 2014. Specifications: Tiered GlobalSoilMap Products, Release 2.3.

Hempel JW, McBratney AB, Arrouays D, McKenzie NJ, Hartemink AE 2014. GlobalSoilMap project history. GlobalSoilMap: basis of the global spatial soil information system. WHERE PUBLISHED AND BY WHOM. Pp. 3–8.

Montgomery D R 2007. *Dirt: The Erosion of civilizations*. Berkeley, CA: University of California Press. ISBN 0-520-24870-8.

McBratney AB, Field DJ, Koch A 2014. The dimensions of soil security. *Geoderma* 213: 203–213.

Sanchez PA, Ahamed S, Carré F, Hartemink AE, Hempel J, Huising J, Lagacherie P, McBratney AB, McKenzie NJ, Mendonça SML, Minasny B, Montanarella L, Okoth P, Palm ChA, Sachs JD, Shepherd KD, Vågen T-G, Vanlauwe B, Walsh MG, Winowiecki LA, Zhang G-L 2009. Digital soil map of the world. *Science* 325: 680–681.

Simons B, Wilson P, Ritchie A, Cox S 2013. ANZSoilML: an Australian–New Zealand standard for exchange of soil data. In: EGU General Assembly Conference abstracts, Vol. 15. P. 6802.