



The International Soil Modeling Consortium: ISMC status, goals and perspectives

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The International Soil Modeling Consortium (ISMC) was established in 2016 with the aim to integrate and advance soil systems modeling, data collection, and observational capabilities. ISMC is a community effort. It follows a bottom-up approach, is based on scientific principles, voluntary contributions, and open to anybody who wants to become a member of the consortium (<https://soil-modeling.org/>). Its activities are organized into three science panels, organized around a broad workflow from data collection and observation (DO-LINK) to model development and intercomparison (Soil-MIP) to engagement with different scientific communities (CROSS-Connect). ISMC has an executive board and a scientific advisory board that guides ISMC in pursuing its objectives.

The mission of the Soil-MIP science panel is to foster the further development of soil models that can predict soil functions and their changes due to soil use and land management, as well as climate change and pollution. A number of model intercomparison studies were recently initiated, focusing on specific processes like soil hydraulic properties, soil thermal properties and related soil heat fluxes, root growth and root water uptake, soil evaporation, soil freezing, infiltration and runoff processes, and coupling between preferential flow in soils and groundwater. From these comparisons, lessons can be learned about how process controls at small scales propagate to larger scales and how this leads to effective process representations at larger scales. The mission of DO-Link is to assist with the development of a global soil data meta-repository that is openly available for soil system research. Data and data requirements are as diverse as the various disciplines developing and applying soil models. The soil data meta-repository will be a resource to analyze past and recent model- and data requirements for continuous standardization and harmonization of soil data. The CROSS-connect science panel identifies soil related knowledge gaps between science communities, and shares this knowledge with other ISMC science panels to push forward development of new tools to better translate soil processes into functions for assessing sustainability and ecosystem services. CROSS-connect develops an exchange platform with other international partners like AgMip/MACSUR, GEWEX, ISCN (International Soil Carbon Network), GSBI (Global Soil Biodiversity initiative) and CSDMS (Community Surface Dynamics Modeling System). In this presentation, we will highlight the most recent developments and activities that are currently underway as well as future projects that are under preparation.