

Soil Systems and Critical Zone Processes Technical Committee - Activities and News Fall 2014
Dani Or (ETH Zurich) and Kate Lajtha (Oregon State Univ.) – SSCZP technical committee co-chairs

The Soil Systems and Critical Zone Processes (SSCZP) technical committee was established jointly by the **Hydrology** and **Biogeosciences** sections of the AGU to promote soil and the critical zone as a central biogeochemical-hydrological interface teaming with life and providing ecosystem services critical for life support and for meeting nutritional needs of human population. Efforts to integrate soil systems into contemporary cross-disciplinary initiatives and policy that address global challenges (climate change, food security, water and land resources and ecosystem health) involve a broad range of activities across scientific communities and disciplines. In addition to increased awareness of soil processes at the AGU as evidenced by establishing this TC and highlighted in the *Global Soil SWIRL* (2013 & 2014 Fall meeting), members of the SSCZP helped organize several interdisciplinary conference to involve other disciplines (ecology, atmospheric science, biogeochemistry, and geological sciences) in this outreach challenge.

Following the inception of the SSCZP TC (Fall 2012), we organized in 2013 two interdisciplinary conferences; in Monte Verita, Switzerland on *Soil Systems and Critical Zone Processes – Integrating Life Support Functions across Disciplines* (<http://www.intersoil2013.ethz.ch/index.php>), and an AGU Chapman conference supported by the NAS on *Soil-mediated Drivers of Coupled Biogeochemical and Hydrological Processes Across Scales* (<http://chapman.agu.org/soil-mediated/>). These continued in 2014 with involvement in a conference in Berkeley *A Path to Improved Understanding of Complex Soil Systems* Supported by SSSA and Berkeley Lab (http://esd.lbl.gov/research/programs/ERWR/soils_conference/). The *Sixth International Workshop on Soil and Sedimentary Organic Matter Stabilization and Destabilization* (SOM6 - <http://www.som6workshop.org/>) held in 2014, and the 7th workshop announced for 2016 with the theme *Soils and the Critical Zone* (to be held at the National Conservation Training Center near Washington, D.C.)

The 2014 AGU Global Soil SWIRL is very popular and received many submissions across AGU disciplines. Current efforts include making this SWIRL, and all SWIRLS more visible on the AGU schedule. We are working with AGU leadership to allow for clearer scheduling of SWIRLS and to show SWIRL playlists as a pathway for attendees. In 2014, a large number of sessions concerning soil organic matter were proposed to AGU, and after sessions were approved, leaders of the sessions took the unusual step of collaborating to combine sessions into a coordinated 3-day grouping of oral and poster sessions. We hope to make this more common and visible in the future.

The GEWEX-Soil Communities: The interdisciplinary meetings made it clear that the soil and climate communities need to foster stronger links leading to an ongoing effort to link soil and critical zone with climate modelers through participation in the GEWEX project (temporarily termed the “GEWEX-Soil communities”). The new co-chairs of GEWEX (Sonia Seneviratne and Graeme Stephens) have graciously agreed to identify topics of mutual interest and devise plans for facilitating such involvement. Preliminary topics of joint interest and potential collaboration were presented to several GEWEX panels at a meeting in Den Haag (July 2014) – these included:

- a. Leveraging knowledge and operation experiences to integrate critical zone observatories (CZO) and similar eco-hydrological observatories within GEWEX activities (TERENO; ICOS; and potentially CUAHSI in coordination with NSF CZOs <http://criticalzone.org/national/>)
- b. Formation of a global lysimeter network to inventory, standardize, and expand coverage of lysimeter observations (an effort led by Julich)

- c. Integration of the ongoing initiative to form an *International Soil Modelling Consortium* (see more below) to improve links between climate, ecology, hydrology and soil modelers concerning available soil processes models, data sets, model repository (effort led by Julich)
- d. Expansion of simple and low-cost soil moisture monitoring networks – following the model of *Texas Soil Observation Network* (TxSON - <http://www.beg.utexas.edu/soilmoisture/>)
- e. Incorporation of near surface soil processes in regional and global hydrologic and observational models (surface evaporation and energy balance physics; plants-soil interactions)
- f. Global soil map (www.globalsoilmap.net) discussions with Dominique Arrouays and Alex McBratney (GSP leaders) to enhance impacts of the GEWEX-Soil initiative

The discussions with the GEWEX panels were positive and supportive, and it was decided to plan a joint workshop in 2015 to identify knowledge gaps and synergies among the communities (dates and venue are not yet available). Information is presently shared with an ad-hoc core group with a range of expertise in the soil-climate interface, with progress in collaboration plans, the interactions will be expanded to facilitate a broader participation (we will post a link on the SSCZP website).

The International Soil Modeling Consortium (ISMC, <https://soil-modeling.org/>): Traditional soil models have been instrumental in the quantification and prediction of soil processes and related ecosystem services. However, as data collection capabilities and resolution rapidly expand present soil models rooted in the profile or field scale are ill equipped to assimilate and benefit from the new informational capabilities. A new generation of soil models, that integrate physical, mechanical, chemical and biological processes across scales is needed to broaden access of soil processes across disciplines and enhance availability for decision makers. The closing of knowledge gaps and developing new generation soil models is necessary to improve understanding of climate-change–feedback processes, account for ecosystem services, link basic soil science research and management, and facilitate communication among disciplines and with society. A recent international community effort was launched earlier this year to meet these challenges through the formation of an ***international soil-modeling consortium*** (ISMC). The activity is patterned after similar initiatives in systems biology, hydrology, and climate. A preliminary meeting took place during the EGU 2014 spring meeting in Vienna where general objectives and path forward were charted. A multi-author white paper on “Challenges and perspectives in modelling soil processes” is being developed to systematically identify the scope and scientific needs considering the state-of-the art in soil modeling. Additionally, a special session is organized for the 2014 AGU fall meeting (H54E: *Perspectives and Challenges in Modeling Soil Processes*). A formative workshop is planned for March 2016 at UT Austin to solidify the concept, governance and operation of the ISMC.

2015 International Year of Soils: The 68th UN General Assembly declared 2015 the International Year of Soils (IYS) in addition to declaring December 5th as the World Soil Day (WSD). Among the activities for raising awareness for soil, an Intergovernmental Technical Panel on Soils (ITPS) was established at the first Plenary Assembly of the Global Soil Partnership held at FAO in June 2013. The main function of the ITPS is to provide scientific and technical advice and guidance on global soil issues to the Global Soil Partnership primarily and to specific requests submitted by global or regional institutions. Members of the SSCZP TC are participating in developing a report on the *Status World Soil Resources* to be presented at the upcoming world soil day in December 2014.



The ISMC and a few other initiatives related to the GEWEX-Soil effort are led by Harry Vereecken from the Julich research center (Germany), Harry was elected and approved as the incoming co-chair of the SSCZP TC from the Hydrology section (starting Dec. 2014). We take this opportunity to welcome Harry - he will serve with Kate Lajtha (Oregon State Univ.) the Biogeosciences co-chair.

SSCZP TC meeting agenda Fall 2014

***Biogeosciences/Hydrology Soil Systems and Critical Zone Processes Technical Committee meeting:
Monday 12/15/2014 from 6:45 to -7:45 AM at the Marriott Marquis, room Sierra B***

1. Approval of the 2013 SSCZP TC Minutes (see attached)
2. Introduction of Harry Vereecken incoming Hydrology section co-chair (2015-2017)
3. The GEWEX-Soil interactions - plans and a workshop in 2015 (Sonia Seneviratne and Dani Or)
4. The International Soil Modeling Consortium (Harry Vereecken)
5. The 68th UN General Assembly declared 2015 the International Year of Soils (IYS)
6. Status of the discussions on CZO – how to become more involved (Kate)
7. Conferences for 2015 (all)
8. Varia