



United States  
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Agriculture

Natural Resources Conservation Service

**INTERNATIONAL PROGRAMS DIVISION**



**IPD Newsletter**  
*June-December 2018*

**ACTIVITIES.....PAGE 2**  
**Australia, Brazil, Canada, China, Colombia, and Pakistan**

***COVER PHOTO:** Participants of the Gomal Zam Dam Workshop October 22-27, 2018, at Pakistan’s National Agricultural Research Centre (NARC) and International Center for Agriculture Research in Dry Areas (ICARDA) in Islamabad, Pakistan. During the workshop participants engaged with the instructors to discuss methods of addressing erosion control in the 21.7 mile (35km) watershed between the Gomal Zam dam and reservoir. **SEE ENTRY ON PAGE 6.***

*Photo courtesy of International Center for Agricultural Research in the Dry Areas and USDA Foreign Agricultural Service*

The IPD Newsletter is a biannual publication produced by the International Programs Division of the Natural Resources Conservation Service (NRCS).

The document provides a six-month overview of NRCS participation in international activities, which included providing technical assistance and exchanging scientific and technical information.

Submit articles, photos, and comments to the newsletter point of contact: Marita McCree at [marita.mccree@wdc.usda.gov](mailto:marita.mccree@wdc.usda.gov)

### IPD Newsletter

International Programs Division  
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Service

5601 Sunnyside Avenue

Room 1-2114C

Stop Code: 5477

Beltsville, MD 20705

### IPD Staff

Lillian Woods Shawver

Linda Risdén

Marita McCree

Stephanie Goglia (detailee)

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## ACTIVITIES

### Australia

NRCS North Dakota **Soil Health Specialist Jay Fuhrer** presented the key note address during the Annual Victorian No-Till Farmers Association in Moama, New South Wales. Fuhrer presented topics on Soil Health and Regenerative Agriculture, July 11-12, 2018, and conducted farm visits to discuss soil health principles July 10, 2018, at the Grant Sims farm near Pine Grove, Victoria. The event provided an opportunity to exchange information regarding cover crop and livestock integration into cropping systems, monitoring the soil food web, and carbon impacts.

### Brazil

A team of NRCS scientists attended the 21st World Congress for Soil Science (WCSS) August 12-18, 2018 in Rio de Janeiro. WCSS is the world's largest soil science event and brings together thousands of professional soil scientists and students representing 104 countries worldwide.

NRCS National Soil Survey Center **Chemist Richard Ferguson** reported on NRCS' progress modeling forms of carbon using MIR spectrometry, vastly increasing visibility for the burgeoning NRCS MIR program and facilitating collaboration with recognized experts. This collaboration will translate to increased reliability of applications served by MIR technology with real implications for mapping, interpretations, research, and conservation efforts. Ferguson also

collaborated with the International Soil Reference and Information Centre, ICRAF/CGIAR (World Agroforestry), and the Ohio State University on developing a global spectral library; participation in a global soil information system and increasing spectral modeling capacity; developing model calibration transfer protocols; and vetting soil health methods.

NRCS Santa Fe MLRA Soil Survey Office Leader **Aaron Miller** presented and discussed ideas for solutions to problems facing the delivery of natural



*NRCS Santa Fe MLRA Soil Survey Office Leader Aaron Miller, wearing a collectable SCS belt-buckle, poses next to a classic Brazilian Oxisol monolith at the 21st World Congress for Soil Science in Rio de Janeiro, August 12-18, 2018. Advancements in agriculture on these types of nutrient-limited soils was a major topic at the conference.*

*Photo Courtesy of Aaron Miller, USDA NRCS*

resource tools and information to the public. In addition, Miller had the opportunity to gain exposure to innovative advancements in soil science such as the newer handheld technologies that sense soil properties in the field using electro-magnetic spectra. WCSS also allowed Miller to engage with other soil science professionals expanding his technical reference network in such areas as ecological dynamics as a function of soil carbon. This information will be useful in his work improving and updating ecological site descriptions for NRCS.

NRCS National Soil Survey Center **National Leader for Soil Survey Standards Curtis Monger** organized a session on Soil Classification, gave a presentation on the links between soils and biodiversity; co-chaired a working group on developing international soil horizon nomenclature; and was elected chair of the International Union of Soil Sciences (IUSS) Commission 1.4 for Soil Classification. Monger's involvement during the WCSS provided the opportunity for information exchange which is critical for the advancement in soil classification. This in turn, increases USDA's knowledge about soils across the globe and how they interact with ecosystems, respond to agriculture, and their role in environmental issues such as water pollution and carbon sequestration. In Monger's role as the IUSS chairperson he will be developing a newsletter that highlights the role of soil classification in addressing current food and environmental challenges and will participate in the international soil classification field excursions in Mongolia (August 2019) and Mexico (April 2020). Additionally, Monger will work with the IUSS Commission 1.4 to create global maps on "Potential Organic and Inorganic Carbon Sequestration."

NRCS National Soil Survey Center **Soil Scientist Zamir Libohova** presented the study, "Comparisons between splines and weighted means for filling missing soil horizon data for GlobalSoilMap standard depths" that Libohova co-authored with Phillip R. Owens (USDA-ARS); Jim Thompson (WVU); Skye Wills (USDA-NRCS-NSSC); Steve Peaslee (USDA-NRCS-NSSC); and David Lindbo (USDA-NRCS-SSD). Libohova co-authored several other presentations and posters related to the Water Smart Agriculture Project in Central America and Mexico. The project drew from the Haiti Pilot Soil Survey project led by NRCS' Soil Science Division and Soil International Programs. The major goal is to conduct pilot soil surveys and build capacity to carry out soil surveys in each country.

### *Canada*

NRCS New York **Resource Soil Scientist Olga Vargas** traveled to Quebec City, Canada, June 10-16, 2018, for the jointly held 13th North American Forest Soils Conference and 9th International Symposium on Forest Soils. The conference included keynote speakers, presentations on research, and poster presentations on: the roles of forests and forest soils in climate change adaptation and mitigation; technological advances in forest soil research, management practices, land-use change, and soil-forest productivity; societal change and forest soils; the effects of fire on forest soils; and forest soil monitoring networks and environmental change—successes and challenges. Vargas presented a poster, completed in collaboration with the US Forest Service, on the USDA National Forest Soil Interpretations from the National Cooperative Soil Survey for the USA—Updates, Revisions, and New Interpretations. Contacts were made with researchers at

Maine University, SUNY College of Environmental Science and Forestry, SUNY Morrisville, University of New Hampshire, and University of Vermont as well as people from the US Forest Service, Canadian Forest Service, US Geological Survey, forestry consultants, and university students. Discussions included Ecological Site Descriptions (ESD) and the need to have more than one ESD where the same soil with different climatic or hydrologic conditions significantly impacts vegetation and management, using soil land inference models to conduct soil mapping nationally and abroad, urban forestry, urban soil surveys, subaqueous soil mapping, and professional collaboration to facilitate efficiencies.

### *China*

Three NRCS scientists and specialists as part of a six person team participated in the United States-China Scientific Cooperation Exchange Programs (SCEP). SCEP is based on a 1978 agreement where each year eight U.S. and eight Chinese teams participate in 14 days of research on topics determined by the U.S.–China Working Group. July 23-August 5, 2018, NRCS CNTSC **Rangeland Hydrologist/Ecologist Dr. Ken Spaeth**, NRCS CNTSC **Soil Scientist/GIS Specialist Dwain Daniels**, NRCS CRSL **Rangeland Management Specialist Tony Garcia** along with ARS Information Specialist Jason Nesbit, University of Arizona/ARS Assistant Research Scientist Haiyan Wei and Michigan State University Director of Center of Global Change and Earth Observations Dr. Jiaguo Qi served as the USDA Rangeland Research Team were studying National Resource Inventory (NRI) protocols in China. The team introduced NRI Rangeland Field Study program and procedures to the Chinese Ministry of Agriculture; discussed field

technologies to approach inventory and assessment protocols, classification and development of Ecological Sites, Rangeland Hydrology and Erosion Model (RHEM) development and usage in the United States, and Soil Mapping and Web Soil Survey. The team also demonstrated the utility of the 3-tier rangeland assessment that correlates data collected through simple and effective field protocols, on-site drone technology, and remote sensing imagery. In Beijing, the team met with the Institute of Agriculture Resources and Regional Planning at the Chinese Academy of Agricultural Sciences (CAAS) where they were presented with CAAS's work on remote sensing, grassland studies, research, modeling programs, and GPS-GIS system calibration with field data. The team also traveled to Inner Mongolia where they visited several animal breeding facilities, cultivated and natural pastures in Ewenk Banner, an alpine meadow in Ulanqab, the Daqing Mountains



*ARS Information Specialist Jason Nesbit (left) and NRCS Rangeland Management Specialist Tony Garcia (right) visit a plant materials center (MGRASS) in Hohhot, Inner Mongolia, China, July 31st, 2018, during the United States-China Scientific Exchange Program.*

*Photo courtesy of Dwain Daniels USDA NRCS*

Ecological Park, and Qingshuihe

County soil and water protection project along the Yellow River.



*During the United States-China Scientific Exchange Program July 23-August 5, 2018, ARS Information Specialist Jason Nesbit visits a test field of cold hardy alfalfa.*

*Photos courtesy of Dwain Daniels USDA NRCS*

NRCS National Soil Survey Center **National Resource Soil Scientist Skye Wills** attended the 1st International Symposium and Workshop on Black Soils in Harbin, China, September 10-12, 2018. The event was hosted by the United Nations Food and Agriculture Organization's Global Soil Partnership, and sponsored by Heilongjiang Academy of Agricultural Sciences, the Soil Science Society of China, and Soil Fertilizer Society of Heilongjiang Province. There were representatives from 18 countries present. During the International Network of Black Soils workshop the definition of black soils was discussed and agreed that black soils refer to soils with dark surface color and high organic matter (soil organic carbon) content, but it was also agreed that the definition should remain general to facilitate



project Cacao for Peace (CfP). The project started in 2016 with the objective to build capacity through public-private partnerships to increase quality cacao production in selected indigenous communities within SNSM. The project is a collaboration sponsored by U.S. Agency for International Development (USAID) through the U.S. Department of Agriculture's Foreign Agricultural Service (USDA-FAS) and implemented by USDA NRCS, Penn State University, and the International Center for Tropical Agriculture (CIAT). Other partners include the U.S. Peace Corps, United Nations Office Against Drugs and Crimes and relevant Colombian government agencies. During this trip Kome and Libohova met with cacao farmer associations and conducted needs assessments in SNSM and worked to finalize the Statement of Work and timeline for project implementation. This meeting was the first time many of the collaborators were able to meet and allowed them to clarify roles and responsibilities. The field

*NRCS Resource Soil Scientist Skye Wills presents Black Soils: Mollisols in the USA at the 1st International Symposium and Workshop on Black Soils in Harbin, China, September 10-12, 2018.*

*Photo courtesy of Skye Wills, USDA NRCS*

communication with other disciplines and the general public. A proposed change to the definition to include deep soil thickness and high base saturation, which would create different requirements for tropical and non-tropical soils and put an upper limit on the amount of soil carbon to restrict it to arable lands (not wetlands) will be circulated to member countries through the Global Soil Partnership's points of contact. The representatives presented the status of black soils in their countries, considered the food basket for many and often recognized as inherently productive and fertile soils. The symposium included a tour of the Heilongjiang Academy research farm where the participants were shown variety trials, nutrient plots, and demonstration fields.

**Kome and Zamir Libohova** traveled to Sierra Nevada de Santa Marta (SNSM) and Cali in Columbia, South America July 28- August 4, 2018, for the pilot



*Technical team for the Cacao for Peace project in front of the office for a project partner, the Center for Tropical Agriculture.*

*Photo courtesy of NRCS Soil Scientists Charles Kome and Zamir Libohova*

## **Colombia**

NRCS National Soil Survey  
Center **Soil Scientists Charles**

visits in SNSM provided the participants with an appreciation of the landscape, landforms, vegetation, weather, and cultural heritage of the indigenous populations with which the project will be engaging. Cacao is not grown on a commercial scale in the U.S. because cacao trees have specific ranges of soil and temperature and moisture regimes that limit geographic distribution. CfP will define suitable areas for optimal and sustainable cacao production and identify and select high-yielding and high-quality varieties for markets in the U.S. In 2015, the confectionary industry positively impacted the U.S. economy with estimated sales of more than \$34.9 billion and this is projected to grow to \$38.1 billion in 2020. Due to growing concerns and new European Union regulations regarding cadmium levels in cacao beans, the projects follow-up plans include monitoring soil, foliar, and bean cadmium levels.

### **Pakistan**

NRCS National Design, Construction, and Soil Mechanics Center **Civil Engineer Jon Fripp** and NRCS National Soil Survey Center **Agronomist Michael Kucera** went to the National Agricultural Research Center (NARC) and International Center for Agriculture in Dry Areas (ICARDA) in Islamabad, Pakistan, for the Gomal Zam Dam Workshop October 22-27, 2018. This workshop was part of ongoing support for two ongoing projects: the U.S.—Pakistan Soil Health and Fertility Project, and the U.S.—Pakistan Water Dialogue: Diffusion and adoption through partnership and action of the best watershed rehabilitation and irrigation practices and technologies to help rural farmers. The primary objective of the three-day workshop on the Gomal Zam

Dam area focused on area-wide planning in the surrounding watershed; reducing sedimentation in the barrage and canal water delivery system; watershed treatment needs; and increasing on-farm irrigation efficiently in the command area. Fripp and Kucera covered USDA-NRCS' 9-step planning process. The workshop participants included researchers, practitioners, service providers, and local farmers. Knowledge and skills gained by the participants can be applied to develop effective alternatives that address priority objectives, concerns, and

in the command area. During the workshop the USDA team noted that building a quality area-wide plan takes time and involvement of all major stakeholders. The involvement of stakeholders throughout the planning process stands out as a top priority to have successful and sustainable watershed projects and positively affect economic development. Follow-up visits for the effort, which would focus on a specific watershed planning project with on-site data, were discussed and tentatively planned for late FY 2019.



*NRCS Civil Engineer Jon Fripp and NRCS Agronomist Michael Kucera discussed the present status of the Gomal Zam dam and work done under the project in the watershed area with participants at the Gomal Zam Dam Workshop, October 22-27, 2018 in Islamabad, Pakistan*

*Photos courtesy of the International Center for Agricultural Research in the Dry Areas and USDA Foreign Agricultural Service*

new opportunities aimed at improving irrigation water delivery and management within the Gomal Zam dam project and watershed. This knowledge will lead to improved management of the Gomal Zam irrigation project to efficiently and effectively deliver and manage 324,400 acre-feet of irrigation water on 191,000 acres