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COVER PHOTO: NRCS's Mike Kucera and a local farmer compare soil moisture levels in Pakistan. Photo by Cheryl Simmons, USDA NRCS.

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 includes providing technical assistance and exchanging scientific and technical information.

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VOLUNTEERING

From Soils to Suitcase, Oregon Geologist Travels the World to Help Those in Need

***Paul Pedone**, a geologist with USDA's Natural Resources Conservation Service, describes the local geology to children in Debre Birhan, Ethiopia, while working on a school construction project with Engineers Without Borders. Photo courtesy of Paul Pedone, USDA NRCS.*

When most people think about retirement, they think of sitting on a beach, reading books, or relaxing. **Paul Pedone**, has different plans. As a newly-registered member of Engineers Without Borders (EWB), Pedone is traveling across the globe to do what he does best — study the soil.

"I was looking for a meaningful retirement opportunity, so I got involved with our local EWB chapter here in Portland," said Pedone, a geologist with USDA's Natural Resources Conservation Service (NRCS) in Oregon. "I started working with a group of students at Portland State University as a mentor for their EWB program."

Pedone has worked for NRCS for 43 years, and as the prospect of retirement nears, his work with EWB provides a pathway to continue his service to the environment and to others.

EWB is an all-volunteer nonprofit group that supports community-driven development programs worldwide, with a focus on providing basic human necessities such as clean drinking water and adequate sanitation.

Read Tracy Robillard's full article at:
http://blogs.usda.gov/2015/03/10/from-soils-to-suitcase-oregon-geologist-travels-the-world-to-help-those-in-need/

*From a different trip and article: NRCS geologist **Paul Pedone** and Portland State University student **Marley Luke** test water samples for a tilapia pond at a senior citizen facility in Nicaragua, during a mission with Engineers Without Borders in March 2015. Photo courtesy of Paul Pedone, USDA NRCS.*

PAKISTAN

Traditional Farming Practices Receive Boost

Agriculture is a major sector of Pakistan's economy, but soil and water inefficiencies are limiting factors to both economic development and food security. Rapid population increase, infrastructure challenges, and climate fluctuations and changes have further intensified the situation. In February, a team from the Natural Resources Conservation Service (NRCS) participated in a variety of activities in Pakistan. The projects, managed by USDA's Foreign Agricultural Service (FAS), called upon NRCS to help improve farming by providing watershed management, soil health, and soil fertility expertise, to name a few.

The team began their assignment by participating in a country-wide symposium on the importance of managing soil fertility. The February 3 event was held in Islamabad and was co-sponsored by the United Nations Food and Agriculture Office (FAO) and attracted attendees from international organizations, academia, fertilizer companies, farmer associations, and government. NRCS's **Thomas Reinsch**, National Leader for World Soil Resources, provided a presentation on "The 4Rs and its use in the United States." The "4Rs," which refers to applying the Right fertilizer at the Right rate at the Right time and in the Right place, would improve fertilizer use efficiency, crop yields, and profit.

NRCS agronomist **Michael Kucera** reinforced Reinsch by following with his presentation on the "Importance of Soil Health and Soil Fertility Nexus." Kucera emphasized that proper management measures such as crop diversity, legume cover crops, limiting soil disturbance, maintaining surface cover, and having living plants throughout the year is essential to build soil health. Kucera also emphasized that access to accurate soil test and cropping data is fundamental for successful application of the 4Rs; determining the Right type and Right amount of fertilizer.

*NRCS's **Jon Fripp** and a local farmer discuss soil infiltration and properties. Photo by Cheryl Simmons, USDA NRCS.*

On February 4 and 5, the team visited field sites in Chakwal and Faisalabad to view soil fertility and watershed improvement practices. These field visits allowed farmers to learn about several conservation practices and share their experiences.

One example, that was especially useful was the no-till wheat planted into a legume cover crops versus conventional-till. Pakistani farmers saw firsthand that more moisture was conserved by using a no-till and less nitrogen was needed to grow wheat following a legume cover crop—vital knowledge to improve rainfed dependent agriculture and reduce nitrogen fertilizer needs.

On Feb. 3, more than 50 representatives met in Islamabad to participate in the Symposium on the Public-Private Partnership to Manage Soil Fertility. NRCS experts presented information on the balanced use of fertilizers; stressing use of the 4R's. The one-day symposium attracted government officials, academia, international organizations, and industry representatives. Photo courtesy of the Pakistan Agricultural Research Council – PR and Protocol.

*NRCS's **Mike Kucera** demonstrates soil slake test to video workshop participants, during a field session. Photo by Cheryl Simmons, USDA NRCS.*

*NRCS's **Jon Fripp** assists a participant during a HecRas training session. Photo by Bill Doan, U.S. Army Corps of Engineers.*

NRCS's **Cheryl Simmons**, National Conservation Technology Specialist, presented as part of a gender workshop to improve inclusion of women in Pakistani agricultural activities. The workshop took place February 10–13 and was organized by the International Center for Agricultural Research in Dry Areas (ICARDA). Simmons provided examples of women famers in U.S. agriculture, the role non-governmental organizations can have in promoting gender equality, and cultural similarities between the two countries.

NRCS civil engineer **Jon Fripp** returned to Pakistan to continue to serve as a technical expert on the USDA team for the Pakistan Strategic Dialogue on Water and the Watershed Rehabilitation and Irrigation Improvement in Pakistan. Fripp had repeatedly traveled to Pakistan to serve as a technical expert and has continued to provide guidance with development and implementation of these projects. On this trip, Fripp also partnered with the U.S. Army Corps of Engineers to lead training sessions on the Hydrologic Engineering Center River Analysis System (HecRas) for Pakistani water sector partners. Finally, Fripp co-authored the technical guidance document Small Scale Solar Powered Pumps for High Efficiency Irrigation, which was jointly produced and distributed by the Pakistan Agricultural Research Council, ICARDA, and USDA.

The NRCS staff assisted each other throughout the entire trip, while also supporting several other activities, such as a video workshop and a series of meetings with host country officials and representatives from international organizations.

FAS will review the success of the overall trip and determine future activities, but all indications show this was a beneficial investment and more NRCS contributions in Pakistan are likely.

NRCS's Jon Fripp, Michael Kucera, Thomas Reinsch, and Cheryl Simmons contributed to this report.

*ABOVE: NRCS's **Thomas Reinsch** (far right) and FAS's **Otto Gonzalez** (right) meet with staff from the Climate Change, Alternate Energy and Water Resources Institute of the Pakistan Agricultural Research Council. In addition, Reinsch and Gonzalez consulted during their February trip with representatives and officials about current and future activities, such as the publication progress of the UN FAO implemented "Soil Fertility Management for Sustainable Intensification in Pakistan" atlas. Photo courtesy of the Pakistan Agricultural Research Council – PR and Protocol.*

*NRCS's **Cheryl Simmons** leads a gender workshop with approximately 20 participants, increasing awareness about incorporating women in agriculture. Photo courtesy of Cheryl Simmons, USDA NRCS.*

GLOBAL SOIL PARTNERSHIP

Technical Panel Moves Partnership Forward

Responding to world hunger remains a top priority for governments and international organizations. Despite agriculture gaining a stronger voice in the overall discussion, many are not fully aware of the critical role of soil.

To address this, the Food and Agriculture Organization of the United Nations established, in 2012, the Global Soil Partnership (GSP) with the intention of incorporating scientific knowledge of soils into the decision making process. In 2013, the Intergovernmental Technical Panel on Soils (ITPS) formed to facilitate the scientific and technical dialogue.

NRCS's **Jon Hempel**, Director of the National Soil Survey Center, served as the U.S. representative on the panel that met in April 2015, in Potsdam, Germany. The 27 members of the panel are soil experts who represent different regions of the world; an attempt to develop a unified framework for sustainable global soil management.

The panel discussed a variety of topics, to include the approval of the work plans for the GSP's third pillar – research – (the GSP has five pillars of action), finalizing the World Soil Charter, and finalizing the Status of the World Soil Resources Report.
The results of the ITPS were presented at the annual Global Soil Partnership Plenary Assembly at the Food and Agriculture Organization, June 22–24, in Rome, Italy.

Read more about the GSP, ITPS, and the Plenary Assembly at www.fao.org/globalsoilpartnership/en/

NRCS's Jon Hempel contributed to this report.

SPAIN

Soil Science Division Collaboration with Spanish Soil Scientists for International Year of Soils

At the invitation of the Spanish Soil Science Society, **Michael Robotham**, National Leader for Technical Soil Services, represented the USDA-NRCS Soil Science Division as one of the featured speakers at an International Year of Soils-focused symposium in Madrid, Spain, co-sponsored by the Ramon Areces Foundation.

During his mid-April visit, Robotham engaged in extensive and wide-ranging discussions with soil scientists and senior leadership from academia and government regarding ongoing and proposed soil survey activities, soil data analysis and information development, and the use of soils data to inform land management in Catalonia and potentially throughout Spain.

"Building these international relationships in soil science and soil conservation and related areas, with a variety of partners, facilitates technical exchange and strengthens professional relationships and capacity to build stronger programs in the United States and other countries," said Robotham.

The ongoing collaborative efforts between the Soil Science Division and Spanish counterparts may lead to the exchange of technical ideas as soil and climate similarities exist in areas of the western United States.

NRCS's Michael Robotham contributed to this report.

Michael Robotham (third from left) and fellow panel members (from left) moderator Jaume Boixedera, Antonio Martinez Cortizas and Eduardo Constantini answer questions from the audience on April 17 at the International Year of Soils symposium in Madrid. Photo courtesy of Jaume Porta, Spanish Soil Science Society.

CHILE

Conservationists Learn Importance of Soil Surveying

Susan Southard *(right), a soil scientist with USDA's Natural Resources Conservation Service, observes students interpreting salt marsh soils on the outskirts of Concepcion, Chile. At this site, students discussed low soil strength, corrosion, subsidence and drainage consequences. Photo courtesy of University of Concepcion.*

The USDA's Natural Resources Conservation Service (NRCS) started the New Year by building capacities in South America. In January, NRCS soil scientist **Susan Southard** traveled to Chile to help teach a soil survey methods class at the University of Concepcion.

The nine-day course included classroom instruction, but Southard's main contributions were during the field visits. Soil surveying of forest land and park reserves are uncommon in Chile and Southard helped students understand how to collect and evaluate soil information. "The soil survey is the foundation to understanding the effectiveness of conservation practices on erosion and soil quality," said Southard.

The students, consisting of professional foresters and other natural resource conservationists, learned various aspects of soil surveying, such as mapping and interpretive ratings; valuable information for making soil management decisions.

NRCS's Susan Southard contributed to this report.

This type of landscape with the native Araucaria tree was the focus of soil property investigations during the class. Soil mapping was performed in the southern Andes Malalcahuello National Preserve, Chile. Photo by Susan Southard, USDA NRCS.

RIGHT: This visual left by a Chilean student may only last until the next car wash, but soil scientist ***Susan Southard*** *left a permanent mark with her soil survey class; building agricultural and land management capabilities. Photo by Susan Southard, USDA NRCS.*

KENYA

Proposed Agricultural Storage Facilities to Improve Value Chains and Local Economy

Agriculture is the centerpiece of Kenya's economy. According to the CIA World Factbook, agriculture contributes 25 percent of the gross domestic product and approximately 80 percent of Kenyans work in this sector.

Supportive countries and organizations are looking at ways to strengthen Kenya's agriculture, but not only to improve food security. The socioeconomic value of improving Kenya's agricultural performance is significant, as it touches the daily life of the majority of the population.

Stakeholders visit a potential construction site. Vu helped assess site conditions and construction capacities. Photo by Phuc Vu, USDA NRCS.

Soil quality and irrigation are factors that influence crop yields and conservationists continue to assist with developing improved farming techniques. However, there is also an infrastructure component that is not always considered; proper food storage. "In Kenya, approximately 40 percent of dairy production is lost due to the lack of cold storage," stated NRCS civil engineer **Phuc Vu**.

In February, Vu traveled to Kenya as the senior engineering advisor for several USAID projects that would address this problem. USAID-Kenya envisions that activities in support of the Kenya Agricultural Value Chains (KAVES) project, will lead to the construction of multiple storage facilities.

Vu visited 17 potential construction sites throughout the country. His resource inventories and site assessments will assist USAID project and program managers with concept finalization and will hopefully soon lead to project groundbreaking.

NRCS's Phuc Vu contributed to this report.

BELOW LEFT: Milk collection at a Kenyan facility; lack of cold storage capabilities lead to the loss of approximately 40 percent of dairy production. Photo by Phuc Vu, USDA NRCS.

BELOW RIGHT: More than 15 percent of grain production is lost at undersized Kenyan storage facilities. Excess grain is stored outside and is more vulnerable to pest and disease infestation. Photo by Phuc Vu, USDA NRCS.

OTHER ACTIVITIES

Australia

On May 29, **Robert Bonnie**, USDA Undersecretary for Natural Resources and Environment, **Wayne Honeycutt**, NRCS Deputy Chief for Science and Technology, and **David Smith**, NRCS Deputy Chief for Soil Science and Resource Assessment, met with the Australian Government's National Advocate for Soil Health, The Honourable Michael Jeffery. The meeting provided an opportunity for the group to intensify discussions about the critical relationship between soil and sustainable productivity, climate change, and food security. Jeffery, a former Governor-General of the Commonwealth of Australia and a retired Major-General of the Australian Army, Bonnie, Honeycutt, and Smith all served as speakers at the Global Soil Security Symposium at Texas A&M University in the previous week.

NRCS's **Michael Strobel**, Director of the National Water and Climate Center, attended the Soil, Big Data, and the Future of Agriculture conference on June 25, in Canberra, Australia. Strobel was asked to give a presentation on "Drought proofing America – the U.S. National Soil Moisture Network."

Canada

Paul Youngstrum, NRCS Great Lakes Coordinator, traveled to Canada for meetings in February and June. Canada and the United States signed the Great Lakes Water Quality Agreement in 2012 and one topic of ongoing discussion pertains to phosphorus reduction targets for Lake Erie.

*NRCS resource conservationist **Karen Hoffman** gives a presentation at the Eco Farm Day conference in Cornwall, Ontario, Canada. The Feb. 3 event, themed "Healthy Land, Healthy People, Healthy Profits," provided Canadians with information about organic farming. The organizers were aware of a previous speaking engagement of Hoffman and asked her to give two presentations about grazing, during the livestock segment of the conference. Photo courtesy of Karen Hoffman, USDA NRCS.*

Wetland restoration engineer **Caroline Clarin**, wetland biologist **Alice Klink**, and Red River Basin Coordinator **Keith Weston** were three NRCS participants at the 32nd Annual Red River Basin Land and Water International Summit, which was held from January 20–22 in Winnipeg, Canada. The conference provided participants with valuable information to provide efficient flood control and improve water quality.

Iraq

*NRCS National Wetland Mitigation Specialist **Shaun Vickers** (center), from the Ecological Sciences Division, meets with a group from Iraq on April 14, 2015, in Washington, D.C., providing them with information on wetland protection and management. Photo courtesy of USDA FAS.*

Philippines

*ABOVE: NRCS civil engineer **Jon Fripp** (left) provides guidance during a water quality sampling and evaluation exercise. Fripp traveled to the Philippines in April, upon request from USAID and the U.S. Forest Service, to provide training in stream bank restoration techniques. Photo courtesy of Jon Fripp, USDA NRCS.*

South Africa

Diane Stott, NRCS National Soil Health Specialist, was invited by the University of Fort Hare in Alice, South Africa, to visit a climate smart crop production project. Stott's trip, January 23–February 7, included giving a presentation during a seminar, advising on greenhouse gas sampling, and participating in a project steering committee meeting with stakeholders.

Spain

NRCS's **Norman Widman**, National Agronomist, traveled to Cordoba, Spain to serve as a speaker on June 24, at the National Spain Soil Conservation Day Conference. Widman's presentation on NRCS conservation programs and the nation-wide structure impressed the audience, especially as the Spanish government does not have a centrally coordinated conservation program to assist farmers. Following the conference, Widman also conducted site visits to observe research experiments in southern Spain. Erosion was the common production challenge on olive plantations, peach and nectarine orchards, and grape vineyards.

Ukraine

*BELOW: NRCS's **Rob Sampson**, National Water Management Engineer, talks irrigation with a delegation from Ukraine on March 23. The Ukrainians were very interested in learning from American experiences in managing irrigation, infrastructure investments, and water rights. Photo courtesy of USDA NRCS.*

PREVIOUS REPORT PERIOD

MEXICO: Climate Change Concerns Brings U.S. and Mexico Closer, Meet with Mexico's Secretary of Agriculture

Upon request from the Mexican government, three NRCS employees traveled to Mexico in December 2014, to discuss a variety of topics related to climate change. **Carlos Suarez**, NRCS State Conservationist, **Luana Kiger**, Special Assistant to the State Conservationist, and **Greg Norris**, Assistant State Conservation Engineer, researched technology for possible application in California, provided technical review of projects, and participated in a series of meetings with government officials, during their trip December 7–12.

The Mexican government was very interested in learning about the U.S. Department of Agriculture's Climate Change Hubs for possible replication, how California promotes and implements renewable energy, and development of agriculture-industry friendly policies. The participation of Secretary Enrique Martinez Y Martinez, Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food, highlights the value Mexico placed in this exchange of scientific and technical information with the United States.

NRCS's Carlos Suarez contributed to this report.

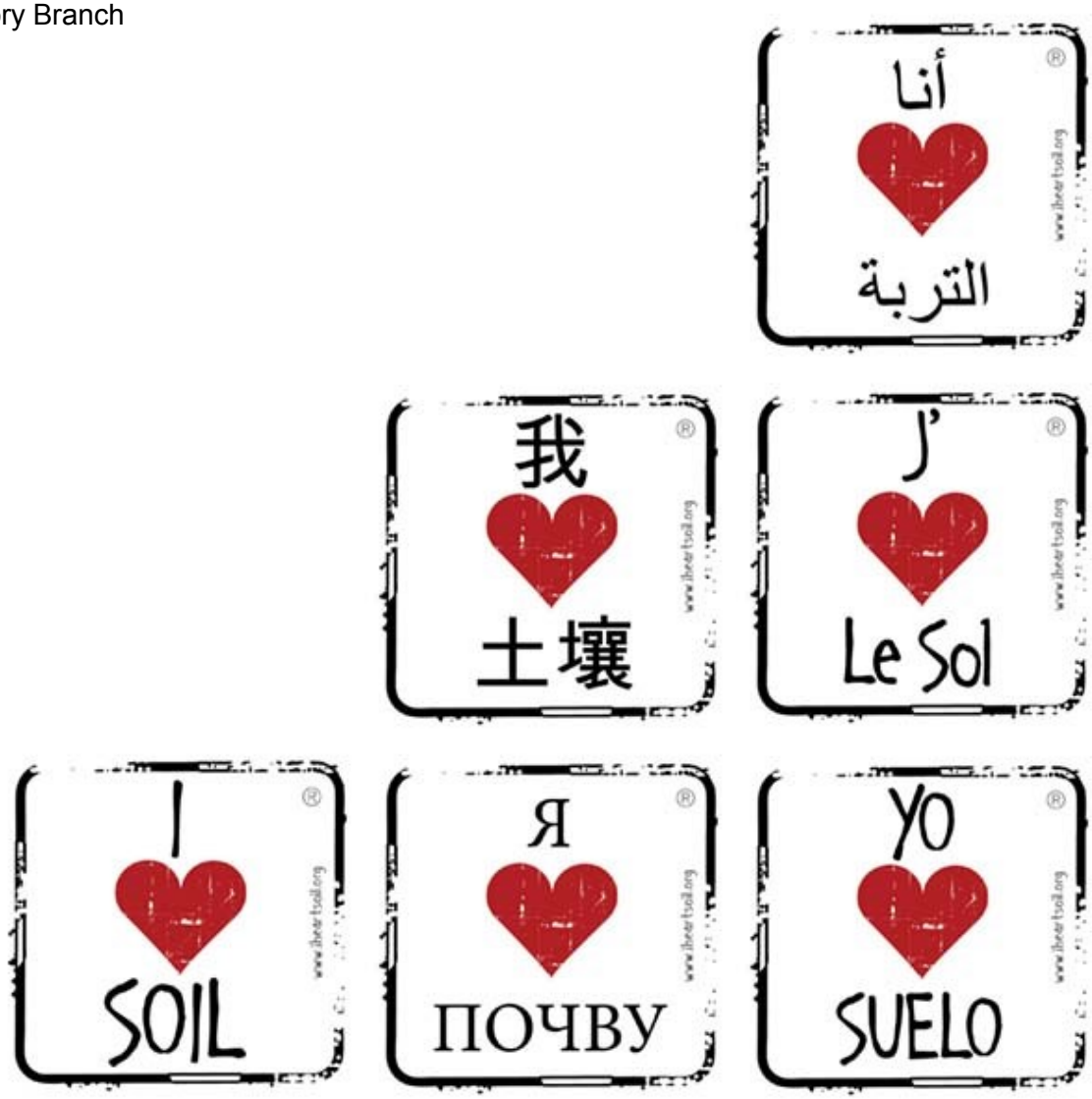
***Carlos Suarez** (blue shirt), NRCS State Conservationist, listens to the manager of La Cienguita Dairy (right) explain manure separation and the manure digester operation at his facility. Opportunities like this are very beneficial, especially as California moves forward with implementing digesters throughout the state. Two California dairy owners, who have manure digesters, also traveled to Mexico for the site visits. Photo courtesy of Carlos Suarez, USDA NRCS.*

CHINA: The 6th Global Workshop on Digital Soil Mapping

The 6th Global Workshop on Digital Soil Mapping (DSM) was organized by The International Working Group on Digital Soil Mapping and State Key Laboratory of Soil and Sustainable Agriculture, Institute of Soil Science, Chinese Academy of Sciences.

The workshop took place in Nanjing, China, from November 11–14, 2014. The major objectives of the workshop were to review and discuss the state-of-the-art in DSM and to explore strategies for bridging research, production, and environmental applications.

NRCS's **Zamir Libohova**, research soil scientist from the Soil Survey Research and Laboratory Branch at the National Soil Survey Center (NSSC), participated in the workshop and presented his work on quantifying uncertainty in soil-property predictions for the Global Soil Map using legacy data.

Read Libohova's full article in the NSSC newsletter, issue 70 at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/partnership/ncss/?cid=nrcs142p2_054340

The Digital Soil Mapping workshop participants visited the Soil Museum, where they were introduced to the major soils of China. The soil monoliths were displayed along with their landscapes, which allowed for an easy understanding of soil-landscapes models. Photo by Zamir Libohova, USDA NRCS.