



INTERNATIONAL PROGRAMS DIVISION



IPD Newsletter  
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*COVER PHOTO: As part of rangeland management and restoration efforts, the Jordanian Ministry of Agriculture has set aside land as reserves. During a February 2, 2017, field visit, NRCS Texas Plant Materials Specialist **Robert Ziehr** assessed conservation efforts at a rangeland reserve in Northern Jordan. This area is patrolled by security to prevent unauthorized grazing and serves as a nursery source of potential rangeland restoration plants. **SEE ENTRY ON PAGE 8.** Photo by Robert Ziehr, 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 included providing technical assistance and exchanging scientific and technical information.

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#### IPD Newsletter

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## RUSSIA

### *Scientists Meet For Urban Soils Conference; NRCS Contributes To Publication*

Natural Resources Conservation Service (NRCS) New Jersey State Soil Scientist **Richard Shaw** and NRCS California Soil Scientist **Randy Riddle** participated in the International Union of Soil Sciences (IUSS) SUITMA 9 conference, held in Moscow, May 22-26, 2017. The conference acronym stands for the ninth gathering of the working group to discuss Soils of Urban, Industrial, Traffic, Mining, and Military Areas. The guiding theme was “Urbanization: a challenge and an opportunity for soil functions and ecosystem services.”

More than 200 international scientists joined for keynote speeches, presentations, information sharing, and professional networking at the biennial event. Participants engaged in scientific discussions related to urban agriculture, storm water management, and ecosystem services provided by urban soils, among others. During thematic sessions, Shaw and Riddle gave individual presentations based on scientific data from soil surveys in urban environments and on how technical soils information assists with planning. Shaw introduced the participants to “Carbon Stocks in New York City Soils.”

Riddle gave a presentation on the results of the recently published “Soil Survey of Los Angeles County,” he led as the project leader. He also took the opportunity to highlight the Web Soil Survey website, managed by NRCS, as the official source for soil survey data and discussed the mapping approach used in Los

Angeles. “Several countries are working on soil mapping in urban areas and there was strong interest in mapping achievements using the methodology applied in Los Angeles,” said Riddle.

Aside from the SUITMA conference itself, Shaw and Riddle also participated in field activities. They received the opportunity, together with attendees from the New York City Urban Soils Institute (USI), to join officials from Russia’s Ministry of Agriculture and the People’s Friendship University of Russia (RUDN) for an unscheduled tour of the Lenin State Farm, May 23. The 3,700-acre farm, located in suburban Moscow, is also the largest strawberry farm in Russia and provides housing, schools, and hospital facilities onsite for the approximately 300 local farm workers.

A day-long field tour of New Moscow on May 24, provided the NRCS soil scientists with an opportunity to visit an active residential construction site on the outskirts of Moscow, an urban forest soil, a city park soil in old Moscow, and a rooftop garden.

New Moscow is an ambitious project that will double the size of the city by creating a new district, designed to improve overall transportation, efficiency, and quality of life. “The goal of the Russian government is to decentralize the Moscow metropolitan population, which stands at a density of 456 residences per square kilometer, by developing a mega-region of mixed land-use with urban forests,” said Shaw.



*NRCS California Soil Scientist **Randy Riddle** (left) and France's University of Lorraine Geologist **Geoffroy Séré** (right) examine a soil profile with a thin surface layer of human-transported materials during a field tour in New Moscow, May 24, 2017.*

*Photo by Richard Shaw, USDA NRCS*

The new district will also incorporate the existing natural system of waterways and forests to enhance conservation efforts, such as managing runoff and lowering the carbon footprint. While traveling by bus, construction was visible in every direction.

Shaw had also made additional arrangements to extend his time in Russia for more scientific collaboration. He was previously contacted by the RUDN to serve as one of the lecturers for 15 international students during the pre-conference "Monitoring, Modeling and Managing Urban Soils" summer school, May 18-21. His session, "Urban Soil Survey: Objectives, Challenges, and Applications," focused on comparing and contrasting the surveys from New York City and Los Angeles. Shaw also assisted with judging the team projects of the students. The summer school is a joint initiative among the RUDN, USI, and Brooklyn College.

Lastly, Shaw participated in a post conference tour, May 26-30, to visit the Central Chernozemic Region, the breadbasket of Russia. The black colored soil is very fertile and produces high yields, which is why they are also referred to as the "Czar of Soils." It is here where Russia's father of soil science, **Vasily Dokuchaev**, studied chernozems in the late 19th century. As part of the tour, Shaw also visited one of the largest open pit iron mines in the world, where he could observe the Kursk Magnetic Anomaly.

The SUITMA experience provides an excellent opportunity to advance soil science as it brings together some of the most prominent urban soil scientists in the world. Fortunately, collaboration is not confined to the professional gathering that takes place every two years. The dialogue is ongoing as scientists share research and explore concepts by phone, email, or in-person meetings. IUSS' 2017 textbook "Soils within Cities –

Global approaches to their sustainable management," is a recent example of dedicated SUITMA scientists working together. Among them are also contributors from NRCS, such as Shaw (co-author, co-editor), Riddle (co-author), NRCS Connecticut Soil Scientist **Jacob Isleib** (co-author), and NRCS National Leader for Soil Survey Interpretations **Maxine Levin** (co-author, chief editor).

For Riddle and Shaw, the trip to Russia provided them with new information and served as a valuable networking opportunity with international experts. Both will be able to contribute to the strengthening of the agency's institutional knowledge, in order to better serve the needs of urban communities throughout the USA.

**Richard Shaw and Randy Riddle contributed to this article.**

# CENTRAL ASIA: TURKMENISTAN, UZBEKISTAN

## *Cochran Fellows Explore Soil Enrichment Practices For Arid Conditions*

Technical experts from the Arkansas and Texas Natural Resources Conservation Service (NRCS) collaborated with several organizations to provide training for twelve visiting fellows from Turkmenistan and Uzbekistan, June 10-24, 2017. A series of activities, consisting of classroom instruction, tours, and field visits, aimed to increase understanding of key concepts to address agricultural production challenges in arid climate, such as higher soil and water salinity. During the two weeks, the delegation, consisting of government officials, researchers, and scientists, also observed agricultural practices successfully implemented under environmental conditions similar to their Central Asian countries.

The University of Arkansas at Pine Bluff (UAPB) submitted the proposal to host the training through the Cochran Fellowship Program of the U.S. Department of Agriculture's Foreign Agricultural Service. NRCS was among the organizations asked to assist with implementing the curriculum. Together, U.S. agricultural partners, such as the Arkansas Farm Bureau and Texas A&M AgriLife Research, shared their knowledge to contribute to the learning experience, "One Framework, Multiple Approaches: Utilizing the Strengths of the U.S. Land-Grant System to Enhance Soil Enrichment and Sustainable

Agriculture Practices in Turkmenistan and Uzbekistan."

Staff from the NRCS Arkansas State Office gave several presentations during the first week. State Conservationist **Mike Sullivan**, State Conservation Engineer **Walt Delp**, State Soil Scientist **Edgar Mersiovsky**, Assistant State Soil Scientist **Nelson Rolong**, and Resource Conservationist **Corey Farmer** each provided valuable information as the fellows learned about NRCS and the state's role in conserving natural resources, how the agency assists land owners by advocating voluntary conservation efforts, irrigation water management, as well as soil health and enrichment.

Helping foreign governments build their policy and regulatory capacity is critical. Although NRCS is not a regulatory agency, the staff explained how the regulatory framework in the United States allows NRCS to encourage and implement science-based conservation practices, for example, through incentive programs. Referring to the soils in Turkmenistan and Uzbekistan, Mersiovsky noted, "The soil is poor in minerals and the

problem is aggravated by heavy salinization caused by intensive cotton growing and tilling. The visiting fellows were interested in how farmers in Arkansas utilize saline soils and how the NRCS assists."

During the second week, the delegation traveled to Texas for additional activities. NRCS Texas Resource Soil Scientist **Amanda Bragg**, District Conservationist **Laurie Meadows**, and Senior Regional Soil Scientist **Wayne Gabriel** further enhanced the program by providing additional presentations and facilitating field visits that focused on soil survey, conservation planning, sharing of lessons learned, and identifying practical recommendations to enhance agricultural production in Turkmenistan and Uzbekistan.

Over the course of three days, the fellows visited several farms to observe real-world solutions for managing the high salinity of soils and irrigation strategies.

*Cochran Fellows from Turkmenistan and Uzbekistan listen to farmer Nathaniel Ensiz (right) as he explains the conservation benefits of reduced tillage and cover crops used on his Saragosa farm, June 20, 2017. Ensiz improves soil health by introducing wheat as a cover crop following the three to four years of alfalfa.*

*Photo by Amanda Bragg, USDA NRCS*



The farm of **Nathaniel Ensz** in Saragosa included alfalfa, cotton, wheat, corn, and livestock. It was a good opportunity for the delegation to see best management practices, such as no-till farming, cover crops, crop rotation, and improved irrigation techniques in a climate and landscape very similar to their own. Ensz has been converting flood irrigated fields to drip and earthen or concrete-lined irrigation ditches to pipelines. According to Bragg, “Traditional practices, which includes conventional tillage, routine land leveling, and flood-irrigation with saline water, have concentrated salts along the soil surface. To flush salts below the root zone, good soil structure and infiltration is essential.”

Ensz focuses on residue and nutrient management to improve his soil health. By incorporating a wheat cover crop and cotton into

his alfalfa hay production, he maintains a protective layer, or armor, for the soil surface, improves soil structure, and promotes the soil biology. “Alfalfa grown for hay and cotton are his primary cash crops. The wheat, along with corn and forage sorghum, are grown with improving soil function in mind,” notes Bragg.

While visiting a pecan orchard at Saragosa the delegates received more insights from another successful farmer, **Fernando Jalife**, who recently converted his orchard to drip irrigation. “Pecans are traditionally flood-irrigated. As water resources become more limited, improving the efficiency of irrigation systems is crucial,” explained Meadows—who assisted UAPB in developing the curriculum for the Texas-based activities along with Bragg and Gabriel.

The final two days took the fellows to the Texas A&M AgriLife Research and Extension Center in Uvalde. The fellows received additional presentations, facility tours, and observed technologies, such as greenhouses to improve production of food crops.

At the end of the two week program, the Cochran participants departed for their home countries with new insights. They will have the opportunity to adopt some of the lessons learned or further modify to fit their context, in order to help their government and population sustainably manage natural resources.

**Amanda Bragg and Edgar Mersiovsky contributed to this article.**

## LATIN AMERICA: MEXICO, PERU, URUGUAY

### *Exchange Provides New Environmental Perspectives*

**A**cademics, technical experts, and government officials from four countries—Mexico, Peru, Uruguay, and the USA—continue to increase their knowledge on conservation challenges through participation in a unique exchange program. The Environmental Sustainability Professional Fellowship Program, which is managed by the Institute for Training & Development, provides participants the opportunity to host and visit foreign counterparts and learn about their efforts in managing natural resources. Overall, a grant from the U.S. Department of State funds the exchange program.

In support of this ongoing international collaboration, Natural Resources Conservation Service (NRCS) Massachusetts State Resource Conservationist **Thomas Akin**, traveled to Uruguay and Peru, April 17-28, 2017. A well-organized itinerary provided the fellows an interesting and demanding learning experience.

In Uruguay, the delegation received a briefing from Agricultural Scientist **Ricardo Romero**, a U.S. Department of Agriculture representative from the U.S. Embassy Montevideo. Romero informed about his responsibilities at the nexus of

animal health and trade, where his work primarily focuses on maintaining market access for American agricultural commodities, but also to support, for example, the demand for high-value Uruguayan meat products.

Other meetings occurred with city officials, representatives from the dairy industry, and university officials. During two field visits, the fellows observed water quality problems stemming from agriculture and suburban sprawl. Their hosts explained the challenges they were facing from sedimentation and high nutrient runoff and the impact it was having on the ecology.

In the nation's capital itself, officials are seeking ways to improve their waste management program, as very little household waste is recycled. A tour of the municipal composting operation did show a successful process, as organic waste from local food manufacturing businesses were composted with additional materials collected by the city's public works department. In turn, the city sells the finished compost or uses it for landscaping projects they maintain.

A third visit took the group to a small dairy farm outside Montevideo. Here, forty Holstein cows and another 40 heifers and calves grazed on approximately 180 acres. Akin was impressed with the efficiency of the operation: "The dairy animals showed excellent body condition, in spite of grazing high protein alfalfa pastures. After each milking, cows had unlimited access to sorghum baleage before they were turned into the alfalfa and wheat pastures." Additionally, the mild climate allows for the cows to remain on pasture year-round, except twice per day as part of the one-hour milking process. Considering this, Akin continues, "The farmer did an excellent job managing the grazing animals. None of the pastures viewed were over-grazed."

In Peru, the fellows traveled to Trujillo to observe conservation challenges in a different environment. During visits to small organic farms, they learned more about hand cultivation and weed control as certification requirements prohibit the use of herbicides. Instead of monocultures, farmers diversified their crops, which included strawberries, asparagus, avocados, and mangoes. It was also noted that women managed

many farms, with one organic farmer cooperative reaching approximately 40% membership.

Trujillo also sits on the coast and is faced with direct and indirect impacts of rising sea levels. The consequences of salt water intrusion for the ecosystem are significant, but so are the socio-economic impacts. After visiting select sites, Akin states: "The loss of the wetlands is reducing the amount of fresh water reeds that local fishermen harvest to build their fishing boats. In turn, they are forced to move further up into the landscape to dig new wetlands. However, many young people are choosing to abandon fishing altogether."

Another challenge for the coastal city are floods caused by El Niño events. The fellows visited several neighborhoods that had experienced flood damage from torrential rain in March—Peru had not endured such intense weather since 1998. The fellows observed damage, primarily to roads and infrastructure. It is likely that urbanization and soil erosion contributed to the resulting landslides.

The group also participated in a day-long seminar at the University of Trujillo. Akin, and some of the other fellows, gave presentations on environmental challenges they were facing and what their countries were doing to mitigate. In Lima, additional meetings encouraged more collaboration on environmental sustainability. Representatives from the U.S. Embassy and local non-governmental organizations added to the discussion. During a half-day seminar, hosted by the Peruvian Ministry of Environmental Protection, the fellows shared more information on their professional contributions to address various conservation

challenges in their home countries.

For Akin, the trip had many anecdotes. The field visits revealed many interesting environmental challenges and the composition of the delegation further intensified the professional discussions. "In both Montevideo and Trujillo we met and dined with fellows who had traveled to the US, and we learned of progress they were making on their action plans in their home countries," explained Akin. Participants of the exchange program benefit culturally and professionally from the experience. For example, the Assistant Director of the Peruvian Ministry of Environmental Protection, who hosted the half-day seminar, had previously participated in the program.

Another strong supporter of the program is NRCS Massachusetts State Conservationist **Christine Clarke**. Under her leadership, the State Office has actively contributed to the program since 2015, hosting five fellows from Peru and Uruguay. Clarke herself traveled as a fellow to Mexico for two weeks in January 2016. There she explored environmental sustainability challenges in the Chiapas region, which borders Guatemala.

Both Clarke and Akin appreciate the opportunity of the Exchange Program and the value the engagement has for the fellows. NRCS MA looks forward to ongoing interactions to help environmental professionals address resource conservation concerns, as well as apply lessons learned in the USA.

**Thomas Akin contributed to this article.**

## OTHER ACTIVITIES

### *Australia*

NRCS California State Conservationist **Carlos Suarez** accompanied an agriculture policy delegation, led by CA Department of Food and Agriculture Secretary Karen Ross, to Australia March 17-25, 2017. During the visit to Victoria, New South Wales, the group, consisting of U.S. officials, academia, and industry representatives, learned about agricultural challenges in a climate very similar to California. They received information on water management policies, soil health, and carbon farming, to name a few. Additionally, field visits provided valuable opportunities to observe conservation practices and systems successfully used on farms and by industry. In particular, a massive \$70 million hazelnut operation, established nearly four years ago by a multinational corporation, further demonstrated how to effectively incorporate climate-smart soil and water conservation technologies, build stronger value chains, and the economic impact of agricultural production.

### *Canada*

NRCS technical experts joined the Agricultural Research Service, National Institute of Food and Agriculture, and Forest Service to participate in a binational workshop with Agriculture and Agri-Food Canada, January 11-12, 2017. USDA's Office of the Chief Scientist hosted the Workshop on Cooperation and Agricultural Resilience for the nearly 40 participants in Beltsville, MD. The ongoing engagement with Canada allowed experts to review the significance of soil biology in resilience, address vulnerabilities of agroecosystems, and practices to enhance

resilience and economic productivity. NRCS was represented by National Nutrient Management Specialist **Dana Ashford-Kornburger**, Conservation Effects Assessment Project Watersheds Assessment Component Leader **Lisa Duriancik**, National Pest Management and Organic Systems Specialist **Lindsay Haines**, then Acting National Leader for World Soil Resources **Jessica Lené**, Rangeland Management Specialist **Loretta Metz**, and International Programs Division Director **Lillian Woods Shawver**.

NRCS Great Lakes Coordinator **Rick Duff** participated in the Nutrient Annex Subcommittee meeting, February 7-8, 2017, in Windsor, Canada. Members shared information on the development status of individual domestic action plans to reduce phosphorus levels of Lake Erie, which is in support of the U.S.-Canadian Great Lakes Water Quality Agreement of 2012. Participation in the well-coordinated approach is critical, as U.S. interests from multiple stakeholders and jurisdictions are assessed and incorporated, as well as those of the Canadian partners.

Three technical experts from the NRCS National Design, Construction, and Soil Mechanics Center, Ft. Worth, Texas, participated in committee meetings, June 11-14, 2017, in Toronto, Canada. Geotechnical Engineer **Ben Doerge**, Construction Engineer **Joe Freeland**, and Hydraulic Engineer **Karl Visser** engaged in professional dialogues during the ASTM International Meeting, which establishes and revises

voluntary standards for methods and products. Doerge followed various activities related to the Geosynthetics track, while Freeland and Visser participated in the Soil and Rock sessions. Additionally, Freeland also attended activities from the Concrete and Concrete Aggregates track. Participation in these meetings allows NRCS to influence international standards and learn new developments as they relate to construction and conservation engineering. The event draws international attendance from industry, consultants, and government agencies.

### *Italy*

The Global Soil Organic Carbon Symposium took place March 21-23, 2017, at the United Nations Food and Agriculture Organization headquarters in Rome, Italy. NRCS National Soil Survey Center Soil Scientist **Skye Wills**, along with more than 450 participants from 111 countries, explored the direct and indirect benefits of properly managing and increasing soil organic carbon. A particular focus was given to black soils, such as Mollisols and Chernozems. Wills contributed during a parallel session by presenting results of the Rapid Carbon Assessment Project, which was launched by NRCS in 2010, to scientifically and statistically estimate soil carbon stocks in the USA. The symposium was organized by request of the Intergovernmental Technical Panel on Soils (ITPS) of the UN Global Soil Partnership. Other NRCS scientists have previously contributed to the work of the ITPS.

## Japan

A representative from Japan's Ministry of Agriculture, Forestry and Fisheries met with NRCS Financial Assistance Programs Division (FAPD) staff in Washington, DC, January 23, 2017. FAPD Director **Mark Rose**, Acting Environmental Quality Incentives Program Team Lead **Travis Thomason**, Acting Conservation Stewardship Program Team Lead **Richard Zetterberg**, and Acting Regional Conservation Partnership Program Team Lead **Christi Fisher** spoke about the 2014 Farm Bill and how individual conservation programs benefit farmers, ranchers, and private landowners.

## Jordan

NRCS Texas Plant Materials Specialist **Robert Ziehr** accompanied a small team, led by the Foreign Agricultural Service, to the Badia region of Jordan, January 26 – February 8, 2017. Droughts, limited freshwater resources, and overgrazing were significant environmental challenges the team reviewed during the scoping trip. Ziehr served as a consultant, assessing in-country capabilities and determining practical rangeland restoration methods for possible future capacity building activities. Additionally, his landscape conservation planning efforts

incorporated the Bedouin traditions of livestock breeding and herding.

## Kazakhstan

NRCS staff from national headquarters and the state of Indiana supported requests to meet with four visitors from Kazakhstan, for presentations on sustainable agriculture. Staff from the NRCS Ecological Sciences Division at national headquarters met with the group, May 16, 2017, in Washington, DC. NRCS National Nutrient Management Specialist **Dana Ashford-Kornburger** and NRCS Acting National Agronomist **Steve Boetger** provided a presentation on the components of sustainable agriculture, implementing conservation practices to address on-farm issues and production limitations, as well as reduced tillage systems, residue management, and no-till equipment. On May 18, 2017, presentations took place at Purdue University, IN, where NRCS Central Region Soil Health Division Team Leader **Barry Fisher** and NRCS Indiana State Resource Conservationist **Shannon Zezula**, further explored the topic with the visitors. The engagement was in support of the State Department's International Visitor Leadership Program.

## Netherlands

NRCS National Soil Survey Center Research Soil Scientist **Zamir Libohova** attended the Pedometrics Conference, June 26 -July 1, 2017, in Wageningen, Netherlands. The gathering drew nearly 200 international scientists who shared perspectives on predicting soil class and property maps. Zamir contributed to the discussion by holding a presentation titled, "The Anatomy of Errors from Soil Property Measurements and Predictions."

## Russia

On March 17, 2017, three representatives from the People's Friendship University of Russia (RUDN) visited the NRCS New Jersey State Office to meet with State Soil Scientist **Richard Shaw** and Assistant State Soil Scientist **Edwin Muñiz**. NRCS staff provided an overview of the agency and assistance programs, discussed the roles and responsibilities of soil scientists, demonstrated how the agency's Web Soil Survey program provides the public with access to soil data and information, and reviewed urban conservation efforts. The visitors were very impressed by the accessibility of soil survey data and the technical soils assistance the agency can provide directly to urban communities in New Jersey and New York City. The Russians also



*Attriplex hallimus*: is an important rangeland plant in Jordan, which helps conserve rangeland natural resources and provide fodder for Bedouin shepherds to sustain their sheep. NRCS Texas Plant Materials Specialist **Robert Ziehr** observed this plant at a U.S. Forest Service nursery in Jordan, February 2, 2017, where it is grown as a rangeland restoration plant.

*Photo by Robert Ziehr, USDA NRCS*

took the opportunity to discuss the scope of teaching and research activities at RUDN, such as efforts in urban ecology that include monitoring and assessment of air, water, and soil in the greater Moscow area, the evaluation of ecosystem services provided by soils, and examining carbon fluxes in urban soils. RUDN personnel have been collaborating for several years with Brooklyn College on urban soil-related publications, conferences, and teaching projects, like an urban soils summer school, planned to be an annual event.

NRCS' **Dan Lawson**, who is currently serving in a two-year assignment as the National Leader for the USDA Climate Hubs, met with six visitors from Russia, April 5, 2017, in Washington, DC. Lawson was called upon to discuss the purpose and regional approach of the Climate Hubs, as well as agency efforts to encourage sustainable agriculture. The meeting was organized in support of the U.S. Department of State's International Visitor Leadership Program.

### *Uganda*

NRCS National Soil Survey Center Director **David Hoover** welcomed a delegation from Uganda to the research facility in Lincoln, Nebraska, January 13, 2017. The group received information regarding conducting a national soil survey program and its benefits. As part of the full-day event, NRCS technical experts discussed several topics with the visitors, such as ecological investigations, methods used to develop scientific interpretations, delivering natural resources

information to the public, and the agency's World Soil Resources program. A tour of the NRCS national soil survey laboratory was included. This meeting was requested by Iowa State University's Center for Sustainable Rural Livelihoods.

### *United Kingdom*

NRCS Research Soil Scientist **Mike Wilson** met with a Nuffield Farming Scholar from the United Kingdom, February 9-10, 2017. During discussions at the National Soil Survey Center in Lincoln, Nebraska, Wilson addressed dynamic soil properties and sustainable practices used in the mid-west.

### *Multinational*

On January 31, 2017, NRCS Energy and Climate Change Analyst **Rebecca MacLeod** informed a multinational delegation about voluntary conservation programs the agency offers through the Farm Bill. One example is the Environmental Quality Incentives Program (EQIP) On-Farm Energy Initiative, which allows for the development of site-specific Agricultural Energy Management Plans. MacLeod explained how these audits are used by agricultural producers to secure assistance for the purchase of energy efficient equipment. Among the 25 participants, comprised of government and non-government officials, were representatives from Bahrain, Germany, Ghana, Iceland, Papua New Guinea, Slovakia, and Vietnam, to name a few. The presentation was part of a request from the U.S. Department of State International Visitor Leadership Program.