

**U.S. Environmental Protection Agency (EPA)
Farm, Ranch, and Rural Communities Federal Advisory Committee (FRRCC)
Meeting**

**January 21–22, 2015
EPA Potomac Yard Conference Center
Crystal City, VA**

EXECUTIVE SUMMARY

WEDNESDAY, JANUARY 21, 2015

Call to Order and Opening Remarks

Sheritta Taylor, Acting Designated Federal Officer (DFO)

Dr. Steven Balling, Committee Chair

Ms. Sheritta Taylor (FRRCC DFO) called the meeting to order at 9:00 a.m. and welcomed Committee members.

Dr. Steven Balling (Del Monte Foods), Chair of the FRRCC, also welcomed the Committee members and other participants to the meeting. He noted that 3 years ago, in December 2011, the FRRCC presented its 85-page report on water quality to the EPA Administrator, a major accomplishment, and the report was well received. Since then, EPA has indicated on a number of occasions its interest in pursuing the FRRCC's recommendations. He emphasized that it is extremely important that the agricultural and rural communities make clear their views on environmental issues and how agriculture differs from other regulated sectors. He stated that a panel of three Washington, D.C.-based representatives of agricultural organizations had been added to the agenda for Thursday to speak about issues they deem important. The intended meeting outcome is to develop a work plan and goals for the FRRCC as it responds to EPA Administrator Gina McCarthy's charge. He introduced Ron Carleton, the new Agricultural Counselor to the Administrator.

Welcome and Overview of Charge to the Committee

Ron Carleton, Agricultural Counselor to the Administrator, EPA

Gina McCarthy, EPA Administrator (tentative)

Mr. Ron Carleton (EPA) welcomed the Committee and noted that he was in his third week at his new position. He added that he came to the job having served as Colorado's Deputy Commissioner for Agriculture. During the 2-day meeting, the charge to the FRRCC is to explore issues pertaining to soil health and the environment, particularly air and water. He noted that the International Year of Soils 2015 was launched earlier in the month, and it is well understood that healthy soil is essential to agriculture and can provide various environmental benefits. The agricultural sector has implemented numerous conservation measures in conjunction with the U.S. Department of Agriculture (USDA) and the Natural Resources Conservation Service (NRCS). The Administrator has requested that the FRRCC explore soil health and any potential role EPA might have in the issue, which will be examined through the meeting presentations and discussions. Partnerships between EPA and agriculture on soil health management may be possible, because EPA and agriculture can find common ground on a number of areas and all parties support a clean environment and a prosperous agricultural sector. The FRRCC can help to find the common ground and address challenges.

Introductions: Get to Know Your FRRCC Members and Agenda Overview

Dr. Balling introduced Ms. Abby Dilley, FRRCC Facilitator (Resolve), noting that her participation was especially important as the FRRCC focuses on soil health issues. He also noted that Administrator McCarthy would not be able to attend the meeting due to a scheduling conflict. Ms. Dilley, Ms. Taylor and the FRRCC members all briefly introduced themselves and described their primary interests. Non-FRRCC members in the audience stated their names and affiliations. In the audience, Ms. Allison Wiedeman of EPA's Office of Wastewater Management was praised for her efforts at building trust when she served as the Acting Agricultural Counselor to the Administrator in 2014. Following introductions, Ms. Dilley reviewed the meeting agenda for both days and the FRRCC charge, noting that it involves several layers of issues, including soil health and its relationship to air and water quality and its role in supporting adaptation to extreme weather events. She explained that the committee would have time after presentations to ask questions and discuss issues upon which it would like to deliberate. The meeting goal is to develop a work plan for deliberations, with the FRRCC members deciding the focus and pace of their work before the next meeting.

Introduction to Soil Health

Dr. Wayne Honeycutt, Deputy Chief for Science and Technology, NRCS-USDA

Dr. Honeycutt provided an introduction to soil health. He began by noting that one reason NRCS is involved in soil health is that world population is projected to rise from approximately 7 billion people today to 9 billion by 2050, requiring a 70-percent increase in food production. Another challenge is posed by the fact that between 1982 and 2007, the United States lost 41 million acres of rural land to development. Thus, the additional food needed will have to be grown on a shrinking land base, and competing water demands will increase. At the same time, growers face extreme weather as a result of climate change, with floods in 2011 and drought in 2012. Crops will have to be resilient to extreme weather events. He presented scenarios for rising temperatures. Increasing soil health will improve water infiltration and nutrient availability, improve water quality and plant health, and achieve other benefits while enhancing crop production.

Dr. Honeycutt explained how the NRCS works with farmers on a voluntary basis to improve soil health, emphasizing the need for a strong scientific basis for the work. He described various projects aimed at modeling the economics and benefits of soil health practices. Approximately 146 million acres of cropland still have a moderate to high need for additional conservation treatments. If no-till and cover crop practices could be applied to the 146 million acres, soil loss could be reduced by 116 million tons per year, carbon loss by 11 million tons a year, and nitrogen loss by 1.9 billion pounds per year. Thus, carbon would stay in the soil, thereby benefitting climate mitigation efforts, nitrogen would not enter water bodies, and soil resilience and food-growing capacity would be enhanced. He described the NRCS Conservation Innovation Grants (CIG) Program, 25 plant materials centers nationwide, and other programs to support soil health. NRCS is establishing a new Soil Health Division, has expanded training and is undertaking a major communications effort. Dr. Honeycutt will lead the new Soil Health Division effort, which has hired Dr. Bianca Moebius-Clune of Cornell University as director. The office will employ a national soil health specialist, a communications and partnership liaison, a national leader, four regional team leaders, and 12 regional soil health specialists.

No-tillage is a key soil health practice NRCS is promoting. Dr. Honeycutt described its benefits, presenting data on the increased carbon content and available water-holding capacity of soil that has been achieved with no-till practices. He also showed cover practices and described their benefits for improved soil health. The Conservation Technology Information Center and others are working in partnerships to examine the benefits of cover-crop use, which supports higher corn and soybean crop yields even during drought conditions. Tillage radishes are used to break up soil and add organic material without tillage. In general, a focus on soil health simultaneously satisfies many natural resources needs, including food for a growing population, water quality, carbon sequestration and others. Huge opportunities also exist in the

585 million acres of U.S. range lands. Depending on how animals are grazed, soil health and resiliency can be enhanced or diminished.

Dr. Honeycutt described some of the educational materials NRCS has developed, many built on testimonials by farmers who implemented good soil health practices. He also reviewed technical materials and the Conservation Training Library, which hosts 240 webinars that are freely available to the public. Partnerships are highly important for the NRCS, including one with the Howard G. Buffett Foundation that led to a cover crops and soil health conference in 2014 with webcasts at farmers' sites and facilitated dialogue. The effort reached more than 6,000 farmers. The National Association of Conservation Districts (NACD) is developing a national inventory of soil health sites and potential demonstration sites across the country. Likewise, the broad Soil Health Partnership is setting up demonstration sites, and the Soil Renaissance partnership has elevated attention to the issue through a National Press Club event. He closed by presenting a picture showing how an improved soil health system doubled the yield of a potato crop compared with a conventional system.

Soil Health Demonstration

John Larson, CEO, NACD

Mr. Larson presented a demonstration of two soils. They were the same soil type, but one was from a disturbed area and the other from an undisturbed area. The demonstration was designed to show differences in soil stability between the two soils. Mr. Larson first showed a video of the same demonstration by Ray Archuleta of the NRCS. In the video, Mr. Archuleta placed a sample of soil disturbed by 30 years of tillage in a plastic tube of water and a sample of undisturbed soil—developed over 40 years of non-tillage and cover crop usage—in another tube of water. The tilled soil lacked stability and crumbled immediately, while the undisturbed soil, which had “biotic glues” created by roots and organisms, stayed intact and floated. Assisted by former FRRCC member and NACD President-Elect Lee McDaniel, Mr. Larson successfully conducted a live replication of Mr. Archuleta's demonstration. He also showed a video simulating rainfall on disturbed and undisturbed soil. The disturbed soil did not allow rain infiltration, while the undisturbed soil was readily infiltrated.

Mr. Larson noted that the involvement of 17,000 local board members, who are trusted peers, is critical to NACD. He stated that the NACD received a 3-year CIG this year to focus specifically on soil health. Through the CIG, very detailed work will be conducted with four pilot farms that will share their management techniques and economic data to show the economic and other benefits for growers who adopt healthy soil practices, such as cover crops that create resiliency to extreme weather. Mr. McDaniel stated that soil health is not “organic farming,” and it refers to more than no-till and cover-crop practices. Past monocultures limited soil microorganisms, but cover crops support the flourishing of all the microorganisms to produce healthy soil.

Mr. Balling opened the floor to questions. Mr. Carleton asked for a definition of tile drainage and its impact on nutrient management. Dr. Honeycutt explained that some soils are better drained than others; tile drainage, using perforated pipes, is used to rid fields of excess water. The procedure enables land too wet for crops to be suitable for growing, but it creates water-quality issues because the drained water that is sent elsewhere can contain excess nutrients.

Ms. Peggy Beltrone (Exergy Integrated Systems) asked, given the compelling case for soil health practices, why 100 percent of growers have not adopted them. Dr. Honeycutt responded that in the past 2 years a huge momentum has emerged, with many soil health workshops being held now in any given week. In his view, the extreme weather patterns have shown that growers who use cover crops and other practices fare better. The reasons are likely diverse, but data show cover cropping and other practices have grown exponentially in recent years. Mr. Lawrence Clark (Farm Pilot Project Coordination) asked what opportunities exist for specialty crops and soil health. Dr. Honeycutt responded that endless opportunities exist for such crops because so many specialty crop systems typically are smaller, very

highly managed land holdings. Specialty crop diversification creates opportunities for diverse cover crop species.

Dr. Larry Sanders (Oklahoma State University) noted that a host of policy programs under the Farm Bill serve agriculture and asked if any systematic attempt has been made to integrate the new soil health program with those others, or if they overlap by happenstance. Dr. Honeycutt stated that the soil health program is consistent with the authorities of Farm Bill programs. For example, the Conservation Reserve Program (CRP) is a Farm Service Agency (FSA) program that focuses on highly erodible land, but health soil practices can help CRP participants with their compliance. He could not say whether CRP scoring incorporates health soil practices, but NRCS is engaged in discussions about applications for funding at base or higher if growers implement healthy soil practices. Mr. Larson added that for the first time in the Farm Bill there was a shift away from Title I commodity payments to Title II conservation payments. Looking at 2018 and the ability to defend rural America, the healthy soil practices should be part of the discussion about crop insurance and other programs.

Mr. Dave Petty (Iowa River Branch—Deputy Chair) commented that the many cover crops in Iowa were driven by an incentive program that was so popular, applicants had to submit on the first or second day before incentives were depleted. This year, the incentives have been lowered to find out if growers will adopt the practice on their own or if they are motivated solely by the money. Because he has taken so much of his farm out of production with grass to reduce soil erosion, his Conservation Stewardship Program (CSP) payments are less than half their previous value. That result is the wrong one arising from the Farm Bill and needs adjusting. He also said that to achieve results, EPA and others must talk to farmers without being patronizing. Dr. Honeycutt responded that NRCS is learning from innovative farmers who are leading the way. Mr. Larson added that half of the NACD CIG is to develop conservation districts across the country.

Dr. Lori Berger (Ag Business Resources) asked if enough technical service providers (TSP) are available. According to Dr. Honeycutt, partnerships are a major component, but NRCS does not believe there are enough providers for the required effort. NRCS is trying to expand the number of TSPs through continuing education credits for soil health and other measures, but more TSPs are needed. He could not estimate whether 10 or 50 percent of the total need has been met. Dr. Larson agreed, emphasizing the importance of local partners all communicating the same message about soil health to generate producer confidence. Mr. Archie Hart (North Carolina Department of Agriculture) agreed on the need for more on-the-ground advocates and experts. He asked whether data were available on the economic benefits of soil management. Dr. Honeycutt responded that NRCS has very little research authority but is partnering with others to collect such information. Ms. Janis McFarland (Syngenta Crop Protection) asked if a list of key research gaps was available. Dr. Honeycutt said that NRCS has developed a list of research needs, and economics is one of the priorities. NRCS has been working with Dr. Jerry Hatfield to mine data on soils sampled over years for water and carbon modeling. He agreed to provide the list of research needs to the FRRCC.

Mr. Philip Korson (Cherry Marketing Institute) asked how the issue of diseases can be added to the discussion of healthy soils for orchard specialty crops, a niche that is very conservation-oriented. Dr. Honeycutt said that it would be beneficial to examine the breadth of research to determine principles for planting to resist disease. Ms. Beltrone asked if the appraisal of home values would be higher if the land had healthy soil. Mr. Larson responded that he expected good soil health would have economic value and noted that groups, such as the Coalition for the Advancement of Precision Agriculture, are working on the issue of healthy soil value. Dr. Honeycutt added that at least one person is using the enhancement of soil health as his business model. In addition, leases with farmers provide credit for soil health improvements if the leases are not renewed.

What Is Soil Health/Why Is It Important?

Dr. Nick Goeser, National Corn Growers Association/Soil Health Partnership

Dr. Goeser began his presentation with three definitions of soil health that all featured the concept of a vital living ecosystem. Soils are complex systems involving physical, chemical and biological components that underlie crop yields. He described the specific water criteria and other components of healthy soils and the system of grids, ranging from 1 to 5 acres in size, used to measure soil health, which includes DNA sequencing as a criterion. He also presented images of the tools used to measure soil components. Soil health assessment tools, such as from Cornell University, are available to quantify and rate soil health. The tools were calibrated using specific soils and must be further calibrated to be applicable to different soils in different regions. The per-sample costs of assessments are large, and many samples are needed, so prices must be lowered.

Analysis of food consumption and productivity projected to 2050 shows that productivity of cereal grains has maintained pace with needs. However, major staple food crops will need much more land to meet growing food demands. Analysis shows an alarming decline in the rate of arable land from 1961 to 2050 (projected). The efficiencies and productivity levels of soils are being stressed. Degraded land has a significant erosion risk, threatening yield levels. Organic matter additions can produce a cascade of positive events. Soil compaction, however, is problematic, with consistent data showing that less compaction creates higher yields. He also presented information on global water scarcity, temperature increases and flooding.

Dr. Goeser noted that economic factors are another reason soil health is important. However, there are many more questions than answers about the economic implications of soil health. New studies are needed, and information must be collected from farmers to truly understand the economics. Onsite costs, such as nutrient loss, and offsite costs, such as impacts to water quality, would have to be examined. The goal would be to provide farmers with better information about the costs and benefits of improving the environment and farming operations with healthy soil practices.

Based on a mid-1990s study, annual productivity losses per acre for onsite and offsite costs were \$91.59, an unsustainable figure, although it is unclear how much credence to give that number. The Soil Health Partnership is collecting information to update the economic evaluation and enrolling individual farmers to provide data. Regarding environmental impacts, the group is collecting data on imports, such as fertilizers, and exports, such as nitrous oxide, with a goal of improving nutrient efficiency and other gains on farmers' land. Analysis will focus on short-term (1- to 3-year) and long-term (10-year) benefits of improved practices. The Soil Health Partnership's four goals are (1) building a demonstration farm network and working with individual farmers (predominantly throughout the Midwest) to understand on-the-farm conservation management practices and challenges; (2) developing research protocols to update information for farmers; (3) publishing findings and recommendations; and (4) providing technical assistance. In 2014, 20 farmers were enrolled in a demonstration farm network, and additional increments of 20 farmers a year are being sought to create a network of 100 farmers within 5 years serving as peer advisors throughout the Midwest. A soil health summit was scheduled for January 29–30, 2015.

Responding to questions, Dr. Goeser noted that between 1982 and 2010 there was a great adoption of no-till practices throughout the Midwest. He also stated that agricultural economists are collecting information from farmers enrolled in the demonstration farms regarding the economic benefits they receive from healthy soil practices. The Soil Health Partnership, however, is not yet examining societal benefits. The partnership also employs metrics regarding progress toward its four goals.

Dr. Richard Bonanno (University of Massachusetts) raised the issue of what information about soil health definitions and practices had to do with the FRRCC and its role. Other members agreed that they also were trying to understand that question. Mr. Omar Garza (Texas/Mexico Border Coalition) added that the NRCS program is entirely voluntary, without any permitting issues involved, and he suggested that EPA

should consider the program as a model for solving problems on farms and in the soil. Farmers working the land know what is taking place at a grassroots level.

Water and Air Quality: The Relationship to Soil Health

Bill Flory, Idaho Farmer, Soil Renaissance

Mr. Flory introduced the FRRCC members to the Soil Renaissance, a partnership between the Samuel Roberts Noble Foundation and the Farm Foundation. The need for a Soil Renaissance arises from the fact that today just over 10 percent of the world's land area feeds the world's population. The Farm Foundation organizes public forums for stakeholders interested in agriculture, food and rural policies, using objective information. The Noble Foundation was established in 1945, after the Dust Bowl, with a mission of safeguarding soil for future generations. Education about land stewardship and seldom-used soil testing were its first endeavor, and today soil testing is fundamental to soil management. In the 1980s, the Noble Foundation began focusing on fundamental plant science research; a decade later, its mission expanded to include translational research, including crop breeding. The Soil Renaissance evolved from the Farm Foundation's Dialogue on Food and Agriculture in the 21st Century for stakeholders to engage in discussions. At one discussion, soil health rose as a top priority for all segments of the agricultural value chain. The group reached consensus on the definition of healthy soil so that the work to follow would be toward a common goal: "The continued capacity of the soil to function as a vital living ecosystem that sustains plants, animals and humans." Convening stakeholders inclusively is the key for both organizations.

Mr. Flory reviewed the Soil Renaissance goals, including the development of a standardized soil testing method, the creation of economic tools, research and education. He described Version 1.0 of the measurement tool developed by the partnership, noting that some procedures in the tool are not indexed to local climate and other conditions. The tool's tiered approach was developed by the Soil Renaissance measurement committee at a meeting in November 2014 in Ardmore, Oklahoma. The dynamics of the measurement tool are just beginning to be developed. It includes standard soil tests for nutrients, organic matter and other properties. One goal is to develop information tools to enable users to conduct a comprehensive analysis of the economic risks and returns of healthy soil investments. The Soil Renaissance seeks to awaken policymakers and consumers to the importance of soil health.

Describing his personal involvement in soil health, Mr. Flory said that in 1978, his farm—which is 2,000 feet from top to bottom across 20 miles—was hit by a quick rainstorm. His farm is in north Idaho on the Palouse River, with slopes of 30 degrees and steeper; one field has 800 feet of elevation. The storm cleaned the soil off one slope that had been heavily tilled, and it has never been the same. At the time, direct seed planting and no-till were in their infancy, with limited technologies and practices. Approximately 20 years ago, he began adopting complete direct seed planting. The placement of fertilizer in the rows, right under the seed, was extremely valuable. In the past 5 years, his fertilizer use has declined, and he is using more micronutrients. He looks at the whole plant and whole soil, both of which are equally important and uniquely intertwined. In 2013, he harvested 30 bushels more of winter wheat than his neighbors, but in 2014, it was only a few bushels. Not all variables can be controlled. Four years ago, his region had a 100-year rain event—more than 4 inches of rain in less than 30 minutes on freshly seeded soil. His farm did not lose any soil, while neighbors lost feet of soil, down to their hardpan. Less than 1 percent of farmers engage in his farm's level of intensive management.

Mr. Flory commented on EPA's role vis-à-vis soil health, noting that intensive management results in less pesticide use, less runoff, and no issues concerning tilled ground and air quality because he does not burn his fields to stubble. EPA's Clean Water Act Section 319 nonpoint source and NRCS's CSP programs are extremely valuable. Many producers regard EPA as a "big stick regulator," but Mr. Flory does not have that view of the Agency, even though EPA regulates air and water. Environmental benefits should derive from a higher level of soil management, which will keep higher levels of nutrients and water on the land and benefit crops in the field. Clean air and water all relate directly to healthy soils and their effects on point and nonpoint source water issues. Mr. Daniel Botts (Florida Fruit and Vegetable Association) asked

about the Soil Renaissance tests, and Mr. Flory explained that they are not indexed to soil types or cropping systems in different locales. The aim will be to seek broad support from farmers in diverse situations.

How Soil Health Can Help Mitigate the Effects of Extreme Weather Events

Dr. Jerry Hatfield, Supervisory Plant Physiologist, Agriculture Research Service (ARS), USDA

Dr. Hatfield stated that his presentation was about how to mitigate the effects of extreme weather variation on production. He noted that he not only directs a laboratory at the ARS, but also directs the Midwest Climate Hub, which encompasses eight states. He stated that temperature and weather extremes are occurring with increasing frequency, as evidenced by data showing trend lines. In northwestern Iowa, 24 inches of rain fell in some spots during June, an unprecedented record. The phenomenon is global, raising questions of how the world will cope with such changes. Additionally, with erosion resulting from such weather, the major questions are how much erosion is tolerable on the land and how can current soil be preserved. Dr. Hatfield presented slides showing major erosion on clean-tilled soils in Iowa, including through wind erosion, estimated at 2.5 tons per acre in Iowa. Top soil is being lost. Because of the changing precipitation, many farmers are installing tiling systems to drain their fields of excess water. Spring precipitation is increasing, reducing the number of workable field days. From 1995 to 2010, compared with 1978 to 1994, the number of workable days has been reduced by almost 4 days from April through mid-May.

From a different perspective, water will become extremely important across the Midwest, with high greenhouse gas emissions scenarios showing an increase in rain during the winter and spring but a decrease in the summer. Midwest cropping systems were built on reliable summer rainfall, but as the rainfall becomes less reliable, production will become less reliable. Managing water will be essential.

Dr. Hatfield reviewed high- and low-emission scenarios, noting that every decade since the 1990s has been warmer than the last decade across the whole Earth. Warming is not uniform across the United States. The Southeast, for example, has cooled a bit in the last 100 years. In the 2090 range, temperatures are projected to increase by 8 to 9 degrees Fahrenheit. Warmer air holds more water and increases evaporation. Plants will need to store water, or production will decline. An analysis of data for Iowa from 1983 to 2013 showed that in the past 5 years, precipitation levels have been outside the normal range, demonstrating the increasing variability of weather. Dr. Hatfield presented temperature and crop maps showing the large effects of warming on crops.

Various climatic factors—such as solar radiation, carbon and precipitation—affect crop growth, phenology and yield, as well as insects, weeds and diseases. Soil is the underlying resource for water and nutrients. For the first time, the latest edition of the National Climate Assessment included soil as part of the agricultural dynamic. Dr. Hatfield showed crop progress and condition maps issued annually by the National Agricultural Statistics Service, noting that differences in crop progress over different years was a result of weather variation. He discussed the “cycle of decisions” over different timeframes, from 1 year, 3–5 years and 5–20 years. ARS has used the cycle together with other information in examining the dynamics of soils and yields over time. Providing water when crops need it solves the production problem for farmers, underscoring how much soil dynamics and the soil’s ability to hold water affects different issues in rain-fed agriculture. Tillage increases soil evaporation rates. He showed charts demonstrating the effects of three tillage practices and the fact that disturbing the soil sends carbon back into the atmosphere. Reducing organic matter through oxidized carbon reduces the soil’s water-holding capacity and produces runoff, increasing drought conditions in fields. It is possible to grow 300 bushels of corn per acre, but water must be invested in the crop. Across the Midwest, agricultural insurance claims are most common first for excess moisture in the soil and second for drought, totaling \$12 billion in payments since 1989.

Dr. Hatfield discussed the role of residue cover in supporting biological organisms in the soil. He used a physical therapy analogy of the Stairmaster to describe building up soil through steps, starting with the

cultivation of biological activity, which leads to organic matter turnover. That would be followed by an improved nutrient cycle and soil structure, improved water dynamics, and other soil health recovery improvements as a farmer ascended higher on the Stairmaster. To achieve these and other soil conditions, soil management in the future must integrate the various soil health factors.

General Discussion

Mr. George Boggs (Whatcom Conservation District) asked Dr. Hatfield if biochar could help achieve several of the Stairmaster steps more quickly. Dr. Hatfield responded that biochar was considered to be a panacea, but in his view it provides a short-term organic source around which microbes cluster and thus serves as a starter-kit to generate beneficial biological activity. A future study will examine the issue more closely. Mr. Boggs added that biochar is a byproduct of pyrolysis in alternative energy. As such, there might be a mechanism whereby EPA alternative energy polices and carbon sequestration could help reinforce soil health.

Mr. Roger Noonan (New England Farmers Union) stated that for biologics in his line of work, compost and manure are used. Dr. Hatfield responded that tillage can be offset by adding residues. His laboratory has an experiment involving 12 14- by 24-inch columns of soil, with various sensors for carbon dioxide (CO₂), water and other elements to measure responses when compost or other changes to the soil are made. Compost can replace tillage losses, but it is a matter of timing. In no-till systems, in the summer CO₂ is generated from the soil but is reabsorbed once the sun rises.

Ms. Dilley asked what role EPA might play in accelerating or retarding progress on the Stairmaster of soil management steps. Dr. Hatfield responded that soil management has a significant impact on nitrous oxide, a greenhouse gas, by changing soil dynamics. Improved soil also can sequester carbon. Mr. Petty inquired about a lawsuit that the Des Moines Water Works is proposing against three upstream counties regarding their farming practices. Dr. Hatfield reviewed the history of the Raccoon River nitrate problems and farmers' reluctance to adopt what they deemed to be risky nitrate application regimes. To solve the nitrate problems, it will be necessary to consider returning to approximately 20 percent diversified crop rotations, involving small grains and hay that were prevalent in the 1960s. Dr. Sanders commented that generally the FRRCC had discussed how farmers could improve their situations through better soil management and, coincidentally, provide some social benefits. He asked the extent to which improved agricultural practices could affect climate change amid the mix of mitigation opportunities outside of agriculture. Dr. Hatfield commented that there are many actions that could be taken across fields that would simultaneously improve environmental conditions and benefit farmers' productivity and profits. Tools are emerging to support a watershed view of the whole rural landscape, and it will be important for farmers and others to begin asking different kinds of questions and to accept hard answers. Agricultural efficiency and environmental protection can and should be viewed in a unified manner, not separately.

Mr. Boggs, commenting on Dr. Hatfield's statement that farmers must invest water into their crops to realize higher yield potentials, added that not taking steps to achieve higher yields will leave nutrients on fields that are then transported to waterbodies. As EPA considers its investments in best management practices (BMPs) through its 319 funds, irrigation management could be a key mechanism to avoid excess nutrients. Dr. Hatfield agreed and stated that rain-fed agriculture is more problematic, but that great advances are being made in transitioning to much more innovative practices for fertilizer application and other tools. These allow farmers to assess the status of a crop at any given time during the growing season. One-time fertilizer applications that leave nutrients on the field should become a thing of the past.

Before Ms. Taylor adjourned the meeting for the day, Dr. Balling asked the FRRCC members to consider EPA's role with regard to soil health, rather than dismissing any role out of hand. He reviewed elements of the agenda for the next day, including the panel of three representatives from agricultural organizations.

THURSDAY, JANUARY 22, 2015

Call to Order, Outcomes From Day 1 and Agenda Review

Ms. Taylor reconvened the meeting and introduced Ms. Cheryl Woodward, the FRRCC travel coordinator, who presented the logistics regarding submittal of invoices and travel.

Mr. Carleton offered his thoughts on the FRRCC's role in informing EPA Administrator McCarthy about their perspectives on key agricultural issues facing the Agency. The committee represents an excellent opportunity to ensure that agriculture's views are heard. Dr. Balling underscored that the FRRCC now has a clear understanding of soil health and its effects on environmental issues, including climate change and water quality. There is a clear reason for EPA Administrator McCarthy's interest, but the FRRCC still has not defined what the Agency can do on the issue. USDA has clearly committed to improving soil health, and the International Year of Soil 2015 is under way.

During a round of quick introductions for FRRCC members who were absent from the meeting on January 21, Ms. Taylor for the record welcomed two new FRRCC members: Mr. Noonan and Mr. Joseph Logan (Ohio Farmers Union). Ms. Dilley said that she looked forward to the discussion among FRRCC members about the work plan for responding to EPA Administrator McCarthy's charge seeking advice on EPA's appropriate role on soil health issues. If the committee must check back with the Administrator about pursuing the charge, there will be a process for doing so expeditiously. She noted that following the previous day's presentations, many members had discussed Dr. Hatfield's presentation, which integrated soil resiliency, water management and other issues that are critical to farm productivity and the environmental conditions that matter to the Agency.

Work Plan Development: Soil Health

Mr. Boggs stated that Dr. Hatfield's presentation was especially compelling in defining why EPA should be engaged in soil health issues. He noted that with a soil index that farmers reported on regularly, as with a National Pollutant Discharge Elimination System (NPDES) permit, all the issues would be solved; however, that raises the concern among agricultural community members that EPA's involvement would lead toward prescriptive requirements. The question is: Why would the agricultural community want EPA to elevate the topic on its agenda? Framed in those terms, there is a clear overlap of soil health with the Agency's environmental priorities—water and air quality, resilience to climate change, alternate energy, and others—all of which affect agriculture. The ethanol production volume standard that EPA sets can lead to stubble removal from fields, with negative soil health effects. It is an example of an improvident policy that runs counter to the Agency's goals. There is concern about national standards, but there are issues that could be explored, such as the economics of health soil practices, the utility of metrics, and how they are tailored to local conditions. If soil health economics were strong enough, it is possible that the practices already would exist widely, but farmers have to deal with mortgages, price variability and other concerns as they make long-term soil health investment decisions. The environmental services marketplace is one mechanism that EPA employs, including trading in water quality and nutrients. Good soil health could provide such services. A fund could help support farmers in achieving good soil health to deliver the services within a systemwide solution. Mr. Boggs suggested that the FRRCC should advise EPA Administrator McCarthy that some policies could work against soil health and inform her of agriculture's complexities. EPA could use its discretion in regulatory and funding mechanisms to support soil health opportunities.

Ms. Dilley thanked Mr. Boggs for his comments, which framed the issues and underscored the need for proactive engagement. His comments also defined categories of issues and policies, including alternative energy and water quality, which could work either for or against soil health. The FRRCC's previous report also underscored the importance of partnerships. Mr. Boggs added that soil health must be

approached synergistically to avoid the kinds of opposition sparked by EPA's Waters of the United States (WOTUS) proposed rule.

Ms. Berger commented that it was clear that soil health is critically important, but she was still wondering how a regulatory agency would approach the issue. She also emphasized the importance of partnerships, especially with the NRCS, whose involvement cuts across all issues. There is significant room for improvement, including a common vocabulary beyond just soil health between NRCS and EPA to foster better cooperation on soil health. Dr. Bonanno stated that he would like to connect the FRRCC's previous charge with the current one, emphasizing the importance of soil health to water quality. He would like to see EPA work more with NRCS, commodity groups and others to show how the various elements—such as tilling, no-till, cover crops and so forth—connect to one another. Producers face numerous decisions over the course of a year relating to fertilizer use, pesticides, cover crops and other parts of their operations, so communication between EPA and USDA could be very helpful. Following passage of the Food Quality Protection Act (FQPA) in 1996, EPA began its Strategic Agricultural Initiative (SAI) Program, resulting in friendly cooperation between the Agency and growers on a common goal. The SAI grants engaged the user community on issues of importance to EPA. Dr. Bonanno would like to see EPA determine how to connect its goals with soil health, working on a voluntary basis with growers to understand not only the environmental benefits but also the economic benefits to farmers of adopting the practices. Ms. Dilley added that a decision chart for growers presented by Dr. Hatfield could be extended to include other decision makers and to define the different information needed to make decisions in a more comprehensive way.

Dr. Janis McFarland (Syngenta Crop Protection) emphasized the importance of understanding how soil metrics could be used to affect EPA's water, air and other metrics. Scientific research could be incorporated into Agency science-based models if EPA program experts could indicate what aspects of soil health would help in their exposure and risk modeling and design better BMPs or mitigation procedures to prevent runoff. The information also could be used to inform land management decisions so they meet broader climate and other goals. Ms. Dilley added that an EPA Science Advisory Board committee on agriculture, established under the Farm Bill, could play a role. Dr. Sanders, noting that his state of Oklahoma is recognized for environmentally beneficial, innovative farm practices, stated that he is often asked why farmers should take actions to improve the environment. Farmers act to improve the profitability of their land and, in doing so, derive internal benefits for themselves and external benefits for society. It is reasonable for EPA and other agencies to embrace soil health, to encourage farmers in constructive ways to do the same, and to educate the public on farmers' beneficial actions. Sometimes farmers receive public assistance through land grant universities and public subsidies, such as the CSP and other programs. Out of frustration, however, farmers are seeking relief from regulation. The FRRCC several years ago asked EPA to consider the principle of certainty, which is supported by a number of farmers. If there is an EPA role, it could be to provide regulatory relief, support scientific research and outreach, and educate both producers and the public on the genuine benefits to society from soil health.

Mr. Botts stated that he has considered how to reconcile the two totally different approaches to nitrate, one using a numeric standard and the other using a waterbody load. Florida has been successful because the issue was delegated to the Florida Department of Agriculture and Department of the Environment to resolve. They produced a method to involve agriculture in degraded areas using fees. At the state level, the academic, regulated and enforcement communities met to discuss options, crafting a manual that includes a checklist process. He noted that the Cornell soil health measurement system is too cumbersome for growers to employ without a clear return on the investment. Water management in Florida is comprehensive and involves a set of regulatory structures. It is unclear how a national program could be created that would integrate with Florida's production systems. Soil health is critically important in Florida, and the agriculture industry has been advocating more research on factors that must be manipulated or managed to reduce the fluctuations that growers experience. Florida growers are all willing to examine soil health, but they do not want to be regulated on soil health. Already, growers are required to use a minimum amount of fertilizer because of Florida's water quality issues. A regulatory program would have to be so site-specific that incorrectly understanding one factor could put growers out

of business. He would be concerned about artificial criteria, such as for carbon reduction, that must be measured against. The two current soil testing models in use are inappropriate for Florida.

Mr. Logan (Ohio Farmers Union) stated that all growers support the nebulous concept of soil health, and there is a great deal to be learned from the scientific and agricultural communities about soil health and how it integrates with other systems on varying soil types. The country must move in the direction of soil health. For the past 100 years, the United States has exported its CO₂ and now must recover it for various reasons. The concept of Discovery Farms probably should be expanded well beyond the few locations where it is currently in place. EPA could be helpful in working with USDA, NRCS and other agencies in developing a network of learning areas where the scientific and agricultural communities can engage with each other and commodity organizations and other interest groups can participate to move the learning forward. He agreed with Mr. Botts that there are not many effective ways to engage with soil health, but there may be a few. In Ohio and elsewhere, nutrient trading networks are growing, although the environmental community remains skeptical about whether such trading will achieve the nutrient reductions sought. EPA could establish very robust monitoring systems to verify that the programs are achieving results and make needed refinements. EPA could work with USDA, NRCS and others to refine the set of conservation practices now in place. Ohio has several areas with acute water quality problems, where millions of dollars have been spent to bolster voluntary conservation. Water quality has not been achieved, and the state's 319 manager has been outspoken about the ineffectiveness of the filter-strip program, which could be made more effective with reconfiguration.

Mr. Philip Korson (Cherry Marketing Institute) stated that soil health takes place on the ground, on farms, and his members support the concept. Fruit trees are unique because, once planted, they remain on the land for many years. He described the voluntary Michigan Environmental Assurance Program (MEAP). The governor set a goal of having 5,000 farms MEAP-verified within 10 years. Currently, slightly more than 1,000 farms have been verified by third parties, with the fruit-tree industry the highest verified sector. MEAP uses NRCS and other available tools to deal with various operations and achieve the standard of zero erosion on a farm to win verification. Growers have embraced MEAP because they see it as a way to protect the environment and ensure a healthy farm can be passed on to the next generation of farmers. Tourists also are able to see that MEAP-verified growers are engaging in beneficial practices. The program, which is chronically underfunded, is directed at educating farmers about why verification would be a good decision and can make a significant difference.

Mr. Paul Martin (Spear Six Ranch) commented that he did not see EPA having any regulatory role in soil health but having a strong support role in helping site-specific locations and regions truly identify the problems they confront and develop alternatives. Farmers must implement the programs, which should be evaluated to determine if they have succeeded. EPA could put resources into these various roles. There are many self-directed, collaborative programs around the country, such as MEAP, and farmers tend to respond to them, rather than to programs that are imposed by regulatory agencies.

Work Plan Development: Other Topics

Agriculture Panel

Keira Franz, National Association of Wheat Growers (NAWG)

Dr. Jamie Jonker, National Milk Producers Federation (NMPF)

Jeremy Peters, NACD

Dr. Balling stated that focusing the FRRCC's meeting entirely on soil health might miss various other concerns that the agricultural community has about EPA. With that in mind, three Washington, D.C.-based representatives of agricultural organizations were invited to discuss issues with the committee.

Ms. Keira Franz, a consultant who works with the NAWG and other clients on conservation and environmental issues, emphasized that soil health is a major topic of discussion for growers nationwide. From the wheat growers' perspective, some of the available soil health tools and tests are not always applicable, such as the discussions of cover crops that do not apply to farmers who do not produce corn,

soybeans or other rotation crops. There are some major regulatory issues. Also, EPA's WOTUS proposal has led to uncertainty for producers about what waters on their operations might be regulated, creating deep concerns about how growers might manage their operations.

Wheat growers are concerned about the availability of pesticides, an issue that is affected by a number of EPA programs, such as worker protection standards, future certification requirements for pesticide applications or applicators, and spray drift regulations. The FRRCC could provide expertise and a reality check on EPA proposals during open comment periods for rules. The committee could examine current pesticide technologies and discuss the implications of Agency rules for the ability of growers to treat their crops. Much of the conversation is about neonicotinoids, which are important for wheat growers and are sometimes the only available product for certain wheat pests. A consistent reregistration process is needed to provide growers some certainty about the products they are using. Honey bee health is a topic of concern and continued dialogue is needed among various parties. North Dakota is a major producer of both wheat and honey. Wheat growers also require a workable Endangered Species Act (ESA) consultation process. Many of the ESA issues are centered in the Pacific Northwest, where tribal concerns about salmon habitat are increasingly being brought to the federal government. EPA's recent ozone regulatory proposal could affect the future ability of growers to use burning as a management practice for wheat fields. Wheat growers often have no alternative to burning.

Dr. Jamie Jonker (NMPF) is Vice President for Sustainability and Scientific Affairs at the NMPF, which represents dairy cooperatives that produce in all 50 states. Some of the approximately 45,000 cooperatives grow substantial amounts of their feed and others grow almost none. Soil, air and water quality are important to the industry. Water quality and quantity issues are the most significant and vary from region to region and locale to locale. The transfer of nutrients to the land through animal manure, even at agronomic rates, can result in nutrients moving into ground or surface water. In the future, the industry will seek to define agronomic uses of manure that nevertheless transfer nutrients and the implications for citizen suits that are allowed under certain regulations. Several such suits are under way on whether manure applications at agronomic rates could be considered waste disposal.

To address these and other issues at a precompetitive level, the industry sponsors an Innovation Center for U.S. Dairy, with a major focus on sustainability or environmental stewardship. A major study examined the industry's carbon footprint, which is about 2 percent of U.S. CO₂ emissions. Customers close to consumers are demanding corporate social responsibility, both in the United States and overseas. For that reason, the industry is exploring with stakeholder groups and experts a set of common metrics that dairy farmers can use to inform their customers about water quantity, quality and stress, as well as soil health, biodiversity and other topics. The metrics will define the industry's vision for environmental stewardship. Members are focused on major regulatory issues, such as the WOTUS rule, and the industry participates in a national dairy monitoring study required under a consent agreement.

Jeremy Peters (NACD) is the Chief Operations Officer with the NACD, which represents 3,000 conservation districts nationwide and works in both agricultural and environmental areas. Local districts serve as the locally led resource for landowners voluntarily seeking to adopt practices that are beneficial to water quality and quantity, wildlife, and other valued resources. Faced with droughts in recent years, farmers who practiced soil health rebounded more quickly, some data and anecdotes suggest, so it is known that benefits exist. Similarly, with climate change, good soil health enables farmers to respond better to varying levels of precipitation. Dairy farmers have played a significant role in agricultural regulatory certainty, such as the MEAP and a recently launched Minnesota pilot program involving EPA. Some dairy farmers who voluntarily take actions see their efforts as an opportunity to receive regulatory relief and are drawn to that as a positive development. Districts help such farmers adopt the right practices and provide technical information on future needs.

Water quality trading also is of interest to dairy farmers, such as the Ohio River Basin program that has enabled trading for the first time among Ohio, Indiana and Kentucky. Soil health practices, such as cover crops to reduce runoff, are an anchor for some of those trades. EPA's role in facilitating trades is a

positive step and includes benefits for producers who generate credits and receive extra revenue. The NACD supports using EPA's 319 grants program as support for trading. For soil health, EPA plays an important role in the problem of herbicide resistance, which Mr. Peters stated has emerged as a major threat to production in many parts of the country. If farmers cannot use herbicides to control weeds, they will have to manually remove the weeds, possibly using tillage that damages soil health. EPA's oversight and approval of products used by farmers is thus very important to farmers.

Mr. Noonan commented that the FRRCC will not be dealing with soil health exclusively. He asked Dr. Jonker if manure composting was a method to mitigate its impacts and if it could be pursued through NRCS working with EPA and the Food and Drug Administration (FDA). Dr. Jonker responded that composting has a key role to play in helping move unused nutrients off farms. The NMPF is developing an environmental services business concept aimed at advancing the adoption of existing nutrient-extraction technologies. Digesters can address fiber issues, but the market for the methane the digesters produce is variable among states, and loans are difficult to obtain because they do not generate a lot of economic return. The Federation is exploring whether larger farms could function as an electricity cooperative, while composting might work for smaller farms of approximately 150 cows.

Dr. Sanders noted that an Oklahoma State University student just completed a thesis on the economics of digesters and encouraged Dr. Jonker to talk with the student about her paper. He also indicated to Ms. Franz that field burning was being used to manage invasive species, such as Eastern Red Cedar in Oklahoma and the Midwest, which is emerging as a dangerous threat to land management in the heartland. If burning is removed as an option, cropland, pasture land and other land uses will be harmed. EPA could be supportive. Ms. Franz noted that the NAWG board would meet the week of January 26 and has invited EPA to speak with growers about the issue of burning and the Agency's ozone proposal.

Dr. Balling asked about the three organizations' views of regulatory certainty. Mr. Peters responded that the NACD regards regulatory certainty as another means to create incentives for voluntary conservation. It must be crafted to work for producers on a state-by-state basis. Dr. Jonker stated that milk producers support the general concept of regulatory certainty, but the details matter. If farmers invest millions of dollars in projects, they want to ensure that the regulatory climate will not change within a few years. NAWG does not have a specific position on the issue, but Ms. Franz stated that wheat growers have worked with the Department of Interior on certainty for ESA reviews. Dr. Balling asked whether growers would be more willing to adopt measures to obtain more certainty if EPA and NRCS agreed on the definition of BMPs for soil health. Ms. Franz responded that it would depend on the measure of soil health, the test used and other factors, including the economics. Producers would need to perceive the benefits and impacts of the BMPs on their financial bottom line. Dr. Jonker agreed that it would depend on how the BMPs were presented. For example, in the WOTUS proposal's interpretive rule, 50 practices were presented as if they were the only options. NRCS standards must be altered at times to fit local conditions and can be more expensive than equally effective options. Mr. Peters agreed that the interpretive rule intent was right, but the execution was flawed. Minnesota's program is a positive example of a regulatory certainty program.

Mr. Clark asked about the catalyst for the water quality trading system mentioned by Mr. Peters. He explained that the power generators along the Ohio River initiated it, with the Electric Power Research Institute taking the lead to improve water quality in the watershed. Producers have had one round of trades, with another scheduled for 2015. Mr. Boggs asked about the importance of a level playing field across the Nation. Ms. Franz responded that NAWG has no position, but wheat production differs in each state. Mr. Peters agreed that a state solution rather than a federal one is likely, given the delegation of programs to state regulators. Dr. Jonker agreed that states and local governments must lead, given the diversity of farming and weather patterns, necessitating flexible approaches. Mr. Botts commented that in Florida's management of its nutrient management problem, growers were given a presumption of compliance with the Clean Water Act in exchange for adopting nitrate BMPs. The role of Florida's Office of Agricultural Water Policy in compliance was pivotal to the program's success. For waters that exceed their Total Maximum Daily Load, entities must conduct expensive onsite monitoring if they choose not to

adopt BMPs. Mr. Botts stated that he understood how such a BMP system works for water quality, but asked what certainty would be sought in a soil health context, dealing with such issues as nitrogen or CO₂. Both Ms. Dilley and Dr. Balling responded that the FRRCC must deliberate on that question.

Mr. Martin asked how the FRRCC could be most effective in communicating to EPA the needs of the three panelists' organizations. Mr. Peters responded that communicating agriculture's ability to provide solutions for resource protection, endangered species and other issues would be important. The sector is not represented by bad actors. Rural district representatives are willing to work with local, state and federal officials to hold regulatory pressures at bay. Dr. Jonker added that early adopters take the greatest risk, such as those who adopted digesters and faced failures, and suggested they should receive commensurate rewards. Ms. Franz emphasized that the FRRCC could serve as agricultural advocates in discussions with EPA about regulatory proposals. The committee could provide information on real-world experiences of growers and facilitate two-way discussions between agriculture and the Agency so that the industry's information affects regulations.

Mr. Balling thanked the panelists for joining the committee to share ideas. Mr. Carleton added that he agreed EPA must work on improving communication with the agricultural community, and he considers improved communication to be his job. Ms. Dilley asked the FRRCC members about any additional issues to discuss.

Mr. Carleton commented that agricultural certainty seemed to be a topic members wanted to discuss. Mr. Garza stated that the certainty issue was critical and certainty programs could be part of a toolkit growers could employ voluntarily. The Minnesota program and others must be considered. Many of the NRCS programs were developed on ranches and farms and later were expanded nationally. Mr. Boggs added that EPA's assertion of some influence on soil health presents the specter of change, and farmers are concerned about the Agency's presence in this realm. Producers recognize gaps in research that EPA could help fill. They recognize the need for change, but are reluctant for EPA to be the agent of change.

Mr. Dennis Treacy (Smithfield Foods) said that in reviewing the 2009 and 2011 FRRCC reports, prompted by the committee's discussion of communication, he noted that both reports emphasized the need for improved communication between agriculture and EPA. He did not believe such improvement has occurred. He would like the third report to contain a theme that endorses open and frequent communication as a central issue, because it is the biggest Achilles heel. Agriculture is still confused about EPA's motivations and goals and vice versa. The past reports also contain many pertinent suggestions about supporting agricultural advisors and outreach to local communities.

Mr. Donn Teske (Kansas Farmers Union) said that using fire to manage fields is essential and using chemicals to achieve the same results would be worse for the environment. Even if banned, burning would likely continue. Controlled burns are used in prairies. Dr. Bonanno related that he left a North Carolina State University position 22 years ago to run a family farm. Only recently, has he begun to regret that decision because as a farmer he now spends much of his time living in fear of the next regulatory action coming from EPA, FDA, the Department of Labor and other agencies. It is extremely frustrating. On certainty, farmers talk about their plans and some become early adopters of good practices, but often they do not receive recognition. He also noted that not all farmers are full-time growers. In Massachusetts, 84 percent of farmers gross \$50,000 a year; in North Carolina and Georgia, it is 80 percent; in California, an outlier, it is 65 percent. A number of small farmers, including new immigrants, believe it is acceptable to use unlimited compost on their fields, so a lot of education is needed to reach the broad variety of farmers.

Dr. Berger asked Mr. Carleton if he was aware of the SAI, an EPA program involving staff in each region interfacing with agriculture. The program appears now to be defunct, but the FRRCC commented in previous reports that it was important for outreach. She suggested that Mr. Carleton might consider quickly understanding what the SAI accomplished, its purpose, whether it was successful, and whether it

could be of service as the FRRCC moves forward. Funding for small grants was provided under the FQPA. Some SAI staff currently serve as regional agricultural advisors.

Mr. Martin stated that an FRRCC task force had addressed the issue of field burning, and coordination with EPA air quality staff on the ozone rule would be useful. On the regulatory certainty issue, the FRRCC could encourage and enhance self-directed compliance activities, such as programs in Michigan and California. When regulations are written, and enforcement becomes necessary for noncompliers, EPA should not seek extensive reporting from farmers who are doing a good job. That would provide some regulatory certainty. Mr. Robert Rynning (U.S. Canola Association) added that the FRRCC's discussion so far made it clear that regulatory certainty would be extremely challenging beyond the state level. In addition, totally regulating field burning would be very challenging. In Minnesota, the Department of Natural Resources does more burning than agriculture. The CRP also burns to manage prairies, and it works well. Ms. Dilley suggested that FRRCC members be sent a link to the EPA website for submitting comments on the proposed ozone rule.

Mr. Botts stated that in Florida, burning is essential to the economy. The state went through an intensive regulatory process regarding sugar cane burning, which is needed as a production management practice. Five years of dialogue were required before county officials understood the necessity of burning and the need to avoid a ban on the practice, an experience that underscores the importance of communication. A critical FRRCC focus should be on communication. He described a tour that Florida has offered for 30 years to familiarize regulators with agriculture and other facets of the economy. The key lesson is that regulators have no understanding of the number of regulatory requirements under which agriculture must operate. Senior EPA managers need to attend tours to gain an appreciation for all of the regulations that affect the sector. It is extremely valuable to establish connections before regulations are written.

Mr. Teske added that he was not convinced that annual burning is necessary for prairie management. Greater stewardship could be shown in burning. He also stated that if the FRRCC develops a soil health paper, that could reverse the good that USDA has achieved over the past decade because EPA's reputation with Kansas farmers is very poor.

Mr. Petty participates on an EPA group that discusses animal agriculture in a process akin to the FRRCC. Building trust between the industry and EPA is the primary issue. The group has created an "Ag 101" document, which includes information that EPA must learn about agriculture and information that agriculture must learn about the Agency. EPA's website over the past years has had mostly negative statements about manure, but the group has asked the Agency to include positive information about manure's economic value. Within EPA, today many people are trying to build alliances, compared with 10 years ago when it was impossible to schedule a meeting with EPA staff. Meetings with EPA are now easily available. Nevertheless, he estimated that 95 percent of producers distrust EPA, and vice versa. Unfortunately, EPA's WOTUS rule generated intense mistrust.

Ms. Dilley summarized the key topics that had been discussed, including soil health, the importance of communication and trust, regulatory certainty, manure and compost issues, and burning. The FRRCC's goal is to develop clarity regarding the issues while developing a work plan for the committee's response to its charge.

Work Plan Refinement and Next Steps

Dr. Balling said that over lunch he had spoken with Ms. Robin Dunkins of EPA's Office of Air Quality Planning about the EPA-NRCS collaborative and asked her to describe the work. Ms. Dunkins stated that she works with USDA under a Memorandum of Understanding signed in the 1990s to address air quality issues of mutual concern. A recurring issue has been concern about EPA's shutting down agricultural operations. In 2012, EPA and NRCS completed a final document called Agriculture Air Quality Conservation Measures. It is a reference guide for identifying cropping systems and general land management practices that provide air resource benefits. The audience is federal and state regulators, but NRCS staff who must learn about air quality issues also use the guide. Ms. Taylor will send the document

to the FRRCC members because it might be useful in its deliberations. The guide offers a menu of options of conservation measures, most with other resource benefits. The agencies are now working on a companion document for livestock. Dr. Balling added that the guide falls short of certainty but nevertheless represents an EPA-NRCS view on steps that could help growers facing air quality issues.

Mr. Noonan commented that farmers manage food safety, as well as various farm inputs and outputs, so they are co-managing. Regulators, however, work in narrow silos and do not ask how their actions affect other issues farmers must manage. Mr. Charles Bowling (Bowling Agri-Service, Inc.) said that he would like the FRRCC to convey to EPA that the Agency should not tell National Corn Growers what to do but ask them what they can do together. He also described the “field to market” alliance in which he is involved with other commodity groups that tell their own story. Because of the WOTUS rule, he invited Ms. Taylor and others to see his farm and other staff to explain what the rule would mean for the farming operations. During a question-and-answer period with EPA staff, they asked many questions about his practices and the reasons for them. Such interactions build trust, because regulators can see how farmers conduct their operations in the real world and why they do not need regulations. Instead of more regulations, more working relationships are needed.

Mr. Carleton stated that EPA Administrator McCarthy charged the FRRCC with examining soil health issues to determine the relevant issues that EPA could pursue. Based on the committee’s discussions, some “consensus” seemed to exist with regard to soil health and certainty programs and the importance of communication as the basis for establishing a good relationship. In responding to the Administrator’s charge, there appear to be issues for the FRRCC to address. As EPA’s Agriculture Counselor, Mr. Carleton shared his initial thoughts on how he would like the committee to proceed. He proposed for consideration a final FRRCC product that would contain three parts. The first section could explain soil health and the environment, with discussions of how good soil health provides air, water and other benefits. A second section could address agricultural certainty, including a discussion of what it means, existing programs, issues that have arisen in programs, measures of success and other topics. A third section could discuss communication issues, building on previous FRRCC reports. The third section could discuss communication mechanisms, the need for opening dialogue rather than telling farmers what to do, and other such matters. Each section would be developed by an FRRCC subcommittee. He suggested that a brief white paper would be preferable to a lengthy report. He could use the paper as a basis for advising EPA Administrator McCarthy on the issues.

Mr. Hart asked where the economic issues would be discussed within the three sections. Mr. Carleton responded that he expected they would come under the section on certainty. Ms. Dillely suggested that economic issues could cut through all three sections. Mr. Petty noted that he and Mr. Balling had received from EPA a detailed description of the Agency’s responses to the FRRCC’s previous report recommendations. EPA provided a good response to every FRRCC point, clearly demonstrating that the Agency read the report carefully and tried to incorporate the committee’s thoughts into EPA operations. Ms. Taylor will send the response to the entire committee.

Dr. Berger asked Mr. Carleton to clarify if it would suffice for the FRRCC to respond to the charge by stating that soil health is critically important—with many possibilities and applications—but that it falls outside EPA’s regulatory authority. That would enable the committee to delve into other agricultural issues that were raised. Mr. Carleton responded that part of the FRRCC’s conclusion could be that EPA has a very limited ability to work in the area of soil health. He envisioned the FRRCC providing a good overview of why soil health matters for the environment, even if the Agency has no regulatory role, and recommendations on how the Agency can contribute to the issue mainly through certainty programs. The FRRCC could explain why the issue is important and EPA should be involved in supporting soil health in whatever limited way it can. Dr. Balling added that it is very clear EPA lacks any authority for soil health, but pursuing soil health can satisfy numerous Agency needs relative to clean air, water and other environmental values. If EPA could play a role supporting USDA and NRCS on building soil health, all parties can win. Ms. Dillely noted that many ideas had been suggested that would entail a support role, such as research on economic benefits and using the 319 program for demonstration projects.

Mr. Treacy stated that Mr. Carleton's proposal did a good job of laying out a path for responding to the Administrator's charge. Reviewing all of the FRRCC's reports and EPA's response to them would be useful. Communication and trust are consistent themes and demonstrating how those goals could be pursued to address soil health, dust and other issues would be useful. The FRRCC, from its first meeting to now, has always demonstrated that communication must be a two-way street. The committee responds to EPA's charge, but the FRRCC members also initiate discussion of their concerns.

Mr. Carleton agreed that reviewing the previous FRRCC reports would be an important action item. In addition, he suggested that the committee should meet again in the late summer or early fall—preferably outside of Washington, D.C.—to keep the FRRCC active and vibrant. Mr. Treacy added that over lunch some members had discussed holding an informational teleconference or webinar before the summer to review past reports. Mr. Carleton suggested that the committee could be organized around three subcommittees to conduct ongoing work starting soon after the meeting adjourned.

Mr. Clark commented that when he was at NRCS, a complicated formula was used to allocate resources. He asked to what degree EPA resource allocations could be made to advance soil health. With limited resources but almost unlimited demands, funding issues will have to be addressed at some point. Mr. Carleton responded that he could not answer the question immediately but the question would be part of the deliberative process and recommendations to the Administrator. He agreed the question must be addressed. Mr. Balling recalled that when he met with Congressional staff and lawmakers to promote more funding for integrated pest management (IPM), they always wanted to know what should be defunded. His response was to explain the importance of IPM as a priority, and theirs was to determine which programs should become lower priorities. Similarly, the FRRCC's task is to tell the Administrator that if EPA truly wants to change the environmental effects of agriculture, which is deemed a major source of environmental degradation, then much more time and resources will need to be spent on the issues, and they must be addressed by building trust and encouraging more communication.

Ms. McFarland said that she was very much looking forward to reviewing EPA's response to the last FRRCC report. The science subgroup for the last report drew direct connections between some EPA guidance documents and soil health. The report recommended additional guidance on suspended and bedded sediments, as well as the important factors that influence the interaction between nutrients and those sediments. The subgroup focused on the water quality aspects of both modeling and adaptive management for nutrients. It was clear that soil erosion directly affected soil health and land management, and the subgroup discussed EPA's role in helping growers understand the guidance documents. Before the next meeting, FRRCC members could review the Agency's response to those issues, determine the current status, and obtain clarifications from the EPA Science Advisory Board and others who have worked on the issues.

Mr. Bowling asked if EPA Administrator McCarthy will want to know the results of the January 21–22 meeting. Mr. Carleton responded that he will seek a meeting with her soon, in a week or two if possible, to brief her. Mr. Bowling stated that he would recommend that EPA take a secondary role, not the lead, on soil health; other groups should take the lead, and EPA can be a contributor. Mr. Carleton responded that it was a good point. Mr. Botts agreed; his concerns about regulations center on nutrients, which in Florida are not managed through regulatory programs but through voluntary efforts. He was unclear how the numerous soil health practices, which are well understood by farmers, will be advanced without obtaining more detailed information from NRCS and analysis of different crop systems. The presentations made to the FRRCC on soil health do not suggest that anything but a completely voluntary approach would be feasible. It is unclear what EPA Administrator McCarthy wants from specialty crop growers. Basically, 20 crops are grown on 99 percent of the arable land in the United States. A landscape-level management program would be most cost-effective if it focused on the seven biggest crops, which represent approximately 95.5 percent of the total intensively farmed land. EPA Administrator McCarthy should know these facts. He added that he would embrace soil health actions, but it is unclear that a

sufficient research base exists to conclude that a specific soil health action would produce a specific net gain.

Mr. Carleton responded that he did not envision EPA pursuing anything but voluntary programs. Regarding agricultural programs focused on providing certainty—such as in Michigan—EPA would be collaborating with state-based programs attuned to local conditions, such as water and cropping systems. If EPA were trying to determine how it could enhance and facilitate the development and implementation of more state-based systems, the Agency would not be pursuing a top-down mandate. Mr. Botts commented that the concern is not about EPA taking regulatory actions. It is with soil health metric systems, such as the one developed by Cornell University, being used by third parties to judge farm performance. After FDA published a guidance document on food safety, vendors quickly began demanding that Florida growers meet all of the FDA guidance criteria before they would continue purchasing the growers' products. His fear was that identifying soil health as even a nebulous goal would lead to its becoming a standard growers must meet, using the Cornell system and recordkeeping. Florida growers cannot afford such requirements.

Mr. Noonan stated that his organization had tried to use a new NRCS program to develop a Master Farmer Training Program, but smaller farmers would not have been able to participate because resources were limited. Creating master farmers would have implied that other farmers lacking the designation were bad farmers, thus creating two classes of farmers. In the supply chain, farmers unable to meet the latest sustainability criteria would lose out. Soil health must be locally led and suitable to the specific local conditions of each grower. He said that NRCS has a role to play and the FRRCC has a different role. The committee should assimilate the diverse perspectives of its members and present recommendations to EPA Administrator McCarthy so that she knows how to communicate with the agricultural sector. Mr. Noonan added that he had not read the current charge from the Administrator.

Mr. Carleton read the FRRCC's charge: "Explore best practices to maintain soil health and the nexus between these best practices and the protection of water and air quality, particularly as it relates to adaptation to extreme weather events, such as droughts and intensive storms." Ms. Dilley added that the comments by Mr. Boots and Mr. Noonan suggested that the FRRCC's final report of five or 10 pages would underscore the importance of trust and communication and describe how soil health fits into an effort that others will lead, with recommendations for how EPA can build trust and communication. Mr. Carleton reiterated that EPA did not expect the FRRCC to produce another 85-page report. Mr. Noonan added that soil health is a brand new topic for EPA and the charge could be differentiated from the NRCS efforts.

Mr. Boggs stated that the FRRCC should not predetermine the limits on its final soil health report, whether it is a white paper or a lengthy document. If there is a consensus to be presented by Mr. Carleton at his next meeting with EPA Administrator McCarthy, a key point is that EPA should make clear that it has no intention of regulating soil health. There also seems to be a consensus that there is such a thing as good soil health, with many attributes, and such soil prevents many environmental problems, so the FRRCC embraces the concept of healthy soils. From those premises, the question to ask would be what barriers prevent adoption of good soil health practices? The economics must be understood because, if the incentives were right, growers would adopt the practices. Technical understanding is needed because metrics and the definition of success in soil health within specific geographic contexts are unknown. EPA's credibility in addressing those issues will depend on the Agency communicating that its role will be to support soil health and not regulations. Mr. Balling agreed that the FRRCC's report should identify the barriers to soil health and the roles that EPA cannot play because all agriculture is local. Resources will limit whether soil health practices can be adopted at any particular location. EPA must be a partner, not a leader. The FRRCC should explain clearly that it embraces soil health, but that it is difficult to define for any cropping system or location. For that reason, soil health must be about defining processes that the Agency can support and encourage.

Mr. Carleton commented that the FRRCC's charge contains the key request to "explore" soil health issues, wherever that might lead. Mr. Balling added that his company has been developing sustainability metrics for the past 4 years, and the process has been difficult. It is clear that sustainability metrics can be misused, and the same could occur with soil health if the concept is not constrained thoughtfully. Ms. Dilley added that the FRRCC's previous report also emphasized EPA's role as a partner, not a leader. Mr. Martin agreed with Mr. Balling's cautionary remarks, but he said that opportunities and options exist that can help growers achieve compliance with environmental requirements.

Ms. Dilley stated that an immediate next step would be to organize a webinar for the end of February 2015 to review the FRRCC's previous reports and EPA's responses. She agreed to poll members immediately following the meeting to schedule a webinar date. In addition, the committee agreed to create workgroups to delve into topics and present their findings at the FRRCC's next meeting. Ms. Dilley asked for committee members to volunteer for workgroups on the topics of soil health, building trust, certainty, and any other workgroups the members choose to create. Ms. Taylor agreed to send the meeting presentations to the members. Dr. Sanders suggested having Agency staff provide a briefing on the status of the certainty program concept, either during the webinar or at the next meeting. Mr. Martin suggested creating a straw man framework for the FRRCC report to provide structure for work plan deliberations. Ms. Dilley agreed to draft the framework.

The committee discussed the memorandum created by Ms. Wiedeman summarizing EPA's response to the FRRCC's 2011 report. Members will review the memorandum and inform Ms. Taylor and Ms. Dilley if it is self-explanatory or a conference call is needed with Ms. Wiedeman to discuss it. Mr. Botts stated that he might seek an opportunity to ask questions later in the process. He noted that he sees an opportunity for Big Data to drive the process.

Mr. Teske asked if the FRRCC operated on a consensus basis. In his view, a majority of members raised concerns about the committee becoming involved with soil health. Ms. Dilley responded that she did not hear definitive comments against addressing soil health. Rather, members indicated that EPA can play a supportive, partnership role, with interest in certainty programs and good communication as key themes. Any final results will reflect consensus and will detail differing points of view when consensus is lacking.

Public Comment

Dr. Keith Menchey of the National Cotton Council (NCC) commented that the NCC welcomed any opportunity for EPA to interact with its staff or former members and has hosted numerous tours to educate Agency staff on agriculture. Such interaction benefits both EPA and agriculture. However, the NCC would recommend that EPA reconsider the appropriateness of the FRRCC engaging in soil health as a topic. For a variety of reasons, NCC believes it is inappropriate, including EPA's lack of statutory authority and the implications of a soil health white paper. Under the shadow of WOTUS, EPA's interest in soil health could be perceived as another expansion of the Agency's jurisdiction. USDA should be leading on soil health issues, with a major supportive role for EPA.

Ms. Taylor thanked Dr. Menchey. She noted that the FRRCC had not received any written public comments within the timeframe for submittal and, as there were no additional public speakers, she closed the public comment session.

Work Plan Development: Other Topics (continued)

Mr. Sanders observed that several FRRCC members wondered why soil health was an issue, given that EPA lacks an obvious role. Having considered the question, he concluded that the FRRCC probably should address the issue and he was willing to work on a white paper, although his personal preference would be for a letter summarizing the committee's comments and a brief summary of the presentations. He was uncertain about the genesis of the issue as an EPA concern, but it was not a matter that the FRRCC asked the Agency to entertain. He expressed reluctance for the committee to go very far with the

issue. Farmers in Oklahoma would likely share Dr. Menchey's concerns. He was willing to educate his contacts in Oklahoma on the importance of soil health and how it could address many EPA environmental problems, but he had some concern that elevating the issue's importance could result in onerous consequences for agricultural producers. The FRRCC must strongly emphasize that soil health is not an issue for direct EPA action.

Mr. Noonan added that the FRRCC should consider revisiting the charge. Soil health, while foundational, is only a piece of the agricultural picture. Co-management, multiple benefits, air and climate benefits can exceed the scope of soil management. Dr. Bonanno stated that he perceived a consensus that soil health is not a topic for EPA except in partnership with USDA, NRCS, and other agencies that already have programs. Farmers are concerned about EPA exceeding its authority. Perhaps the FRRCC should encourage EPA not to become involved in soil health. Mr. Logan added that there is consensus that EPA lacks a regulatory role, but many have noted that there is an ancillary role for the Agency. EPA has an opportunity to express its clear support for soil health and to indicate that it can be extremely helpful in attaining environmental goals. The Agency could make clear that it intends to work cooperatively with USDA and others to achieve the goals. Responding to the soil health charge could present a modest opportunity to begin repairing relations between EPA and agriculture.

Responding to a question, Mr. Carleton explained that EPA Administrator McCarthy had expressed to him that soil health was an exciting topic worth exploring but did not explain the reasoning behind her choice. Mr. Noonan suggested that an alternative charge could focus on how 319 funds could be leveraged effectively to improve BMPs. Mr. Balling noted that 319 funds had been mentioned several times as a leverage point for EPA and could certainly be part of the work plan. Mr. Boggs added that EPA had authority and resources that could frustrate soil health initiatives, and the committee should use its opportunity to inform EPA where potential conflicts could arise. The FRRCC could point out to the Administrator that taking one approach versus another would produce a better outcome.

Ms. Dilley offered her view of the discussion. There seemed to be differing opinions on how difficult it would be for the committee to take up soil health. Part of the committee supports an alternative charge, but another part supports addressing the charge in a way that makes clear EPA lacks authority while also conveying suggestions for possible Agency roles, such as the 319 program and economic benefits. The Administrator must understand the range of issues, and the FRRCC must not allow a misunderstanding in the agricultural community about how the committee is advising EPA on soil health. If the FRRCC cannot resolve differences, it must inform the Administrator of that outcome and explain that it is still struggling with the charge. Mr. Petty agreed that both the EPA and FRRCC must engage in building trust and improving communication, a view Mr. Rynning seconded.

Mr. Balling was concerned, based on Mr. Teske's comments, that he might have misread the committee's sentiments. Based on earlier comments, he believed that members were energized by soil health as an issue and wanted to ensure that EPA does not embrace an inappropriate role. Dr. Bonanno added that if the FRRCC had been given a blank slate to produce a charge, the members would not have chosen soil health. In his view, the committee members were struggling with how to be supportive while avoiding an undesired outcome vis-à-vis EPA and soil health. The committee could discuss the importance of soil health without recommending that the issue become a top priority for EPA. Mr. Noonan suggested that the issue need not be branded as soil health but could be framed more broadly in recognition that private markets and USDA are pursuing water retention and other soil health goals. Such messages are worth conveying. Mr. Martin added that the FRRCC is free to respond to the charge as it sees fit and can communicate its points. Mr. Balling suggested that an advisory committee can provide advice on questions that are important to the Agency as well as questions that are important to the committee members. He said that the meeting discussions had been positive.

Ms. Carleton agreed that the meeting had been positive, and he was pleased that the process was under way. He will seek to discuss the meeting with EPA Administrator McCarthy as soon as possible to

receive any final directions on the charge. He will propose holding the next meeting outside of Washington, D.C.

Ms. Taylor stated that agriculture is a very personal issue for many people. It is one of the issues at the forefront of the Administrator's agenda. Although Congress cut EPA's budget, the FRRCC was nevertheless funded, and the Agency is committed to supporting its important deliberations.

Ms. Taylor adjourned the meeting at 3:00 p.m. EST.

Full Committee Action Items/Timeline

- ✧ Dr. Hatfield will provide a list of research needs identified by ARS-USDA to the FRRCC.
- ✧ The FRRCC members will be sent a link to the EPA website for submitting comments on the proposed ozone rule.
- ✧ Ms. Taylor will send to the FRRCC members the EPA/NRCS Agriculture Air Quality Conservation Measures document.
- ✧ Ms. Taylor will send to the FRRCC members EPA's responses to the FRRCC's previous report for their review.
- ✧ Ms. Taylor will send to the FRRCC members the January 21–22, 2015, meeting presentations.
- ✧ Ms. Taylor and Ms. Dilley will poll the FRRCC members immediately to schedule a webinar for the end of February 2015 to review the committee's 2011 report to EPA and the current status of the Agency's responses.
- ✧ Ms. Dilley will work with the FRRCC members to establish workgroups and enlist volunteers to work on select topics, with workgroup findings to be presented at the committee's next meeting.
- ✧ Ms. Dilley will draft a straw man framework for the FRRCC's report for members to review.

**Farm, Ranch, and Rural Communities Federal Advisory Committee (FRRCC)
January 21–22, 2015, Meeting Participants**



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