American Farmland Trust

NATIONAL AGRICULTURAL LANDSCAPES FORUM
APRIL 7 & 8, 2011
NOTES FROM ALL FORUM SESSIONS

April 7

OUTCOMES OF REGIONAL ROUNDTABLES
Moderated by USDA Natural Resources Conservation Service Chief Dave White

Blue Ribbon Panel Members: Roger Allbee, Varel Bailey, A.G. Kawamura, Teresa Lasseter, Patrick O'Toole, Ross Racine

Theme 1: Need for institutional innovation such as block grants to states, larger group projects, Agricultural Water Enhancement Program (AWEP) grants for irrigation

Kawamura
When a legislative fix was not feasible to resolve a fight between California bee keepers and mandarin orange growers, CDFA [California Department of Food and Agriculture] pushed it back to industries to solve their own problem. NRCS stepped in and asked: Can we create bee pasture for those bees when the mandarins are pollinated? By opening up the program, they were able to grow a flowering crop that also solved someone else's feed problem.

Have to allow for NRCS directors in your region to be innovative, not one size fits all. We need block grants to states, changes to AWEP to allow use by irrigation districts and farmers, opportunities for programs to look at watersheds in broader way—alignment and convergence, not silos.

Lasseter
Did not feel we had silos at national level like in countryside. But they are there—conflicting info from different agencies. Need to bring different, up-to-date technology.

Racine
There are additional jurisdictional issues on tribal lands. Each jurisdiction "is always right, has trump card on any given day." In 1994, the reorganization act in Kansas showed the ideal USDA office, with common computers and land data, but the effort only lasted about six months.

Example of inability of various federal agencies to recognize each other's needs: Example of young man from South Dakota who wanted to get into EQIP [Environmental Quality Incentives Program] negotiating between BIA [Bureau of Indian Affairs], NRCS and FSA [Farm Service Agency].

Bailey
Farmer example of ping ponging with federal, state and local government agencies: It took 12 agency interactions over four years to use EQIP for intensive grazing. At regional

roundtable we heard that government regulation is a blunt instrument—like weeding the garden with bulldozer. We have to figure out how to modify programs to be innovative and work through regulations as they are written.

O'Toole
Western ranchers are frustrated that the system does not work better. Recommendations at roundtables were very specific: FRPP [Farm and Ranch Lands Protection Program] very popular; WRP [Wetlands Reserve Program] doesn't work. Need to be sensible about taking the things that do work and accelerating that use. With a western renaissance and incredible energy coming out of the vision for what kind of West we could have, we need USDA and Interior to work closely together.

Theme 2: Role of regulatory, voluntary and incentive-based programs—what should we look toward in the future?

Allbee
In New York roundtable heard lots of issues related to landscape integrity, shale gas and Chesapeake Bay. Conclusion: No one approach works—need new tool boxes, thinking and ways to leverage funding. Watershed approach is most popular for landscape integrity. Regulatory agencies tripping over each other: farmers don't know where to go for what.

Bailey
A thorough discussion in Midwest roundtable aired different views. Some said progress with conservation compliance progress has tapered off after 10 years; so we should just regulate. Others said that regulations alone won't work, farmers are too innovative, will turn around and bite you.

Information response is another approach: If we had a way to document how many pounds of nitrogen are going down the river, farmers would convert this into dollars. A feedback approach would be more powerful than regulatory or incentive-based approach, if we had the ability to get information on individual performance to operators.

Kawamura
There is a challenge when agencies do not recognize overall net benefits but look for benefit in their own separate silos. In California, there is an example of a successful young dairyman who went out of business after too much regulatory friction over trying a digester. He was on the forefront of environmental innovation, but we couldn't help him because there was no mechanism to streamline and incentivize.

O'Toole
As a state legislator, discovered laws are designed for lowest common denominator, e.g., for the worst case scenario. As a result, regulatory requirements are so onerous that we must ask: are we going to be able to recruit young farmers? Can we talk them into filling the gap? At annual Family Farm Alliance meeting, emotions were high about whether children should farm given the regulatory environment. Even with good relationships with

government offices, farmers do not feel trusted. “Trust us, and we’ll be the innovative caretakers of the land.”

White
In 2008 Farm Bill, in EQIP, provision in CIG [Conservation Innovation Grants] for air quality work. Air quality is a big issue in California’s Central Valley, which is placing lots of pressure on producers. Taking 400,000 cars off the road may preclude regulations on agriculture.

Theme 3: Greater program efficiency

Lasseter
Not many suggestions in my region except to streamline and focus on local level input. The Southeast is very focused on water issues, needing to educate the public and bring government programs up to speed on technology being used on farms.

Bailey
Government needs to figure out that the modus operandi in the countryside is changing. Example of his son: Young people are running their farms and organizations from their Blackberries. No need for paper, phone or copying. The IRS is ahead of USDA in electronic interface. USDA needs to develop electronic interface with agriculture and rest of population to achieve its goals: this will be a major transition.

Allbee
There are many ways to measure program efficiency. Today there is much less need for bricks and mortar. Gave an example of agencies tripping over each other in Vermont where the issue is why isn’t NRCS doing technical and FSA program work? Likewise landscape integrity and Rural Development, in some cases promoting sprawl.

What are various roles of various agencies? We had a case in Vermont where a farm was declared to be a wetland because it had one small area with wetland plants; The Army Corps of Engineers made them do a major study.

White
Do we need four easement programs and the various cost-share programs? Are there opportunities for program consolidation?

O’Toole
The FRPP block grant approach is effective because it gives local entities the power to determine what works. On the other hand, WRP does not make sense. USDA shouldn’t send money for programs that don’t work but should support programs that do. The right choice is to put dollars on the ground so the local entities can make the decision.

Kawamura
When you see a program is oversubscribed, it’s clear it is that region. Having the ability to shift dollars would help that region. It’s about having the right management program.

Bailey
The Midwest is oversubscribed for terraces—needs to be turned into a marketplace. Not a list for 75 percent cost share. CRP [Conservation Reserve Program] shows that we can get more done if the farmers can bid.

Racine
You must always be very cognizant of the local landscape and the local producers. There's nobody in Indian country who has the ability to bid on the programs so there's only 7 percent participation in Indian country. Bidding block grants are not conducive to our efforts to using these programs; one size doesn't fit all and there needs to be some local manipulation of these programs to make them work.

Theme 4: Technology, research and innovation

Racine
Example of a kid trying to get into EQIP; while most tribal governments have the best GIS [Geographic Information Systems] in local regions, NRCS only has one per state and FSA doesn't use it. Why aren't they using local institutions? City governments have capabilities far above the USDA agencies. Why not use local contracts to eliminate bottlenecks?

Bailey
Conservation is like politics: all politics are local. One of the issues here is whether we have the research capacity to create these new technologies. NRCS is a tech transfer outfit. ARS [Agricultural Research Service] does research to develop the new technology. Do they talk to one another?

The issue is deeper than that as USDA and federal budget are forcing the collapse of land grant university research farms. By moving funding to NIFA [National Institute of Food and Agriculture] research farms have to figure out how to be part of major grant to continue funding and find a professor. System we're moving toward is moving us away from the site-specific conservation technology we'll need in the future, which is the wrong trend.

White
What is your number one research/technology development need?

Kawamura
Invasive species: we need tools and technology to manage weeds, diseases, etc. We also need to deal with public fear and misunderstanding about pesticides. First we need to keep invasives out, then invest in detection and diagnostics, and deal with increasing amount of non-natives and natives gone wild.

O'Toole
Water. How we evaluate water. The next discussion is on climate change. Family Farm Alliance wrote a pamphlet on adaptation four years ago. We looked into why river flows were higher with mediocre snowpack and found it is because the forest is dead, trees aren't

aspirating. Until we understand how various environmental issues are integrated into a whole, we can't do our job.

Allbee
In New England, we need to keep the best farmland going in future—farmland protection. Other issues are water quality, soil fertility, local and state government involvement.

Bailey
In the Midwest the greatest need is soils research. The development of growth regulators for above ground species is just in its infancy. Microbial growth regulator is answer to hypoxia in Chesapeake Bay and the Gulf as well as to increasing productivity in long term. It also supports the issue of why site-specific conservation is so important. On my field go from loss to till to alluvial. I have GPS [Global Positioning System] technology, but need better soil technology to give right treatment.

Lasseter
Water is the big issue in the Southeast. We need better understanding of how much water we have, where it's coming from, how we're using it. We also need to educate the public. It is unclear if community bank board understands the risk we're all taking; we are waiting for decision on water battles among Florida, Georgia and Alabama.

Racine
The paradigm of food production maximization got us into trouble. We need research to focus on reducing carbon footprint: Optimization, not maximization is key.

Theme 5: How to adapt to climate change

Kawamura
Most California agriculture is irrigated: We need to assess water supplies, water quality and water reuse. California has adapted for a long time because we are a desert state and will continue to push forward with or without government from the agriculture sectors.

We "need to mine the brine line." Lack of water supply will force people begin to innovate. Keep water on land and recycle it. If you can stay ahead of adaptation needs that's all you can do. But we need Land Grant College investment to supply good research and Cooperative Extension.

O'Toole
We have century-old delivery systems with infrastructure built during Roosevelt administration, and we are far behind on maintenance. Pushback on climate has happened because it felt to farmers that there was little actual policy. On infrastructure side, you're going to do small storage, which will be important. Small reservoir took 20 years to get permitted. Climate will force us to be more nimble.

Allbee
In Vermont, maple is signature industry. There is concern that due to climate change, in 100 years it will all be in Quebec. We will need to be able to adapt to keep it in Vermont with appearance of new invasive species.

Bailey
The U.S. is divided at 100th meridian: half the country has too much water and half too little water. East is dealing with floods as West dries up. A water rights attorney lectured on country's problem with arcane water laws. We have to solve the problem of water imbalance and wrestle with the issues of redistributing water through better water laws.

Lasseter
In Florida, state budget cuts may shut down weather stations. Farmers are talking about being willing to pay for the stations. There are opportunities to do more of that from the private sector so they know how much rainfall they've had. We need to find out what farmers are willing to pay for to support their business.

Racine
Conservation programs need to build in reward structure to give producers incentive for disaster mitigation. Montana just came out of nine years of drought with no emergency program. We didn't learn anything to go forward and mitigate drought. Mitigation programs that award producers will lessen the cost of government.

White
- Recap: 5 common themes
- Institutional innovation
- Regulatory, voluntary and incentive-based
- Greater program efficiency
- Technology, research and development
- Dealing with a changing climate and weather patterns

KEYNOTE SPEAKER
Kathleen Merrigan, USDA Deputy Secretary of Agriculture
The Next Generation of Soil & Water Conservation

The "Know Your Farmer Know Your Food" initiative opens up an overdue dialogue about American agriculture. While touring colleges and universities, I ask students what percentage of land is managed by private landowners and emphasize the role they have on air quality, water quality and rural quality of life. Students across the country are overwhelmed by the fact that 70 percent of USDA funding goes to Nutrition programs. Awareness of this fact will open up a new conversation about farm programs that should continue as we move toward a new Farm Bill.

When people talk about farm subsidies sometimes the conservation programs are lumped in with direct payments. Some people think the work of conservation programs is about

income transfer—this goes back to the notion that we have to engage in a dialogue about why the public, as taxpayers, benefits from the investments of conservation programs. The Obama administration has done good work—record setting enrollment in the WRP (272,762 acres), aggressive sign-ups for the CSP [Conservation Stewardship Program] (21,000 landowners in 2010)—and has committed more than ever to the NRCS basic tenet of assisting with voluntary conservation.

There has been a lot of conversation about the Chesapeake Bay restoration. NRCS has extended a hand to help them get the job done in the Chesapeake Bay area as well as all the way down to Florida with the Everglades initiative. This work is an example of what can be done to solve natural resource problems in a targeted area when dedicated people, sound science and funding all come together. "Targeting" is one of the hallmarks of this administration.

Wonderful things are also happening in farmland preservation. As one example, in Rhode Island, a small family farm made a commitment to preserve its farmland rather than develop the property, which was accomplished through a $4 million private/public partnership.

The USDA has a lot of big goals, and whether or not the budget is there with which we started, we will continue to keep these programs at the heart of all that we do at USDA.

During the National Agricultural Landscapes Forum we need to roll up our sleeves and grapple with a few key questions:

- What approaches are needed to protect the soil and water resource base most effectively?
- Which approaches in the toolkit will or will not make the most efficient use of taxpayers' dollars?
- What are the best ways to deliver technical and financial assistance to landowners?
- The USDA, along with the whole federal government, is looking at ways to streamline and reduce the burden on the public, for example, we are talking to NRCS about a common application approach. How do we make the application process easier and reduce barriers to programs?
- How do we balance voluntary incentives and regulations?
- Which new tools are needed to ensure that agriculture, farmland and natural resources remain productive in the face of water shortages, climate change, etc.

We need partnerships in order to be successful and for developing the blueprints needed to move forward.

Questions and Answers

Q: *What is the balance of conservation and energy?*

KM: There are a lot of challenges. With how much people drive and high gas prices there is an opening to think about alternatives. The President laid out a blueprint in his speech at

Georgetown. There is a struggle internally at USDA. A wonderful suite of new energy programs in the 2008 Farm Bill will facilitate the creation of a new energy paradigm; however, there are some anxieties that go along with that as well.

Q: *Are there possibilities for breakthroughs in more inter-agency collaboration?*

KM: That's a tough question. Even when we're trying to set things up from scratch we don't always do a great job. The way our bureaucracy is set up doesn't facilitate the cross-learning and cooperation we'd like. There have been some wonderful successes among inter-agency councils dealing with tough questions, but this could be something discussed at the Forum and recommendations could be made.

Q: *Will the Obama administration renew the practice of beginning the Farm Bill debate by drafting a proposal of its own?*

KM: We're still early in the process in some ways because so much hinges on baseline issues, and we're not at all clear how to structure the conversation. That said, last year Secretary Vilsack testified in front of both the House and Senate committees, and in the House he focused on safety net and how we need to expand that notion to include the concept of rural America. Times are tough in rural America where persistent poverty continues. To the Senate committee, Secretary Vilsack said we need 100,000 new farmers a year, reflecting the huge transition taking place—the average age of a farmer is 57, and 30 percent of farmers are 65 and older, and these farmers can't advise their children to come back to the farm. Who will be the next generation of people on working lands? Secretary Vilsack said we have some tools in the 2008 Farm Bill but that they're not sufficient for the magnitude of the job at hand. It has yet to be decided whether or not the Obama administration will deliver a proposal.

Q: *With nutrition programs coming out of the Farm Bill, how do you see that playing out with regional food systems? Is there any opportunity for tremendous modifications that can help build a future farmer potential?*

KM: This was a big question and one that was asked of the college students—where should the resources go? Conservation? Food safety? Farm subsidies? Nutrition? The students were shocked that 70 percent of the USDA budget goes to nutrition programs. It's this misunderstanding that undermines the USDA's work. This is a timely question given the Ryan proposal that would switch to a block-grant system for the SNAP program constituting a major change. Everything being done at USDA is under the microscope and is being reevaluated.

Q: *Is it appropriate in the Farm Bill to strengthen the role of the USDA within the federal government in the context of non-point source pollution?*

KM: Providing farmers with certainty is an extremely important initiative. We want to make sure that farmers are well aware of the programs, that they're being helped into them, that we're helping as much as we can and that they're getting credited for their effort.

Working closely with states in [Chesapeake] Bay has made a lot of progress and will help [the state] deal with issues of TMDLs [Total Maximum Daily Loads] and how to move forward. The USDA currently has a strong role, including communications with colleagues at EPA [Environmental Protection Agency]—Bob Perciasepe and I, and tech teams, have been around the table together. Farmers are stressed and are trying to do what's right, while some are not doing enough and some are doing extra but not getting credit. The USDA needs to gather that intelligence and act on it.

Q: *We need progressive conservation solutions that transfer our ability to produce in this country and others, and we really need to invest in unleashing productivity while we do that. We need to raise biomass on head and shoulders, before and after soybeans. When I was Chief, I failed to understand the importance of the partnership among NRCS, ARS and NIFA. We need to take the last 10–20 years of productivity research from the shelf and transfer it into practices. Conservation and research are second and fifth priorities. We need USDA to be a zealous advocate for these in the final budget.*

KM: About 80 million people are added to the population each year, which poses an incredible challenge. In 1995 there was a conference "Environmental Enhancement Through Agriculture," and people didn't know what to make of that title. There's a greater appreciation for the connection today. The title made it clear that production and conservation go together—that message needs to continue today.

Q: *My town of Anita, Iowa, has gone from three to 12 counties to fill a K–12 school. Main Street has emptied out; there's no longer a volunteer fire department from 8:00 – 5:00. For 110 years the town had served agriculture; Main Street made a living off of it. Agriculture is now vertically integrated and no longer needs the community, and the community needs to find a new core business. It's moving toward becoming environment and recreation based. This may be a concept that USDA needs to take a look at: how to transition these towns? There needs to be a way to help small communities develop core businesses so communities survive. Communities need programs that will help them; this is critical to bringing people into agriculture and onto farms.*

KM: This example is instructive to us all, and the problem is a challenge. The number of agricultural products that are exported is great, but there's no reason why we can't help farmers build domestic markets and opportunities for rural communities. Secretary Vilsack has a vision for rural America that includes four pillars. One part is recreation. Ecosystem markets should also be part of the future vision as it offers a real opportunity and is somewhat nascent. They are a very important part of the solution and will also help address climate change and other natural resource concerns.

SPEAKER

A.G. Kawamura, Former Secretary, California Department of Food & Agriculture: ***Envisioning Healthy Rural Communities of the Future: The Convergence of Watersheds, Energy Sheds & Foodsheds***

There have been enormous changes in land use and cropping patterns during my generation. Missouri, before prohibition, was the number one wine state in the nation, and Delaware was the capital of canned tomatoes. We lived in rural cities or suburban areas adjacent to rural areas but now we're out of touch with nature, things that are natural and where our food comes from. We don't realize how much trouble we're in if those things aren't working well. We don't believe it when we hear that 70 percent of the population will be living in megacities by 2050.

What I see taking place today is a change in our perspective and that we need to come full circle to the stability of a rural town or community. For this to happen we have to think about how and what to do, "If you fail to plan, you plan to fail." In California, the Governor put into play partnerships in San Joaquin Valley in which we stepped back and recognized how important the Valley is, but what is its future in the face of urban growth and sprawl? Monterey County is the top county for agricultural production, and San Diego has the highest population of farmers. Ranchettes that grow avocadoes and other commodities are part of what drove us to do the Ag Vision project. It was an effort to imagine California's future in 2030 and what the state might look like, and if we agree that it can look a certain way we can work towards what we want to see happen. We looked at the success of the Chesapeake Bay plan, which was work not being done in a vacuum.

An interesting part of the Ag Vision discussion was the number of stakeholders who showed up to talk about their role in the vision…

There is very little pork production in California; it's a wide open market for local sourcing. The 25 by '25 coalition has the opportunity to energize rural and urban communities. Our watershed has all kinds of needs—we have more of a salt problem than a water problem. If we had more technologies driven by energy, or more drought- and salt-tolerant crops, solutions would come together nicely. Whether or not there is a renaissance of agriculture in the rural or urban sectors, we see alignment and scalability. Agriculture will be big, small, conventional, organic, exports and local. Customers who are demanding will have products when and how they want them.

There was an exciting announcement from retired Admiral Denny McGinn for the military to wean itself off of imported fuel and use more U.S. biofuels. The Navy plans to increase U.S. fuel use by 50 percent in 2015. These changes establish a marketplace for renewable fuels, which is a key for young producers. There are other solutions taking place on a national and international scale and at such a fast rate that by 2050 the BMPs will be in place throughout the world. All of this sounds good, and I truly believe it will happen; yet there are dark clouds on the horizon.

As a farmer, I don't know what to say about climate change. We've had tough experiences this year with unpredictable weather, which means an unpredictable harvest and difficulty for the global system to feed 9 billion people. And there is more unpredictable weather on the way with record rain and heat. One of the most important speeches at Copenhagen was by a retired admiral who said that the instability caused by unstable food systems is important.

Farmers work toward a goal of enhancing production—improving tractors, breeds, seeds, processing plant—and they invest to improve predictability. There has been a decline in investment of invasive species protection, exclusion and eradication. The government is walking away from very important information that is the foundation of agriculture. As we move into the 21st century the public is still clinging to the perceptions of what agriculture used to be—that farmers use DDT and plow the prairie, and that the dustbowl is just a day away. We need to realize that just because we can plow the whole Midwest that's not the best soil management practice; that just because we can kill every bug that's not the best pest management; that just because we can put out every fire that's not the best management. We are moving away from using words like degradation, destruction, denial. In the 21st century we are using more words like restoration, reforestation, renovation and revitalization. As we embrace these successful forestry and agricultural models, we'll see much faster movement towards sustainable practices everywhere.

The National Agricultural Landscape Forum deals with a couple of things: the rural landscape, and permaculture, the circular use of energy, water and food. We all know that the original farm operation was by a water source, in a community, with horse or water power. Today we could do that all over if we wanted to—the tools are there in a new way to enhance the food-water-energy shed. Likewise in urban landscapes we can now grow food in vacant lots, a sign of the urban scale in the 21st century. The changes in systems management are also exciting, and in California the nursery/horticulture sector is the second agricultural industry, though it's taken a beating during the economic downturn. At the same time, the number of backyard gardens has exploded, and edible landscaping companies are doing well with transplants for gardening. There is an opportunity for education and creating an agricultural system based on potentiality, and there is an excitement about what can happen in agricultural systems around the country.

The human landscape means that there's an agricultural landscape as a part of the human environment. As long as we have dependency on agricultural systems the human environment goes side by side with it. While I was working with an old Marine base in Orange County, people wanted to build an airport to take pressure off of LAX, while others didn't want it in their backyard and so shut it down. The citizens wanted to turn it into a park the size of Central Park, the San Francisco Golden Gate Park and Balboa Park combined, making if the first 21st century park in the country. Now there's farming taking place on green spots of the tarmac, creating an agricultural showcase for the 21st century that embraces the food and energy systems and provides a great example to help educate the public and international experts.

There are great reasons to be optimistic about the future while recognizing the jeopardy that still exists, especially with the shrinking pie of the Farm Bill. What a mistake it would be at this point in time to not invest in the Farm Bill, which provides food, clothes and energy.

WATER SECURITY: QUALITY, QUANTITY, AND WATER RIGHTS
Moderated by Patrick O'Toole

Panel
Jose Aguto – National Congress of American Indians
Jeff Jacobs – National Research Council Water and Technology Board
G. Tracy Mehan – The Cadmus Group, LLC
Kristen Saacke Blunk – Ag and Environment Center, Penn State University
Marc Thalacker – Three Sisters Irrigation District

Pat O'Toole – Introduction
Water has been a major concern at a series of conferences concerning the Resources Conservation Act. Yet part of the water security issue is institutional. Used example of different legal situation for water on his farm on the Colorado/Wyoming border.

Most of the water is under the control of agriculture, while cities want more water, some conservation groups want water for wildlife, and now have increased demands for water for energy development, such as fracking.

In order to find solutions to water issues, there is a need to better understand the issues.

Jose Aguto: Tribal Issues and Water Security
The National Conference of American Indians is the oldest and largest Indian organization in the country. Tribes have many water issues that go well beyond agriculture because water affects so many aspects of tribal life.

Tribes need to overcome decades of inequity. Tribes are not asking for pity, but instead seeking equitable opportunity for tribes. There have been historical funding inequities over a period of time. The BIA [Bureau of Indian Affairs] has had the lowest funding increases and the greatest decreases within the Department of Interior. Tribes are not eligible for major natural resources programs, cooperative forestry assistance, land and water conservation fund, etc. Community extension is much lower for tribal colleges compared to counties across the country.

For water rights, tribes have earliest priority dates and seniority. Only 75 tribes have received water rights. This is an important priority for tribes. They are currently cooperating with Western Governors Association and Western Water Council to try to rectify water rights priorities. In three decades of water rights settlements, the federal government has not committed adequate resources for resolving tribal claims.

Current situation is adverse. For example, in New Mexico over 40 percent of Navajos are still hauling water for domestic use. Tule River Tribe in California can't process housing applications because of the absence of infrastructure. Twelve percent of tribal homes lack access to clean water compared to a national average of 0.06 percent for all homes. Some villagers in Alaska are hauling waste to open pit lagoons.

Some solutions should include creation of permanent funding for water rights settlements. Could include a 3 percent set-aside for tribes in Clean Water Act state revolving funds. There are also needs for funding water infrastructure maintenance.

Only 40 out of 465 tribes currently have water quality standards delegated from EPA because EPA delegates this to states.

Concerning agriculture, the 2007 Agricultural Census found an 88 percent increase in Native American farmers compared to 2002. Tribes are turning to farming again. Navajo nation president has said that they want their farmers to begin farming again, but that they need infrastructure to help support it. For example, they have 1.1 million acres potentially irrigable, but lack the infrastructure to make it happen. Tribes would like to collaborate on these challenges.

Jeff Jacobs: Water Security and Availability: National Trends and Challenges (PowerPoint presentation available)
Cited recent books on topic of water security – Harvard professor Peter Rogers *Running Out of Water*, Robert Blennon *Unquenchable*, Steven Solomon *Water*

Concerning water availability, from a global standpoint, there is little chance of running out of water. Quoted a study that stated: *"There are huge volumes of water—many thousands of times the volumes that humans appropriate for all purposes"* (Gleick and Palaniappan, 2010)

According to USGS [U.S. Geological Survey], at the national level, water withdrawals peaked in 1980. Irrigation and thermo-electricity withdrawals are stable or have decreased. Withdrawals for public supply and domestic uses have increased steadily since estimates began. Nationwide, groundwater withdrawals for irrigation were about 3.5 times larger than groundwater withdrawals for public supply.

Water availability tends to be more of a regional scale issue. Regional shortages, limits, conflicts over limited availability are driven by:

- Changing **demands** and variations in **supply**
- And as affected by differences across riverine and aquatic systems

One example concerns the Colorado River Basin. The Basin provides drinking water for 30 million people, so it is very important. The river has had high annual variations in flow over much of the 20th century while some developments have provided critical water supply and storage capability. Water supply ebbs in the early years of this century, while

water demand has grown. In early part of last century, demand was not a critical issue. But now, demand is outstripping supply.

From 1996 to 2006, annual flow of the Colorado River was about 15 million acre feet, but based on longer term studies using tree ring reconstructions, long-term flow seems to be more like 13-14.5 million acre feet. These reconstructions and temperature trends suggest that future droughts will exceed the recent one, leading to shortages in the Basin.

A January 2011 Colorado River Water Users Association conference suggested that they need to rethink the future of the Colorado River. One quote suggested why: "there is just not any water left on that river." Projections of water demand to 2040 show 96 percent increase in manufacturing and industry, while irrigation water use decreases by 6 percent. William Patzert of NASA [National Aeronautics and Space Administration] says that the continued growth in the population of the West will exacerbate the problem. "The problem in the West is not climate change; it's too many people using too much water."

Another example of regional water issues concerns the Missouri River Basin. It straddles the arid West and the humid East, has more storage, and does not have large cities like Los Angeles and Las Vegas, with rapidly growing water demands. Yet, it still has conflicts among water users. Difficult choices are inevitable and priorities among competing uses must be established.

It is important to acknowledge limits to water use for producing goods and services and to develop trade-offs among competing uses.

Aquatic systems and estuaries also exhibit limits on capacity to assimilate pollutants. Examples include nutrient-based impairments in water bodies across the nation and the downstream effects in Chesapeake Bay and northern Gulf of Mexico. EPA's Office of the Inspector General issued a report that found that development growth was outpacing progress in watershed efforts to restore the Chesapeake Bay. Nutrient and sediment loadings were increasing faster than reductions.

This illustrates limits and the need to set priorities and make difficult tradeoff decisions concerning water and related uses.

In summary, the key drivers of water security, availability, and conflict are:

- Regional differences matter…arid—withdrawals, scarcity; humid—water quality and pollutants. Not strictly an issue of water withdrawals and allocations.
- Hydrologic/climate variations can add or detract from stresses (less controlled by policy decisions and choices).
- Demographics and development patterns can greatly exacerbate stresses (driven largely by policy decisions and choices).

<u>Tracy Mehan</u>
Agriculture is a crucial partner for water quality managers. While not the only part of the puzzle, agriculture is a big one. There is a need to overcome the sense of mutual

incomprehension between traditional water sector and agriculture—a need to get back to better understanding of the water quality issues. A new 21st century Farm Bill with market segmentation would help.

The demands on water are clear and they affect everyone. There will be an estimated 125 million more Americans by 2040, and they will be clustered on the coasts, including the Great Lakes.

In the 39 years since passage of the Clean Water Act, great progress has been made in addressing point source discharges. Efforts have cleaned up the Great Lakes (Lake Erie) and the Potomac River among others successes. While some lakes may not yet be fishable and swimmable, at least they are not flammable.

Storm water runoff is a major concern. It has high velocity, carries nutrients and is aggravated by the rapid growth of impervious surfaces.

There is very little regulation of total nitrogen and phosphorous for point sources. Less than 10 percent of all publically owned treatment works have limits for total nitrogen ad phosphorous. Without numeric limits, the permit writers have a difficult time specifying what the permit should actually say and be credible. Hence, the permits are not written to include specific limits.

There is a need to develop a holistic approach to water quality on a watershed basis. Agriculture is the largest contributor of nitrogen to the Chesapeake Bay and the Gulf of Mexico, in part due to unregulated non-point sources like crops. Question becomes, how can we move towards a watershed or drainage unit, like an eight-digit HUC [hydrologic unit code] in order to better consider the downstream effects from upstream uses.

Looking ahead to Farm Bill authorization, essentially our conservation programs will have to be performance based, outcomes based, reality based. Have to move in that direction. How? Have to justify to taxpayers. Need to make steps to ensure that conservation programs are not surrogates for commodity price or income support. Conservation programs are intended to deal with market failure.

Conservation efforts need to deliver environmental results for the taxpayer. There have been successes, such as erosion reduction, WRP (contributor to no net loss of wetlands). Have to have systems that are performance based. The MRBI [Mississippi River Basin Healthy Watersheds Initiative] is a model to be learned from—not taking new money, but redeploying money in a way that's performance based. This approach deserves more discussion.

In order to effectively do performance-based management and deployment of conservation efforts, you've got to have information. The comment by Varel Bailey about information response approach was right on. A major problem with all environmental programs is that data and modeling are the first things to go when budgets are cut in tough times. Instead,

there is a need to keep the data coming over time and use it effectively to design programs for maximum effectiveness.

Asymmetric information is one of the classic problems of market failure. If you can't measure it you can't manage it. Having good data that is valid and transparent will improve management of conservation programs. Common datasets can help overcome barriers.

Kristen Saacke Blunk: An Integrated Targeting Approach for a Watershed (PowerPoint presentation available)
Need to look at targeting, not only to align resources to critical areas, but also to allow collective aggregation of efforts at a place and scale to measure outcomes that those collective practices provide. Also, there still are populations that truly need targeting, such as tribes and the plain sects in Pennsylvania. These groups have huge influence over large portions of the landscape.

The Chesapeake Bay Watershed Initiative (CBWI), like the MRBI, has provided huge benefits for the region. Just a few years into CBWI, so we still need to see what the outcome will be.

Targeting needs to be integrated across all landscapes and sectors, so that it is more of a community approach that considers agriculture, municipalities and others.

The market reflects the economic forces from the outputs of products and signals back to influence production methods. However, the environmental outputs are not covered by the market, so no feedback is possible to producer's production process. Except through social forces, the environmental costs are external to the producer. This is not going away regardless of how many practices are implemented. The policy challenge is to find a way to internalize the costs of environmental outputs. If the environmental costs of production can be internalized, then producers may be more inclined to adjust production processes, such as through the use of best management practices. Right now, the Farm Bill commodity and conservation programs do not address this need, and we will continue to have the mass imbalance issue of nutrients coming into the system and not being able to be assimilated.

In order to seek ways for conservation adoption to result in the desired outcomes, we need to work on a concept of "transformative conservation." The country needs to transform conservation through authentic engagement and relationship building. Conservation happens through people, not programs. That means looking upstream at the source of water quality problems and possible solutions.

Several items came out from an "Agriculture in Balance" conference in June 2008. Participants worked on developing a vision of what agriculture will look like in Pennsylvania. These include:

- Innovations are critical. Innovations are largely at pilot level now, yet need to quickly apply them out into the non-research areas.

- Need to reenergize partnership and build integrated approach across all landscape types. While focus is on agriculture, must recognize that farmers live in communities with yards, wastewater treatment, zoning decisions. Cannot address agriculture in a vacuum. The solution involves a mosaic of interests.
- Encouraged to build discovery sites (UW is model). Integrated in a targeted approach. Do it at a scale that we can measure what conservation practices collectively do.
- Charged to help all landscapers, farmers, foresters, and others understand ecosystem services, so they can understand the changes and really know what's lost when making land use changes—not just the farm, but what is in the soil, changes to the aquifer, etc.
- Resulted in mutual desire across wide range of partners and NRCS to build a place where pooling resources and aligning resources in a meaningful way to build a success story. Using a targeted approach with a measured outcome. Targeted approach is about a process that is applicable to the next watershed. Building a system. Build on landscape successes in different organizations. Case of the Conewago Creek watershed in Pennsylvania. This model integrates four key assets or attributes: 1) people, 2) practices, 3) environmental condition / monitoring, what's going out in a discharge to the Susquehanna, and 4) ecosystem services.
- People
    - Social dimensions at any scale are the dimensions for which we don't have funding, but we know that understanding the points of entry is not just critical, it's paramount.
    - Invested with support from Mid-Atlantic water program to survey residents – all farmers and 50 percent of non-agricultural residents. Usually, other approaches are interested in administrative and process indicators like funds used and activities completed. Of greater interest are the social indicators—change in knowledge/awareness and behavioral change, adoption of recommended practices, actions that result in the environmental outcomes.
    - Part of the targeted approach is learning who producers want to hear from. Neighbor, district, preferred agent of trust? Penn State extension / NRCS / SWCD, etc. While all of these entities need to be engaged, no one of them can always be in charge of the process. Need to use delivery mechanism that the producer is most receptive to. Have to step back and not care who gets credit for it. When we go out there we allow the most credible source to lead at any one time.
- Practices
    - Have assessed all 220 farms based on needs and practices, and prioritized them as well as working to match them with the right program for them. Working on getting practices on the ground through EQIP and CBWI, including innovative practices. Precision feeding is one such practice. Got people to come to a small group focused on precision feeding by offering a free manure sampling kit. Another practice is the "subsurfer" (manure applicator). It can incorporate dry manure without disturbing the no-till.
    - Looking for practices that also lead to value-added products or by-products.

- Not focused just on the agriculture landscape; the non ag landscape is also critical with riparian lands and wetlands. Not an ag initiative, but a watershed initiative. Agriculture is glad to see that their neighbors are part of it. Going to farmers as agents for communicating about helpful practices to their urban neighbors.

- Monitoring
  - Penn State's economist is looking for early signals of change in the environment. Trying to move monitoring up to the small watersheds rather than in the tidal zone. Have USGS on board working with NRCS. They need to know where the practices are in order to know what they're monitoring. Now looking at macro-invertebrates from creek. They're in the stream. An important concept is encouraging farmers to incorporate water checks (stream and wetland checks) into their daily routine for monitoring what is happening on their farm.
- Ecosystem services
  - All need to find a way to better articulate what it is and how you help people measure it, monitor it, and use best management practices for improving it. Assess what ecosystem services are on the landscape, how to improve them using different practices.

<u>Marc Thalacker: Water Conservation, Energy Conservation and Generation, New Ideas of the Next Farm Bill</u> (PowerPoint presentation available)
The Dalles project in Oregon is one project funded through the AWEP. In it, we partnered with Bonneville Power, NRCS and others to implement irrigation water management through telemetry and a program of scientific irrigation scheduling. Process included replacement of older control valves to save water and energy and putting moisture meters on every farm in whole irrigation district, hooked meters by telemetry using existing weather station as radio towers. In addition to saving water, reduced pumping costs by 10 percent from saving 1.8 million KWH of electricity. Improved farm productivity and reduced pesticide use. In second year, doubled farmer interest in efforts.

Three Sisters Conservation District—Whychus Creek project. This has evolved over the last 12 years with NRCS and the Bureau of Reclamation to pipe 10.3 miles to replace open canals and on-farm ditches to improve water quality in a 303(d) listed creek; conserve water, save energy and improve fish habitat. These and related actions have resulted in:

- Reduced water transmission losses by 40 percent to 70 percent.
- Saving 10 cu ft/sec of water over season.
- Estimated savings of 3 million kwh of electricity; $1000's in energy costs.
- Decreased creek temps; increased water flow, improved fish habitat
- Can now have a spawning flow in low flow periods and most farmers have received 25 percent increase in available water

Pressurized 2,000 acres, eliminate many pumping systems, AWEP completed conservation on farms with pivots, pop-ups and systems that allow them to raise seed crops and higher value crops.

Key to every project is partnership. One of best items include: Confederated tribes partnered with Portland General Electric and have committed $120 million over 50 years for reintroduction of steelhead and Chinook above the dams. With additional streamflow should see adult salmon in the creek by 2013 and 2014, could double steelhead run in Deschutes River.

Building the partnership is necessary for projects like these. Planning is a key. Used the NRCS Oregon rapid watershed assessment process and PL 566 watershed planning funding to carry that out. Projects that address ESA [Endangered Species Act] and CWA [Clean Water Act] get more successful in obtaining funds. Need to involve all stakeholders. End goal is certainty and sustainability, and the piping and pressurized system has helped restore the stream flow, provide more water, and achieve protections as called for in the ESA and CWA.

New energy frontier has huge potential for the West. Based on DOE's [Department of Energy] initial review, could be tens of thousands of open canal turbine projects and pen stock pipeline projects just in irrigation canals throughout the 17 western states. Tremendous opportunity for DOE, EPA and Interior to look at how to move projects forward.

Hydro projects can, over time, pay for a majority of project. So if the project is restoring flows and addressing ESA and CWA, win across board. So believe that energy generation is a key for the future.

Hurdles and Impediments, especially on small hydroelectric projects:

- Expanding "Bridging the Headgates" MOU to include all federal agencies and avoid duplication
- Incentivizing the projects (state by state; Oregon has set power purchase agreements)
- Agency cooperation and avoided duplications. Have had to run dual NEPA [National Environmental Policy Act] projects before, and the agency differences for the same activity should not have to occur.
- Need plug and play standards for interconnections, new technologies will be innovative but can have interconnection be standard
- Wheeling costs need to be fair and equitable. Right now they are a problem. There are different regulators, state or federal, depending on who you are. Co-ops' wheeling costs not regulated by anyone.
- FERC [Federal Energy Regulation Commission] requirements of just and reasonable need to apply to all parties

Funding is the biggest hurdle. Many programs have been helpful. NRCS has been good partner. EQIP has been good, and AWEP has been a nice improvement, as has CCPI [Cooperative Conservation Partnership Initiative], BOR [Bureau of Reclamation] Water SMART challenge grants work well with NRCS programs. Irrigation districts have been very successful with EPA clean water state revolving loan fund. DOE and hydro

generation will be key with super tight budgets going forward since energy can help pay for some of these multipurpose projects.

Argues that these projects are win, win, win. Everybody wins, no losers.

- Clean Water Act benefits
- Endangered Species recovery
- Sustainable agriculture
- Clean green renewable energy generation
- Reduced carbon footprint

Questions and Answers

Q: *There has been no mention of Marcellus Shale. Is there or should there be a role for NRCS in use of water as it pertains to energy development or even soil and water in the traditional sense? Or does it need to be stovepiped into EPA or another entity?*

Blunk: have ag 101 training underway with NRCS for early career professionals. In northern tier of Pennsylvania both farmers included natural gas as something they farm. Producers in Bradford County with farm and dairy and incredible conservation; has also utilized resources from Marcellus Shale to reinvest in the dairy system. NRCS and Denise Coleman new state conservationist doing fantastic job engaging, really looking at how the programs do and do not accommodate the industry; that is only going to get bigger in the region and other states. Where it comes into conflict is an issue, in particular in conservation easement programs. That needs to play out. But in terms of the land-based practices there's a lot of compatibility.

Q: *We had a discussion about ecosystem markets and how government is principal buyer. I love that you talked about measuring outcomes and performance. What is your sense of what it takes to get cross-agency concurrence to accept performance outcomes that can be delivered by agriculture to meet things like TMDL requirements for the Chesapeake Bay?*

Mehan: in 2003, came out with water quality trading policy and technical guidance based on previous work the agency had done. Not taken off as much as we'd hope. Still have a lot of people in EPA in command and control model. Because of this, the market approach can work in some regions and not others. Whether using numeric criteria or technology-based approach, wastewater entities would be lining up to do trades if they had to meet a certain requirement. The market may require that kind of a driver to really take off. Perhaps the Farm Bill should find a way to encourage brokers, bankers and aggregators of credits to move forward, at least for water quality. Sometimes farmers are hesitant about these transactions because of concerns on liability. Actually have interface between wastewater and agriculture sector around biosolids disposal, that involves brokers in between that knows the laws, regulations, and aggregates producers. That might be an assist to help reduce transaction costs, uncertainty and the unknown and bring two sectors together to put everybody at ease. That's secondary to regulatory and water quality standards driving. Seeing some trading in the Bay because you've got those kinds of standards.

LANDSCAPE INTEGRITY
Moderated by Roger Allbee

Panel
J. Gordon Arbuckle – Assistant Professor, Iowa State University
Richard Barringer – Research Professor, University of Southern Maine
Craig Cox – Senior Vice President for Agriculture and Natural Resources, The Environmental Working Group
Jeff Herrick – Research Soil Scientist, USDA ARS
Walter Hill – Dean, College of Agricultural, Environmental and Natural Sciences, Tuskegee University
Charles W. Rice – Soil Science Society of America

Roger Allbee – Introduction
The U.S. has not assessed the nation's farmland needs in 30 years—especially cropland and prime farmland—since the National Agricultural Lands Study; since then we've lost as much farmland as Illinois and New Jersey put together. Panelists asked to address a series of issues:

1) How much land do we need?
2) What are research needs?
3) Are current conservation efforts working?
4) What new approaches might be needed?
5) How do we steer production to most suitable acres?
6) How to accelerate soil conservation and sustainability going forward?

Dr. J. Gordon Arbuckle: Conservation implications of the increasing number of non-operator landowners in the Corn Belt (PowerPoint presentation available)
Magnitude of non-operator landownership in the Corn Belt: Illinois: 62 percent; Indiana: 54 percent; Iowa: 53 percent. Recent examination of data from recent Iowa study suggests implications for conservation and ways to work toward ensuring conservation on rented land.

Rented farmland is not distributed equally, but concentrated in most fertile areas of Corn Belt—up to as much as 80 percent in some counties.

Management practices are similar between non-operator landowners (NOLs) and operator-landowners. Participation in set-aside programs (CRP or WRP) also is about the same. However, there are marked differences in structural practices that require time and money (e.g., terraces, grassed waterways, etc.); NOLs are much less likely to use EQIP and CSP and to participate in working lands programs.

Two studies show types of NOLs: former farmers, spouses, inheritors, investors with family ties, investors without family ties. Former farmers and spouses are 75 years and 79 years old on average; inheritors are younger, investor even younger. 70 percent of pure investors live within 25 miles of the farm.

NOLs are both geographically and culturally removed from land and overall spend less on conservation: 25 percent spent $0 on conservation in last 10 years. They are satisfied with their tenants' conservation, but tenants think that their NOLs should do more

Conclusions: NOLS will grow; NOLs care about their land and impacts of farming but there's a need to cultivate awareness and demand for conservation on their land.

Suggested Mechanisms: Conservation certification for tenants based loosely on the Extension master gardener program; Targeted conservation: don't wait for NOLs to walk into an NRCS office; create a program that targets inappropriate activities on vulnerable land.

Richard Barringer

The six New England states share an ecosystem, and the landscape is largely privately owned: 92–93 percent excluding the White Mountain National Forest. New England is land of rugged individualists, but we are living in new time.

Two propositions: "if we fail to plan, we plan to fail" and "all conservation is local."

In 1908, Teddy Roosevelt convened 41 governors in Washington, DC, to motivate them to improve forest practices in the headwaters of great rivers. Also in 1908, the New England governors convened for first time and three years later passed the Weeks Act.

In 2008, the New England governors celebrated the centennial of that first meeting and assessed the state of region's landscape of today. They commissioned a process that included outreach meetings which prioritized critical resource issues including fragmentation, generational turnover, unyielding demand for coastal property and climate change, concluding that together these forces had created a crisis, which although not widely understood, threatened the viability of the region's resources.

They developed a set of principles to address these issues including:

- Private ownership creates challenges and opportunity;
- No longer is it sufficient to conserve land as a good solely for natural benefits; today must incorporate the social and economic benefits that derive from conservation;
- Regional collaboration is absolutely necessary.

The governors established a standing Blue Ribbon Commission and directed the chief state officers in each area to launch a series of five initiatives: Keep farmland in farming (strengthen long-term profitability and regional food system infrastructure; retain and protect the region's farmland; improve access to nutritional local foods) and set similar goals for the other four initiatives: Keep forests in forests; Connect people to the outdoors; Protect wildlife habitat; and Protect coastal and estuary lands. The Governors passed resolution 200 in July 2010 to support these efforts.

"America's Great Outdoors model is key." Secretaries should be given opportunity to define regional landscape opportunities and compete for resources to bring them together. Make working lands financially viable. Strengthen regional connections between people. Retain and protect farmland. This will take time. It's not enough to set aside special lands, it's about coordination. But enormous advances in coordination are already being made.

Craig Cox

The central principle that will gird future conservation efforts is that there will be less land and water with which to do more. The future of pressure for all-out production is here, crop surpluses are over, prices likely to remain high. This is partly because of biofuel mandates to use 40 percent of corn crop for ethanol.

What's happening in the Corn Belt suggests we do not have the policies and programs in place to deal with the pressures on the agricultural land base and maintain conservation. We are losing rather than gaining ground. Farm and insurance subsidies are facilitating expansion in all-out production with little regard for conservation. Intense competition for land; land tenure issue is a remarkable phenomenon.

Upshot is intensive if not extreme pressure on land and water resources: "We will have to run much faster and smarter to stay in the same place." Landscape scale is the only way to manage agriculture for conservation; act at the farm or field scale but strategize at the landscape scale.

Knowledge and real-time information are the keys to success: less emphasis on modeling and simulating and more emphasis on knowing what's happening now. Large national inventories may be focusing us on the past—when corn was $2 a bushel.

Reality of investing in knowledge and information for agricultural communities comes down to rebalancing how much money goes to farmers and how much to infrastructure.

Challenge of maintaining landscape integrity in the future will force us to ask what the public interest is in private land. We need open, honest discussion about what we expect of farmers in terms of conservation on their land. Science tells us that inappropriate behavior on vulnerable areas can create a disproportionate share of environmental damage.

Can we require significant conservation effort in exchange for subsidies? In the Farm Bill context this will mean strong provisions for conservation compliance programs.

Greatest threat is complacency: we're running out of time in two ways: We're still dealing with legacy of poor conservation of 30 years ago; Ag committees are in great danger of losing leadership on these issues.

If we fail in this next Farm Bill to get after these problems, all Farm Bills in the future will just be about budget cutting. We need to get the attention of the Ag Committee to develop a national conservation strategy and program but we will have to work hard to make this Farm Bill a real conservation bill.

Jeff Herrick: Resilience-Based Management (PowerPoint presentation available)
Assumptions: Development and amenity farms/ranches will increase loss and fragmentation; demand for food, fiber and energy will drive expansion and intensification of production on 'marginal' grazing lands.

Resilient landscapes have capacity to recover from extreme weather events; resist and recover from degradation; less likely to cross a threshold or 'tipping point'; maintain their capacity to support current and future societal needs (ecosystem services).

Need next generation resilience-based management at the field, landscape/regional scales. Targeted conservation actions. CEAP [Conservation Effects Assessment Project] is doing a great job); favors sustainable production at landscape scale; integrates *relevant* scientific and local knowledge; often requires strong communication and cooperation among stakeholders and is supported by Long-Term Adaptive Research networks.

First Generation: limiting nutrients and erosion at the field scale; Second Generation: precision agriculture; CEAP and REAP [Rural Energy for America Program].

Next Generation I: Target management to low resilience areas, those at risk from drought or flood. Examples: Hydrology/erosion: shallow soils/convex slopes; invasives: favorable conditions for establishment plus persistence

Next Generation II: Target management to control landscape-scale resilience, create connectivity, may not be on my farm or my neighbor's farm . Examples: Hydrology/erosion: gully formation; invasives: dispersal nodes

Soils control resilience. Hills are more resilient than gravelly soils, which are more resilient than sandy. Lost over 50 percent of forage cover in sandy soils between 1970 and 2003 (also more productive soils). Drought and landscape scale overgrazing on sandy soils reduced grass production and increased soil erosion and native shrub invasion.

Malpais Borderlands Group example, landowner-driven nonprofit working on 1 million acres, partners include BLM [Bureau of Land Management], NRCS, USFS, ARS and others, recently established CAMINO [Cooperative Assessment Monitoring and Interpretation Network] with ARS.

New opportunities: Tremendous advances in last couple of years. Extending conservation programs to public lands; Sharing knowledge: "ecological sites" adopted by USFS, NRCS, BLM with support of ARS; Partnership Management Team (ARS, NIFA, NRCS) re-established; informing resilience-based management:

- NRCS and BLM have adopted common core rangeland assessment and monitoring protocols
- Conservation program funding can be used for monitoring
- Increased NRCS and ARS commitment to CEAP

Charles Rice (PowerPoint presentation available)
Underlying factors for the challenges of the coming decades:

- Nutrition/Food security – Food quantity, Food quality, Food cost: 9 billion people in 2050, land area per capita in developing countries will decrease by half
- Land resources – soil and water: Less land per person, soil degradation from contamination, erosion and shopping malls; water needed for irrigation to feed the world, declining water quality – example, Ogallala aquifer in Kansas dropped 40 feet from overuse, going back to dry-land condition; creates more pressure on other lands; energy increases demands on land, as well.
- Climate change: biggest concern is not temperature change but change in water distribution ; some projections in central US are for more extreme events, less frequent—impact on soil and water resources? More erosion, downstream flooding, more drought between the events,

Primary goal for agriculture is to increase global productivity and efficiency. Improving efficiency without improving productivity increases pressure to produce more on other lands. Squandering resources to maximize productivity puts more pressure on other lands to reduce environmental impact. Need to do both together.

Many opportunities exist to improve soil. On cropland by reducing tillage, increasing rotations (more intense and more diverse), using cover crops (e.g., hairy vetch), fertility management, nitrogen efficiency, productivity and greenhouse gases, and water management – smart irrigation systems that are less energy intensive.

Crop production has dominated landscape and ecosystem services. Now increase in interest in water quality, but maybe less in water flow regulation, air, etc. Need to strike the right balance.

Need to think of landscape unit instead of farm and field; don't treat everything equally but target areas. One can't expect zero emissions from a particular field, but can look across landscape to management emissions

Need to up-scale from soil to field to regional/state/national level: Are we equipped to do that? Must recognize the time factor, this isn't going to happen tomorrow. Both spatial and temporal factor—requires innovative approach, databases, remote sensing, models

Soil organic carbon observatory (SOC): combines remote sensing, modeling; ground-based measurement for assessing changes; quantifies regional SOC changes at the resolution of individual agricultural management units for diverse environmental conditions and cropping systems; evaluates the relative contributions of management factors, environmental conditions, and cropping systems for SOC changes.

Needs:

- Geospatial databases (e.g., NRI) – scale up
- Test sites (universities, NIFA, ARS)

- Remote sensing; integration through a model
- Ground truthing

Approach:

- Targeted conservation programs at watershed level, do we have the assessment tool? We have CEAP, but it's mostly focused on water.
- Markets for environmental services: Soil, water; Canada has carbon market; the public needs to see the benefits that they're getting for their food dollars
- Foster appropriate landscape diversity;
- Avoid fragmentation of agricultural lands by urban development
- CRP Issues: There is a lot of land enrolled in CRP; there will be increasing pressure to take it out. There are risks with that but also may be some benefits as these lands could be targeted for biofuels or perennials

Dr. Walter Hill

Aldo Leopold: "A thing is right when it tends to preserve the integrity, stability, and embodiment of a biotic community, and wrong when it tends to do otherwise." Integrity: consistency of actions, values, methods and principles based on the ability to achieve stated goals, a holistic approach. Integrity of landscape includes biological and socioeconomic parameters.

For the first time in a holistic and systematic way, the 2008 Farm Bill brought integrity of blacks, Hispanics, other historically disadvantaged to agricultural landscape. (Does not like the term socially disadvantaged; work to change to "historically disadvantaged" in the next Farm Bill.)

Forty programs that mention Socially Disadvantaged Farmers and Ranchers have opened the door to participation, but USDA employees and community organizations also must proactively assist.

Historically we have not done a good job bringing in the whole community including all related spheres and socioeconomic groups. Youth program needs to expand. Rural Development has been great in Alabama Tuskegee County.

Different states and counties define eligibility differently. Flexibility is needed to give power to operators at the local level. Example: a historically disadvantaged farmer in Macon County who was working with Wal-Mart was building a processing plant. He had such a run around by multiple government agencies that in the end he got his loan but missed the timing on the grant by just a few days.

Between 2040 and 2050, 50 percent of the U.S. population will be comprised of what we now characterize as minorities. We need to leave a legacy for future generations of minority farmers so that they are better off than they are today. All of the concerns of conservation and the agricultural landscape that we've been talking about are concerns of socially disadvantaged farmers and their communities, as well.

Challenge everyone to get inclusion from every group that you can. “Building trust is a monster, it takes time.”

Question of new farms cannot be taken lately. Big farmers in Alabama frustrated that no one will take over farms. This has become a national security issue. Mentee-mentor relationships are needed.

The more we lose the site specific Land Grant component, the more trouble for the future. Need to develop the entrepreneurial component. By cooperating with Wal-Mart, a lot of good efforts were catalyzed in Alabama farms. Also having students in land grants adds something we don’t want to lose.

If we are going to make it, we will have to become masters at the sharing table. Need to teach diplomacy, to hold the dream, to put your money where your mouth is. For example, Land Grant universities in Alabama created line item in state budget that was bipartisan, across board, acknowledged that Land Grants help everyone in state. The process of working with people and the land is just as important as every other aspect of agriculture.

Allbee

Common themes:

- We’re losing ground on landscape integrity
- It will take new approaches
- Farmer are a big part of the landscape but not the only part of the landscape preserving the landscape will take multi-jurisdictional cooperation.

SPEAKER

Krysta Harden, Chief of Staff to Secretary of Agriculture
Choosing a Future for Conservation

What will conservation look like in the future? Given ongoing federal budget discussions, USDA has to find better ways to do its conservation work. Programs will be reshaped, and processes streamlined, to reach more people and achieve results on more acres.

Current programs aren’t available to everyone who wants to conserve resources, and often it is not because individuals aren’t eligible or qualified for a conservation program but because they do not know about it. Groups of landowners and producers are disenfranchised from USDA and its programs designed to serve them. Every acre counts, so USDA’s programs need to reach every landowner and producer.

USDA’s Rural Development has more than 41 programs. There are more than 17 conservation programs. While in the past, we may have worked for Farm Bills that were much like “circling everything in the Sears Roebuck catalogue,” we know we are not going “to get both the Barbie Dream House and the Barbie car.”

Will the next Farm Bill be driven only by budget reconciliation? Will good policy matter? Will results matter?

Congress writes the Farm Bill. While not the driver of the process, USDA will be involved, helping to steer the process and making sure important priorities are included. Among those priorities is helping the next generation of farmers. What is needed to help tomorrow's producers? What will make a difference in the Farm Bill and other legislation to ensure the tools people need—to begin farming, stay farming or return to farming—are available and accessible? Developing a better Farm Bill that better serves all farmers is not simple, not easy; the answers are not at our fingertips.

Conservation brings people together more than many other issues. That hasn't changed. People in both parties who love land and love the people who work the land will make sure we have a remarkable Farm Bill. While it surely will not be as "thick," it will likely be more practical in its streamlined approaches to getting resources on the land.

USDA must come together with farmers and ranchers all across the country to make great solutions to conservation needs. The coalition must be richer, deeper, broader, to bring about the differences that conservation makes—no matter the kind of farmer or producer. We must be flexible in devising ways to protect everything we have to have, rather than every program we may want to continue. We must make an effort to talk with all the right people, including those who usually do not have a place at the table, and not just those we are comfortable with and know.

Our country and its land, water, other natural resources and people will be better served.

April 8

INNOVATION, TECHNOLOGY AND RESEARCH TO DEVELOP SOLUTIONS FOR PRODUCERS AND THE AGRICULTURAL LANDSCAPE

Moderated by Varel Bailey

Panel
John Copple – President & CEO, Sanborn Total Geospatial Solutions
Raymond Forney – Global Stewardship Manager, DuPont Crop Protection
Leonard Gianessi – Director, Crop Protection Research Institute, CropLife Foundation
Mark S. Kieser – Principal & Senior Scientist, Kieser and Associates

Varel Bailey – Introduction
Innovation and technology are critical to address the issues of today and tomorrow—even the future of humanity. The means of addressing food supply, feed supply, fuel supply, environmental concerns and landscape problems are in the laboratories, research plots and in the minds of the people across the country who are addressing these concerns.

This panel of experts will address topics in their field of expertise.

John Copple: Geospatial data, information, and technology (PowerPoint presentation available)

Here to talk about something we all use every day no matter what we're doing. A map. How are we telling each other about information that's important? With a picture. It has some relevance, location. That's what geospatial is all about. Started in '66, walked around on the street and we drew things and then we went into space and used cameras and now we have satellites. Fundamentally this is a very large industry across the world and used by many people.

Two basic types of data that are used. Imagery and digital data. A navigation system is a routing algorithm developed by mathematicians. Obtained the data from vectors that came from an image that was made with a camera or other popular instrument like laser systems. The technology is allowing much more accurate and consistent geospatial data that will benefit a wide-ranging user group including Soil Scientists, engineers, and the natural sciences.

Geospatial technology for soil survey enable the following:

- Slope gradient, aspect, and complexity
- Areas that are inaccessible are mapped
- Improve correlation between soil types and landscape positions in a low-relief environment
- Hydric soil identification

For Hydrology and Water Resources Modeling

- River basin and watershed planning (PL-566)
- Dam construction and rehabilitation
- Flood plain management
- Watershed delineation
- GIS based hydrologic and hydraulic models
- Detect and restore micro depressional wetlands

Flood plain management, water basin, watershed, all of this is being done today with technology. You can buy more and more amounts of data with less money as tech improves. The little camera now is much better, has more pixels.

Scientists need to do this efficiently and effectively, and I need to know what happened. I need to know how many acres have been lost to urban growth. USDA is a leader in understanding what's happening and using this technology.

In Colorado we have grass fires and then there is erosion afterwards and how we impact our water, our streams, etc., is a big deal, and if you fail to understand and deal with that you have polluted streams, lakes etc. Geospatial technology is one of the things that helps you deal with that.

Geospatial tech is all around us (Google Earth, Bing). You can build 3D models on your computer to simulate the landscape and impact it and see what happens. Many labs are developing algorithms and models to help assess what is happening. For soil conservation planning, capabilities include:

- Locate sheet and rill erosion
- Design and layout of grass buffer strips and terraces
- Calculate sediment erosion and transport models
- Determine riparian area erosion, sedimentation, degradation
- Irrigation layout

We can grow a virtual forest, virtual crops, model weather patterns, apply soil types, see what happens next.

Across the government. There are a lot of programs but two stand out:

- Natural Agricultural Imagery Program (NAIP) – provides baseline of imagery across US to agencies like FSA, USDA, etc.
- The National Resources Inventory (NRI) undertaken by NRCS

Policy issues for geospatial technology include the lack of any real coordination governing the ways to use it. Government has grown up with having to do more with less and each department or agency has its own approach. We haven't created the most efficient use of these things so that people can use it every day. There are potential cost savings if it was better coordinated across agencies and it can help agencies do more with less.

There are many important programs that exist but the funding is sporadic and we need to do a better job managing it just like other resources. This includes having a better understand the technology and its uses, apply appropriate funding, and having a clear set of goals for what we want to accomplish from it.

Moderator Bailey – Farmer's point of view: on our farm we have five years of data collected off our equipment, we can pancake those on top of each other, we have algorithms that determine which areas need help, which are super productive. We can feed that back into our combines and tractors and correct problems and improve management on our farm. This technology allows farmers to have a totally new and different management system than we ever did before. But the government needs to get up to speed and we need to be able to integrate what the government is doing with the material and technology that we have on our farms.

Raymond Forney
Talking about technology that helps preserve agriculture and natural resources. This can help agriculture to provide the ecosystem services that society is asking for.

The DuPont company has three overarching themes about technology:

- Requires science and risk assessment based regulation. Policy can either foster or hinder the creation of technology. We need our technology to be safe but without the costs and hindrances that come from organizational silos and cross-jurisdictional issues.
- DuPont believes that they need a certain level of intellectual property protection, certain patent life policies because of the product life cycle and the need to recover the large upfront investment. Policy has to favor a business orientation in order to satisfy shareholders.
- Depend on customers and their needs as well as shareholders that recognize the value of the investment in our kind of technology development.

Megatrends that are discernable:

- Increasing food production
- Decreasing dependence on fossil fuels
- Protecting lives and the environment

Invests about 61 percent of resources into increasing food production. Drivers for their work include the need for innovative solutions for agriculture and natural resources, all the way down to water usage and conservation. For example, we get a call a month now about the use of brackish irrigation water and the technology to separate the salt from the water.

Implications – need technology, can't get it done on our own. We need technology and support, a strong public sector, research and extension, and a strong voice from our stakeholders. With innovations and technology based products, our customers can meet increasing demand for food, fiber, and fuel while improving input efficiency and increase the end use value. In effect, applied biosciences business is enabling expansion of end uses and profitability of customers.

DuPont's seed business works to provide the right product for the right acre. Development of innovative technology and local product advancements based is on information feedback from customers. What are farmers seeing on the farm? Also, management of route-to-market results requires two way exchange (technology out and feedback in return) with customers.

For drought tolerance, we have germoplasm dating back to Henry Wallace's day. We maintain a large private library from which we identify traits then bring in targeted systems and biotechnology.

DuPont crop protection helps address increased food production from pest control; explicit that technology is improved chemistry, improved formulations, and improved delivery system.

At policy matter, need an overarching acceptance and agreement across jurisdictions that pesticides are needed technologies that must be applied judiciously across landscapes where they fit to solve problems because mowing and tillage cannot do the whole job.

Land management – deal with weeds and invasive species, have to apply technology to manage them because many are in areas beyond their native controls as they have spread due to human influence.

New ways to deliver our products. Look for new molecules with favorable profiles and bring benefits from their performance to reduced risk, but also look for new technologies like seed treatment, drip irrigation, nursery boxes—lots of growth potential around the world.

Industrial biotechnology. Reach back to farm and producers to enable growth of materials for marketplace, drive toward new products we're developing—a lot of potential markets.

Concerning the biofuels industry, must recognize that non-food sources and marginal lands need to be managed sustainably to address needs around the world. There are multiple feedstocks available, but need to figure out how to develop them and that may take a lot of infrastructure development and technology along the way. DuPont has biobutanol programs and looking at advantages vs. ethanol. Findings indicate that they are low-cost and low-carbon salable solutions, but will take time and investment to develop.

DuPont is working through partnerships to bring together a wide range of expertise and viewpoints to solve the megatrend issues of today.

DuPont's facility – Chesapeake Farms. Gave an open invitation for people, groups and other audiences who want to get out and see the practices and how to manage the farmland and sensitive landscapes of the Chesapeake Bay today. For productivity, for wildlife, and the interface between farmland and the estuary. Managing cover crops—technology enables them—application technology, etc.

Environmental Respect Awards. Reaching out through value chain: agricultural retailers, who provide so much technology, collaboration and extension. Entering third decade of a program honoring retailers just by enabling them through a self-assessment to see if they're managing well, bulk storage, etc. Extended around the world, brought ambassadors from 25 different countries.

Moderator Bailey – Farmers are multidisciplinary innovators, partake of expertise of major companies and the government. USDA has to integrate all the work that the major companies are doing, we aren't do it individually, need to use all the technology being developed, have to work real hard to make sure that were ahead of the research curve.

Leonard Gianessi: Sustainability of Modern Farming in the U.S.: The Importance of Herbicides (Power Point presentation available)
Crop Protection Research Institute undertakes studies and conducts outreach about benefits of pesticides and assessing role of herbicides in sustaining farming, sustaining yield and providing ecosystem services.

Historical context: In the early 1900s, farmers would till 9 or 10 times a year for weed controls. This excessive tillage contributed to dust bowl in 1930s. In 1938, 50 million acres were ruined for growing crops, 50 million acres were severely damaged; 100 million acres lost half of top soil. Clearly pattern of tillage was not on sustainable path.

Herbicides helped turn it around, gave choice on how to control weeds. Use of herbicides as dominant weed control tech, adopted in '60s and '70s; since 1982 more than 90 percent of crop acres treated with herbicides. Use of herbicides enabled use of no-till on the landscape. No till provided obvious advantages for these acres: fuel use reduction of 50 percent and erosion reduced up to 90 percent.

No till planted acres rose from 6 percent in 1990 to 36 percent in 2009. Impacts include:

- Reduced erosion
- Reduced fuel use
- Lower sediment concentrations in streams – improving water quality
- Less irrigation water use

Tillage tends to dry out the soil through exposure to air. Conservation tillage in Georgia has reduced irrigation requirements by 9 percent. This has saved enough water to sustain 2.8 million people per year. In the Ogallala aquifer, conservation tillage has helped reduce groundwater withdrawals.

The development of weed biotypes that are resistant to commonly used herbicides is becoming a significant problem in the U.S. Resistance limits the use of this important technology. Desperately need development of new herbicides with unique modes of action to manage resistant weed species. Great to have more selective herbicides as well since that can promote biodiversity.

The most recent introduction of a novel herbicide mode of action of commercial relevance was in the early 1980s—about 30 years ago. Herbicides with new modes of action have not been brought forward in R&D due to uncertainty about regulation requirements for new chemistry. What will the requirements be? Will they be different? More costly? What might activist groups claim should be done?

Cost about $256 million to bring one new active ingredient to marketplace, gone up $100 million in last 10 years, not new classes of chemistry, just new active ingredients.

Current regulatory requirements for herbicide registration include 120 health safety and environmental tests required by regulators. This process has become more complex, taking 10 years to complete—and has become 20 percent more lengthy during the last decade.

Some policy choices to consider:

- Should there be differential priority for encouraging registration of herbicides with new modes of action?
- Should there be policies to promote no-till farming?

Could also consider how federal research dollars should be spent:

- On non-chemical methods of weed control?
- Defining the role of herbicides in sustainable agricultural systems?
- To evaluate the appropriateness of risk measurements for new compounds?

Georgia has increased tillage because of resistant biotypes, losing some of the water savings from no-till. There are consequences. We know that weeds can be managed in crop systems to provide high yields and ecosystem services. The potential is there to maintain this technology, but we can lose the technology if we take it for granted. So we have a need to plan accordingly on where we go from here.

Moderator Bailey: Last summer we had a gully washer in SW Iowa—3 inches of rain in a few hours. We're in no till for last 15 years, neighbor is not. My flat acres had no visible water puddles; his flat acres had 3 inches of water. There was no real damage on flat acres, but it rained 3 inches on sloping part too. Major difference in erosion when you manage the land differently.

Let me change gears because we're going to have a speaker talk about mechanisms of change. Change is costly in money and costly in an emotional sense. My farm was first to try minimum tillage. On Sunday afternoon had friends over, one of old friends he's neighbors with took him out to field, getting ready to plant with minimum tillage. Neighbor turned to father and said "you can't plant corn in that field with all that trash." This resulted in emotional stress. The next day we planted corn. Need to consider mechanisms that not only financially support these changes, but also emotionally support changes like adoption of conservation tillage and no till. One of the ways to do that is through the use of markets.

Mark Keiser: Emerging Water Markets for Agriculture (Power Point available)
Introduction: I will be sharing the research in environmental markets. Give whirlwind tour of where they are and how they apply to agriculture. I'd like to remember a mitigation banking conference in San Diego, then: Chief Knight said future of agriculture must be wrapped around ecosystem services. USDA has really supported this shift in what we do on the landscape. These markets are tied in to performance based concept of how we're working the land.

Three major water markets that could apply to agriculture:

- Water quality trading – market around sediment, nutrient and sometimes temperature in watersheds. They are compliance-driven, focused on regulated dischargers that face very high costs and are looking for less expensive alternatives for meeting their compliance goals. Australia working hard on these markets for many years.
- Water quantity trading – mostly in the West with regulated allocations of water resources, often comes around fisheries issues. Also seeing water scarcity and footprinting driving interest in water quantity markets.
- Source water protection – Local environmental protection of surface / ground-water resources. This is emerging in the Upper Midwest. Referred to Varel's story about

Des Moines water works and choice between investing in expensive treatment technology verses investing in land management practices that minimize pollution loads coming to their source water intakes. Indiana and Minnesota cities looking to agriculture to implement nutrient management practices to reduce nitrogen loadings to groundwater. Having cities paying farmers to reduce impacts on source waters.

These area voluntary programs for sale and purchase of environmental services. This represents an opportunity for farmers to get involved.

How water quality trading works – Permitted source of pollution, looking for another source with lower costs that can generate a credit. Electric power industry has spent billions on stack emission controls for nitrous oxide, use ammonia, convert to put into water discharges, would need to add wastewater treatment system to air system.

Where is it happening? Some states have policy, some are working on policy, and others are investigating and moving forward. Developing rapidly, exciting in Chesapeake Bay that states have really looked at WQT as opportunity for states to meet this goal.

Trading is happening in a number of small watersheds. Typically dealing with a watershed with a local water quality issue and compliance for waste water treatment plant and looking for a local solution. From large areas such as the Mississippi River basin down to very small watersheds.

What will be required of agriculture?

- Fundamentally about performance based actions, putting BMPs on the ground, then using carefully defined metrics for identifying their impact on water quality issue. Not acres of practices, but pounds reduced per year.
- Usually some threshold baseline level for participation. Farms will ask: What do I have to do on my land to generate credits? This can be a controversial issue. Chesapeake Bay TMDL requires agriculture to do many practices before generating credit. In other areas, baseline could be your current practices. If you make improvements you can generate a credit.
- Have to be able to quantify this. Either estimated or measured outcomes. Estimation technique, simple as RUSL calculation or as complex as the nutrient trading tool. Need quantitative estimate of that reduction. Trading pounds of phosphorous and nitrogen reduced.
- Other key feature is farmers asking if they are going to be regulated. Under the CWA [Clean Water Act], point sources can't relinquish liability. Thus, they enter into private contracts with farmers—farmers used to it.
- Have to be verification that farmers have done what was promised. Third-party verification, crop consultants, SWCDs, etc. Buyer is expecting that kind of certainty on these practices.
- Farmers always looking for certainty. Buyers don't know what they're required to do. And farmers don't know the baselines they'll face in the future. That challenge will remain.

Realities. Markets are not a panacea.

- Scale is needed for sustainability. While we have had quite a few pilot programs, without more demand (buyers) the programs will just fizzle. Elaborate programs developed but with no driver they wither.
- Not everyone can participate. If already have a lot of practices in place and costs of additional BMPs are going up, may not be able to take actions to generate credits. Using Varel's example, his neighbor doesn't have anything in place, so he could put in no till cheaper than Varel can do new projects. So there are equity issues involved.
- There seems always ample supply and not enough demand, but that's changing.
- Markets won't work everywhere.
- We've tended to champion this tool as a solution, but it has grown to be the solution itself. However, the net benefit from the trades will rarely be enough to solve all water quality problems.

Success stories:
Great Miami River water quality trading. Seven waste water treatment plants that are participating in the program as buyers. They are contracting with farmers through the conservation district. Have 275 approved agricultural BMP contracts so far. Using reverse auction. Farmers are lining up. Farmers typically have not participated in Farm Bill programs. $1.5 million invested, gotten 130 tons of phosphorous, 340 tons of nitrogen.

Exciting in that they are helping rural communities survive. Relationships that have been started go beyond WQT and developed a new program branding the watershed, municipalities engaging the farmers, looking for trailways through farms, supporting open space preservation and other amenities.

Ohio River Basin – Agriculture is trading with power companies. Ohio River basin covers 14 states so it involved considerable scale. Idea is to carry out interstate trading at a scale to be more sustainable as a larger endeavor. For example, a power company in Ohio buying credits from agricultural operations in Indiana. These companies have high costs to reduce small amount of nitrogen at the company, or they can spend less to get much greater reduction from agriculture.

Regulations coming in the future, but only 10 percent of country is regulated for nitrogen and phosphorous discharges at the present time. In the Ohio River basin there are about 7,000 permitted dischargers, not regulated for nitrogen and phosphorous. If they are regulated, as we anticipate they will be, that's a big market and a big driver with a fairly low cost for credits at least initially.

Decade ago they were primitive. Have things changed? Haven't heard about them taking off because regulatory drivers haven't been in place. Cities saying why regulate us? Instead you should regulate agriculture. Under CWA, going to be facing tighter regulations. Good thing is that they've been tested and many of these things are coming into place, so when the drivers finally here, we are going to have effective program for agriculture.

Moderator Bailey: What is the role for a government agency in these trading markets? Asked friend at CBT about satisfactory trading contract in future market – develop contract, put it out and see which side doesn't like it, then change it a little bit. Develop one that's equally disliked on both sides of the market. Government has a role in developing the markets—being the market guardian, making sure that it works and is balanced.

Questions and Answers

Q: *You made a Freudian slip about private/public library of germoplasm. To what extent will Pioneer, under DuPont, be willing to share that library? When will we see the seed companies marching on Washington and demanding that Congress support the public library?*

Forney: Can't answer in detail; refer back to the people who manage those assets. Some relationships to the value of the property, resources invested to maintain libraries and access in proprietary way, not necessarily that trait in itself would be proprietary, but the technology to put it to good use does require investment.

Q: *Every one of you mentioned USDA. Gianessi and Bailey gave pointed direction to what USDA should be doing. Want to hear from the other three about where public sector research dollars should be going concerning agricultural landscapes.*

Keiser: CIG program has really played a huge role in ecosystem service markets, tremendous value. One of the pieces we see as really important is the certainty, which comes from quantitative tools. Had a chance in a CIG to look at the nutrient trading tool, NTT. That would be a great tool if we invested more in that. Had expected a public roll out. Tool really essential. Mechanistic model, great management tool.

Forney: Need to look at how to integrate across the technologies, e.g., on biofuels, feedstocks. Need a strong ARS involved in actual applications at grower level, bring in the growers in practical ways that can be successful.

Copple: On geospatial side, USDA taking on the burden by itself but other agencies benefit, need to equalize the burden and do cost sharing among multiple agencies, combine in a way that will save the government money. USDA doing great job but need some dollars and infrastructure in order to use the information effectively.

Q: *What is the top one recommendation to the nine agencies following the RCA, on how to accelerate innovation of technologies pertaining to conservation? What is the one thing that they can do to accelerate innovation and adoption of new technologies pertaining to conservation?*

Forney: Harmonize regulations; avoid patchwork of redundant requirements that don't necessarily enhance protection or perception of protection.

Gianessi: Open discussion to define priorities, what do farmers need for weed management, what do they rely on, potential threats, setting priorities for bringing technologies to the marketplace around problems that farmers face.

Keiser: In 2003 when you were excited about ecosystem services one thing we heard was that USDA will respond and participate but we'll let somebody else paint the painting. That's allowed for innovation. But now the office of ecosystem markets has been charged with developing protocols. Now have patchwork now across the country. Need standardization of protocols.

REACHING ACROSS JURISDICTIONAL AUTHORITIES

Moderated by Otto Doering

Panel
Earl F. (Buddy) Hance – Secretary of Agriculture, Maryland
Bruce Knight – Principal and Founder, Strategic Conservation Solutions
Doug O'Brien – Acting Deputy Under Secretary, USDA Rural Development
Ross Racine – Executive Director, Intertribal Agricultural Council
Steve Robinson – Former President, National Association of Conservation Districts

Bruce Knight (PowerPoint presentation available)
When considering issues related to jurisdictional authorities, much attention has been given to the rural/urban interface. However, the public/private interface is a much larger issue and others are emerging, such as local foods vs. global needs. It is important to recognize natural vs. manmade jurisdictions and address an inherent challenge we impose upon the landscape, which is the scarcity vs. abundance mentality.

In the rural/urban interface, open space has been a big issue; vibrant and dynamic easement programs have evolved to address it. It also has created a forest management challenge with forest fires and the cost of fire suppression. Urban-rural interface also plays out with invasive species—many escape from horticultural crops or other well-intentioned things and because of our transportation ability, we are moving invasive species around the world at unprecedented pace with massive ecological impacts.

There are jurisdictional issues between rural and "damn rural," where for example challenges occur between people who want a hunting interface, but won't fix fences. To a cattleman there is nothing more irritating than a neighbor who doesn't close the fence just as there is nothing more irritating to a horticulturalist than the neighbor's weeds. These things are vital to remember when we talk about how you build conservation coalitions.

Another issue is how to balance public and private interests in the land? How do we achieve greening of communities to attract sustainable development without creating conflicts with most city councils and zoning laws that incentivize sprawl? We hear the term "crisis of the commons" often in pastoral grazing systems, but now increasingly

referring to things like air and air sheds or in volatized nutrients coming out of lagoon systems.

Technological adoption is another jurisdiction we need to reach across. There's something about psyche of people committed to conservation makes us slow to want to adopt technology, so we (NRCS) make them jump through inordinate hoops before they're approved.

Local foods/global needs: When I look at farmland preservation we need to take advantage of the interest in local foods to protect those farms so we do not damn them to eternal serfdom. There is room for conventional agriculture, local foods and global food production. The broader ideas of sustainability are coming on fast and a major agent of change. With predicted population growth, we have to be aware that middle class appetites will be satiated.

Natural/man made jurisdictions. All conservation is local. It would be better not to have county or even state boundaries and manage it all by watershed boundaries, but politically we can't do that. Carbon is a globally driven conservation issue and is creating a major change of mindset in conservation community. School districts are another jurisdiction we have to reach across. We have consolidated schools in rural America to be able to field an 8-man football team.

Do we have too much infrastructure in conservation? Not boots on the ground but overhead? For example, to get ecosystem services off the ground, we can't have a different definition for "range" between FSA, BLM and NRCS. To make trading work, we will need a common language. One thing that challenges ecosystem services is the lack of maturity in the effort.

Scarcity vs. abundance mentality is another jurisdiction to reach across. The traditional fight has been preservation vs. conservation; regulation vs. responsibility. In a life cycle assessment (LCA) process we have to completely change our own mentalities to deal with whether our inherent assumptions are correct, deal with hard facts of science and efficiency. This is true whether for water or air or both.

An institutional jurisdiction to reach across is technology adoption. While the conservation folks are deciding if a technology is pure enough, farmers have adopted it anyway, so conservation lags behind adoption curve.

There is an evolution occurring on sustainability, after 25 years it is going mainstream because farmers can profit with increased efficiency. An executive from Robobank said sustainability lowers the risk for people they're lending money to.

Conclusions: Watch those mega trends in technology, information and consumer demand. Be prepared for a world of 9 billion people who will not go without having their needs met. Make sure jurisdictional boundaries are real, not self-imposed.

Ross Racine
Struggled with what to present, decided to go back in history to provide some understanding of why Indian country lags so far behind in agriculture although we have retained much of what is now called “natural.”

Today there are 565 tribes that represent 2 million people on 96 million acres—an area larger than state of North Dakota—including 80,000 farmers with more than 3 million acres in agricultural production.

Indians farmed the Ohio Valley as far back as 500 AD. By 800 AD they had irrigation around Phoenix. Fifty percent of world foodstuffs originated here with Indians. In 1521 Indians taught pilgrims how to grow food: the first Extension project. There’s a Squanto luncheon every year to celebrate Squanto, but still no USDA Extension offered on reservations.

1754 – Benjamin Franklin proposed union of colonies to centralize Indian affairs, which led to federal government oversight.

1789 – US Constitution recognized tribal governments: Article 1 Section 8 authorized Congress to regulate commerce with tribes; Constitution also empowered president to make treaties with Indians.

1824 – Bureau of Indian Affairs (BIA) was created and subsequently taught all federal agencies that BIA was the only agency responsible for working with tribes, isolating services to one agency.

1831 – Cherokee Nation v. Georgia established guardian/ward relationships between federal government and tribe; 1832 Worcester v. Georgia ruled state laws have no force in Indian country, no jurisdiction over tribes. This is very important if you’re proposing state block grants.

1868 – Dawes Allotment Act, took 90 million acres out of Indian control and put in hands of homesteaders. It also put lands in the hand of individual Indians creating a big mixture of land ownership types, which created barriers to delivering services.

1871 – Period of treaties established many reservations either through executive order or Congress.

1891 – It was determined that Secretary of Interior could lease Indian allotments if Indians not using them; for example, one ranch leased a whole reservation for 3 cents an acre.

1908 – Winters Doctrine established Indian reservations entitled to water to serve reservations (in fact, 1851 was the first treaty providing water rights.)

1924 – Granted citizenship.

1934 – Indian Reorganization Act put a stop to allotments on Indian reservations, stopped erosion, established tribal self-governance and Indian preference for hiring.

1940 – MOU between Interior and agriculture that excluded USDA from delivering services on Interior lands

1977 – SCS [Soil Conservation Service] said Indians could apply to programs and receive services if requests come through conservation districts, but districts are subunit of state government…which has no authority in Indian country: another barrier

1990 – First Farm Bill we worked on mandated USDA presence on reservations, erased barriers, but 5 years behind.

A few other laws that bring barriers: McCarran water rights that said they're bound by state adjudication, in conflict with other ruling; care from federal government subjugated to state, also gaming laws: states have jurisdiction.

USDA policies, BIA policies and tribal policies are separate entities, but a week ago, USDA and BIA finally started talking about how to get policies to meld. Last night found out something astounding: off-reservation entities have to get seven permits to establish alternative energy production while on-reservation tribes are required to get 47 permits!

Buddy Hance
Chesapeake Bay watershed covers six states all the way up into New York. In a process that began at the federal level, for the past two years we've been working with EPA on a model and process to develop allocations for Chesapeake Bay TMDL to meet the EPA goal for 2025.

Phase 1 of the WIP [Watershed Implementation Plan]: States given allocations broken down by sector. Phase II: Strategy where those loads are broken down by sector in individual watersheds. We are working to develop a strategy to meet those goals by 2020, which is the governor's target date.

Counties are just starting to get those numbers and are realizing what targets they have. The next stage will require everybody. Now that states have defined their goals, they are working with municipalities and sectors to understand their load and develop a plan.

The credibility of the goals is of utmost importance. Communities need to feel confident in how they were achieved and allocated by sector. Industry and environmental groups are out there with agendas and processes.

The environmental groups working in the Chesapeake Bay are impatient to do everything humanly possible right now. Agriculture feels picked on but is more practical. Soil and water conservation districts have been pulled in to help farmers, which will be especially important in TMDLs. The environmental groups in Maryland need to tone down the rhetoric of "do it now," have to get farmers to ramp up a bit and not pull back.

It's going to take everybody for Maryland to meet its goals by 2020 or even 2025. "We are all linked together in this. If any link breaks we're going to fail." It will cost $9 billion for Maryland to reach the goals by 2017 but there isn't that much money. It's a daunting task that will require breaking down jurisdictional barriers.

Three things are needed: Communication, communication, communication. Need to communicate to the public how to achieve these goals; then communicate to NGOs and local governments to help them develop a deliverable plan to achieve the goal; and finally to communicate to general public.

Steve Robinson

Conservation districts are represented all over the nation: 17,000 folks elected, volunteers and several thousand employees. They participated in RCA appraisal process by holding listening sessions, conducting focus groups, surveying local workgroups and identifying priorities across the country

Jurisdictional boundaries are different in different states. Conservation authorities cover all the jurisdictions and stakeholders: town-city, school, drainage, etc.; public lands – highways, parks, forest, wildlife; industrial – corporations; individual farmers, ranchers, woodland owners, native American community.

Conservation districts can do many kinds of projects, within and without jurisdictional boundaries, for example working on lawn-care products in urban areas; a pristine water course like the Darvey Creek project that covers five different counties; or nationally working with landowners and local communities on government-funded watershed programs, whether they're led by EPA, state or local governments addressing load reductions, flood prevention, stream flow, recreation and other uses.

Conservation districts play a unique role in knowing state and local laws and how they affect communities. They also work with private sector in a way that they can bring trust and respect to planning process.

Significant conservation has been accomplished since '70s: less erosion, more habitat but there's no doubt pressure will increase in next few decades. There will be great demands for more food, fiber and energy while protecting land, water and habitat. Districts and others will have to deal with these.

To succeed, we must include all stakeholders and work across every jurisdiction. It is no overstatement to say that districts are important piece of conservation delivery. "We will be able to provide local coordination necessary to make good decisions, implement those decisions." NACD [National Association of Conservation Districts] will help foster ideas to help improve natural resources for the future.

Doug O'Brien
Want to talk about federal jurisdictional challenges and the administration's vision on "busting down the silos." Sound conservation is essential to ensure the vitality of rural communities.

Rural development is a mission area that has three agencies that focus on utility service (electricity, broadband, water and wastewater), housing and business development, which is more and more involved in energy programs. The mission always has been to make rural communities a great place to live: economic opportunities, natural amenities, clean air, water and green space.

Rural Development is now trying to connect to sustainability movement that is being encouraged by the Obama administration through the interagency relationship called Sustainable Community Partnership. USDA not formal signatory to the Memorandum of Understanding between DOT [Department of Transportation], EPA and HUD [U.S. Department of Housing and Urban Development], but is in coordination.

With scarce budget resources it's essential that all partners, especially federal, work harder at partnering and leveraging. Sometimes this means breaking down silos and barriers, or even agencies within the department. While many people are committed to conservation issues, there are different cultures in different agencies and mission areas.
One of the greatest hurdles we've faced is in integrating conservation with economic development. While there are lots of examples of good outcomes, mostly we don't see the world in the same way. However, with fewer resources, we will have to work together.

On public private land interface, rural development working with forest service, e.g., in Tsongas in Alaska, helping them move to revitalization forestry economy. This is hard to do because even if rural development has some tools, the effort has to be locally driven. To get buy-in, it has to come from the ground and from people. Also, we have to have metrics for success, which is very difficult. We need better models and ways to consider how to better integrate conservation and economic metrics.

One of the issues is the culture in the different groups: a history on the ground of people not getting along in the county office. We just need to get past it. Another great challenge is committee jurisdiction in Congress, which will drive USDA versus BIA, EPA, HUD, etc. Within the Obama administration there is an absolute commitment to collaboration in senior political leadership. But there are challenges in our authority and in what Congress will want us to do.

Questions and Answers

Q: *With respect to farmers on Chesapeake Bay TMDL, what are the two or three main practices or initiatives that you see ahead, and do you see opportunities to go beyond and get involved in market opportunity for WQT?*

Hance: We have a history with BMPs so we know which are cost effective to implement. Cover crops can yield 6- to-7-pound reductions per acre, cover 40 percent of cultivated acres at $3-$4 per pound. Buffers can do different BMPs around livestock production areas. With poultry the leading agricultural industry in Maryland, we have significant task in those regions. Last year legislation authorized the Department of Agriculture to be crediting authority and authorized baseline assessments. Anything above that can be traded. This will be a tremendous opportunity because it's most cost-effective, although because of the load we'll reduce, there won't be a tremendous amount to trade.

Knight: There are a couple of practices with a lot of potential. Need to push cover crops and buffers north to Pennsylvania and New York. Accelerating precision technology in placement of fertilizers and nutrients. We know that greater feed management will make greater difference in Bay. With precision placement and feed management, you'll solve the bay and climate change problems as well.

Q: *One of the key things in TMDL is number of practices on the ground. It's important to have real on the ground information. Will you adjust what you're going to do?*

Hance: Now that we have a software program to track practices, we found some practices were 85 percent under counted. Give credit for all those in the TMDLs, so we have to track not just the practices we paid for, but those farmers did on their own. Next phase is to get farmers to report voluntary practices and certify reductions. Right now the model is based on NRCS standards, which says 35-foot buffer, but if farmer has done 30-foot buffer, there are still benefits. Also using CIG grant to do GIS mapping and recording so we don't have to do as much boots on the ground. This watershed showcase program is targeting NRCS resources to sub-watershed to see what you can get done in a short period of time.

Q: *We have the issue of protecting reservoirs that cut across crop reporting districts. There will be a turf fight for who will be top dog. Any suggestions?*

Robinson: All follow state laws. May be part of the issue in Iowa – state law. A lot of that is trust as well. In some areas SWCDs have earned the trust, but in yours it appears not. Beyond that, wish you the best of luck.

Q: *Are there other areas to increase government efficiency and synergies in conservation and research?*

Knight: If I could roll back the clock on anything, when we launched CIG I should have had the research agencies more at the table on design, implementation and outreach. Examples of pockets of innovation and brilliance but only people who know are those in the pockets of brilliance. The rest of us can't get the information because they're in cardboard boxes in the program offices. We need to get more collaboration, maybe publish the results. In last 20 years of American agriculture, we've been taught we're one surplus commodity away from economic disaster. Much of the research has been on end uses; now we need to comb the libraries for productivity-enhancing research.

Q: *In Ag Vision process, siloed regulations came up. One of the solutions was to create a regulatory ombudsman. In renewable energy projects, we naively started to ask whether we should start working with reservations because they have an easier process. But in fact it may tougher.*

Racine: Yes. The federal government is the largest barrier to individual success on reservations. For example, in Montana, conservationist is sitting on $1.5 million worth of EQIP applications from Indians because BIA wants legal survey of water conveyance before doing water projects. It doesn't matter if it doesn't cross individual land ownerships, if all in one requirement is still there. BIA has taken the position of limiting liability by not making decisions. This is why we need 47 permits.

Q: *Bruce Knight mentioned imperative to meet world demand for food. What are the implications for government support of the ethanol industry?*

Knight: I want to see us unleash the productive capacity for food, fiber and fuel and let the marketplace sort out how much of that mix.

Q: *In terms of ag landscape, land use is as important as land management when we look at future demand. A lot of people have said that the failure to plan is to plan to fail. Dough O'Brien mentioned Sustainable Community Partnership. Rural communities have a hard time playing in that sandbox because they don't have the capacity. Do you see ways to give them that capacity in next Farm Bill?*

O'Brien: Does point to paradox that those communities most in need of capacity are those that tend to lack the capacity to do so. That's a good place for government resources to help. In FY '12 budget the President proposed to increase two programs: Rural Business Opportunities and Rural Development, which both provide flexibility to work with communities and regions. However, the fact of the matter is that when you look across the USDA budget for economic development, it is very small in comparison to DOT, EPA and HUD budgets, which have significant resources to play in rural places. In terms of next Farm Bill, the agriculture committees are just beginning to have the conversation, but we're trying to work with all federal agencies that have the ability to provide capacity to those rural places. One of the punch lines was a consideration of how the authority of those agencies within USDA and other federal and state agencies give the right types of flexibility to allow us to work together and mandate us to collaborate in the smartest way possible. In time of scarce fiscal resources, have to look for policy innovation.

WHAT DO WE NEED IN A 21ST CENTURY AGENDA FOR CONSERVATION
Moderated by Charlie Stenholm

Panel
Larry Elworth – U.S. Environmental Protection Agency
Tom Hebert – Principal and Founder, Bayard Ridge Group
Bill O'Conner – Senior Agricultural Policy Advisor, McLeod, Watkinson & Miller

Will Shafroth – Deputy Assistant Secretary, U.S. Department of the Interior
Dave White – Chief, USDA NRCS

Charles Stenholm, Introduction – Krysta Harden, Chief of Staff to the Secretary of Agriculture, really "nailed it" at last night's dinner when she spoke about the need to find better ways to do conservation work going forward in order to reach more people and achieve results on more acres with what will be far fewer dollars. The hat I will be wearing this morning is that of Co-Chair for the Committee for a Responsible Federal Budget. I will quote Varel Bailey in saying "America has a great reputation of responding to crisis," and I hope that holds true today.

Tom Hebert
My own expectation is that discretionary programs will take as great a hit or greater than mandatory programs—10–20 percent cut after 2011 cuts. Yet with constrained resources, we will have to take on sophisticated challenges.

The need to more or less double food production will dominate everything else that happens in the marketplace. USDA has to pull all the pieces together to stay on path of total output growth so we can be part of the solution to feed billions of hungry people, helping other parts of the world deal with their food security issues.

Struck by what we know and don't know about sediment and erosion control and nitrogen management. How do we stop erosion to protect surface water quality and also prevent phosphorous loss? What is the essential role of nitrogen fertilizer in maintaining productivity? These need to be addressed systematically and together; do we have the research capability?

What type of biotech traits will we pursue in the years to come? Like idea of having strategic capability someplace so we can evaluate policy proposals against the strategic goal. What are implications for staying on productivity growth path we need to be on?

The NRI [National Resources Inventory] and CEAP [Conservation Effects Assessment Project] capabilities may allow us to unlock the problem of how we move forward with sound, accountable and effective watershed-based strategies. We need to provide information that farmers can embrace to figure out the goals for the watersheds. Back in '95 and '96 when EQIP was created, part of what we were talking about was priority watersheds; 40-60K TMDLs later I don't think we succeeded; didn't have enough money, had trouble politically. We now have a $1 billion program; reducing its budget can help us target more dollars based on CEAP without sacrificing broad appeal and political strength.

Not a fan of farm-by-farm regulatory approach, even semi-regulatory approach is fraught with problems, and we don't have the resources. Start talking about using NRI CEAP as a way to set goals with farmers, then use NRI CEAP to report back to the public. Measuring what's being done will drive decisions in ways that we haven't ever seen in these watersheds. Key part of what we do has to be ramping up modeling capability so we can manage dynamically to unlock entryway into next level of performance.

Larry Elworth

When I look at 21st Century conservation issues, I have two propositions in mind: First, that natural resources are critical, increasingly scarce, assets of the country. Our ability to conserve these resources is a key part of our economic and environmental future. Second, that agricultural land use is a preferred land use. Well managed land is a way to preserve those resources.

Delivery of conservation programs: In North Carolina, the average age of farmers is 60 years old. In a very short time, there will be a wholesale change in people operating farms. Will today's farmers pass their farms on? That next generation of farmers will look very different—election info, education levels, etc. Will have to dedicate our support on both technical and organizational side and will have to invest in them.

Until and unless balance sheet becomes more positive, we've hit the high water mark of dollars available for FA and technical assistance. I'd argue that benefits are enough, but programs have created an inverted pyramid of FA on top balanced on much less technical assistance. Cracks in our ability to deliver conservation programs. Very best conservation not done based on availability of dollars; it's done with trusted relationships over time with sustained management.

Now understand the value of watershed level efforts. Collective efforts are particularly important, but in terms of programs, whether through grants or CCPI [Cooperative Conservation Partnership Initiative], I'd say you can't get better results through better RFP. Have to invest in organizational capacity so that collective efforts add up to more than just cool events.

Intersection of conservation and regulations: Hard to deny that agriculture's contribution to watershed problems has generally been extremely positive, making some of the most important contributions to reductions. Have all the basic tools and lots of technology, though need more on livestock waste. But there are still watersheds that don't meet standards, where the ability to protect them has not kept up.

The EPA's tools are not well suited to agriculture. The EPA has strong point source program, but its nonpoint-source authorities are limited.

Two concerns: Farmers who might be willing to invest in conservation, with or without regulation, are deterred by the possibility that the bar will continue to be raised. Secondly, the problem may be about development or because other farms don't take action. Relatively small number of farmers drive problem.

Two solutions: Need mechanism to provide certainty to farmers. Talking to USDA and states. EPA provides protection to nonpoint people based on the actions they take. Need similar concept for agriculture. Secondly, we need to look at much more targeted regulations and enforcement. It doesn't make sense to have regulatory program that doesn't recognize the normal distribution of people in a watershed. Given that we have inexact tools, we make

enemies of everyone when we are really interested in the actions of a few. Need to look at not only targeting resources but also at dealing with persistent challenges.

William Shafroth
The President hosted a conference a year ago at the Department of the Interior, beginning the conversation about a 21st Century conservation agenda. It kicked off 51 listening sessions; 10,000 showed up and 150,000 more participated online. The sessions pulled out different themes in different places: urban parks in Los Angeles, working lands in many states. These resulting report ["America's Great Outdoors: A Promise to Future Generations"] that the President issued on February 16th laid out his agenda for the administration.

There was a strong interest in connecting people in close-to-home places in the outdoors. First initiative about urban parks and forests, and the need for more and better ways to connect to the 80 percent of people who live in and around cities. We have to get them engaged so we have the support in coming years. Most people are disconnected from the outdoors and from food production, especially young people. There was also huge interest in connecting people with waters.

There's recognition of the need to help protect private working lands and connect them to the bigger conservation effort—need is for landscape scale, not random acts of conservation. Heard from Montana folks working to protect ranches to protect some of the most pristine wildlife habitat. Similar situations are happening in Florida, the north Maine woods; people are finding common ground, and we need to support that.

The U.S. Fish & Wildlife Service (FWS) manages 20 percent of the land in the country and is moving to a model where private landowners are seen as significant partners; it is the future of how FWS will achieve its mission.

NRCS and Interior are working together in an unprecedented good way. It is hard enough to break silos within the Department but monumental to go between agencies.

Bill O'Conner
The entire federal budget is looking forward to substantially reduced funding over the next 10–15 years. In the Farm Bill, conservation starts out in the hole with no new money. We can rail against the tide, or deal with it.

Need more coordination between USDA programs. Wonderful among all the agencies as well, but simply start with dozens of USDA programs and begin to put them back together again. Not ancient history that there were two programs for conservation, which turned into dozens. This provided the ability to emphasize specific problems, but it's time to go back to a consolidation phase, where the system and structure are not duplicative and more complex than necessary. There needs to be a significant change in thinking.

Need to get farmers' trust in the government and the system. If government agencies had all the good faith in the world and promised farmers certainty for their actions, you still

have the problem of the outside groups who go to court. Until you solve that problem you are not going to get farmers' trust because they've been burned before. May mean we will have to bar people from bringing suit in statutes. Need to do that so that the farmer knows if he puts the future of his farm on the line he'll have the kind of support he needs.

Dave White
Focus investments on our problems – Some examples: Chesapeake Bay, Mississippi River, Sage Grouse. Sage Grouse is candidate species. Remember the Spotted Owl? Sage Grouse has same potential but covers 10 times the area.

If we move to a new approach, we have to do better at integrating science with real approaches, integrating information technology. We're working on developing a client gateway—like Amazon—where farmers can go in and use their conservation plan, use RUSL, see where their EQIP contract is or schedule an appointment with a local office. Internally, we need to streamline business processes (not enter data multiple times); could allow local people to spend 75 percent of their time in the field, which would be the equivalent of picking up 1,500 more people.

I'll speak only from NRCS's standpoint, but other agencies have the same issues. Have got to get into this century and increase adoption rate of new technology. Dealing with 590 standards. In the past everything was on national basis, then states adjust. 590 cover northern and southern states, wet and dry. How can we do that one size fits all? Need to rethink how we're using tech and standards. Cross-collaboration between our departments.

Tom Hebert talked about increase in population and food production. Must make sure that farmers and ranchers can survive. Don't mean this in pejorative way. My goal would be to turn the regulatory community into the Maytag repair man—with so little to do they just play cards.

CEAP reports show us we need integrated approach. We built a ton of terraces in Missouri that stopped erosion, but by holding back the sediment we were increasing nutrients in water.

Sage Grouse. Prevented 800–1,000 bird strikes by marking miles and miles of fence. That's equal to entire male population of sage grouse in West. Not providing palliative care to every Sage Grouse, protect core areas. Know there will be energy development and suburban growth, but if we preserve the core of the core and prevent this bird from being listed, we've done a lot to help cattlemen survive.

Questions and Answers

Q: *As we look at AGO see ash trees going down with ash borer, palm trees with weevil, mussels in waters, cheatgrass. How do you elevate invasives up to secretaries?*

Shafroth: Roosevelt conservation was against industrialization, now invasive species and climate. High priority for Secretary Salazar. We're working on it, tough budget environment, do it better and more.

White: Don't want President to hear about endangered species, stop it at our level.

Q: *We have 89 years left in 21st century. We're talking about taking the status quo forward. Have used a lot of subsidies and policies to get where we are now. Struck by Hance's comments on cover crops—improve simpler farming systems. Where are we in terms of farming systems? Have it so simplified, now fewer options. Have to get marketing in to offer farmers a greater diversity of farming systems.*

O'Conner: Have freed up farming more than it was. Still statutory problems keeping farmers from growing fruits and vegetables on land. Could be education problem. The market is the market. With corn at $7 and beans a $14 (/bushel), farmers will plant those crops. Unless you can ensure them that alternative crops can be competitive, they won't plant them. Would have to use regulations to do it. Until market is stable and equal, difficult. Oats might be a good idea to rotate with corn, but oats sell for next to nothing, so farmers won't do oats. Farmers are there to make a living for family, keep farm together, also preserving the land.

Hebert: I believe that if we eliminated Title 1 programs, we'd probably have more corn than less. Lose cotton, rice and wheat acres. Programs follow the market, not the other way around. Still a really good question. Think about ways to get more done in these cropping systems. Have to do it in light of budget shortfalls. Don't know how much the MD cover crop program works.

O'Conner: Farmers do take on voluntary conservation once you establish it's good for their farm. If you can't do that you'll have to pay them to do that. Still some practices out there that could be profitable but aren't used.

Elworth: One other wrinkle is specialty crops and growing number of small farmers and intersection with marketing—not sophisticated everywhere, often export-oriented.

Q: *Have heard very little about the global dimension…?*

Stenholm: Farm Foundation project on future of animal ag in North America. Part of the report was on conservation. Dealt with Mexico and Canada. Haven't gotten close to the recommendation for the partnership among the three countries. Providing for some discussion among differing viewpoints, but the international discussion for conservation is hard to get beyond in America. We need to be the example of how to do it, not the problem.

Bailey: last 3 years I've worked for state department. with farmers in Germany, Poland, Czech and Slovakia. U.S. still ahead of Europe in terms of conservation. They pour a lot more money into farms. They have tremendous incentives to sustain organic ag. In one

sense wrestling with climate change, we're not ahead on policy but on practices, they're starting to experience North American weather, which is a shock for them. Starting to see nutrient flow that they thought they'd never experience.

White: Just add one more thing. As we look to the future and diminishing role of government, what role does the advent of Wal-Mart, Costco and BJs have? They buy everywhere to guaranteed specifications. Wal-Mart moving to sustainable. Rise of large buyers have just as dramatic impact as governments worldwide.

Shafroth: One of the things we deal with is atmospheric, e.g., migratory birds. Tough going into South American countries because they're not as sophisticated; we're having better luck with nonprofits on the ground down there.

Hebert: Difficulty answering it is because we do not have an organized strategic discussion about how to meet these challenges of food security, so we can't engage in the conversation overseas, don't have metrics so we can't plug things in.

Stenholm: Want to reiterate Krysta Harden's point about expanding horizons. Comes with expansion of priorities. Litigation is killing us and will kill conservation. With those communities there is a responsibility to avoid the litigation to get certainty. Farmer not going to perform without some certainty.

Q: *A decade ago Bill O'Conner warned me that the targeting and cost-effective stipulations were in trouble, and they were taken out. A decade later with budget concerns, are we beyond the point that "all the members want each of their good folk to be able to join the program and get money"?*

O'Conner: Not when we come to EQIP, designed to offset regulatory burden, which is everywhere. People feared they'd be prioritized out. Some of the other programs, it may be possible, e.g., a revival of wetlands program. Maybe enough wetlands for enough years that you could prioritize. Hard to believe but may be. Maybe grasslands. Not sure the programs will even be there, more likely will be subsets of something else. No place to go to get money. If you have clear priorities you almost have to pass a bill to address that priority—need a rotten apple bill, otherwise the pressure will always be for access for everyone's constituents

Elworth: been involved in many places, there's ability to set priorities based on county needs

Q: *Larry, would love to be able to talk to you about farming or basketball but the reality of EPA and farmers as I see it after the three meetings, there are fundamental issues of why we don't have more people participating in NRCS programs. I was shocked at how few people do. They would like to be, but don't understand or have experience. Guys at NRCS I work with are at home, you guys (EPA) are here. They don't trust EPA. Closest office in Denver. I understand the process, but the perception that USDA is subjugated to EPA. Big issue.*

Elworth: Real issue – would be surprised if in any place or real way that NRCS would be subjugated to EPA. You're saying the determining factor is the EPA boundaries. Boss understands and committed to work on that. Fix what we can and communicate clearly.

Hebert: could have long conversation on that one. Pesticide policy will shape Ag/EPA relations.

Moderator Stenholm
Common themes:

- necessity of research – if you can't measure you can't manage or regulate
- how to best target public/private research dollars for conservation
- those working for us and with us don't always seem to be listening to each other or trying to do the same thing. One of the goals is to begin the dialogue to start to put together the ideas so that the house and senate ag committees will have something similar to look at.
- The challenge is a realistic, not optimistic, approach. It's what we heard in our roundtables. That's why cooperation between agencies and the Indian tribes is crucial.

CLOSING REMARKS

USDA Natural Resources Conservation Service Chief Dave White
(PowerPoint presentation available)
NRCS Chief Dave White noted that the Forum's discussions had brought about good and interesting perspectives. Everyone talked about focusing on results, what we need to do and what is really important, especially given the budget situation. Chief White provided examples of conservation work being done around the country—conservation practices on the land that have made a difference. Among these examples: the Mississippi River and 43 watersheds where conservation efforts focus on the best nutrient application practices for farmers that improve the producer's bottom line, productivity and the environment; Sage Grouse habitat conservation and management; air quality improvement techniques in Central Valley, California, through Conservation Innovation Grants and EQIP programs; water quality conservation in Big Hole Valley, Montana, and the Chesapeake Bay area; the application of new energy efficient technology on farms; forest stand management; and partnerships between agencies and organizations to achieve conservation benefits for land and water resources.

In closing, Chief White reflected on how the programs, policies and approaches discussed during the Forum manifest themselves on the land—what we're doing and what it means to the nation's landscapes. He reminded participants that whatever budget situations we face, whatever resources organizations can bring to bear, conservation is not about us but also about America's future generations.