



NATIONAL AGRICULTURAL LANDSCAPES FORUM LANDSCAPE INTEGRITY AND WATER SECURITY IN THE 21ST CENTURY

EXECUTIVE SUMMARY

The National Agricultural Landscapes (NAL) Forum brought together agricultural and conservation leaders from across the country to discuss policy, programs, and economic factors that will shape the future of the agricultural landscape and rural regions in the 21st Century. Hosted and organized by American Farmland Trust (AFT), Farm Foundation NFP and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the NAL Forum addressed two key resource issues: Landscape Integrity and Water Security. The following major themes emerged from NAL Forum discussions:

Improve Jurisdictional Flexibility and Share Responsibility – There was a strong shared belief that local state, tribal and regional directors must be allowed to make resource decisions and to innovate based on local conditions.

Improve Program Efficiency and Inter-Agency Cooperation – Panelists and participants called for greater facilitation of inter-agency learning and cooperation to improve conservation outcomes.

Target Regulations and Reduce Uncertainty – Participants called upon USDA to better direct resources to deal with persistent challenges and to harmonize regulations to avoid redundant requirements that do not enhance protection.

Leverage Program Assistance to Maximize Program Effectiveness – Regulatory approaches must be balanced with investments focused on solving problems and, anticipating substantially reduced federal funds, participants saw partnerships and leveraging state, local and private funding as essential to achieving resource conservation goals.

Expand Market-Based Solutions – Government can play a supportive role in developing ecosystem market regulatory and environmental quality standards, as well as ensuring policy drivers and performance-based outcomes to encourage participation.

Support People on the Land – Participants called on USDA to support the next generation of farmers—through tools designed to support access to land and financing, mentoring, marketing and managing downside risk. In addition, the unique historical and jurisdictional issues for black family farmers, farmers on tribal lands and other underserved populations must be addressed to ensure equitable treatment in conservation programs and access to agricultural infrastructure and markets.

Food Security – Decisions affecting land and water use are critical in determining whether we will be able to produce enough food in the future but often receive little policy discussion or recognition. It will be necessary to substantially increase sustainable production both to supply local and regional market demand and to feed an estimated 9 billion people in 2050.

Plan for Agriculture – “A failure to plan is a plan to fail.” The agricultural landscape is part of the human environment and as such federal policy innovations are needed to help communities and regions plan for agriculture within an integrated approach across all landscape uses.

Research and Technology Needed to Accelerate Innovation – Participants identified a number of research needs and the adoption of technological capabilities and innovations to improve natural resources management. Research needs included improving soil fertility, reducing the carbon footprint of food, and the effect of climate change on water. Much emphasis was placed on the need for geospatial technology and improved measurement capacity and tools to provide producers with information and a direct feedback response.

Lastly, participants suggested that in the 21st Century, NRCS would have to change its modus-operandi from an organization that prevents loss, conserves and maintains resources to one that is more focused on improving and building soils, increasing water reserves and even reclaiming land for agriculture including in urban areas.

BACKGROUND

The National Agricultural Landscapes (NAL) Forum brought together agricultural and conservation leaders from across the country on April 7–8, 2011, to discuss policy, programs, and economic challenges and opportunities that will shape the future of the agricultural landscape and rural regions. Hosted and organized by American Farmland Trust (AFT), Farm Foundation NFP and the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), the NAL Forum's one and a half day program was organized to address questions affecting two key resource issues: Landscape Integrity and Water Security.

Landscape Integrity – Connected landscapes that support agricultural production and provide environmental benefits face increasing challenges from urban/suburban development, climate change and other forces. How much land do we need for food, energy, bio-diversity and ecosystem benefits? Have we already converted too much? How can jurisdictions work together on a regional or landscape scale to address growth and development? What will be the effects of increased weather variability on the agricultural landscape? How can we build our soil resources and address regional differences in definitions of prime and unique farmland?

Water Security – Agriculture is the nation's largest water user, but increasing demand and shifting consumption patterns challenge water quality and quantity for all sectors, including agriculture. How much water do we have? Do we need? Have we already diverted too much? How do we improve how communities grow to protect water rights and ensure enough water to grow our food as well as our cities? How might new policies encourage producers to work together in a strategic, coordinated fashion to improve water quality? Is there a way to improve coordination and streamline the regulatory framework between agencies like USDA and the Environmental Protection Agency (EPA) to improve environmental outcomes?

These issues were explored in the context of forces affecting conservation outcomes:

Innovation, Technology and Research – Rapid advancements in physical, biological and information technologies are creating new means to augment conservation gains. How can these ensure maximum environmental gain?

Institutional Arrangements – Legal, regulatory and normative arrangements (policies, programs, resources) can serve to lessen conflicts and balance competing objectives for agriculture (e.g., increasing food supply and exports, ensuring food safety, keeping food costs low, improving environmental performance). How might these be strengthened?

Market Forces – Private markets may provide opportunities to accelerate conservation. How might these be best developed to benefit their participants and the environment?

The NAL Forum was open to the public, and its program and registration information were widely distributed via print and electronic media, Forum sponsors and partner agencies and organizations. More than 255 people registered, including representatives from nine USDA agencies, seven other federal agencies, House and Senate staff, and a good balance of agricultural, conservation and nonprofit groups.

The Forum was part of an assessment process, required by Congress under the Soil and Water Resources Conservation Act (RCA), of how well USDA conservation programs are serving the long-term needs of the nation. Reauthorized in the 2008 Farm Bill, the RCA places new emphasis on the importance of assessing conservation needs, evaluating the effects of conservation practices

and analyzing alternative approaches to conservation programs. NRCS serves as the lead agency on the assessment, collaborating with nine other USDA agencies and offices.

The NAL Forum was one of a series of activities undertaken by NRCS with AFT and Farm Foundation NFP to gather nationwide input on challenges and opportunities facing agricultural landscapes in the 21st Century. A Blue Ribbon Panel (BRP) of prominent authorities in agriculture and conservation guided and informed the information gathering process (see listing, page 13). AFT, Farm Foundation NFP, NRCS and the BRP contributed their collective expertise to identify key issues, which served as the basis for six regional roundtables convened by Farm Foundation NFP (see full Farm Foundation NFP Summary Report, Appendix).

A total of 218 farmers, conservationists and policy experts participated in the regional roundtables, providing diverse “on-the-ground” perspectives to inform a vigorous national dialogue. The picture provided by the roundtables is one of a diverse set of resource conservation issues, varying with geography, climate, economics and culture. While the specific issues critical to stakeholders differed across regions, their perspectives on policy approaches and options emerging from this diverse landscape of issues were remarkably consistent, centering around five themes:

1. A need for institutional innovation
2. The role of regulatory, voluntary and incentive based approaches
3. Greater program efficiency
4. Technology, research and development
5. Climate and weather patterns are changing; we need to deal with it

Blue Ribbon Panelists led the regional roundtables, and the insights gained from those events, a full-day planning meeting and a series of teleconferences with the BRP informed the content of the national Forum agenda. Conservation, environmental and rural development leaders were invited to provide multiple perspectives on program needs and policy approaches. Presenters included prominent authorities from: agriculture, the environment, land use and rural development, private sector industry, academia, planning agencies, nonprofit organizations, commodity and tribal associations and government. Forum participants included senior-level government officials, current and former state secretaries of agriculture, elected officials and their staffs, leaders within USDA, and officials from EPA, Department of Interior (Interior) and related agencies. Their active participation was encouraged in Forum discussions.

NATIONAL FORUM SUMMARY

AFT President Jon Scholl kicked off the Forum with a warm welcome to participants. NRCS Chief Dave White and BRP members led a lively discussion summarizing the key themes heard at the regional roundtables and soliciting feedback from participants to see if these themes resonated with a Washington, D.C., audience. USDA Deputy Secretary Kathleen Merrigan then charged participants to tackle a few key questions:

- What approaches are needed to protect the agricultural landscape most effectively?
- Which approaches will make the most efficient use of tax payer dollars?
- What is the best way to deliver technical and financial assistance to landowners?
- How can USDA and the whole of federal government streamline regulations?

- How do we balance voluntary incentives and regulations?
- What tools are needed to ensure that agriculture and natural resources remain productive on the landscape in the face of water shortages, climate change and other challenges?

While the NAL Forum program was not specifically designed to answer these questions, presenters and participants clearly kept them in mind. Given the threat of a potential government shut-down, which shadowed the Forum, budgetary austerity and improved governmental efficiency were ever-present themes, with much emphasis on how to improve conservation outcomes with diminished federal resources.

Another key theme was that 21st Century approaches are needed to address 21st Century problems including development of new technologies—especially information technology, policy innovation and improved program efficiencies. It was generally agreed that preventing loss, protecting and conserving would not be enough—that improving, enhancing and restoring resources also will be important. Both will take public/private partnerships and multi-jurisdictional cooperation. This was often framed in terms of the need for landscape-scale, watershed-based conservation approaches to ensure the sustainable use of the land and water resources upon which our nation depends.

MAJOR NAL FORUM THEMES

The NAL Forum’s goal was to provide national, state and local policymakers with information and insights to improve delivery of services at all levels of government, especially federal programs that aim to improve environmental quality and rural development. Through dialogue engendered by diverse perspectives, the Forum identified key issues and generated thoughtful recommendations to guide the development of improved approaches, policies and use of resources to support agriculture as a critical and viable component of the nation’s landscape.

Improve Jurisdictional Flexibility and Share Responsibility

The point was frequently stated that “all conservation is local” so ideally conservation programs should be delivered on a landscape or watershed level without being confined to county or even state boundaries. Given the political challenges of a watershed approach, and that “one size does not fit all,” strong sentiment was expressed throughout the Forum that federal programs must provide sufficient flexibility to address unique conditions on the ground.

A universal theme was to increase state, local and tribal flexibility to leverage funding and approaches and to empower local decision-making with accountability and metrics. Because different jurisdictions define eligibility differently, local authorities who are cognizant of the local landscape and the abilities of local producers must be empowered to make decisions. Strong sentiments were expressed to shift dollars to what works and to put them on the ground so local entities can make the decisions. It was suggested that a good indicator of success is oversubscribed programs. As one moderator said, “Don’t send money for programs that don’t work; support programs that do.”

There was a strong shared belief that local, state, tribal and regional directors must be allowed to make resource decisions and to innovate based on local conditions. For example, Indian tribes often lack jurisdictional authority to participate in programs, so there must be sufficient flexibility built in to ensure they receive technical assistance and support.

Overall, block grant approaches were favored with the caveat that they must be expanded to allow tribal entities to apply. The Farm and Ranch Lands Protection Program (FRPP), Specialty Crop block grants and Conservation Innovation Grants (CIG) were suggested as models. Changes to the Agricultural Water Enhancement Program (AWEP) were recommended to allow use by irrigation districts and farmers, and the Wetlands Reserve program (WRP) was not favored by ranchers.

Improve Program Efficiency and Inter-Agency Cooperation

Some participants suggested that conservation and research tend to be lower priorities in USDA's final budget process often because of Congressional mandates or OMB decisions. Participants asked questions ranging from "why isn't NRCS doing technical assistance and Farm Service Agency (FSA) financial assistance?" to "why do rural development policies promote sprawl while NRCS is funding easement programs to promote landscape integrity?" Presenters called for closer ties between the Agricultural Research Service (ARS), National Institute of Food and Agriculture (NIFA) and NRCS and greater facilitation of inter-agency learning and cooperation. It was noted that there is a need to take the last 10–20 years of productivity research and transfer it into practices. As one participant said, "USDA needs to become a zealous advocate calling for greater inter-agency cooperation" and "bridging the head gates" to bring in all the federal agencies to work together and avoid duplications.

One approach to breaking down silos within departments and between agencies would be to build on current successes, such as the common core rangeland assessment and monitoring protocols adopted by NRCS and the Bureau of Land Management (BLM), which use the same methods across nonfederal and federal lands. However, mechanisms are needed to streamline, incentivize and improve program efficiency by focusing on coordinated governmental action and local level input. Although many tribal governments have the best Geographic Information Systems (GIS) in their regions, NRCS only has one per state, FSA doesn't use GIS and the federal government is not willing to use local institutions. Not only tribes but often city governments have capabilities far above USDA agencies. It was recommended that USDA use local contracts to eliminate bottlenecks.

Numerous examples illuminated the practical frustrations producers encounter trying to navigate the red tape of multiple jurisdictions that have authorities over conservation practices. One producer gave the example of a farmer "playing ping-pong" for four years with federal agencies including NRCS and FSA and state agencies including the Departments of Natural Resources and Agriculture to get an Environmental Quality Incentives Program (EQIP) to support an intensive grazing program.

Isolated conservation was seen as insufficient, but a "transformative conservation approach" was recommended to achieve shared goals of diverse partners and pool resources to build on landscape successes across multiple organizations. America's Great Outdoors (AGO) was touted as a model of a cooperative, multiparty initiative to improve conservation outcomes by calling for state secretaries to define regional landscape opportunities and compete for resources to bring them together.

Target Regulations and Reduce Uncertainty

Participants called upon USDA to harmonize regulations to avoid the existing patchwork of redundant requirements that don't necessarily enhance protection or even the perception of protection. In general, government regulation was viewed as a blunt instrument, described as "weeding the garden with bulldozer," and participants called for program modifications to keep up

with practices occurring on the ground. One example was statutory problems that prevent farmers from growing fruits and vegetables on land enrolled in commodity programs. Incentives were preferred—especially those delivered in the form of block grants to states, so long as tribal governments are expressly allowed to participate.

When it comes to regulations, farmers don't trust EPA. EPA reported that while it has a strong point-source program, its nonpoint-source authorities are limited, although some efforts have been made to strengthen their authority. Farmers who otherwise might be willing to invest in conservation are deterred by the possibility that the bar will be raised. In addition, producers do not want to be punished for problems caused by others—whether by neighboring development or because other farms do not take action.

In general, more targeted regulations and enforcement were suggested to better direct resources and deal with persistent challenges. To address the perception that a relatively small number of farmers drive problems, a “rotten apple” bill was proposed to help solve conservation problems. Another proposal was for EPA to extend to agriculture the protections it offers to other nonpoint sources based on actions taken.

Transcending the regulatory/incentive paradigm will require tools to document performance and provide producers with information and feedback. A feedback approach was seen as more powerful than either regulatory or incentive-based, but at the present time tools have not been widely available or adequately developed to provide precise feedback information to operators.

Overall, agriculture's contribution to solving watershed problems was described as positive. Although more work is needed on livestock waste and to address watersheds that do not meet standards, with better tools and new technology, great improvement is possible. One participant suggested: “turn the regulatory community into the Maytag repair man—so little to do they just play cards.” Short of that, creating a regulatory ombudsman was offered as a way to help alleviate regulatory bottlenecks.

Leverage Program Assistance to Maximize Program Effectiveness

Have we come to the point where we can really go after cost effectiveness and targeting of conservation in terms of using our resources most effectively? Targeting must be based on local understanding of the issues.

Targeted regulatory approaches must be balanced with investments focused on solving problems. One example is the cross-collaboration between the U.S. Fish and Wildlife Service (FWS) and NRCS that is successfully protecting the Sage Grouse. An FWS report says “if you do good things for the Sage Grouse, it won't be regulated even if it's listed (as a candidate species.)”

Models suggested for incentive programs included block grants and other ways to leverage state, local and private funds, such as with FRPP. However, anticipating substantially reduced federal funds, participants did not believe new money would be available and generally believed less federal money would be available to incentivize voluntary approaches. Therefore, partnerships and leveraging funds were seen as essential. One producer expressed the belief that the best conservation is not based on availability of dollars but on trusted relationships over time with sustained management.

Improve Market-Based Solutions

Ecosystem markets hold great promise but so far are immature concepts with no objective measure of what works. For these markets to improve conservation outcomes, it is important both to assess and to articulate what they are and how to improve them. Water quantity trading mostly occurs in the West due to the regulated allocations of resources under water rights. Water quality trading markets have been developed mostly around sediment and nutrients. They are compliance-driven, focused on regulated dischargers and face high costs.

Despite differing opinions about the potential of ecosystem markets, successful examples underway can inform future market efforts and policy decisions. Great Miami River Water Quality Trading has seven buyers and 275 approved agricultural Best Management Practice (BMP) contracts. It uses a reverse auction and “farmers are lining up.” So far, \$1.5 million has been invested, reducing 130 tons of Phosphorous and 340 tons of Nitrogen. In the Chesapeake Bay, water quality trading is occurring because state-level regulatory and water quality standards generally are in place.

However, trading has not taken off as much as many had hoped. One reason cited was because EPA has a “command and control model.” Another was that federal agencies do not use the same terminology (e.g., the term “range” is used differently between the U.S. Forest Service (FS), BLM and NRCS). Given the patchwork of examples across the country, a coordinated entity, such as the USDA Office of Ecosystem Services and Markets (OESM), should develop consistent protocols.

Ecosystem markets will only work if there is balance between buyers and sellers. The conservation Reserve Program (CRP) was offered as an example of a stable market because the federal government serves the role of a reliable buyer. As well as regulatory and environmental quality standards, policy drivers are needed to encourage brokers, bankers and aggregators to participate. Especially with wastewater, it was suggested that brokers will be required who know the laws and can aggregate producers to reduce transaction costs and uncertainty.

Performance-based actions will be measured by results: not acres of practices, but pounds reduced per year. Thus, it will be necessary to verify and quantify results. Buyers will expect certainty on the practices applied, which will require third party verification such as crop consultants or Soil and Water Conservation District (SWCD) staff. Government has a role in developing markets, being the market guardian and making sure that they work and are balanced.

Support People on the Land

Improving resource conservation encompasses social as well as economic and environmental characteristics. Current programs are not available to everyone who wants to participate; some demographic groups are disenfranchised from USDA and its programs. Secretary Vilsack’s Chief of Staff Krysta Harden challenged the audience to expand the conservation tent, asking: “Are we talking to all the right people to ask them what they need or are we only talking to people we are comfortable with and know? Or are we talking to people who feel like they don’t usually have a place at the table—who are farming, ranching, but don’t have a say?” The coalition must be richer, deeper and broader to achieve conservation outcomes and programs must be accessible to all producers and landowners.

Next Generation

One of the most frequent concerns raised at the Forum was “will the farmer pass the farm on to the next generation?” This question was seen as affecting the future of conservation as well as agriculture, rural development and food security. It is especially critical today as a wholesale change is imminent not only on farms and ranches but also in conservation districts.

The age breakdown of farm operators was deemed unsustainable (30 percent of operators are at least 65 years old, but only 5 percent are under 35). Non-operator landowners are becoming more prevalent, especially in the Corn Belt where most of the land in Illinois, Indiana and Iowa is no longer owned by operators. While many more questions were asked than answers proposed, participants called for dedicated USDA support on both the technical and organizational sides.

Secretary Vilsack was quoted as calling for bringing on 100,000 new farmers every year. Citing onerous regulatory requirements and red tape, some participants questioned whether this is possible. Some programs were included in the 2008 Farm Bill to encourage the next generation to enter agriculture but were considered insufficient for the magnitude of the job. More tools are needed to support access to land and financing, mentoring, marketing and managing downside risk.

The next generation likely will look very different and own less land. The demographics of the U.S. are changing, and sometime between 2040 and 2050 Caucasians no longer will be the majority. Thus, it is important to provide resources to and leave a legacy for future generations of minority farmers. Examples included African American farmers in the South and Native American farmers on tribal land.

Several presenters offered hope in the renewed interest in farming with young people interested in local and regional food systems. Local food markets were suggested as a good entry point for the next generation of farmers. Suggestions were offered to use the Beginning Farmer Loan program in FSA and the 2012 Farm Bill to help young people get in and stay in business.

Tribal Issues

Tribes have unique jurisdictional issues that must be addressed for them to receive equitable opportunities from conservation programs. The 2007 Census of Agriculture reported an increase of 80,000 Native American farmers since 2002. Today 565 tribes represent 2 million people on 96 million acres with about 3 million acres in agricultural production. Tribes import 99 percent of their food so are trying to produce more food locally but need better agricultural infrastructure and markets.

The federal government has had centralized authority over Indian affairs since 1754. Article 1 section 8 of the U.S. Constitution authorized Congress to regulate commerce with tribes and empowered the president to make treaties. Since the Bureau of Indian Affairs (BIA) was created in 1824 services have effectively been isolated to one agency. USDA, BIA and tribal governments are separate authorities, so tribes often are not eligible for natural resources programs, especially those that are administered through states or local conservation districts.

Water rights and water quality are significant tribal issues. While tribes have earliest priority dates and seniority, only 75 have received water rights. Permanent funding for settlements is needed; after

30 years, the federal government has not committed adequate resources for resolving claims. In terms of water quality, a core federal standards rule would help address regulatory gaps. While states have EPA-delegated standards, only 40 tribes have standards under Clean Water Act Authority.

Food Security

Governments—at the local, state and federal levels—make and affect decisions about how we allocate land and water use among agriculture, commercial, industrial, housing and public space. These decisions are critical in determining whether we will be able to produce enough food in the future but often receive little policy discussion or recognition. Feeding an anticipated 9 billion people by 2050 will require substantially increased and more sustainable food production, whether for local or global markets. Decreasing land area available for agricultural production at home and abroad is a significant concern. (One out of 3 acres ever developed in the U.S. was developed between 1982 and 2007; per capita land area available for agriculture has decreased by half in developing countries.) Stronger policies are needed to address competing societal demands for land and water with food security in mind.

Food security depends on quantity, quality and cost. Soil and water resources needed to support it are threatened. Not only is there less land per person, soils have been degraded by contamination, erosion and urban development. More water will be needed for irrigation but water quantity has declined in many places. For example, overuse of the Ogallala aquifer in Kansas has resulted in a 40-foot drop, putting more pressure on other lands. Climate change and energy development also increase pressure on declining agricultural land resources. In terms of climate change, the greatest concern is not temperature but water distribution; some projections in the Central U.S. are for more extreme events, which will have impacts on soil and water resources such as more erosion, downstream flooding and more drought between flood events.

Local and regional food systems were suggested both as ways to bring young people into agriculture and to protect farmland—especially on the rural/urban interface. People are looking into food systems not just local food markets, which are well developed, but from regional foodsheds and watersheds. Demand for local food significantly outpaces supply.

At the same time as growing to meet demand for local food markets, agriculture is under pressure to increase global productivity and efficiency to meet the demands of world population growth and growing middle class appetites. Increasing sustainable production will be important to improve efficiency and productivity while reducing environmental impacts.

Plan for Agriculture

Humanity depends on agricultural systems so the human environment must be addressed in tandem with the agricultural landscape. A common refrain throughout the Forum was “a failure to plan is a plan to fail.” Farmers live in communities with yards, wastewater treatment and zoning decisions that all affect land use patterns, water quality and quantity. Community and regional planning efforts require partnerships and build an integrated approach across all landscape types rather than addressing agriculture in a vacuum. Examples included: California Ag Vision that looked at the state’s agriculture in 2030; the New England Governors Commission on Land Conservation initiative, which addressed five critical resource issues, among them “Keeping Farms in Farming”; and the NRCS Oregon rapid watershed assessment.

It was suggested that USDA expand the safety net notion to include rural America and to help farmers build domestic markets to support rural communities. Given changing weather patterns, conservation programs and communities must begin to plan for natural disasters and build in a reward structure to give producers incentives for disaster mitigation.

However, the communities most in need of planning often lack planning capacity. Two programs proposed in the president's 2012 budget, Rural Business Opportunities and Rural Development provide flexibility to work with communities and regions. Beyond that, USDA's budget is small relative to budgets in EPA, the Department of Housing and Urban Development (HUD) and Department of Transportation (DOT), which are part of the interagency Sustainable Communities Partnership (SCP). USDA is in coordination with the SCP and could share expertise on how to expand planning capacity to rural communities. These kinds of policy innovations were seen as necessary to improve the delivery of USDA services in a time of shrinking fiscal resources.

Research and Technology Needed to Accelerate Innovation

Many participants encouraged USDA "to get into the 21st Century" and develop electronic interfaces with agriculture and the rest of the population. A major transition is occurring throughout society and is changing agricultural management systems. Farmers are rapidly adopting new methods such as precision farming and are increasingly reliant on technological advances such as Global Positioning Systems (GPS) and smart phones.

States also must keep up with technological change and adoption. One of the challenges to accelerating innovation is that it is difficult and expensive to get new technologies approved in all 50 states and through 120 health safety and environmental tests required by regulators.

Much emphasis was placed on the need for improved measurement capacity and tools to provide producers with information and a direct feedback response. As one participant said, "If there was a tool that could document how many pounds of nitrogen are washing down the river, farmers would convert that information into dollars and reduce their use." Site-specific knowledge and real time information were seen as being critical to success. Modeling capabilities are needed to allow for more dynamic management systems and to provide tools farmers can use to meet watershed goals. Improved NRI and CEAP capability were suggested as ways to unlock the problem of how to move forward with accountable and effective watershed-based strategies.

USDA is leading in the use of geospatial technology, which can build 3-D models on personal computers to visualize and predict causes and effects. For example: the FSA National Agriculture Imagery Program (NAIP) provides baseline imagery across the U.S. and the Map and Resources Report. Great potential exists to use geospatial technology to improve analysis and resource management over larger areas for lower cost. As it improves, more data will be available at lower cost with better quality. So far geospatial technology use is not coordinated and, as with many new technologies, each department or agency has its own approach. While important programs exist, funding is sporadic. One thing that would help would be to scale up geospatial databases, such as NRI, test sites and remote sensing. Another would be a soil organic carbon observatory to combine remote sensing, modeling and ground-based measurement for assessing changes. These must be integrated through a model and tested on the ground.

USDA was called upon to share research information between ARS, NIFA and NRCS and to integrate private sector efforts to make sure it stays ahead of—rather than lags behind—the research

curve. A variety of research needs were proposed: Some related to determining how much land and water do we need, how are we using them, have we converted/diverted too much? Others related to identifying the “core of the core” of land to protect and how to improve the way our communities grow to ensure adequate land and water to grow our food as well as our cities?

Specific research areas included soil fertility and microbial growth regulators, erosion control and nitrogen management, water quality, reducing the carbon footprint of food production and the effect of climate change on water, invasive species and trees, as well as research into new technologies.

More research is needed to develop feedback oriented information tools to support individual performance-based management systems. Long-term adaptive research is needed to guide up-scaling from sites to regions across time to create sustainable production at the landscape scale—from soil to field to regional/state/national levels—integrating relevant scientific data and local knowledge as well as using remote sensing and databases.

Fully captioned video recordings of the National Agricultural Landscapes Forum and PowerPoint presentations of Forum panelists are available online at the AFT Forum Web pages: www.farmland.org/AgLandscapes.

NATIONAL AGRICULTURAL LANDSCAPES FORUM
Blue Ribbon Panel Members

- Roger Allbee** – former Vermont Secretary of Agriculture, Foods and Markets
- Varel Bailey** – Iowa crop and livestock farmer; a former president of the Iowa and National Corn Growers Associations
- Craig Cox** – Senior Vice President of Agriculture and Natural Resources, Environmental Working Group
- Otto Doering** – public policy specialist on economic issues affecting agriculture, natural resources and energy at Purdue University Climate Change Research Center, Department of Agricultural Economics
- P.J. Haynie** – owner-operator of Haynie Farms, Virginia; Secretary/Treasurer of the National Black Grower’s Council
- A.G. Kawamura** – former California Secretary of the Department of Food and Agriculture; Orange County produce grower and shipper
- Teresa Lasseter** – former Administrator of USDA Farm Services Agency; former FSA state executive director for Georgia
- Patrick O’Toole** – Wyoming rancher; President, Family Farm Alliance
- Ross Racine** – Executive Director, Intertribal Agriculture Council
- Charles Stenholm** – Senior Policy Advisor, Olsson Frank Weeda Terman Bode Matz PC; former member of the U.S. House of Representatives for the 17th District of Texas
- Sara Wyant** – President of Agri-Pulse Communications

message on climate change follows: Climate change is happening, let us not argue about why let us focus on how we adapt to the changes that are occurring. This message was clear and consistent, the agricultural community and other conservation stakeholders are prepared and in many cases keenly interested in discussing climate change within the context of adaptation. Specific policy options mentioned include:

- Research to improve understanding of impacts of climate change on agriculture at the watershed level.
- Research to improve plants' ability to resist drought and other environmental stress.
- Research on ecosystem adaption to climate change and invasive species.
- Investment in water storage and management infrastructure.

Conclusions

Stakeholders across the country were generally positive about the progress we have made on resource conservation in recent years, while being realistic about the environmental, economic and political challenges that lie ahead. The challenge posed by local, state and federal budget constraints is almost universally viewed as the single biggest threat to further progress on resource conservation. There is broad recognition that meeting this challenge will require innovative approaches and greater efficiency in current programs. There is also a growing recognition that budget constraints pose a fundamental challenge for our historical reliance on voluntary approaches to conservation. However, there is no consensus on what the appropriate mix of voluntary, regulatory and incentive-based (market) programs should be going forward.