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Golden Opportunities

The Role of Education and Community Engagement in Sustaining Natural Resources

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Biographies and Abstracts of Oral Presentations, Roundtables and Workshops

ANREP

UC Cooperative Extension
University of California
Division of Agriculture and Natural Resources

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Biographies of Invited Presentations

Barbara Allen-Diaz

Barbara Allen-Diaz was appointed vice president – University of California Division of Agriculture and Natural Resources September 15, 2011.As systemwide vice president for the UC Agriculture and Natural Resources (ANR), Allen-Diaz leads a statewide research and public service organization responsible for activities in agriculture, natural resources, nutrition, as well as 4-H/youth development and related areas. As vice president, she serves as Director of the Agriculture Experiment Station and Director of Cooperative Extension in California, and thus works closely with the Davis, Berkeley, and Riverside campuses as well as overseeing statewide, county-based Cooperative Extension programs. In the Division of Agriculture and Natural Resources, Allen-Diaz served as associate vice president-Academic Programs and Strategic Initiatives since 2009 and as assistant vice president–programs from 2007 to 2009. She is currently on leave from her position as a tenured faculty member in the College of Natural Resources on the Berkeley campus, where she has worked since 1986. She currently holds the prestigious Russell Rustici Chair in Rangeland Management. At Berkeley, Allen-Diaz served numerous roles including Divisional Chair and Chair of the Department of Environmental Science, Policy, and Management; and associate dean, Executive Associate Dean, and Acting Dean of the College of Natural Resources. Allen-Diaz was among 2,000 scientists recognized for their work on the Intergovernmental Panel on Climate Change (IPCC), when the Nobel Peace Prize was awarded jointly to the IPCC and Vice President Al Gore in 2007. Allen-Diaz's contributions focused on the effects of climate change on rangeland species and landscapes. She has authored more than 160 research articles and presentations and is an active participant in her professional society; she has served on its board of directors and on various government panels.

Allen-Diaz earned a B.A. in anthropology, an M.S. in range management and a Ph.D. in wildland resource sciences, all from UC Berkeley.

M. Kat Anderson

Kat Anderson is the national ethnoecologist of the United States Department of Agriculture's Natural Resources Conservation Service and a lecturer in the Department of Plant Sciences at UC Davis. She is also associate ecologist with the Agriculture Experiment Station and on the Faculty in the Graduate Group in Ecology and the Faculty in the Graduate Group in Geography at the University of California, Davis.

She reconstructs the plant uses, harvesting strategies, and land management practices of indigenous peoples in the United States with an emphasis in California. This work involves the use of both qualitative and quantitative research methods. A unique feature of her research is the use of the western scientific experimental approach to simulate indigenous horticultural practices and assess their potential ecological effects on the productivity and yield of wild plant populations. This information in turn can be used to assess the potential application of traditional ecological knowledge for restoring traditional gathering sites, and the biodiversity of degraded ecosystems.

Dennis Baldochhi

Dennis Baldochhi is a professor of Biometeorology at the University of California, Berkeley. His research focuses on physical, biological, and chemical processes that control trace gas and energy exchange between vegetation and the atmosphere and the micrometeorology of plant canopies. Professor Baldocchi received his Ph.D. (1982) in bioenvironmental engineering from the University of Nebraska, Lincoln, his M.S. (1979) in agricultural engineering from the University of Nebraska, Lincoln, and his B.S. (1977) in atmospheric science from the University of California, Davis. He has received numerous awards, including the Award for Outstanding Achievement in Biometeorology from the American Meteorological Society in 2009, is a Fellow of the American Geophysical Union, 2007, and has received awards from the University of California, including the Faculty Award for Excellence in Postdoctoral Mentoring in 2011. Professor Baldocchi is an editor of numerous journals, is

Editor-in-Chief of the Journal of Geophysical Research, and is a member of advisory boards for national and international organizations and projects. He has over 200 peer-reviewed publications.

Brandon Collins

Brandon Collins is a Research Scientist with the USFS Pacific Southwest Research Station and UC Berkeley. Brandon's background is in forestry, and as such, much of his research is applied. Brandon has investigated effects of long-term managed wildland fire programs. He has also done fire modeling to assess effectiveness of landscape fuel treatment projects. Additionally, Brandon is currently working on characterizing forest/fuel dynamics following both fuel treatments and wildland fire.

Chris Jones

Chris Jones is responsible for Agriculture and Natural Resources extension programming with the University of Arizona Cooperative Extension office. His programs include Master Gardeners, Master Watershed Stewards, Firewise and Forest Health, Noxious Weeds, and Climate and Natural Resources. His research interests include the wildland-urban interface and climate and natural resources management.

Kevin Koy

Kevin Koy is the Executive Director, Geospatial Innovation Facility (GIF), College of Natural Resources, UC Berkeley. He has over fourteen years of experience working with geospatial technology. Kevin leads research projects and applications, develops and teaches technical workshops, provides organizational support to the facility, and promotes geospatial solutions throughout the Bay Area community.

Prior to his arrival in 2008, Kevin was the Remote Sensing/GIS Specialist for the American Museum of Natural History's Center for Biodiversity and Conservation. His experience at AMNH included mapping land cover change and developing capacity building initiatives in Vietnam and Lao PDR. Kevin's experience in geospatial technology began as a Remote Sensing / GIS Analyst for the Smithsonian Institution's Conservation Biology Institute where he mapped Eld's deer habitat in Myanmar's dry dipterocarp forests.

Kevin received a B.A. in Environmental Studies and Anthropology from the University of Pennsylvania in 1998, and an M.S. in Biology from George Mason University in 2003. He has also completed advanced graduate work in Geography at the City University of New York with a focus on Earth and Environmental Science.

Peter Moyle

Peter Moyle has been working on the ecology California's freshwater and estuarine fishes since 1969, culminating in his 2002 book, *Inland Fishes of California* (UC Press). He has co-authored numerous scientific papers on the ecology, status and trends of California's diverse fish fauna and has just finished, with three co-authors, revision of *Fish Species of Special Concern in California,* for the California Department of Fish and Wildlife, an effort which included evaluating the status of 130+ native species. His expertise on endangered fishes has led him to be involved in a number of legal actions. He also is a co-author of a book published in 2011 by the Public Policy Institute of California, *Managing California's Water: from Conflict to Reconciliation* (PPIC) and is lead author of the just-published *Suisun Marsh: ecological history and possible futures* (UC Press). He is a professor in the Department of Wildlife Fish and Conservation Biology and associate director of the Center for Watershed Sciences, UC Davis.

Doug Parker

Director of the California Institute for Water Resources (CIWR) and leader for UC ANR's Water strategic initiative. As Director of the CIWR, he coordinates research, education and outreach on California water resources issues among the 10 UC campuses and other academic institutions within the state. He is also a member of the National Institutes for Water Resources, which gives him access to information on water

activities at academic institutions across the country. As Leader of UC ANR's Water Initiative, Doug chairs the water initiative panel. The panel sets direction for water research, education and extension throughout ANR. Prior to joining the University of California, he spent 14 years as an agricultural economist at the University of Maryland and 4 years as an Extension Economist at the University of California, Berkeley. His research and extension programs have focused on environmental economics, water markets, drainage management, non-point source water pollution control, the economic impacts of regulation and water quality, and ecosystem service markets.

Karen Ross

Was appointed Secretary of the California Department of Food and Agriculture on January 12, 2011, by Governor Edmund G. Brown Jr. Secretary Ross has deep leadership experience in agricultural issues nationally, internationally, and here in California. Prior to joining CDFA, Secretary Ross was chief of staff for U.S. Agriculture Secretary Tom Vilsack, a position she accepted in 2009. Before her time at the United States Department of Agriculture, Secretary Ross served more than thirteen years as President of the California Association of Winegrape Growers (CAWG), based in Sacramento. During that same period she served as the Executive Director of Winegrape Growers of America, a coalition of state winegrower organizations, and as Executive Director of the California Wine Grape Growers Foundation, which sponsors scholarships for the children of vineyard employees. Among Secretary Ross' many achievements at CAWG was the creation of the nationally-recognized Sustainable Winegrowing Program, which assists wine grape growers in maintaining the long-term viability of agricultural lands and encourages them to provide leadership in protecting the environment, conserving natural resources, and enhancing their local communities.

Roundtables

R1 Building partnerships for natural resource protection: What is the role of Extension?

Janice Alexander, University of California Cooperative Extension, jalexander@ucanr.edu

What are the ingredients for a successful partnership, and what does Extension uniquely bring to the mix? In this Roundtable Discussion, we will use our experiences with sudden oak death, a tree disease caused by the introduced pathogen Phytophthora ramorum, as the starting point to explore the role of Extension in multi-agency, cross-border partnerships. For almost 20 years, a coalition of federal and state agencies has partnered with Cooperative Extension in research, monitoring, policy, education and outreach for sudden oak death. Along with being a significant forest pest, P. ramorum infects popular garden plants such as rhododendrons and camellias and is thought to have been introduced via the commercial nursery trade. Cooperation among many groups is necessary to address the interplay of regulations, management, research, and outreach that this issue - as with many other invasive species - requires. The need for interstate cooperation by Extension offices on national issues and the potential roles for Extension in limiting the spread of invasive species will be considered. For instance, just how involved should we be in quarantine enforcement? What do our partners know - or think they know - about Extension, and vice versa? We will discuss how California's experience is similar to and different from other efforts, such as the sudden oak death programs in Oregon and Washington and the national firewood outreach campaign. Participants will leave with a better understanding of how Extension can continue to facilitate partnerships for the benefit of natural resource protection. Speakers include representatives from University of California Cooperative Extension, Washington State University Cooperative Extension, USDA-Forest Service, and you! We welcome your insights and participation in the discussion.

R2 Catalyzing Community Engagement to Sustain Lasting Impact in River Restoration: Wisconsin Extension

Gail Epping Overholt, Environmental Resources Center, Regional Natural Resource Prog., Univ. of Wisc-Cooperative Extension, gail.overholt@ces.uwex.edu
Debbie Beyer, Natural Resources Educator, Environmental Resources Center, Regional Natural Resource Prog., Univ. of Wisc-Cooperative Extension; Chad Cook, Natural Resources Educator, Environmental Resources Center, Regional Natural Resource Prog., Univ. of Wisc-Cooperative Extension

Forty-one Areas of Concern (AOC) across eight Great Lakes states are harnessing Great Lakes Restoration Initiative funding to implement large river restoration efforts to clean up contaminated sediment and restore natural processes. Wisconsin, with five AOCs, is complementing the technical and regulatory expertise of the Department of Natural Resources by partnering with Extension Natural Resource Educators (NRE). NREs engage local partners in education and outreach efforts and provide a connection to state and federal agencies. Capacity building, citizen engagement opportunities, and multi-media materials help connect the dots for community members. NREs have created a framework and developed templates for locally-tailored applications, bridging the gap between technical information and public-friendly interpretation. As the go-to resource for natural resources education, NREs enhance citizen and NGO partner participation in the restoration planning and implementation.Conclusion:Restoring the AOCs is an important first step in larger watershed restoration efforts. Through the leadership of the NREs, citizen engagement efforts have expanded and complemented data collection for state and local agencies. Citizen science, citizen monitoring and river ambassador programs are just a few examples of ways volunteers become local experts and spread the word, building a cadre of stakeholder stewards for long-term sustainability of restoration projects as they move towards river revitalization. Learning from each other, staff in the five Wisconsin AOCs are building a network of AOC-specific education tools and templates to share with the other Great Lakes AOC staff. As a parallel effort, a Tracking Tool was developed to monitor the progress of the Wisconsin AOC restoration efforts and is integrated with the annual Remedial Action Plan updates and restoration reports. Using program evaluation, personal interviews,

observation, and statistics, the stage has been set and a model created for Extension Staff in other states working on large restoration projects.

R3 Inspiring Natural Resource Stewards: A Collaborative Approach to Youth Education

Tristan Huff, Oregon State University Extension Service, tristan.huff@oregonstate.edu
Elissa Wells, Oregon State University Extension Service

Natural resource education is a proven tool for improving outcomes for students and for instilling a love of the outdoors that continues into adulthood. However, tight budgets and multiple demands on the time of natural resource professionals can make it challenging to provide quality outdoor educational opportunities. In lean times, impacts can be maximized by leveraging resources from a range of stakeholders including professional societies, natural resource agencies, forest industry, K-12 educators, non-profits, and community members. Programs are most successful which match the assets and mission of a collaborating group with the educational needs of a youth audience.Join us for an interactive discussion about cultivating and maintaining community partnerships that result in successful K-12 natural resource educational programming. We will share personal experiences, program evaluation data, impacts, and strategies from two successful, collaborative programs that we have coordinated for the past seven years: Fifth Grade Natural Resource Field Days and Sixth Grade Outdoor School. We will also be able to provide comparison between a large program (Field Days) and a smaller one (Outdoor School). Participants will be invited to share successes and challenges that they have encountered with similar field-based educational programs. Along with the opportunity for networking, participants will also come away from this session with a summary of best practices for collaborative, community-based educational partnerships as reported in current literature.

R4 Strengthening Extension Capacity for Bioenergy Program Outreach

Shiba Kar, Washington State University Extension, shiba.kar@wsu.edu
Patricia Townsend, Washington State University Extension; Nora Haider, Washington State University Extension; Kevin Zobrist, Washington State University Extension

Across the United States, Extension systems are adopting new bioenergy programs. These efforts support renewable fuel initiatives that address energy independence and fuel security concerns, and explore the potential for economic development in rural areas. New technological developments show emerging opportunities for the development of bioenergy industries based on sustainably managed natural resources such as purpose-grown energy crops. The potential feedstock growers, industry stakeholders, and communities need increasing Extension support to learn about and engage in these innovative bioenergy systems. Extension professionals need to be equipped with information, technology, and an extensive stakeholder network to provide support to these groups. The objective of this roundtable discussion is to inform Extension professionals on effective bioenergy outreach strategies through participation and sharing. Outreach examples from the Advanced Hardwood Biofuels Northwest project will kick off the discussion. The discussion will focus on communication strategies for diverse bioenergy stakeholders including policy-makers, landowners/growers, and business entrepreneurs. The session will conclude with identifying key bioenergy outreach strategies that strengthen Extension networks, increasing Extension's capacity to support the needs of diverse stakeholders in sustainable bioenergy industries.

R5 Creating a National Stormwater Core Curriculum

Shahram (Shane) Missaghi, University of Minnesota Extension, miss0035@umn.edu

Human activity on the landscape has drastically changed the natural hydrologic cycle by concentrating much of the output into surface water as excessive runoff. The consequences of the excessive runoff have been flash flooding, loss of property and significant water quality degradation. Since the 1980s a national effort called green infrastructure has focused to remedy the problem by providing a series of tools to minimize the impact of our developments by mimicking natural hydrology. Recently, there has been expanded and a very rapid growth in the number of publicly available stormwater educational programs for professionals and communities that focus on green infrastructure tools (referred to as best management practices). However, much of the growth has been "home base" and addresses specific local needs and issues. What has been missing is a publicly available uniform comprehensive stormwater core curriculum education. A collaborative group of stormwater educators from across the country are leading the effort on developing just such educational program. The goal of this collaborative is to develop publicly available uniform research base stormwater core curriculum that can be readily used by educators, local governments and professionals. We would like to expand this national discussion on developing a uniform comprehensive stormwater core curriculum. At this interactive round table presentation we will discuss what is presently being done globally and resources already available asking for your input on what should be included in a core nationally available stormwater curriculum. One of the questions is how to best integrate a core curriculum and address regional specific needs. We will also discuss the efficacy of identifying and using proper evaluation metrics to measure program impact and its public value. Finally, we will share our idea of delivering the final product in the form of a live e-format.

Workshops

W1 Civic Engagement in Management of Natural Resources - The Role of Cooperative Extension

Holly George, University of California Cooperative Extension, hageorge@ucanr.edu
Barbara Radke, University of Minnesota Extension; Susie Kocher, University of California Cooperative Extension

This workshop will explore the role of Cooperative Extension in engaging citizens in natural resources management by both presenting current examples of Extension outreach efforts aimed at building the civic engagement skills and by eliciting additional information and examples from workshop participants. The University of Minnesota Extension is leading a state-wide initiative to enhance civic engagement understanding and skills, provide forums for co-learning on the issue of water quality, and create regional networks of water resource management professionals to support one another in embedding civic engagement in their approach to water protection and restoration. They have developed a research-informed civic engagement model to guide civic engagement programming, synthesized applied research to design a cohort delivery method to address issue-based programming, and have entered into a funding partnership with Minnesota Pollution Control Agency to deliver three cohorts across the state to water resource staff from agencies, boards and organizations.The University of California Cooperative Extension has presented a series of workshops with scientists, public land managers and stakeholders to build their capacity to collaborate in adaptive management of Sierra national forests as part of the Sierra Nevada Adaptive Management Project. The workshops are a "train-the-trainer" model with curriculum on process, framing collaborative projects, meeting logistics, group dynamics, understanding interactions, dealing with difficult behaviors and reducing conflict. Staff from federal and state forestry, fire, wildlife and research agencies, local conservation districts, non-profits and irrigation districts are attending and report that the workshops are timely and relevant dealing with issues with which they are currently dealing.An interactive component of this workshop will introduce and use a civic engagement technique with those attending to identify and explore efforts at embedding and facilitating civic engagement in issue-based programming. Information collected during the workshop will be compiled and shared with ANREP members.

W2 Building Local Capacity for Conservation and Land Use Planning in Hudson Valley Communities: Tools, Outcomes, and Evaluation

Laura Heady, Cornell University, lth6@cornell.edu
Shorna Allred, Cornell University; Karen Strong, Cornell University; Richard Stedman, Cornell University; Maureen Mullen, Cornell University

The ecosystems of the Hudson River watershed support the health of the estuary, provide benefits to over half of New York's population, and sustain astonishing biodiversity. With over 90% of its land in private ownership, the watershed's future is largely determined by municipal volunteer boards and commissions charged with land-use and conservation planning.To build community capacity for sound decision-making that balances future development with protection of the region's biodiversity, the Hudson River Estuary Program and Cornell University initiated an outreach and technical assistance program in 2001. Building from regional conservation priorities, the program developed tools, training, and partnership projects to help Hudson Valley communities 1) learn about habitats of ecological significance; 2) understand the value of these resources and the role of local planning in conserving biodiversity; and 3) create and implement plans, policies, and procedures that incorporate ecosystem protection into land-use planning. One-on-one technical assistance, data sharing, and peer roundtables are also offered.We have trained over 700 individuals and provided technical assistance to approximately 70 municipalities. The process of land-use planning takes time to unfold, however, and less is known about the program's long-term impacts. In 2012, we partnered with the Human Dimensions Research Unit to develop a survey instrument and evaluation protocol to better understand program effectiveness, audience attitudes and behaviors, and barriers (and catalysts) to local conservation action. Results show that

participants now seek out and utilize science-based biodiversity information in land-use planning and many have achieved successful outcomes. Additionally, the study revealed an essential role of peer communication in biodiversity education. During the workshop, we will share program tools and implementation strategies; present evaluation results; and discuss outcomes. Workshop participants will be encouraged to share experiences with community planning extension and discuss how the Hudson River Estuary Program's model may apply to their program.

W3 New Directions for Statewide Naturalist Education Programs: Citizen Science and Diversity

Adina Merenlender, UC ANR Cooperative Extension, Berkeley, adinam@berkeley.edu
Andrea Lorek Strauss, University of Minnesota Extension; Joe Bonnell, Ohio Certified Volunteer Naturalist Program; Sabrina Drill, UC ANR Cooperative Extension; Amanda Tedrow, University of Georgia; Joy Hazell, University of Florida/IFAS Lee County Extension; Alycia W. Crall, Virginia Tech/Virginia Cooperative Extension

Throughout the country, Master Naturalist-type programs promote learning, awareness, and community engagement in sustaining natural resources through science-based education and service programs. These programs use science curriculum, hands-on learning, problem-solving, and community service to instill a deep appreciation for the natural communities and to inspire individuals to become stewards of their local resources. Citizen science projects engage the public in the process of scientific investigation and monitoring of natural resources. Volunteers collect and share data that can be analyzed by scientists, project participants, or both -- achieving important results for both science and science education. Coupling Master Naturalist-type programs with experience doing citizen science presents a golden opportunity to improve scientific and environmental literacy, change behaviors, and improve environmental stewardship. Unfortunately, Master Naturalist programs and many citizen science efforts have not successfully attracted full involvement by underserved groups that may have socio-economic or other barriers to participating, particularly young adults and those from ethnically and culturally diverse backgrounds. There is a clear need to include a more diverse audience in naturalist learning networks. In order to diversify naturalist communities, we will share ways to improve access to naturalist programs by underserved populations. This will include working with job corps and other workforce programs to improve outreach as well as employing new technologies, social media, online experiential learning, and attention to urban ecology. Program leaders from several states (e.g. California, Minnesota, Nebraska, Ohio, Oregon, and Texas) will address these topics based on the experience throughout the country. Discussion among panelists and participants will result in guidelines for ways to couple citizen science into natural science and environmental training programs as well as tips for improving outreach efforts that will be shared nationally through the Alliance of Natural Resource Outreach and Service Programs (ANROSP).

W4 Tools and Approaches for Effective Water Quality Monitoring of BMPs for Stream Systems.

Ginger Paige, University of Wyoming, gpaige@uwyo.edu

Effective water quality monitoring programs require that careful thought and consideration be given to collecting appropriate data that will meet the specific monitoring objectives. This is especially true if the objectives change from monitoring for compliance to monitoring for assessing the effectiveness of a BMP that has been implemented. This workshop will address and identify challenges and successes in monitoring programs to assess the effectiveness of BMPs. We will present a guidance document and associated tools and approaches that have been developed to assist water quality monitors in developing effective monitoring programs for stream systems. The workshop will cover key principles such as defining monitoring objectives, developing a monitoring program to address those objectives and assessing program effectiveness. Speakers will share their experiences and insights on the challenges and successes of monitoring BMPs for stream systems. An open discussion will allow all participants to join the conversation, ask questions or offer solutions. This workshop will collaborate with the ANREP field tour of the UC ANR Sierra Foothill Research and Extension Center on Thursday, May 22. This full-day tour of the Range and livestock management, watersheds, oak woodland

management and restoration will allow workshop participants to discuss effective monitoring programs and use and test some of the tools and approaches in the field.

W5 Maximizing the Benefits of Integrated Extension, Teaching, and Research Teamwork for Stormwater Management

Steven Rodie, University of Nebraska - Lincoln, srodie@unomaha.edu
David Shelton, University of Nebraska - Lincoln

Stormwater management is a critical natural resource concern for communities with populations over 10,000 largely because of mandates to reduce runoff pollution and volumes. A University of Nebraska-Lincoln (UNL) Stormwater Work Group was organized in 2006 to develop educational programs and materials to address best management practices for municipal stormwater management. A USDA-NIFA grant titled "Improving and Conserving Water Resources through Stormwater Management Education for Community Decision Makers of Today and Tomorrow" was received in 2009 which has further supported and greatly expanded work group efforts. This, coupled with support from numerous Nebraska communities and organizations, has successfully blended extension programming with university teaching and research components. The resulting synergy has helped communities and individuals more effectively manage stormwater quality and quantity while building a knowledge-base that will support future initiatives and programs. Extension programs have included: presentations for design and green industry professionals, stormwater program managers, municipal officials, Master Gardeners, and homeowners; all-day rain garden workshops/installations; rain barrel construction workshops; green infrastructure tours; web-based resources; an interactive rain garden model; numerous youth activities; and publications. Research projects have evaluated rain garden hydrologic and plant growth attributes, homeowner perspectives on rain gardens, and bioretention design parameters. Academic programs in both landscape architecture and landscape horticulture are expanding curriculum in green infrastructure, low impact development, and stormwater BMPs as a direct result of extension and research efforts. New course lectures, as well as studio design projects conceptually addressing real-world stormwater management projects, represent teaching deliverables. Strong, synergistic integration of extension, teaching, and research can often be a significant challenge. The documented success of UNL stormwater management programming will be illustrated and discussed using both lecture and audience-participation formats. Topics will include critical team dynamics, examples of the multi-faceted products and activities to address multiple audiences and needs, and selected impact documentation and evaluation.

Concurrent Sessions

1 RU goes Organic: Developing an Organic Land Care Extension Program for Professional Landscapers

Michele Bakacs, Rutgers Cooperative Extension- Middlesex/Union Counties, bakacs@njaes.rutgers.edu
Amy Rowe, Rutgers Cooperative Extension- Essex/Passaic Counties; William T. Hlubik, Rutgers Cooperative Extension of Middlesex County; Jan Zientek, Rutgers Cooperative Extension

Organic land care is an ecological landscaping system that promotes soil health, improves biodiversity, and reduces the need for synthetic inputs on managed landscapes. A 2011 needs assessment of professional landscapers in New Jersey conducted by Rutgers Cooperative Extension showed that 40% of those surveyed (n= 173) stated their customers had expressed interest in organic or "all natural" landscaping products and techniques to be used on their properties. Currently, there are no federal standards for organic land care which has led to confusion in the landscaping industry and the general public over what organic actually means. The prevailing notion is that "going organic" is simply about the type of fertilizer or pesticide applied. In order to educate and assist land care practitioners in determining what is acceptable for organic land care, Rutgers has developed an Organic Land Care Certificate Program. The program focuses on providing education on organic practices for promoting healthy soil, enhancing biodiversity, restoring habitat, and reducing polluted runoff from managed landscapes. The core of the organic land care program is a week-long certificate course offered on an annual basis usually in January. Since 2013 this course has been offered twice and 45 landscapers have fulfilled the program requirements which include attending the week long training program and passing an exam. Thus far the program has the potential to impact close to 2,600 acres of residential and commercial properties. This presentation will cover program impact, certification issues, lessons learned, details of local best practices being written, and how the program can be adapted in other states. As stricter fertilizers laws are enacted and chemical pesticides restricted on public properties, the public's demand for organic and environmentally friendly land care techniques is on the rise. Extension professionals can help meet the demand for this education as well as set the standard for how organic land care is practiced.

2 Interpreting Ecosystem Services and Working Rangelands for an Urban Audience

Sheila Barry, University of California Cooperative Extension, sbarry@ucdavis.edu
Stephanie Larson, University of California Cooperative Extension

The future of both private and public working rangelands and the ecosystem services they provide throughout California and much of the western United States will depend on public support and public policies that allow ranching to be viable. The San Francisco Bay Area open space lands provide an unprecedented opportunity to increase awareness and knowledge, and ultimately support for working rangelands and their ecosystem services. Over 30 different public entities in the Bay Area manage open space lands with livestock grazing. These working rangelands host over 3 million visitors per year. A collaborative effort between the University of California Cooperative Extension and three park districts has generated and is working to extend unique educational information about what ecosystem services are and how they relate to California's rangelands. Extension efforts are primarily focused on park users through pilot "sustainable conservation" interpretative trails. Signage being developed for the trails interprets ecosystem services by informing visitors about why they are sharing open space with grazing livestock and also provides information on how to share open space. Topics such as grazing benefits, cattle behavior, ranching heritage and rancher stewardship are covered on signage which includes links through QR codes to additional web content such as videos and digital stories. Factsheets on these topics and others related to working rangelands are being developed for park interpreters, managers and decision makers.

3 Using Multiple Approaches for Program Evaluation–Case Studies from Minnesota's NEMO Program

John Bilotta, University of Minnesota Extension & Minnesota Sea Grant, jbilotta@umn.edu

Program evaluation is and can be so much more than an end-of-event questionnaire. This presentation will feature multi-pronged approaches to Northland NEMO workshops on-the-water programs featuring case studies from two its larger programs; the View from the Big River (VFBR) NEMO program (focusing on the Mississippi River) and the Making Change Happen for the St. Croix (focusing on the St. Croix River–a National Scenic Riveway.) The VFBR program used a pre and post KAP study approach, participant interviews by staff, participant video interviews, and a 'ticket off the boat' evaluation to piece together a comprehensive look at the program; what was effective, the knowledge and skills gained, and to help articulate follow-up actions. The St. Croix Program used post program evaluations, surveys, and small groups to evaluate it. This presentation will highlight the approaches used, their strengths and weaknesses, the discoveries we made, and how we are using the evaluation results for reporting but more importantly, to design next steps for key audience and needs.

4 The Watershed Game: Interactive Simulation for Watershed Wide Education and Implementation

John Bilotta, University of Minnesota Extension & Minnesota Sea Grant, jbilotta@umn.edu

The Northland NEMO (Nonpoint Education for Municipal Officials) program's Watershed Game is an interactive tool with a record of success in helping local government officials and other leaders understand the connection between land use and water quality. Participants

learn how a variety of land uses impact water and natural resources, increase their knowledge of best management practices (BMPs), and learn how their choices can prevent and mitigate adverse impacts. Participants use this interactive simulation of a landscape (watershed) to apply plans, practices, and policies that help them achieve a water quality goal for a stream, lake, or river. Modeled after the popular Monopoly Game, the simulation requires teams to balance resources (expertise, funding) with the need to accomplish a clean water goal (TMDL) and instead of competing, they learn to collaborate. The WSG has a demonstrated and measured impact on the ability to build the knowledge base of local leaders, providing sound science and easier understanding of TMDL's, watershed plans, and MS4 permits, and their role as leaders to achieving them. The WSG has been used throughout Minnesota and in more than 12 other states by nearly 100 trained facilitators many of which are Extension and Sea Grant Extension Educators and agency professionals. The WSG was a workshop feature at the 2012 ANREP Conference. Since that time, the WSG has gone through a complete revision, expansion of use, and increased availability of supporting resources. This presentation will feature the highlights of Watershed Game, showcase several case studies where and how it has been used, highlight its train-the-trainer program used to build capacity across Minnesota and the country, and share some of the outcomes and impacts measured through evaluation. We will also briefly introduce the 2014 revision project to create electronic enhancements to the WSG and a K12 version. This presentation will not feature an actual use of the Watershed Game with participants in the session (insufficient time). (Acknowledgement to Extension team members: Jesse Schomberg, Cindy Hagley, Eleanor Burkett, Karen Terry, Doug Malchow, Mary Blickenderfer, and Shane Missaghi.)

5 Charting the Course for the Bluewater Coast: Working towards Sustainable Coastal Community Development

Mary Bohling, Michigan Sea Grant Extension, bohling@msu.edu
D. McCole, Michigan State University; C. Vogt, Michigan State University; L.E. Vaccaro, Michigan Sea Grant; J.S. Diana, Michigan Sea Grant

The declining recreational Chinook salmon fishery has negatively impacted the coastal economies of communities located in Michigan's "Thumb" area, from Tuscola County to Port Huron in St. Clair County. Historically, individual port towns and coastal businesses in the thumb area have worked in isolation. However,

this regional integrated assessment aims to help communities work collaboratively to adapt to these changes and challenges for a more sustainable use of their natural resources. The project brought together researchers, natural resource managers, and town, community and business leaders to assess current conditions and identify possible opportunities for the coastal region of the Thumb. Stakeholder workshops guided a socioeconomic and ecological assessment of the region centered around the question "How can the natural and cultural resources of Lake Huron and its coast be enhanced and leveraged to benefit residents and visitors of the Thumb Area, support local economies, and maintain environmental quality?" The goals of the project were to 1) clarify the issue – including the status, trends, causes and consequences; 2) identify and evaluate strategies for adapting to the changing economy and fishery; 3) provide practical information that can guide planning related to tourism, recreation, and sustainable use of natural resources; and 4) promote collaboration and coordination in the region. The project team gathered information on fishing on Lake Huron, socioeconomic trends in the region, regional coordination and marketing, and travel, tourism and recreation. As a result of the project, stakeholders and researchers developed new ideas for marketing outdoor recreation in the region, new strategies for attracting visitors to the region, and increased collaboration between communities.This session will define integrated assessments, describe the process, share products developed through the project and explore the results.

6 ANREP's New Professional Development Committee: Lessons Learned in Webinar Development

Eleanor Burkett, University of Minnesota Extension, burke044@umn.edu
Lara Miller, University of Florida

The idea of holding webinars for ANREP members has been around for a number of years. At the 2012 biennial conference the creation of the ANREP Professional Development Committee was presented to the membership and members were invited to join. As part of the conference evaluation as well as a separate survey for those who didn't attend the conference, members were again invited to join the committee and provide input on format options and topics of interest for future professional development opportunities. A committee was formed in the fall of 2012 with 17 members from across the nation. Topics were analyzed based on ANREP member survey responses. Initially three webinars were planned, but with input from ANREP partner, National Institute of Food and Agriculture (NIFA), two additional webinars were added, plus one on the new ANREP Awards structure totaling six webinars in the first year. Committee members had varying levels of experience in planning and presenting via webinars; serving on the committee provided an opportunity for many of the members to increase their computer and communication skills and learn how to deliver programs using this technology. This session will include how the committee structure has evolved, formats used in presenting webinars, and lessons learned from this collaborative experience including insights gained from webinar participant evaluations. Year one of webinars have been well attended and are now open to all JCEP affiliates.

7 Minnesota's Watershed Education Program

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Several of Minnesota('s) state environmental agencies have adopted a watershed approach to restoring and protecting Minnesota's rivers, lakes and wetlands. (on a recurring 10-year cycle.) Each of the state's 81 major watersheds will be monitored and assessed on a recurring 10-year cycle by state and local agencies. From this process a report called the Watershed Restoration and Protection (WRAP) is developed. Targeted protection and restoration practices will then be implemented, completing the cycle. Local agencies within a watershed may create a "One Watershed - One Plan" based on watershed rather than political boundaries combining natural and social science aspects of water management within a watershed framework. The University of Minnesota Extension Water Resources team has developed the Watershed Education Program (WEP) in response to educational needs that are identified in the WRAP process. Team members collaborate with agency

staff working at many levels within the WRAP and "One Watershed - One Plan" in developing the program. The WEP team works with local leaders and stakeholders in assessing water education needs to develop a watershed education plan specific to their watershed and to meet the priorities and goals of the WRAP, and then works to provide community leaders, citizens, and natural resource professionals with knowledge and tools to make informed water and land use decisions to protect and restore Minnesota's water resources. Components of the educational plan may be offered at the watershed or local level, depending on audience. Once the watershed education plan has been established, a series of workshops, tours, community discussions and other education and outreach methods are employed, typically over a 12-24 month period. The success of the WEP requires building trust and strong working relationships with agencies as well as local leaders and citizens. End-of-event and impact (issued after two to three years) evaluations will be employed for short term feedback and curriculum modification.

8 Conducting Climate Change Outreach in a County Extension Setting

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Though climate change issues are becoming more commonplace, much of the information discussed in the media is global in scale with long time frames. County and municipal decision makers, government employees, and residents need information to address the challenges they are facing at a local level. UF/IFAS Extension agents in Pinellas County work with coastal constituents to protect natural resources, improve community resiliency, and maintain the coastal economy which promotes sustainability.Extension agents in Pinellas County utilized the Coastal Resilience Index (CRI) tool, designed a flood insurance workshop, and facilitated community climate conversations. Extension agents utilized face-to-face meetings, follow-up evaluations, and surveys to facilitate the implementation of these climate education tools. Each strategy was an integral component to promote climate change awareness to diverse stakeholder groups. Agents facilitated the CRI with local decision makers and businesses to assess disaster preparedness. The flood insurance workshop educated public sector employees about changes to the National Flood Insurance Program while community climate conversations educated interested citizens about the local impacts of climate change through visual modeling and interactive scenario discussions. Community stakeholders benefit when a multi-faceted approach is used to enhance learning about complex issues. Extension agents are ideally positioned to develop responsive educational programs that provide vital information to assist local communities.

9 Mining and Environmental Educational Modules for Tribal Colleges

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American Indian lands contain a vast amount of both renewable and non-renewable resources and have consequently been mined. Therefore, it is understandable why tribes are concerned about environmental impacts and the ability to manage their resources. This has created a need to better understand mining. Mining Educational modules are being developed for tribal colleges that focus on environmental impacts of mining, remediation of mining wastes, and sociocultural impacts of mining. These will be independently packaged units of study designed to enhance the learning process and can be modified and adapted to different learning scenarios and objectives. In addition to providing specialized knowledge, the modules feature hands-on activities, incorporation of technology, student involvement, discussion, and exchange of ideas. Modules will incorporate traditional ecological knowledge and approaches that promote effective science learning for native students. Modules will be designed to augment existing associates of science programs (e.g. biology, chemistry) currently offered at tribal colleges and can be modified for use in K-12 education and for non-tribal audiences.

10 A Watershed Group's Approach to Public Outreach for Floodplain Protection

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Steve Lewis, University of Nevada Cooperative Extension

In 1998, after a large flood on the Carson River in western Nevada, University of Nevada Cooperative Extension organized a major watershed conference. The outcome of the two day event was a vote by participants to organize a watershed group to implement integrated watershed management (IWM). IWM addresses issues of water quality, water quantity, habitat and floodplain management in an integrated fashion. The group, which is still active 15 years later, has voted that its top priority is to protect its agricultural floodplains from urban development. The goal is to maintain a "living river," with riparian areas and floodplains that function as they would naturally to attenuate flood flows and provide good habitat and clean water.In 2008, the watershed group wrote a Regional Floodplain Management Plan (RFMP), which was adopted by all five counties in the watershed. It recommends a living river approach as opposed to reliance on floodwalls, levees and other structures. The problem is that the RFMP has no teeth. Progress is painfully slow, as the flood memory of most people is relatively short, and the perceived urgency of floodplain protection wanes. To implement the RFMP, the watershed group is engaged in outreach education about the functions and values of open floodplains and the ecosystem services they provide to the community. The group also warns about the potentially high costs of the flood damages that will occur if subdivisions are located near the river. Publications, presentations to community boards and displays at public events are ongoing. Cooperative Extension plans to organize regional flood awareness weeks, complete with advertising on mass media. To evaluate long term outcomes, we are working with county floodplain managers to develop a publication and map showing which open space parcels in our floodplain have been protected by conservation easements or other means.

11 Technology for Today's Extension: The Wisconsin Idea at Work

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Technology evolves at a breakneck pace, providing new opportunities for Extension clientele to access information they desire. In the past three years, we've seen a shift in how audiences access technology. In 2009, over 30% of Wisconsin residents used dial-up to access the internet. In 2013, this dropped below 5%; mobile devices are now at 25% and growing. We ourselves must evolve to better connect to clientele using the tools and technology they embrace or we risk losing SOMETHING of our niche of providing science-based information to our residents where they live or work. In today's landscape of lean budgets, lack of a clear overarching vision for technology acquisition and deployment can result in frustrated educators, who are often capable and willing to try new technologies to reach clients. The University of Wisconsin-Cooperative Extension addressed these issues head on by investing in technology and training crucial to working efficiently today. Adopting Google Nexus tablets and Google Apps for Education across the organization allows us to take much needed steps towards bringing delivery of our educational programming to the modern age.The technology investments were put to immediate use in outreach classes to private woodland owners. Many attendees report having access to the internet and a tablet/smartphone so apps and websites are integrated into class presentations. Often held in rural locations, mobile hotspots are used, allowing live website and app demonstrations. Extension educators are now able to do more than simply recommend websites and apps, they can provide in-depth reviews and expertise in using them. Our presentation will highlight the considerations that went into selecting Google Apps for Education and Google Nexus tablets. The benefits and challenges of an organization-wide deployment will be explored as well as examples of how educators are using new technology with colleagues and clients.

12 Transitioning from the Bucket to the Barrel Educational Biofuels Webinar Series

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A fundamental issue currently faced in the Biofuels arena is the lack of knowledge and understanding of the advanced biofuels industry and its move from the research and development phase to full scale commercial production of biofuels and byproducts using a variety of advanced biomass feedstocks. To over come this issue an outreach program is being implemented that was planned using a logic model framework. The program consists of a series of webinars being developed and conducted, targeting natural resource professionals and others. The series covers policy, feedstock characteristics, creating and maintaining a work force, transportation logistics and feedstock demand, sustainability, and research and development advances. To determine success of the series a formal evaluation process was conducted consisting of pre and post evaluations. Initial outcomes currently indicates that the series has reached 160 participants with its first three webinars in 2013 and that participants have had 35% gain in knowledge, 79% plan on further investigating the information presented, and an equivalent of 26,166 acres of forestland potentially impacted based on adoption of knowledge gained from the webinars. The advanced biofuels industry and its move from research and development to full-scale commercial production using a variety of advanced biomass feedstocks will occur. How fast it occurs depends not only on how fast technology will change but also on societies willingness to adopt these technologies. Education, extension and outreach programs will be needed to create a trained workforce, and landowners, stakeholders and policy makers with the knowledge, attitude, skills and aspirations necessary to enable a biofuels industry.

13 IDAH2O: Master Water Stewards Serving Idaho Through Volunteer Monitoring

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[The following is derived from a 2012 ANREP-accepted proposal by Ashley McFarland, who could not attend for the early birth of her daughter! In the last two years, IDAH2O has grown significantly, Ashley handed the program to me one year ago, and I have started program analysis.] University of Idaho Extension's citizen-scientist, volunteer water quality monitoring program, IDAH2O Master Water Steward, begins its fourth year by seeking to understand patterns of volunteer activity. Volunteer program management requires understanding of patterns of consistency and activity. Programmatic growth and improvements are tied to working effectively with volunteers and a wide variety of stakeholders to identify individual characteristics and strengths, interests, and abilities/limitations.

Maintaining water quality is necessary for drinking supply, recreation, and fisheries. Successful monitoring programs are integral to maintaining quality and are coupled with robust outreach. However, in Idaho, funding constraints require that agencies prioritize only areas with known problems; environmental education funding is equally sparse. University of Idaho Extension created a unique volunteer water quality monitoring program called IDAH2O Master Water Stewards to help meet substantial gaps in statewide data collection and education. Primary goals of the IDAH2O program: increase citizen knowledge on water quality issues; promote volunteer monitoring on Idaho streams; enhance watershed stewardship.

The most important assessment question for Extension volunteer program coordinators is, are we causing positive behavioral change? In the case of IDAH2O , does this behavior change result in improvements in water quality via increased knowledge and action within the community? How is this change in knowledge, activity, and associated improvements quantified? Can a dollar value of the water quality improvement be expressed?

Using a combination of volunteer Master Water Steward (MWS) contact list data and datestamps of water quality data uploads, certain patterns of activity were observed. These data provided a Snapshot of volunteer activity patterns that are viewed through the lens of one set of sociological organizational theory of volunteer motivations. These results and interpretations are presented in a package that is intended to be informative to

those who administer volunteer water quality monitoring programs, and to be helpful for those considering developing such a program. The author intends to provide a reflexive space and an initial assessment of program efficacy, from a human resources and organizational perspective, to promote constructive discussion on the limitations imposed by choosing one combination of “pros and cons” versus another.

14 How Extension Can Spark Collaboration

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Laurie Gharis, NCSU Extension Forestry; Robert Bardon, NCSU Extension Forestry; Dennis Hazel, NCSU Extension Forestry

The role of North Carolina State University Extension Forestry within the Southeast Regional Partnership for Planning and Sustainability (SERPPAS) Prescribed Fire Work Group is to bring together state, federal, and non-governmental organizations in the Southeast to increase the application of prescribed fire for longleaf pine restoration. Since the majority of land in the Southeast is privately owned, working with private landowners and consultants to increase the use of prescribed fire to restore longleaf is a top priority for the SERPPAS Prescribed Fire Work Group, and coincides with their 2013-2014 goals, which are to: increase the number of qualified prescribed burners; minimize landowners' risk of liability associated with prescribed fire; minimize local smoke impacts on air quality and public health and safety; maximize coordination between air and fire communities; and ensure sufficient resources to promote and implement increased prescribed fire operations. We have used social media and have developed an integrated curriculum, training modules, and online resources to meet these goals. An evaluation plan was developed to demonstrate the quality of this multi-state, multi-level collaborative Extension effort. The plan includes: development of the Work Group, defining the target audience, creating objectives that mutually benefit multiple agencies, and monitoring results of Extension efforts over the long term. With tight fiscal environments, work groups must demonstrate their ability to maximize resources and leverage funding. However, if multiple agencies come together, it will be important to demonstrate that individual agency objectives are not lost in the regional effort. Our goal is to demonstrate how the SERPPAS Prescribed Fire Work Group is collaboratively implementing the Comprehensive Strategy for Prescribed Fire to Restore Longleaf Pine in the Southeast United States to improve the application of prescribed fire on both private and public lands to ensure longleaf pine restoration, while meeting the individual agency missions.

15 On-line Woodland Options for Landowners Course: Impacts and Evaluation

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Most forestland in Virginia, like the rest of the US Southeast, is privately owned. In fact, about 80% of Virginia forestland is owned by non-industrial private forest landowners (Rose 2009). Of these, 89% have less than 50 acres. While these numerous small-scale landholdings provide significant economic, environmental, and social value to the state, they are at a disadvantage because forest management and harvesting is something they do not practice on a daily basis, meaning there is an information gap. This places a premium on dissemination of knowledge and best practices to private individuals. Unfortunately, many small-scale landowners have 9-5 jobs and other commitments that make it difficult for them to attend traditional Cooperative Extension events.In 2001, the Virginia Forest Landowner Education Program developed an online course for forest landowners called On-line Woodland Options for Landowners. This 12-week self-paced on-line course teaches the fundamentals of forest management. Topics include: setting management goals and objectives; forest history; stewardship and sustainability; marking your boundary lines, and locating, reading, and understanding your deed; using maps, photos, Google Earth, and soil surveys; forest ecology and management; and sources of assistance and planning options. Upon completion of the program, the participants can have a draft forest management plan. Natural resource professionals serve as mentors and the class winds up with an optional end-of-the-semester hands-on field trip. To date, almost 700 people from around the country have participated in the course.In 2013, we conducted a survey of past participants of the On-line Woodland Options for Landowners Course to determine program impacts. We compared forest management statistics for our participants to data

from statewide surveys of forest landowners to measure successes in improving forest management and increasing income and ecosystem services.

16 Hydrilla IPM RAMP- Starting a Statewide Extension Project

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Objectives: Hydrilla is an invasive aquatic weed, and millions of dollars are spent each year managing it in the southern US. Thanks to a new 4-year grant from the USDA National Institute of Food and Agriculture, University of Florida / IFAS research and extension faculty, FAMU faculty and an ARMY Corps researcher are studying new chemical and biological control methods as part of an overall hydrilla integrated pest management (IPM) plan and transferring the information to stakeholders. The goal is to increase stakeholder awareness of research-based information regarding the hydrilla miner and other sustainable strategies for managing hydrilla. Methods: Materials have been developed to help resource managers understand how new strategies for managing hydrilla fit into a hydrilla IPM plan. A perception survey was distributed throughout Florida to determine the most effective information distribution method. The information distribution platform includes field tours and demonstrations, educational publications and exhibits, promotional items, project websites, and presentations at professional and stakeholder meetings. Results: SurveyMonkey was used to determine hydrilla stakeholder perceptions and preferred information delivery methods. 541 stakeholders completed the survey. Responses indicated that the internet, boat launch signage, Florida Fish and Wildlife Conservation Commission, and Extension Offices in Florida were the preferred outlets for stakeholders to receive information about Hydrilla IPM. Extension faculty developed 10,000 Hydrilla IPM RAMP 1-yd Vinyl Fishing Rulers, 70,000 6-in Rulers/Bookmarks, and 17,000 web cards for distribution to Extension offices and collaborators. A web portal was developed. Conclusions: New tactics such as the hydrilla miner will be incorporated into Hydrilla IPM programs throughout Florida. The information obtained through this perception survey will have enabled Extension faculty to most effectively target their educational programming efforts.

17 Forest and Woodland Certification Outreach for Mississippi Farms

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Certification is the guarantee increasingly sought by industry and consumers that timber and other ecosystem services are managed according to sustainable standards. Perhaps more importantly, producer risks are reduced vis-à-vis product diversification, water use decisions, certified marketing, and strategic planning. This paper describes program materials and results from a woodland owner certification training short course. The short course was developed in cooperation with public and private partners, including key producers, and combined Internet training modules and video telecasts. Emphasizing farmers with uncertified woodlots, the course helped participants increase their understanding of emerging markets for certified wood and ecosystem products; committed to using best management practices; analyzed risks related to water resource management and product diversification; and used public-domain software to develop management plans used towards certification. In addition to producers, an in-service training was conducted for extension agents. The curriculum differed from previous outreach efforts by emphasizing forest risks relevant to Southern forest production systems, such as Southern Pine Beetle, wildfire, and water resources management. Assessment was conducted using in-class and Internet-based pre- and post-test scores to assess changes in participants' attitudes and knowledge of the most important concepts (including risk topics being addressed), principles, and practices covered in each module. Phone interview surveys were conducted 6 months and 1 year following completion of the course to assess medium and long-term attitudes and behaviors regarding forest certification as well as provide additional technical assistance to program participants. In short, results demonstrate that 150 farmers and other landowners increased their knowledge and appreciation for risk reduction through certification. Within one year, 75 participants began certification of their forestland and 30 became certified. Information

presented here will be useful to extension programs with an interest in providing certification and marketing outreach programs towards risk reduction within farm and woodland production systems.

18 Process vs. Product: Evaluating the Importance of Landowner Engagement in Forest Management Planning

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In Oregon, like many other states, family forest owners can obtain a forest management plan for their land in various ways: through federal cost-share funds that offset the cost of a professionally written plan; by hiring a professional directly and paying out of pocket; or through an OSU Extension program (the Mentored Management Planning Shortcourse) in which the landowners write their own plans with assistance from a mentor. The Mentored Management Planning (MMP) Shortcourse is one of several forestry extension programs nationwide that follow a similar “coached” planning model. Coached planning proponents argue that landowners are more invested in a plan that they write themselves, and thus may be more likely to engage in positive stewardship behaviors as a result of their plan. On the flipside, the plan completion rate in coached planning programs is often very low (< 25%). Is there a different outcome when landowners write their own plans vs. hiring a forester? Who is attracted to this model? To find out, we mailed surveys to participants in 2008-12 MMP classes and to landowners who had received cost-share funding for professionally-written management plans from the Oregon Department of Forestry. Specifically, we were interested in: 1) the demographics of landowners using each method; 2) the types of management objectives expressed by each group; 3) the reflection of management objectives in the plans; 4) the level of implementation of the plans; 5) and impacts of having the plan as reported by landowners. This presentation discusses our rationale and reports on some of our preliminary findings. Our study results should help forestry extensionists improve "coached" planning programs through this long-term impacts assessment. They should also help state and federal agencies better understand the value of the management plans they fund to their clients, and better target limited funds.

19 Creating Climate Change Ready Communities in Wisconsin

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Climate change is affecting Wisconsin communities with record heat waves, droughts, floods and snowstorms in recent years. Communities find that extremes are becoming more normal and that local government needs to be better prepared for changing climate means and weather extremes. The University of Wisconsin Cooperative Extension along with a county Extension educator led the coordination, design, and implementation of a county-wide project to build climate change awareness and resiliency in all facets of county government in Dane County, Wisconsin, including the state capital, Madison. Regional historic climate data and future climate projections from the Wisconsin Initiative on Climate Change Impacts (A multi-year study team comprising the University of Wisconsin, the Wisconsin Department of Natural Resources, and state-wide stakeholders. More information at: https://fyi.uwex.edu/climate) were used to add legitimacy and a specificity for local community planning. The data show that southern Wisconsin can anticipate annual average temperatures increases of 6 o F, more frequent and longer heat waves, two more inches of annual precipitation, more extreme rainfall events, and other changes by the mid 21st century. Once climate change awareness was raised using these research findings, all units of government engaged in a collaborative process to assess their climate vulnerabilities and develop adaptation strategies. From this information a core team designed a climate change readiness plan that included prioritized actions, a timeline and links to the budget and other planning efforts in the county. The subsequent climate change long-term adaptation implementation process will be outlined. The author will describe the process of how this climate change readiness project was developed, designed, and launched in Dane County, Wisconsin. Additionally, the educational development efforts to make this project a potential model for other communities along with climate change outreach connected with this project will be discussed.

20 Bringing Water Quality Education to the World via eXtension

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The state of Florida and many other states have enacted urban landscape and fertilizer management ordinances as a result of the concern for the protection of waterbodies. In an effort to reduce nonpoint source pollution and its effect on water quality, ordinances require applicators to obtain a certification and renew that certification with continuing education credits (CEUs) to legally apply fertilizer to urban landscapes. The ordinances also apply to all urban residents and property owners. Many landscape professionals and urban residents need a better understanding of the causes and consequences of nonpoint source pollution and how to manage urban runoff to encourage behavior change that results in protecting water quality. Methodology: This Agent developed a program consisting of a series of articles, a series of Power Point presentations and five 10-14 minutes videos which educates applicators and the public on non-point source pollution, urban storm water run-off, managing urban storm water runoff, water quality and conservation issues and fertilizer regulations. Each component includes a question set to measure knowledge gain and intent to improve or adopt practices. The program was revised to provide the materials in a format accessible by anyone, anywhere internet access is available. Results: The environment of eXtension provides that accessible format. eXtension is an interactive learning environment originally developed by Texas A&M and available to and supported by many Land Grant Universities. Providing education via eXtension allows users to progress through training in a logical step wise process. Curriculum development tools enhance the designer's ability to evaluate enrollees based on pre and post tests. Continuing education units may be approved and issued based on enrollee successful completion of the program. Other valuable statistical information may be collected to further program development and reporting to University and governmental stakeholders. This presentation demonstrates an eXtension accessible format for an urban water quality education program.

21 Engaging Stakeholders in Fisheries Management

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Having been historically overfished, the goliath grouper fishery has been closed in U.S. waters since 1990. While goliath are now commonly seen by divers and fishers, the full extent of recovery is not well understood. Scientific uncertainty around stock status and stakeholder uncertainty with divergent perspectives cause significant challenges for management. It is therefore important to have in-depth understanding of stakeholder views and experiences to work toward a shared understanding for improved management. The goals of the goliath grouper stakeholder project were to provide diverse stakeholders opportunities to share their views on goliath grouper and its management, to provide management agencies with comprehensive information on stakeholder views, and to evaluate the effectiveness of the engagement process. Stakeholder perspectives were examined using an online survey of 5882 respondents and a facilitated social learning workshop with 16 stakeholder representatives. The stakeholder workshop allowed invited participants to work toward a shared understanding of management issues and brainstorm a menu of management options as well as the pros, cons and uncertainties of each option. The survey allowed respondents to self-identify their stakeholder group(s) and assess their level and nature of personal or commercial interactions with goliath, measures taken to avoid or enhance such interactions, perspectives on goliath biology and ecology, and preferences for alternative management options. Workshop evaluations and participant interviews revealed that shared understanding and greater acceptance for management outcomes were fostered via social learning workshop processes including unstructured interaction, constructive conflict, facilitation, and extended engagement. A Reasonable Person Model approach to survey analysis revealed that stakeholders who consider goliath to be a nuisance have different direct experiences with the fish and different methods for engaging in meaningful action within the fishery than those stakeholders who do not consider goliath to be a nuisance in South Florida waters. Findings

will serve as a model for fisheries-based decision making processes in the absence of in-depth scientific information.

22 Connecting Middle School Students with the Hogtown Creek Watershed in Gainesville, FL

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Michael Andreu, University of Florida, School of Forest Resources and Conservation

Due to concern about the growing disconnect between children and nature, the U.S. Forest Service (USFS) launched the More Kids in the Woods Initiative in 2007. Extension and science delivery experts from the University of Florida's School of Forest Resources and Conservation (SFRC), the USFS InterfaceSouth, and several local partners were awarded funding from the USFS Kids in the Woods program in May 2013 to initiate a project that engages 6th grade Westwood Middle School students in outdoor science learning activities in the Hogtown Creek Watershed in Gainesville, Florida.

Through this project, students are learning about the scientific method through active engagement in the process of scientific query. Loblolly Woods Nature Park , located within the Hogtown Creek Watershed, is our study site for exploring how urbanization affects ecological functions and services such as: wildlife habitat, erosion and sedimentation, and tree diversity. We are working with the students to develop hypothesis, participate in experimental design, collect data and analyze the data to draw conclusions. Our assessment of this program will measure how the students' enthusiasm and impressions of nature may have changed after taking part in outdoor learning experiences.

Partners have also organized a school camp out and are participating in career day events and science fairs. Professional development opportunities will be provided through teacher workshops. Project successes, materials and information will be shared locally, regionally and nationally through our combined partner networks.

23 Assessment of the Adoption Practices of Agroforestry Technologies by Limited-Resource Farmers in NC

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The purpose of this study was to assess if limited-resource farmers in North Carolina understood agroforestry technologies that may improve their sustainability through crop diversification and environmental conservation. Agroforestry technologies are part of the responses to challenges that limited-resource farmers and woodland owners are faced with, but adoption of these technologies is critical if the technologies are to have an impact and make a difference. Respondents lacked adequate information on agroforestry technologies. In regard to the barriers, respondents reported no market for products, expenses of additional resources, not familiar with the technology, lack of technical assistants, lack of information on agroforestry, lack of demonstration sites, insufficient land, and lack of seedlings were most important barriers for the adoption of agroforestry technologies. Respondents were knowledgeable about the benefits of Agroforestry. They highlighted the following agroforestry benefits by depicting them in salient themes such as: increase income, improves wild life habitat, protect soil, improves water quality, increase biodiversity, and increase shelter for livestock and diversify production. The respondents were also knowledgeable about obtaining information on land management practices. They also showed very high degree of willingness to take action to establish agroforestry. The uncertainty observed shows the need for more rigorous incentives that will attract farmers to consider agroforestry as an income generating venture. Limited resource farmers should be supplied with equipment and other agricultural inputs to prevent all sorts of barriers to agroforestry adoption. More importantly, agricultural policy needs to recognize the contribution of agroforestry to addressing farmer needs and ensure agroforestry is a part of the agriculture agenda for improving land productivity.

24 Ohio River Basin Wetland Conservation Planning Project

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The Ohio Division of Forestry manages over 200,000 acres of state forest within the Ohio River Basin (ORB), and therefore has a significant influence on water quality issues. Forested wetlands carry out critical hydrologic, biogeochemical, and ecological water management roles as well as enhancing habitat for a variety of species. Forest wetlands are also excellent carbon sinks and perform natural services such as carbon sequestration, nitrogen and phosphorus remediation, and reduce sedimentation. Since European settlement, Ohio has lost 90% of its wetlands. This presentation will highlight a project where Ohio State University Extension partnering with Ohio Department of Natural Resources - Division of Forestry located, collected water quality and vegetation data on all forested wetlands within Zaleski State Forest. The data collected by OSU Extension staff was provided to ODNR- Division of Forestry (DOF) for addition to the Ohio Statewide Forest Resource Assessment. Recommendations were developed by OSUE to manage, protect, and expand these forested wetlands as appropriate. These recommendations have been provided to DOF for inclusion in the Division's State Forest Strategic Plan. Additionally, areas on state forests where forest wetlands can and should be developed have been identified by OSUE for inclusion in long-range plans. OSUE has worked with DOF to develop plans for forested wetland demonstration sites. Another critical role of the project was training for DOF service foresters by Ohio State University Extension to initiate the identification of existing and potential wetlands and incorporate BMPs into Stewardship Plans developed by DOF service foresters. These BMPs were developed to not only protect wetlands and streams but also to enhance associated forest uplands (skid trails, log landings, etc.), critical for the protection and enhancement of water quality "downstream."

25 Maryland Wood Energy Coalition: A Model for Policy Change & Coalition Building

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The Maryland Wood Energy Coalition is composed of representatives of state agencies, university extension, non-profits, and business committed to increasing the adoption of advanced wood energy technologies and developing wood markets to supply the developing industry. The Coalition was organized in April 2010 by the University of Maryland Extension (UME) to overcome the lack of regulation, policy and programs that support or even allowed the use of commercial biomass boilers. The Coalition believes the greatest potential for wood energy in Maryland is achieved through small to medium-sized commercial thermal applications for government, schools, and businesses as well as residential thermal applications. In February 2012, UME working through the Coalition, released a research-based prospectus, with policy recommendations, for advancing wood energy in Maryland. In November 2012 the conference, "Accelerating Wood Energy in Maryland", organized by UME with the Coalition attracted 120 policymakers, industry professionals and others. The conference initiated rapid progress on four priorities: 1) air quality regulations for biomass boiler; 2) a permanent residential wood grant program; 3) thermal renewable energy credits in the Renewable Energy Portfolio; and 4) encouraging biomass boilers in public facility construction. The Coalition held a second conference with UME leadership in October 2013. To date, all four priorities have been addressed. The major barrier was removed in April 2013 with the enactment of new air quality regulations that removed the prohibition on burning biomass. The Coalition is changing the focus to actively educating target audiences to generate projects and seek funds for feasibility assessments. UME has provided leadership for the Coalition but there is a move to partner with the Pennsylvania Biomass Association to transition to an industry run effort, with UME focused on educational outreach to residential, woodland owner and industry audiences. This presentation will demonstrate the effective role of extension policy education and serve as a model for states or organizations lacking a developed focus on wood energy policy.

26 Engaging Audiences Through Video: Communicating with Forest Landowners Effectively and Interestingly

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Educators and communicators in the digital age should have a grasp on how to use the technology that engages millions of people every day—video. Video is an underused tool for environmental educators. If used correctly, video can engage audiences and put information in a form that is quickly and easily digested. Communication of the science of climate change is a notoriously difficult task. Many studies have been done to explain why the American public cannot or will not grasp the concept of climate change and take action to mitigate or adapt. The research done aimed to find an effective way of communicating climate change science to forest landowners in the Southeast with video. The research questions were as follows: 1. How does framing of the video in the context of climate change affect attitudes toward climate change, forest researchers, and forest landowners? 2. Are university researchers and local forest landowners trusted sources of information? To what degree do viewers regard the landowners as homophilous? Which values will be most effective in motivating participation by landowners: economics or stewardship (egoistic or biospheric)? In order to answer the research questions, four videos were created, using interviews with researchers and landowners. Two variables were manipulated in the videos: mention of climate change and value framing (stewardship vs. economics). The videos manipulate two conditions: framing of what the researcher(s) and the landowner(s) will be saying. At the time of the conference, the project will be in its final stages, and I will be able to present data in order to answer the research questions. I will present information on how framing the information in the video affected viewers' attitudes and trust in the researcher and landowners, and which format was most effective at stimulating trust and interest in landowners.

27 Evaluating Websites and Web Tools in Extension Education

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Declining budgets and needs that extend across wider geographic ranges make web technology attractive to sharing Extension information and programs with larger audiences. As with other Extension programs, it is necessary to evaluate websites to determine if they are meeting intended outcomes and to learn how they can be improved. This presentation will summarize the results of qualitative interviews with users of one website and explore whether various features can enable a website to replace an in-person training program. Our website introduces and supports secondary science teachers using a new instructional resource, Southeastern Forests and Climate Change. This new module consists of fourteen activities for teachers to educate their classes about climate change, provide students with opportunities for critical thinking, and explore how students can become engaged in this issue. The website (https://sfrc.ufl.edu/extension/ee/climate) supplements the module and includes resources that provide teachers with the knowledge and tools to effectively implement the module activities in their classroom. Qualitative interviews were conducted to assess the efficacy of these web tools. Respondents were chosen from 63 teachers who are pilot testing the module in fall, 2013. These interviews enabled us to answer questions such as: What user attributes (such as age and computer anxiety) affect impressions and use of the website? What opportunities can a website provide to help educators increase their self-efficacy? What are the key characteristics teachers look for in online educative curriculum? Identifying issues important to users will define avenues for future research that could improve the use of websites as an educational tool. It is important to consider the adequacy of web-based educational training as internet resources play an increasingly crucial role in shaping the attitudes and perspectives of users.

28 Updating Extension Programs to Improve Marketing

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Traditionally, county forestry association (CFA) membership provided an established base of clientele for a curriculum of Mississippi State University (MSU) Extension Forestry short courses and workshops. The curricula developed gradually by analyzing post-session evaluation responses.

Several challenges common to all natural resource Extension programs affected client participation. As mentioned, CFA members tended to dominate audience composition with the traditional delivery method of face-to-face instruction before individual county audiences. Yet, MSU Extension Forestry missed the non-CFA clientele segment. Furthermore, CFA membership had aged because participation of younger age groups failed to offset declining CFA rolls. Consequently, the traditional delivery method yielded lower average attendance per class compared to other delivery options. These challenges of aging family forest owners and attracting younger clientele have been common to natural resource Extension professionals nationwide.

MSU Extension Forestry faculty addressed these issues through a multi-pronged response. First, short courses were consolidated to single-day programs, conducted during the workday. MSU Extension Forestry continued conducting evening programs to maintain local CFA organizations. Second, the MSU Extension Service aggressively adapted the technology of interactive video broadcasts (IVB). Through this delivery method, educational programs were broadcast to participating county Extension offices statewide. Third, Extension Forestry faculty generated grant funding for targeted face-to-face programs. Soft funding for travel expenses had been vital for Extension Forestry to continue conducting face-to-face programs before multi-county audiences. Fourth, the process of updating included the development of new courses and revising old ones.

Programmatic improvements and alternate delivery methods appealed to different clientele needs and/or demographic groups. Altogether these techniques have proven effective, improving average attendance per class. Moreover, updating delivery methods and curricula are applicable to Extension efforts across the country. These techniques should be useful to Extension professionals in many disciplines to remain relevant and appeal to a wider range of demographic groups.

29 Thirteen Years of Forage Monitoring on the California Central Coast Shows Tremendous Variation in Rainfall, Production and Plant Species Composition

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To better understand forage production (above ground biomass) and precipitation patterns in the Central Coast region of California, A network of monitoring areas was started in 2001. The California Central Coast has a Mediterranean climate with cool moist winters and hot dry summers, and is dominated by annual grasslands and oak woodlands. Twelve sites were established across San Luis Obispo County, stratified into three different rainfall zones. These rainfall zones ranged from greater than 25 inches (coastal) to less than 8 inches (inland) for an average year. Forage production was measured each spring. The amount of rainfall varied from site to site, as well as from year to year. Rainfall ranged from less than 2 to over 40 depending on the site and year. Both annual rainfall and its monthly distribution varied significantly. Total production ranged from a low 29 lbs ac-1 to over 10,000lbs ac-1 . Total annual rainfall was a major driver of production. Monthly distribution of precipitation was also influential. In addition, residual dry matter (RDM) seemed associated with plant species composition. The percentage of forbs was inversely related to RDM level.This data has helped local ranchers, agricultural commissioners, resource conservation districts, and others in making management decisions for rangelands on the Central Coast, ranchers being particularly interested. This data set will also be useful for comparing changes that may occur due to climate change in the coming years.

30 Pathogen Risks from Livestock, Wildlife and the Environment in the California Central Coast

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The livestock and leafy green industries face increasing demands to provide safe food while simultaneously protecting water quality, prevent erosion, reduce herbicides, and preserve wildlife habitats. However, certain strains of pathogenic Escherichia coli (E. coli) and other enteric pathogens are threatening the safety of California's food supply. Recent research has shed light on the occurrence of foodborne pathogens in cattle, wildlife, and the environment and potential risks to produce food safety. In one project, ten central California coast ranches were visited between 2008 and 2010. A total of 2715 fecal, 209 water and 93 sediment samples were collected for bacterial culture. E. coli O157:H7 was isolated from cattle feces (2.6%), water (1.5%) and sediment (1.1%). Wildlife sampling conducted during the same time indicated that E. coli O157:H7 was present in feral pigs (5%), coyotes (2%), crows (5%), cowbird (3%), and Tule elk (2%), yet none detected from rabbits, skunks or black-tailed deer. A follow-up project conducted in 2010-2013 indicated that small rodents such as deer mice that traveled in or around produce fields had low infection rates of 0.2% for E. coli O157:H7, but 3% infected with Salmonella. Lastly, during 2009-2010 twenty three rivers and creeks along the Central Coast showed a high prevalence of Salmonella (35 % of water samples) but very low occurrence of E. coli O157:H7 (2.4% of water samples). The purpose of these research projects is to understand pathogens in the environment and possible animal sources that result in food safety and water quality risks. Future steps will be to develop management practices that will decrease the probability of pathogenic risks in our food and water supply.

31 Mapping the Dynamics of Social Resilience in a Forest Management Setting: Use of Affiliation Network Analysis of Public Meetings and Participants in the Sierra Nevada Adaptive Management Project

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Collaborative adaptive management is widely seen as the appropriate management regime for dealing with complex social-ecological systems, and to ensure ecological and social resiliency in these systems. More research has been devoted to understanding the ecological resilience of social-ecological systems; in this paper, we concentrated on the social resilience of a forest management system and modeled its social resilience framework using affiliation network analysis. Our objectives were: 1) to quantitatively characterize aspects of social resiliency of collaborative adaptive management for a social-ecological system through affiliation network analysis of attendance data; and 2) to understand which factors in our project contributed to its social resilience. Our participants included managers from federal and state natural resource agencies and the public. We examined 7 years of attendance data at all public meetings associated with the Sierra Nevada Adaptive Management Project (SNAMP) and constructed an affiliation social network that allowed us to ask questions about project cohesiveness, participation, and overall social resilience. Affiliation network analysis helped us evaluate critical aspects of the SNAMP social network, for example, the geographic and core-periphery patterns, the importance of individuals and particular public meetings were highlighted, and the dynamics of the network and its ability to withstand external perturbations were evaluated. In this case study, the SNAMP program showed aspects of social resiliency in the face of exogenous stressors. Important to the success of the SNAMP

network were: 1) the ability of members of the management and public groups to become leaders; 2) the project norms of transparency and science integration; and 3) a flexible governance structure.

32 Research and Education Envoys with the Regulatory and Regulated Communities

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A new era in nonpoint source pollution (NPS) water quality regulation began with the approval of Grazing Land Conditional Waivers by California's State Water Resources Control Board and Regional Water Quality Control Boards. The first of these was the Tomales Bay Grazing Land Conditional Waiver, originally approved in 2008 and renewed in 2013. For working landscape extensive animal agriculture operations, Conditional Waivers were precedent setting in removing self-directed options and promulgating required participation in water quality compliance programs. University of California Cooperative Extension Academics and staff have partnered with conservation agencies and organizations to facilitate Conditional Waivers that are reasonable and feasible for the regulatory and regulated communities. This included maintaining a shared understanding of the current science for NPS management in grazing livestock operations and brokering agreements for the format and use of ranch water quality planning tools. The tools and agreements, developed through the Tomales Bay Conditional Wavier, have since been adapted and adopted for use in the subsequent Conditional Waivers in the region and across California. Through these efforts, more than 200 individual ranchers have been supported to effectively navigate these new regulatory requirements. Most significantly, these efforts have resulted in on-ranch implementation of water quality improving conservation practices. We will provide a brief overview of the origins of Conditional Waivers in California and their requirements for grazing land operations. We will then detail the processes, partnerships, and collaborations facilitated for the development of the Tomales Bay Grazing Land Conditional Waiver and support of individual ranchers for on-ranch conservation practice planning and implementation. Lastly, we will explore implications and lessons for Cooperative Extension's participation and role in working with the respective communities in this regulatory and policy arena.

33 Made in the Shade – Riparian Restoration Effectiveness on California's Livestock Grazing Landscapes

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Cooperative Extension has a critical research and education role to provide in collaboration with grazing livestock ranchers and conservation organizations that are implementing stream restoration projects. In California, this Conservation Partnership has been actively or passively establishing woody vegetation in stream corridors for more than five decades with minimal feedback of the outcomes resulting from the developed tree and shrub canopy. Our program team has enhanced the Conservation Partnership by providing this needed evaluation. Specifically, we have completed a 50-year programmatic review of on-ranch conservation practice planning and implementation, researched watershed function outcomes from riparian restoration, and grown monitoring capacity through the development of standardized monitoring programs. We will share the methods and extension publications we have developed to through these elements. We will also detail the results of this research and education program. This includes the documentation of more than 40 miles of stream fenced to provide livestock management in the riparian corridor. Of this extent, 25 miles have been actively vegetated through planting. Based upon our research results, increases of canopy cover from less than 20% to a threshold of approximately 70% are achieved in approximately 20 years. Corresponding with this increase in shade are increases in pool depth and frequency, stream bank stability, and plant community richness. Support of monitoring capacity through training of conservation organization staff have initiated longitudinal monitoring of new project sites that was previously not possible. Additionally, this monitoring capacity has supported the Conservation Partnership’s ability to meet increasing accountability demands of funders to document long-term

performance at project sites. We will expand upon these results and how we have implemented a research and extension program to understand what this restored stream shade is making in terms of watershed benefits.

34 Expanding Extension's Clientele through Collaborative Partnerships

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To leverage the UF/IFAS presence in the county, Pinellas County Extension partnered with Pinellas County Government to assume management of the educational centers at Weedon Island and Brooker Creek Preserves. The goal was to develop, deliver, and evaluate educational programs that would increase visitor attendance and complement the natural attributes of the county-owned facilities. Faculty utilized a combination of educational hikes, in-classroom trainings, workshops, and hands-on citizen science. Programs focused on natural resources in the coastal and upland environment e.g. water quality, sustainability, coastal habitats, urban forests, and, plant and wildlife identification. Faculty actively engaged with existing volunteers and support organizations through volunteer training and community events. In 2012, faculty delivered 201 educational classes with 5275 participants; 131 guided hikes with 1262 participants; and supported five special events, each with more than 100 people in attendance. Customer satisfaction surveys revealed that 86% of participants rated hikes as "Excellent" and 90% (n=368) rated educational classes as "Excellent" or "Very Good". Faculty also provided supervision and training for volunteers who collectively donated more than 11,000 hours or $205,260 to support programs and operations at the centers. The wide variety of programs offered at the centers highlight the resources available to county residents through UF/IFAS Extension; contribute to increases in center attendance; increase visibility of UF/IFAS Extension in the county; and solidify that the educational centers exist for the benefit of the public.

35 Engaging Youth in Energy Conservation

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Pinellas Energy Efficiency Project (PEEP), a community energy awareness program targeted youth audiences in K-6 to promote sustainability awareness through energy education. PEEP partnered with the Pinellas County School System to provide and promote youth oriented activities that focused on the three pillars of sustainability – environment, economy and society. In 2011, PEEP hosted a T-shirt design contest for K-5 with the theme of 'Saving Energy at Home,' challenging students to create a T-shirt design that would convey a message of energy conservation and efficiency. In 2012 and 2013, PEEP designed and hosted a Kill-A-Watt Youth Challenge for 4th and 6th grade students utilizing a 4-H activity from the Steps to Achieve Viable Energy curriculum. The Kill-A-Watt Youth Challenge focused on phantom energy as well as electronic plug loads and encouraged students to examine their families' energy behaviors. PEEP received 980 entries from public and private schools for the T-shirt contest. Ninety-two percent of the students demonstrated that they understood the link between energy conservation and environmental impacts. In the Kill-A-Watt Youth Challenge, 200 students and teachers from 12 schools participated in 2012 and 2013. The average phantom plug load reported by students was 8kWh. Sixty percent of students and families pledged to reduce energy use, 21% would unplug devices, and 14% would switch to more energy efficient lighting. The hands-on, interactive activities allowed students to creatively engage with scientific principles while utilizing core curriculum principles like math and science to demonstrate how energy use and behavior would positively or negatively affect the environment.

36 Extension for Sustainability: Web-based Participatory Extension Resource for Natural Resources

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Over the years, agriculture and natural resources management extension and advisory services have undergone major changes worldwide. The emphasis on interdisciplinary, holistic and sustainable management of natural resources, compounded by low technology adoption, led to the shift towards participatory approaches in extension. In this project, we synthesized information on extension practices that employ participatory approaches and value local knowledge in developing sustainable natural resources management strategies, in order to highlight how participatory approaches have become central to extension many programs. This open access resource (http://globalrangelands.org/international_outreach#.UiD2jD9H3To), provides evaluated links and summaries of selected documents on outreach and extension practices relevant to community development and natural resources management. Although synthesized from a variety of sources and disciplines, the practices and approaches can be adapted to rangeland and natural resources management programs. We developed this online resource mainly to demonstrate: (1) successful collaborations between extension or community development agencies and local communities; (2) that community participation is critical in identifying local needs and issues; and (3) that communities better adopt technology and services that directly address their needs. We highlight two broad approaches in this web resource: Participatory Action Research (PAR); and innovation systems. PAR emphasizes collaboration, democratic decision making and common action, which strengthens mutual understanding, consensus building and potential for addressing local problems while furthering the goals of science. The concept of innovation systems views innovation as a process through which knowledge is generated by adopting a more interactive and inclusive networking approach in order to improve knowledge flow from users, extension and/or technology developers. The main message is that extension programs should focus on facilitating the development of relevant technology and transferring it, building human and social capital, and educating land users to manage natural resources sustainably.

37 The Dragon Wagon and the Utah Biomass Resources Group

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Pinyon Juniper (PJ) woodlands cover nearly 100 million acres of the western United States; this is ten times the number of acres it covered at European settlement, and the density of existing PJ stands is expected to triple in the coming decades. With the threat of extreme wildfire looming over much of the system this problem must be addressed on an economic basis. By creating a value for this woody biomass perhaps a sufficient number of acres can be treated to make a difference. The Utah Biomass Resources Group (UBRG) engaged the community of Beaver, Utah by hosting Utah's first ever wood powered concert surrounded by the PJ resource, the Muddy Boots band country-rocked 150 people as part of the third annual Southern Annual Biomass Field Days event. The power was supplied by the Dragon Wagon, USU's mobile gasification unit. The UBRG is also conducting multistate demonstrations of a self-contained mobile pyrolysis trailer that makes biochar and bio oil in the field. We have conducted research on PJ harvesting techniques, biochar pyrolysis, biochar use in horticulture and mine reclamation, phragmites pyrolysis, and other topics. Through research, field days, technology demonstrations, conferences, web presence and printed materials, the UBRG is changing the face of biomass in the Intermountain West. These efforts are continually evaluated and modified to better meet client needs. By utilizing waste wood from forest restoration and wildland fire hazard reduction projects for energy production, soil amendment, and carbon storage, rural economies will be diversified, jobs will be created and our dependence on foreign and fossil fuels will be reduced. These are the goals of the Utah Biomass Resources Group (UBRG.) This presentation will introduce the UBRG and detail our educational programs to date.

38 Get Outdoors with Extension!

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The long-term objective of the “Get Outdoors with Extension” event series is an increase in Environmentally Responsible Behavior (ERB) as a result of the knowledge and awareness gained regarding the interconnectedness of Florida ecosystems. As a first step in reaching this goal, the “Get Outdoors with Extension” series aims to increase the number of 1st time participants of the Polk County Natural Resources Extension program and increase environmental awareness of Polk County’s urban residents by offering free outdoor recreation opportunities. METHODS: In 2013, four "Watershed Ecology Tours" and three "Take a Hike" events were held. The 2013 "Get Outdoors" programs occurred once a month (Kayak: May – August, Hikes: November 2013-February 2014) for 2-3 hours depending on location and topic area. Locations in the Peace River watershed that are compatible with group kayaking were identified and reviewed by the Natural Resources Extension Agent and the City of Winter Haven's Natural Resources Division for environmental significance regarding aquatic vegetation, wildlife habitat, stormwater and urban impact, and development pressure. Hiking locations were selected for ease of access, entrance fee, and bio-diversity. RESULTS: Results of the 2012 pilot kayak program were successful; results included requests for additional tours from participants and a letter to the editor from an impressed citizen. Results for 2013's tours will be presented and will include preliminary results post-event research. The evaluation/research methods included pre/post tests on the day of the event and a follow up electronic survey 3-months after the last kayak tour (6 months after the first). The questions were designed to develop understanding regarding the motivations for participating in environmental education (EE) and the potential impact one-day EE can have on ERB. CONCLUSIONS: Results of the questionnaires indicate that single-day kayak trips or other outdoor recreation may be a viable option for reaching new extension audiences. Preliminary results indicate that a significant portion of participants surveyed not only gained knowledge but retained it at least 3 months and shared it with an average of 7 individuals. This model can be applied to any extension program area by focusing on the fun and bringing the environmental education!

39 Traveling Tree Walk: An Ecosystem Services Outreach Project

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Pinellas County stands as the most densely populated county in the State of Florida and as such, citizens' access to and connection with the green spaces around them is critical. The Traveling Tree Walk is designed to increase participants knowledge of ecosystem services, increase the amount participants value trees, and increase the number of trees participants plant in their yards (if applicable). Common trees throughout the county were identified for the sign-making process. Signs were designed in the shape of a large price tag to emphasize the ecosystem services component of this project. Signs include specific tree statistics from the National Tree Benefits Calculator (www.treebenefits.com), photographs of the tree, and a QR code linking to a factsheet of the particular tree species participants are viewing. Various natural sites (parks and preserves) can reserve the signs for a three month period through an online EventBrite registration page (http://travelingtreewalk.eventbrite.com/). The Traveling Tree Walk is accompanied by a brochure defining and explaining ecosystem services. Participants use these brochures to identify the positive impacts trees have on the environment. Knowledge gain and behavior change are evaluated with an online survey accessed by a QR code or link supplied on the brochures. The Traveling Tree Walk is currently stationed at three parks and preserves throughout Pinellas County and will be visible to thousands of visitors. This project is an innovative way to educate participants about ecosystem services trees provide. Its unique design allows for easy sharing among extension agents and other natural resource organizations. This project can be adapted and implemented anywhere in the world.

40 Watershed Education for Elected Officials, Resource Managers, and Concerned Citizens

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Around the globe, water availability and quality are significant issues and will continue to play a large role in the political decisions made by elected officials, resource managers, and concerned citizens. The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) Extension Service hosts Water Schools in five southwestern Florida counties to provide local elected officials, county and municipal employees, community leaders, and the voting public with the background information needed to make informed decisions about water resource issues and management.The primary goal is to increase participants' awareness and knowledge of local and regional water issues, regulatory stakeholders' responsibilities, scientific information available, and the influence water issues have on public policy. The objective for elected officials is for the knowledge gained to be utilized in making sound policy decisions regarding future planning and development. Each Water School's format is unique to its target audience. Water Schools bring in experts from partnering organizations, provide the opportunity for an interactive panel disucssion, and include field tours to illustrate real-life implications of the principles discussed in class. The evaluation process involves a self-assessment of knowledge gained and potential behavior change. Data collected from post-evaluations indicate participants gained knowledge and understanding of water systems and their interconnectedness to human activities within the watershed, learned of resources available to communities and governments to make better choices regarding water management, and acknowledged the need to consider potential impacts of future policy decisions on local and regional water supplies. It is imperative for all citizens to become educated about water resource issues and learn how to positively impact the future water supply and demand. Water Schools serve as an ideal platform to accomplish this goal.

41 Enriching Florida's Teachers Through Environmental Education Training

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With a renewed emphasis on Science, Technology, Engineering and Math (STEM) curricula, providing teachers with tools to make these disciplines fun and interesting is important. A teacher training program was developed in 2012/13 to facilitate this for local elementary school teachers and college students aspiring to be elementary school teachers during their summer break. A partnership with a local college allowed for undergraduate students to attend the training with current K-5 teachers who would act as mentors. A week-long series of modules was developed using the national 4-H, Project Learning Tree, Project WET and Project WILD curricula to provide teachers with ideas for introducing STEM related topics with a natural resources and conservation twist. After the five-day workshop 20 participants reported the following outcomes: 95% strongly agreed that the information, strategies, and instruction methods shared were helpful and prepared them to use environmental education materials with their audience.

42 Measuring the Public Value of a Stormwater Education Program

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Measuring impacts of our educational programs is critical in an environment where our local governments strive to meet their communities' Clean Water Goals with dwindling resources. Stormwater runoff is one of the largest threats facing water resources. Local governments are legally accountable to document and minimize the environmental impacts of their generated stormwater runoff. In Minnesota, many of the local governments have looked to Extension to help them and in turn Minnesota Extension has responded since 2007 by successfully leading and implementing two collaborative and locally tailored stormwater public engagement, education and outreach programs for stormwater professionals and communities. NEMO or Nonpoint Education for Municipal Officials focuses on providing elected and appointed leaders whereas Stormwater U is a response to provide training to city and county staff and professionals on stormwater best management practices in

urban environments. Educational and outreach programs are understood to be an integral part of our water resources management schemes. But there is a lack of data relating the impacts of educational programs to improved water quality. This presentation will focus on the lessons learned from the Stormwater U program. Each Stormwater U training is developed based on seven essential criteria, has three main parts, and is focused on a specific stormwater concept. Workshops are designed to allow participant to gain an in depth knowledge and sufficient skills so to immediately begin addressing their stormwater needs. We will share program evaluation statistics, outputs, outcomes, impacts, and descriptions, what is missing from the program, and challenges. Finally we will share methods and results of a novel approach of calculating "credit" or load reduction contributed to this program. This presentation aims to promote discussion on how to better design educational programs that have real and direct measurable impacts on management and protection of our water resources.

43 Teaching Teachers about Climate Change: Factors for a Successful Symposium

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The Cooperative Extension Service is well positioned to play a critical role in helping teachers understand climate change and the ways citizens can mitigate against and adapt to future changes. Extension agents and specialists have the potential to effectively translate current research about local impacts of climate change and provide educators with both information and teaching strategies. Teachers have expressed an interest in receiving both information and engaging activities for their students that use local data. Blending this mix of basic science, applied research implications, and teaching strategies may be unfamiliar to Extension agents, however, if they do not work with schools. We developed and implemented a Climate Change Symposium for secondary science teachers in May 2013. We offered concurrent sessions and plenary presentations by researchers and worked with presenters to help integrate research findings and teaching strategies into their session. We provided presenters with existing and draft activities designed for secondary science classrooms. To evaluate the effectiveness of the symposium, participants completed a pre and post survey and also offered feedback through short interviews recorded on video.Teacher surveys suggest we were most successful in providing a respectful learning atmosphere, using credible experts for presentations, and presenting information in a way that participants could understand. The symposium was also successful at helping educators feel like part of a community of educators interested in teaching about climate change, increasing educator confidence in teaching about the topic, and preparing educators to incorporate climate change into their course—all of which are important characteristics for those educators who had low levels of confidence or had not taught about the issue in the past. We will use survey results and teacher comments to identify key factors and explain how they can be used by others to create successful professional development programs for educators.

44 Expanding Reach: A Climate Change Adaptation Virtual Symposium

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A virtual symposium on climate change adaptation for states, tribes and local governments was held in June 2013. Over a two week period, national and regional specialists offered their expertise and insight on some of the most pressing issues surrounding climate change adaptation challenges, reaching over 1200 tribal, state and local community members through 12 interactive webinars spread over a two week period. Funded by the US

EPA and originally conceived as an "in person" event, economic considerations and travel restrictions led us to the unique virtual approach. A national planning committee prioritized topics and recruited expert speakers. Symposium topics covered included the EPA's new Climate Change Adaptation Plan; Planning for Sea Level Rise; Water, Communities & Planning; Air Quality & Health Impacts of Climate Change; Achieving Resiliency to Drought; Tribal Climate Adaptation; Emergency Preparedness and Hazard Mitigation; Risk Management and Insurance Strategies; Adaptation and Equity for Vulnerable Populations; Decision Support Tools Café; Successful Response to Coastal Adaptation Challenges; and Climate Adaptation: The Way Forward. All webinars were live, interactive with Q&A and chat, and presentations were recorded for asynchronous viewing. The series total attendance was 1235 (556 unique email addresses), with representation from 44 states, Puerto Rico, as well as seven non-U.S. countries. This presentation chronicles the year-long planning and delivery process, lessons learned and benefits of virtual (indirect) delivery methods of climate change extension and education, for both administrators and participants. We will feature evaluation results describing attendees' impressions of the virtual symposium format, and their self-reported plan progress and knowledge gains. We will also discuss challenges and obstacles facing participants as well as resources they would find most helpful - thus highlighting extension needs and opportunities. Interactive discussion will be encouraged as attendees are asked to share experiences with virtual and in-person program delivery.

45 How to Manage Your Forest: Using New Technologies to Enhance and Expand Outreach Education

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Numerous incentives exist for embracing new education technologies to expand and enhance Extension outreach programming including an audience preference shift towards self-directed/self-motivated web-based programs, and an erosion of available FTE leading to fewer agents serving larger client bases. Recognizing these trends, the OSU Extension Forestry team decided to adapt its popular Basic Forestry Short Course (BFS) series for web-based delivery. A pilot module, Silviculture, was created by four authors to test software and creative design applications. When completed, the Extension Forestry team felt the approach would serve audiences well and ten authors committed to create ten more modules for inclusion into a new "How to Manage Your Forest (HTMYF)" online program, including: Reforestation; Timber Harvesting; Forest Insects; Forest Diseases; Watershed Management; Mapping and Measurements; Wildlife Management; Oregon Forest Property Tax; Oregon Harvest Tax and Federal Income Taxes. The modules can be viewed at: http://extensionweb.forestry.oregonstate.edu/programs/how-manage-your-forest The modules now form a foundation for building new program delivery options. Initially the modules are simply available for viewing on an as-needed basis. However, they could also be incorporated into a "hybrid" version of the traditional Basic Forestry Short Course which combines the online learning modules with either live online discussion with an instructor and other participants and/or in-classroom meetings and field trips. Another project now in progress will create an interactive, online publication "How to Mark Your Trees" which will link out to the HTMYF modules in order to provide requisite background information on Silviculture, Harvesting and the many other considerations needed to mark a stand for harvest. The frequency HTMYF modules are accessed will be tracked to develop a sense of audience acceptance and usage. A formal evaluation process will also be developed in which Extension professionals from other states and disciplines, woodland owners and others will be invited to provide feedback.

46 Uneven-Aged Management in a Mixed-Conifer Forest: A Case Study with Innovative Education

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Little is known about the application of uneven-aged management methods, like Individual Tree Selection (ITS) for managing mixed-conifer forests in the northwest. Many family forestland owners and state and federal managers are interested in ITS because it provides a continuous forest canopy, reduces reforestation costs, it's aesthetically pleasing and avoids clearcutting. However, there are many questions we don't know the answers to. The goals of this comprehensive educational program are to: 1) learn more about and document the "how to's" for implementing ITS in a typical mixed-conifer forest and how the stand, including regeneration, responds to periodic harvest entries; 2) understand if ITS promotes a shift in species composition to shade-tolerant species; 3) learn what kind of wood fiber production is possible with ITS; 4) determine fire hazard risk; 5) document associated logging costs and damage to residual trees and regeneration; 6) better understand how ITS can be used to enhance wildlife habitat primarily snags and large downed wood; and 7) communicate what we learn through typical delivery systems such as tours and workshops, as well as a traditional PDF coupled with a separate interactive, online multimedia app. In 2005 we implemented an ITS case study in a 50-acre dry mixed-conifer forest on the Oberteuffer Research and Education Forest near Elgin, Oregon, which is a satellite research forest of Oregon State University. A series of permanent plots allow tracking tree and forest changes over time. We have before and after harvest information and 5 years following harvest. This case study is one of three currently under development in Oregon which will provide similar educational materials. We will provide an overview of this project including lessons learned to date in the case study and an example of the twofold educational materials, a PDF and interactive, online multimedia app.

47 Florida-Friendly Best Management Practices for the Protection of Water Resources by the Green Industry

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The sustainability and protection of Florida's natural resources in the urban landscape is an important issue facing landscape maintenance providers in the state. Fertilization of urban turfgrass areas is often targeted as a primary source of nonpoint source pollution, which prompted development of the Green Industries Best Management Practices (GI-BMP) Training Program. This began as a voluntary training program in 2002, and is now a statute-mandated training for those applying fertilizer commercially as of January 2014. So far, the program has trained and certified over 29,000 industry professionals.

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The GI-BMP Program is administered by Florida Department of Environmental Protection (FDEP) Nonpoint Source Management Section (NPSMS) and implemented by the UF/IFAS Florida-Friendly Landscaping™ (FFL) Program. The training is taught by 344certified instructors consisting of Extension Agents, industry, government agencies and volunteers. 1,028 training classes have been provided in either English or Spanish. In addition to in-person training, online and DVD training are also available. In-person classes are held at Extension offices and other locations around the state.

The training consists of six GI-BMP learning modules covering efficient use of water and fertilizer, integrated pest management (IPM), fertilizer application, and lawn and landscape cultural practices to reduce nonpoint source pollution. Passing rates for in-person training: English 92%; Spanish (75%). Knowledge gain results (14% avg.) are based on pre- and post-test scores. An end-of-training evaluation is given to in-person participants: 13,153 (83%) out of 15,771 indicated a willingness to adopt BMPs; 2,332 (15%) indicated they "Already Do" use the BMPs. 12,574 (79%) out of 15,999 responding said, "I will" use the recommended fertilization rates and methods presented in the BMP manual; 20% indicated they "Already Do". Annual follow-up survey results indicate at least 17 BMPs adopted (15% avg.) based on before and after questions.

In conclusion, this statewide Extension program enhances water quality awareness by delivering science-based information, skills, and tools to address potential nonpoint source pollution related to landscape business practices.

48 Walking Our Talk: Exploring Practices, Motivations, and Impediments Among Extension Personnel

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The April 2008 issue of Journal of Extension contained a commentary from the National Network for Sustainable Living Education (NNSLE) entitled "Sustainable Living Education: A call to all Extension" that included the statement: "Extension must become the model for others to emulate. We have to walk our talk. Extension staff members will 'learn by doing' as we green our own lifestyles, offices, campuses and 4-H camps. As a result, we will radically shrink our ecological footprint and visually demonstrate the knowledge and practices we are teaching." In 2010, NNSLE surveyed Extension personnel across the US about their habits, both at work and at home, related to environmental conservation and sustainable living practices. We received 633 responses from 37 states plus Washington, DC. This presentation highlights the choices, questions, motivating factors, and impediments reported by participants in the survey. Key Findings: 1. Some Extension employees are implementing many sustainable practices on their own and want to share with both the public and their colleagues. 2. Some Extension employees are not interested or are neutral about living sustainably, often because they're already swamped with work. 3. A small group of respondents is 'anti' sustainability, and vocal about it. 4. At home, Extension employees are engaged in sustainability practices for personal and ethical reasons, and to save money. At work, personal philosophy and saving money are the primary motivations for incorporating sustainable practices. 5. The most common impediments to implementing sustainable practices are external, such as homeowner association rules, rented property, poor public transportation, limited bike routes, and minimal recycling programs in their location. Less common impediments include a lack of time and perceived lack of support from Extension and county administrators.

49 Rutgers Environmental Steward Program

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New Jersey is the most densely populated state in the nation, exacerbating most environmental problems. A needs assessment conducted in 2003 revealed an opportunity to establish an adult environmental education program that would utilize the growing environmental expertise at the land grant university, while complimenting a 100 year old tradition of agricultural extension in New Jersey. Program participants were expected to gain an improved understanding of the science behind environmental issues, knowledge of environmental technology, and enhance their effectiveness as community leaders. The Rutgers Environmental Steward Program was created to provide a grounding in environmentally related science with leadership skills

for citizens interested in environmental issues without formal scientific education. Graduates are knowledgeable in basic environmental/earth processes of earth, air, water and biological systems. They become aware of techniques and tools used to monitor and assess the health of the environment, while receiving an understanding of the research and regulatory infrastructure of state and federal agencies operating in New Jersey. The class consists of 20 sessions of lectures and field trips followed by a 60-hour internship. The Program has been operating since 2005 at three sites and is increasing to five locations, including evening hours and urban areas to reach a greater diversity of residents. Lecturers include experts from Rutgers University, Department of Environmental Protection, Association of New Jersey Environmental Commissions and NJ Conservation Foundation as well as others. At this time 91% of participants have completed the program; 47% are engaged in the internship; and 30% have completed the internship project. Success of the program is measured by actual impacts of the internships which are documented annually and featured on the website http://envirostewards.rutgers.edu/. Three-hundred and twenty-six participants have completed the program, and one-hundred and fifteen completed their internships providing a minimum of $152,766 of volunteer service to the state.

50 River Friendly Business Program

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Water quality improvements in New Jersey will require a concerted effort of public and private partnerships. This includes residential and business partners. The River-Friendly Business Program (RFBP) is a voluntary certification program initiated as a pilot program in Morris County in 2013 to encourage businesses to adopt various conservation and stormwater practices to reduce their environmental impact on local waterways. These practices will improve water quality, help reduce flooding, promote wildlife habitat and provide economic benefits to the business and the community. A local economic study by New Jersey Department of Environmental Protection (NJDEP) estimated that $8.4-$13.6 Million/year was contributed to the community by a large inland lake in the state. The program consists of four categories; 1) stormwater management, 2) water conservation, 3) lawn maintenance and 4) wildlife management. The businesses choose from various options to achieve the category objective, with the technical assistance of Rutgers faculty. Certification is achieved when the business achieves all four category objectives. Mack-Cali, a real-estate company, local companies and golf courses, are involved in the program. As the program is rolled out in Somerset County we anticipate that Bloomberg Corporation will work towards certification, based on interest shown thus far. The NJDEP, Bureau of Compliance and Enforcement is enthusiastic about the program and is providing our checklist both to their star performers and to those who can improve performance. A checklist, overview and guidance document has been developed. The Program is intended to be collaboration between businesses, their employees, and Rutgers Cooperative Extension. We have utilized expertise from several Upon completion of the RFBP certification requirements businesses receive public recognition of their achievement.

51 Natural Resource Education and Community Engagement in an Adaptive Management Project

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To be successful, adaptive management on public lands must include opportunities for mutual learning and ways for the community to engage in a meaningful way. Best practices for community involvement, methods of interaction, information to be shared; and success outcomes will be explored in this presentation based on the experience of the University of California Cooperative Extension's involvement in the Sierra Nevada Adaptive Management Project (http://snamp.cnr.berkeley.edu), a cross disciplinary study of forest fuels reduction

treatments carried out on national forests in the Sierra Nevada of California. The 8-year, 13 million dollar study involves independent third party research by University of California scientists of the integrated effects of forest thinning on fire hazard, forest health, wildlife, water quality and quantity, and public participation. Because the SNAMP project is a long-term study, it enables us to follow community and stakeholder education and engagement, as well as outcomes of the participatory process over the course of project development, implementation, and evaluation. The SNAMP process of mutual learning and community engagement includes use of multiple interactive techniques, such as science meetings with researchers, agencies and public stakeholders; management workshops; presentations to community groups; field trips; group conceptual model building and web-based tools for sharing the science of various natural resource fields. These methods allow for mutual learning, group discussion, information sharing, community involvement in the research process and face-to-face interaction between all parties. UCCE plays a pivotal role by conducting outreach to engage the project communities and stakeholders, share new scientific information, ensure a transparent process, and evaluate whether the effort is providing new information to resource managers in order to achieve adaptive management on public lands. Evaluation results show that SNAMP has been effective at fostering learning about forest science and management and has improved relationships between stakeholders, agencies and scientists.

52 Florida Seafood at Your Fingertips: An Outreach Program for the Florida Consumer

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The Seafood at Your Fingertips program was created by a multi-disciplinary team consisting of professionals in seafood, marine, nutrition and industry fields. Objectives of this program are to provide extension agents in Florida with updated, easy-to-access information regarding seafood, resulting in increased consumer awareness and consumption. Due to the abundance of outdated/inaccurate information available, it is difficult to determine the difference between science-based information and myths regarding seafood consumption and safety. As technologies improve and access to information becomes overwhelming consumers are often receiving misinformation. This program is taking the science-based information and packaging it into an easy and understandable educational tool for University of Florida IFAS Extension agents. A combination of traditional extension teaching methods and new technologies make this program timely and a bridge between various teaching and learning styles. Through focus groups and a statewide survey, the program was designed with consumer input in order to provide appropriate information in the educational tools. Program tools include outreach modules that are designed for extension educators to teach their clientele about Florida seafood nutrition, preparation, seasonality and purchasing. Extension educators are able to use these modules in their extension programming and offer workshops on seafood education when previously they did not have the information or resources available to them in a succinct package. By incorporating information from the survey, programs can be regionally tailored yet conducted statewide and allow the program to reach a greater audience of consumers throughout the state where we did not previously have an impact. Additionally, a mobile application was created for the general consumer to assist in purchasing and handling of seafood and promoting seafood consumption. By combining education modules, public displays, and the mobile application with the community teaching expertise of extension professionals, this program has provided a wide-reaching Florida Seafood promotion opportunity.

53 Enhancing the Value of Indiana's Public Spaces

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Public spaces are essential to the social, economic, and environmental sustainability of communities. They are the shared resources such as parks, parking lots, and town centers that define a sense of place and where residents experience social interactions, explore nature, and purchase goods and services. Public space management decisions made by public policy makers, private business owners, and residents impact the wellbeing and livelihood of the community as a whole. Many Indiana communities underestimate and inefficiently leverage the value of public space to the detriment of their quality of place. Quality of place, in turn, is a significant focus of community and economic development initiatives that seek to enhance community vitality and sustainability. A new Purdue University Extension program, Enhancing the Value of Public Spaces, has been created to address public spaces and their role in enhancing the quality of place by helping regions, communities, and neighborhoods plan and prepare for a sustainable future. Since January 2013, a diverse Purdue Extension team - comprised of the four Extension program areas, the five state districts, and campus-based specialists - have developed an innovative curriculum and implemented pilot workshops throughout the state. The curriculum utilizes the community capitals framework and the appreciative inquiry process to demonstrate how high quality public spaces improve a community's quality of place with emphasis on Indiana examples and best practices. The curriculum provides tools for data collection, strategic planning, and an array of resources for implementation projects. The target audience includes public decision makers and leaders in rural, suburban and urban communities. This presentation will provide an overview of the program development and implementation processes and will highlight the materials and resources created as well as evaluation results, lessons learned, and next steps.

54 The Greenhouse Project – Engaging the Community to Educate Youth

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The Greenhouse Project (TGP) serves as an innovative teaching facility for hands-on activities and vocational opportunities that emphasize environmental stewardship, the importance of outdoor activity, civic engagement and academic achievement for high school agriculture, natural resources and special needs students. With a 2,160 square foot commercial greenhouse, 33-foot hoop house, 65 raised beds and a small orchard, youth learn about composting, growing food commercially and horticulture business practices. The project teaches sustainable living with solar panels for energy, a ground source heat pump for heating and cooling, organic pest management and sustainable growing methods. Ninety percent of the food produced is donated to the hungry; 10 percent supports the high school culinary arts program. Special needs students plant the seeds and raise the flowers for the 65 downtown flower baskets. TGP is a non-profit corporation run by volunteers who raised $350,000 to build the greenhouse and facilities and continue to raise the money needed to pay for annual operations. The goals of the project are to provide fresh nutritious food free of charge to food banks, to teach children and families the importance of living sustainably and to help children and the community unplug from the TV or computer and reconnect with the outdoors. Since opening in 2012 over 7,000 pounds of produce have been donated. Student and volunteer participation totaled 3,641 hours in the first year of operation. A hearing-impaired student was hired at a local nursery after his vocational experience at TGP. An agriculture/natural resource program was reinstated at the high school after a 15-year hiatus. Four students have have gone on to college to study agriculture. The Greenhouse Project is an excellent example of Extension outreach and building partnerships to make a difference in the lives of youth.

55 Blending Technology and Face-To-Face Approaches to Meet Land Use Training Needs in Northern Michigan

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Online technologies offer excellent opportunities to efficiently reach new audiences, but how can Extension programs utilize these approaches in rural, natural resources-rich areas with limited broadband access. For the past decade, Michigan State University Extension's Citizen Planner program (www.citizenplanner.msu.edu) has provided basic training to over 8,000 planning officials through a locally-based, seven session, 21-hour intensive classroom or asynchronous online workshop series. Despite the Citizen Planner program's success, we struggle to meet needs in rural portions of the state where travel distances are greater and it is difficult to attract enough participants to meet program expenses. An online, asynchronous version of the Citizen Planner program (www.americancitizenplanner.com) is an option in many areas of Michigan, although two natural resources-dependent parts of the state - the Upper Peninsula and northeast Lower Michigan - have limited broadband availability. Local officials in these areas are very used to in-person, group workshops. To increase Citizen Planner program participation in those areas and test new methods, MSU Extension Educators employed a blended approach. Participants gathered in small groups (3-8 individuals) at 2-4 public facilities with broadband access, and live instruction was provided simultaneously at all locations using Adobe® Connect technology. Using this approach, attendees experienced benefits of both technology and group discussion, including an activity to apply information learned. An eXtension Moodle course allowed participants to complete missed classes online by watching the presentation and engaging in activities that were similar to experiences during the "live" session. Evaluation responses from these pilot efforts were very positive, with 62 percent (n=30) indicating that this webinar format was the better or much better than similar workshops that did not use this technology (34 percent reported that it was the same). Overall, participants accepted the technology we introduced, and reported enjoying both the convenience of reduced travel and the small group interaction.

56 SLO Scientists: Engaging Youth and Adults in Non-Formal Natural Resource Education

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Combining positive youth development, experiential education, and scientific learning, SLO Scientists highlights how Cooperative Extension can provide opportunities for community education and engagement related to sustaining natural resources. Offered through the University of California 4-H Youth Development Program in San Luis Obispo (SLO) County, SLO Scientists utilizes non-formal education principals to engage youth and adult partners in exploring our world. Examples of the curricula include From Ridges to Rivers: Watershed Explorations, Oak Woodland Wildlife, and It Came From Planted Earth. Providing experiments and concepts that require hands-on investigation, data collection, and critical thinking, SLO Scientists promotes awareness and advocacy for local community issues. Through this program, youth partner with an important adult in their lives to participate in a process of co-inquiry, which enable mutual learning and awareness. Operating since 1995, the program continues to be evaluated and refined. While many of the reported outcomes relate to positive changes in familial interactions and behavior, other measures relate more directly to impacts on natural resource awareness and education. More than 50% of youth participants and 33% of adult participants reported spending more time on scientific observation and experimentation as result of their involvement with SLO Scientists (Enfield, 2013). Additionally, 67% of youth participants and 95% of adult participants indicated that they speak with others about the SLO Scientist experiments and activities (Enfield, 2013). However, the impact of this program on the local community extends beyond measuring participant outcomes and program evaluations. Numerous participants have utilized their learning to educate others and improve their communities. Some examples include: planting trees to stabilize stream banks, hosting community awareness building events, and serving within the community by teaching other residents about worm composting. Through experiential education, SLO Scientists enables youth and adults to work together to investigate, understand, and respond to natural resource issues of local relevance.

57 An Experimental Approach to Science Delivery: Using Extension to Develop a Knowledge to Action Network

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The Big Wood Basin Alternative Futures Project is an ongoing collaboration among PNW Climate Impacts Research Consortium (CIRC) researchers, regional extension, and local stakeholders to explore future scenarios of water supply under climate change in the Big Wood River Basin, Central Idaho. Over the past 24 months, the CIRC Regional Extension Climate Specialist has worked with county extension agents and specialists to develop a 'knowledge-to-action network' (KTAN) whereby researchers and stakeholders collaborate to co-produce information that is useable to local decision makers (Cash and Buizer, 2005). This approach is in contrast to what Cash et al. (2006) refer to as the traditional or 'loading dock' approach where science is developed independent of local knowledge and made available to decision makers at the end of the research process (Cash et al. 2006). The KTAN approach draws heavily on extension's legacy of managing boundaries between academia and communities of place or practice (Stevenson et al, forthcoming) but emphasizes their role as a convener and mediator among scientists and decision makers who collaborate in a network to develop relevant information to local issues. The KTAN process is an experimental one, however, with significant investment of resources and staff to manage the boundaries between researchers and local stakeholder participants at each stage in project. Given these demands, and the relatively nascent understanding of KTANs, the CIRC has administered an evaluation protocol to track the Big Wood project's success in improving understanding of KTANs efficacy in developing usable science for local communities. This talk will review the major steps of boundary workers in this project since it began in July 2011 and share initial findings from the evaluation protocol and preliminary lessons learned.

58 Engaging Landowners on Forests and Climate: Outcomes of a 2013 NRC Workshop

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In August 2013, the National Academy of Sciences' Boards on Science Education and Environmental Change and Society convened about 75 Extension foresters, human behavior researchers, program administrators, nonprofit organization leaders, and others for a workshop on engaging family forest landowners on issues related to climate change. The agenda was designed as a conversation -- including diverse case studies from climate education and communication practitioners targeting landowners, interspersed with the responses and reflections of social scientists. The purpose of the workshop was to identify strategies and tactics supported by social science research to effectively engage family and community forest landowners on issues related to climate change and forests. Cases addressed development of regional conservation partnerships, consulting forestry activities, engagement with minority landowners, digital communications, peer learning, technical assistance, and more. Strategies generally viewed as effective included a focus on landowner engagement rather than a top-down approach to education and communication; a focus on stories along with technical, research-based information; targeted communications to specific audience segments; a focus on evidence of a changing climate that landowners can see, touch, and relate to; application of social and behavioral theory in program design; and recognition of the value of local knowledge. Understanding and appreciating landowner agendas and values was seen as key to successful engagement, as was the prudent use of a "climate change frame" when discussing forest management practices with landowners. We will present specific ideas discussed at the workshop and present a detailed report, currently in development, that will be of value to Extension professionals engaged in or considering climate-related natural resources programming. We will also discuss next steps to build on this work, including how Extension faculty can get involved.

59 Invasive Blitz: Training Master Volunteers to Remove and Manage Invasive Species

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Terrestrial invasive species pose serious threats to Minnesota's natural resources, ecosystems and economy. Unfortunately, limited resources make it difficult to effectively control invasive species across large areas. Minnesota's Invasive Blitz program trains and mobilizes an existing, statewide network of natural resource volunteers to identify new invasive species (such as emerald ash borer, Asian longhorned beetle and thousand cankers disease) and locally eradicate invasive species already present (such as buckthorn, honeysuckle, multiflora rose, garlic mustard and wild parsnip) to reduce costs to public agencies and increase the success of native ecosystems. Volunteers from the Minnesota Master Naturalist, Woodland Advisor, Forest Pest First Detector, Master Gardener and other existing volunteer programs have been trained to recognize the impact of invasives in Minnesota and to identify target terrestrial invasive species. They learn appropriate methods for removal of selected invasive plants and how to mobilize work groups to help remove invasive plants. Volunteers share their knowledge with organizations and clubs they belong to and host local invasive plant removal events as part of the annual statewide "Invasive Blitz". They may adopt a local natural area (back yard, park, woodlot, nature center, etc.) to regularly monitor and provide stewardship for into the future. Post-workshop evaluations measure participants' knowledge and intended behavior change using a retrospective pre-test. One-year follow up surveys compare aspirations to actual volunteer activities. Results from these two evaluations will be shared, as well as lessons learned. This program is adapted from successful programs in other states.

60 Master Composter Programs to Meet the Changing Clientele of Extension

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The Georgia Master Composter Program is an adult environmental education course developed as a partnership between University of Georgia Cooperative Extension and Athens-Clarke County Solid Waste Department. The program was created in 2011 to address the growing requests for composting education across the state of Georgia. This nine week program lasts for eight weeks and includes two weekend field trip sessions with over 30 educational contact hours. The instructional sessions are customized and provide educational experience in the chemistry and microbiology of composting, types of and reasons for composting, climate and conditions in Georgia that impact composting, and lessons on teaching varied audiences. The program partners with various organizations statewide to provide unbiased, scientifically accurate information about composting in Georgia. Facilitators work with both public and private entities to provide experiential programming. More than half of the participants in the Master Composter program were not familiar with Extension education or programming before joining the class. This project provides visibility for Cooperative Extension and has built diverse and lasting partnerships between Extension and a variety of Georgia communities and organizations. Participants have helped extend the efforts of the Cooperative Extension by fulfilling more requests as well as building partnerships with a wide range of community groups. The 2012 program participants provided over 400 volunteer hours to their communities and interacted with over 800 community members. Participants trained in this program are an asset to their community and fill a vital role in waste reduction and soil improvement to their local environments.

61 Youth Summer Forestry Leadership Program: Workforce Preparation and Life Skill Development

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The 4-H Forestry Leadership Summer Program in Mason County, Washington, enrolls 15-30 high school students from Mason County to learn leadership skills and experience sustainable natural resource management through service-learning projects alongside natural resource professionals. This program is designed for students who

want to explore and experience activities in forestry and wildlife related careers and who have a special interest in hands-on community service activities such as trail construction, native plant revegetation, salmon stream restoration and shoreline bulkhead removal.The program begins with intensive challenge course training; building teamwork, communication, and leadership skills to help the youth succeed in the summer program as well as the rest of their lives. In addition to receiving one high school credit, the youth enrolled in the program receive a monetary stipend simulating real-world employment. This program empowers the youth of Mason County to succeed by getting them on-track to graduate, and instilling in them a sense of intrinsic motivation to see a job through to completion. After conducting a community-wide needs assessment, program leaders decided to focus on students that are on probation or at risk of failing school because of broken families, homelessness, and/or problems at home and in the community. Not only do these challenged students perform better when working outside, but when students with diverse backgrounds work together, misconceptions that students have about each other are broken down. Program leader, Krag Unsoeld says, "One of the past participants who had struggled through school and with her family while in the program is now in college." Many other students are able to graduate and learn how to cope with life's demands to prepare for life beyond high school.

62 The Ranching Sustainability Analysis System

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California oak woodland creates a landscape of renowned beauty, providing the public with essential natural resource services and economic values through ranching. Ranchers, however, come under intense pressure and scrutiny from the public to demonstrate stewardship of the land they manage. The solution often chosen to address these concerns is, simply, more regulations. Regulations impose a financial and philosophical burden on California ranchers; in fact, they threaten the very existence of ranching. This paper discusses the development and on-going implementation of the Ranching Sustainability Analysis System (RSA). The RSA is a self-assessment process that guides the rancher through a series of questions that cover social, economic, and natural resource aspects of 11 ranch-management categories. Ranch scores can be submitted to a confidential database. Anonymous summary scores allow ranchers to compare the operation to their peers and to track sustainability progress over time. Essential components for the ongoing implementation of the RSA have been the strong support of an ad hoc committee of ranchers, delivery through a series of Workshops, San Luis Obispo County Cattlemen's Association support, and voluntary participation. Although in the early stages of implementation, the RSA has potential to aid private landowners throughout California in implementing—and demonstrating—sustainable ranching practices.

63 StreamWise Students Tackle Water Quality Challenges

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OSU Extension's StreamWise program transforms students into citizen scientists and restoration specialists, partnering class rooms with restoration organizations and on-the-ground projects. The program was conceived to educate the population of the urban Bear Creek watershed about non-point source pollution resulting from such things as pet waste, car washing, lawn care, disposal of household cleaners, and other individual activities that compromise water quality through polluted stormwater and runoff. StreamWise has expanded into a multi-contact watershed improvement program with significant impacts. The program provides standards-aligned watershed science education and connects schools with local restoration groups and projects where classes participate in watershed enhancing activities such as establishing monitoring plots, planting trees, and maintaining existing restoration plantings. They also collect and report stream and water quality data. Schools have the opportunity to become long-term restoration and stewardship partners. Teacher trainings and

outreach at community events are also part of the program. Pre and post-tests indicate that students make significant knowledge gains. In 2012-13, analysis of 529 pre-post student knowledge tests showed an average of 43% questions correct prior to program participation and 77% correct afterwards, an average gain of 79%. Participating teachers appreciate that StreamWise provides fun, hands-on science education, resulting in growing demand for the program. StreamWise has reached more than 6,000 students and thousands of community members since its inception in 2007. An important factor in the success and popularity of the program is its responsiveness to the needs of its many partners: teachers, students, restoration groups, and the watershed itself. In this presentation we review the StreamWise program, the importance of adaptability, discuss our experiences in developing meaningful evaluation instruments, and talk about the on-going challenge of linking knowledge gains with changes in attitudes and behavior

65 Cost-Benefit Decision Tool to Help Transportation Agencies and Landowners Establish Living Snow Fences

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The Minnesota Department of Transportation (MnDOT) administers a living snow fence program to increase the safety and mobility on Minnesota highways that have blowing and drifting snow problems. Currently the program has installed living snow fences in less than 5% of the 3,700 snow problem areas. A cost-benefit decision tool developed by UM researchers was created in order to justify MnDOT's operations and maintenance funding being diverted to landowner payments to establish living snow fences or snow control measures. Snow control measures includes; modifying road ditches, leaving standing corn rows, planting living snow fences (shrubs), or installing structural snow fencing. Farmers are more willing to review a standing corn row contract than a perennial shrub planting contract. The decision tool is being used by MnDOT field staff to determine a fair and reasonable payment to offer farmers to leave standing corn rows to protect snow problem highways in the winter. Farmers are hesitant to sign these contracts because they don't want to till the standing corn in the spring and they are worried about volunteer corn (due to the ears left on the standing corn). By using the cost-benefit decision tool, MnDOT officials can justify paying landowners increased payments. To eliminate the volunteer corn challenge, we are contacting local 4-H clubs/FFA chapters to hand pick the corn ears on the standing corn rows (6 rows) for the farmer and the farmer gives a donation to the youth organization. Topics discussed at this session will include; the web based living snow fence cost-benefit decision tool, how to partner with MnDOT and other agencies, working with the landowners and involving 4-H/FFA youth in hand picking standing corn rows.

66 Educating Farmers and Natural Resource Professionals on Agroforestry

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In June 2011, the USDA released an Agroforestry Strategic Framework to serve as a roadmap for advancing the science, practice, and application of agroforestry in order to enhance America's agricultural landscapes, watersheds, and rural communities. Of major concern is the fact that educators, including USDA NRCS, state agency conservation staff, and extension professionals are not sufficiently equipped to provide technical, financial, and marketing assistance needed to plan and apply agroforestry systems on behalf of landowners. Second, landowners and farmers lack knowledge about the practice of agroforestry. The goal of the Framework is to increase agroforestry adoption by expanding learning partnerships with stakeholders and educating professionals and farmers about the practice. To help realize this goal, the UMN Agroforestry and Bioenergy Program in partnership with other organizations has conducted research and demonstration trials serving as tools of educating natural resource professionals and landowners about agroforestry. The Program will also be offering Agroforestry Academy in partnership with other organizations to provide intensive "train the trainer" professional development for a diverse group of educators from IA, IL, MN, MO, NE, and WI. Advanced training will be provided on the five recognized temperate zone agroforestry practices integrated with options for bioenergy, economic, and environmental services. Increased depth of knowledge in agroforestry will enable

these educators to transfer proven principles and strategies to an even broader audience that will reach into rural communities across the Midwest as a pilot for a national program. The academy will create a learning community of researchers, professionals and practitioners with a range of expertise in agroforestry that will facilitate education, idea exchange, and adoption. Lessons in developing an effective agroforestry in Minnesota with greater application throughout the country will be discussed. Also, details of the academy training approach and feedback from the first group of trainees will be presented.

67 Youth and Water Program

Pat Rector, Rutgers Cooperative Extension, Rutgers The State University of New Jersey, rector@njaes.rutgers.edu

Youth and Water ProgramRector, P. Rutgers Cooperative Extension of Morris/Somerset Counties, Morristown, N.J., Youth Programs can perform double-duty as experience has taught us, from the earliest days of 4-H to recycling, a great way to bring a message home is through the children. An Environmental Youth Program teaching the next generation environmental attitudes and solutions provides great opportunities for implementation at home. The goal of the Rutgers Cooperative Extension Youth and Water Program is to provide quality hands on experiential learning opportunities focused on stormwater, non-point source water pollution and water conservation with small solutions that students can be a part of; thereby empowering them with problem-solving techniques to real world issues.The program has reached children as young as preschool and as mature as college-bound high school students with diverse backgrounds. Participants have come from various 4-H clubs, Vacation Bible School, Pre-School where English was a second language, Elementary School Children, Catholic High Schools and Boy Scouts. The program has also provided a Team Building exercise for young counselors at the ARC, a community day camp that serves individuals with developmental disabilities and then followed that program with a program for the residents.A Rain Garden Manual for Elementary School Children was developed and reviewed by 4-H in New Jersey for their use statewide, utilized at several schools and requested from several other local schools. The rain barrel program has received newspaper notice, been presented at national and regional conferences. A JOE article was published on a rain barrel project with Morris County 4-H teens showing the improvement of teens who “taught back” at their county fair. Often the rain barrel programs include a painting session and auction, with parents typically buying their child’s barrel and implementation occurring at home for close to 100% implementation.

68 Invasive Species Education Through a Social Media Team Approach

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Invasive species are the number one threat to biodiversity in Florida. As extension educators, our jobs are to bring the best science forward, educate the public, and guide land managers to the best of our abilities. Getting the public educated on best management practices for management, prevention and eradication of invasive species is a continuous challenge. Every year, the federal government designates a National Invasive Species Awareness Week to promote awareness of all types of invasive exotic species across the nation. In Florida, most Cooperative Invasive Species Management Areas (CISMA) groups use this week to do massive education campaigns. Northwest Florida Extension Agents, from multiple disciplines, worked together to provide the content for a social media/web education campaign in association with the Six Rivers CISMA group. Through this team effort, individual species were highlighted throughout each day on websites, email blasts, and social media. This information was focused through extension efforts capturing over 4000 hits throughout the seven day campaign, and many more that were not captured from non-extension means. In addition, this daily information was provided in advance to the Six Rivers CISMA group partner agencies to highlight throughout the week. As a result, information was shared statewide, throughout local military bases and in some cases shared nationwide. Team efforts allowed for the most education to be shared and provided great results. Using this web/social media approach was unique for this particular kind of subject matter and was commended on a

statewide level. Both extension and partner agencies were able to reach new audiences through this effort and expanded their invasive species awareness in new and innovative ways.

69 Engaging Communities through Volunteer Monitoring in Montana

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Educating communities on water quality issues is important in Montana for several reasons. Most importantly, 85% of assessed streams in the state are impaired. In addition, raising awareness on the connection between impairments and human behaviors educates citizens on actions they can take to reduce water pollution. Creating a volunteer stream team - recruiting volunteers to collect stream samples in a watershed - is an excellent way to educate community members about water quality issues. Volunteer monitoring continues to gain momentum in Montana each year as enrollment in existing stream teams increase and new groups are formed. Our program provides technical support and insight by helping watershed coordinators focus on issues present in their watershed. By focusing on issues that resonate with the community, we help watershed coordinators collect relevant data and educate the community. We develop sampling and analysis plans, choose monitoring methods and sample sites that address the parameters of concern. There are currently over five volunteer monitoring groups with varied interests and needs across the state; we assist a group in central Montana whose primary constituents are ditch riders concerned about salinity levels in irrigation water, and we work with a group in southwest Montana who are mainly comprised of fisherman concerned with aquatic health. Although each volunteer group is unique, they are bound by the desire to collect relevant, useful data to inform baseline conditions or management decisions. Therefore, it is important to present the data publicly in a meaningful way that is easily understood. Currently, Montana is lacking any central data repository where volunteer data can be uploaded, viewed, and analyzed. We are exploring the use of a new online database to address this shortcoming, as it is key to make the data accessible online to educate a greater audience and maintain enthusiasm among volunteers.

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