



The OutREACCH

A quarterly report by **Regional Approaches to Climate Change**
Pacific Northwest Agriculture

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Director's Corner: It's Meetin' Season

Sanford Eigenbrode, Project Director, UI

This fall, REACCH has contributed to several key national professional meetings. REACCH made its presence felt at the ASA-CSSA-SSSA (American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America) Annual Meetings - in Cincinnati, OH, where our faculty and students gave more than 20 talks and posters, including these **highlights**:

- Dave Huggins and colleagues spoke on Dynamic Agroecological Zones, a concept that is a keystone concept in our efforts to understand the interplay between climatic factors and grower practices throughout the region.
- Jodi-Johnson Maynard, Katt Wolf and Jonathon Velez presented on education and extension aspects of the project.
- I had an opportunity to present ideas for how to address the complex issues facing agriculture, like those that are the focus of REACCH. One talk, coauthored with Dave Huggins, Mark Walbridge and Steve Shafer from the USDA's Agricultural Research Service, envisioned a plan for establishing a long term agricultural project at the Cook Agronomy Farm at WSU by building on partnerships to enhance our capacity to conduct research, extension and education that can improve the sustainability of our region's agriculture.
- With Lois Wright Morton and Tim Martin (directors of our sister climate CAP projects, Sustainable Corn and PineMAP), we proposed new approaches to managing very large, transdisciplinary projects like REACCH so our work can be as effective and impactful as possible.

The Entomological Society of America (ESA) meeting in Knoxville TN, Nov. 11-15, will include a special program symposium on Insects and



REACCH has 14 masters, 12 PhD and 3 postdocs working on the project. The grad student retreat was held in Sept. to build stronger integrated ties within our cohort. All students will produce an education or extension products from their research.

Climate Change. REACCH is a co-organizer of this symposium and we will have a prominent talk in the lineup. Other talks include effects of climate on pests of forests and various systems from soybean to wheat to invasive species. Entomologists and climate scientists from across the country will participate.

Finally, this fall, we expect to have a presence at the American Geophysical Union meeting in December, as we did last year.

Why do we attend these meetings? Meetings like the ASA-CSSA-SSSA and the ESA annual meeting are a crucial part of our efforts within REACCH, and with our partners and stakeholders. They allow us to share our results with other researchers and learn from them about aspects of our project, from the basic science related to climate and agriculture to working with producers and other partners. They provide our students with exceptional opportunities to have their work examined by the best scientists and to build relationships as they build their careers. These contacts help them do a better job of carrying out research that is useful and impactful. By networking at the national level we can build collaborative partnerships to enhance the work and application of REACCH.

To view our presentations, please visit:
www.reacchpna.org/resources/conferences/tri-societies-conference-2012

Achieving More than the Sum of the Parts? Integrating Research, Extension and Teaching Initiatives on Climate Change and Agriculture

Chad Kruger, Director WSU's Center for Sustaining Agriculture and Natural Resources

The Pacific Northwest:

Global leader in Agricultural Climate Science

Over the past decade, more than 50 million dollars in competitive grant funding for climate change research has been invested in Pacific Northwest agricultural science institutions. Much of this investment has come in the form of large, trans-disciplinary collaborative projects like REACCH. These major projects integration of research, teaching, and extension functions addressing nearly every aspect of the agriculture and climate change interface.

The 3rd Annual Pacific Northwest Climate Science Conference October 1-2, 2012 in Boise hosted REACCH's panel: *Integrating Pacific Northwest Research, Extension and Teaching Initiatives on Climate Change and Agriculture*. We initiated conversations among agricultural scientists regional scientific community members, and key stakeholders focusing on the central question:

How can we better coordinate among climate and agriculture projects to relevant science to stakeholders in the region?

Our goals for the session were:

1. To bring everyone up to date on the current breadth and depth of research;
2. To discuss the benefits and challenges of conducting trans-disciplinary, integrated projects;
3. To expand to a "more than the sum of the parts" cross-project integration in terms of generating outcomes from the federal investment; and
4. To clarify tangible "next steps" for coordination of ag climate science.

Pictured, left to right: Chad Kruger, WSU, CSANR; Aaron Carter, CSS, WSU, TCAP project; Liz Whitefield, Animal Sciences, WSU; Jennifer Adam, Department of Civil and Environmental Engineering, WSU, representing BioEarth; & Sanford Eigenbrode, Plant Soils and Entomological Sciences, UI.

Key conclusions:

1. By coordinating our efforts we can leverage for continued federal funding and support and lead the world for agriculture and climate change.
2. Panelists identified sharing instrumentation, cyber-infrastructure and data management tools; coordinating graduate education opportunities; and generating researchable topics—much of which is already in progress—as key sites for collaboration.
3. **Stakeholders in the audience had the clearest message:** How can we overcome the major logistical challenge for those outside of the research institutions to find out which project(s) or scientist(s) are doing work that is relevant to their interests. There was a clear call for a "one-stop-shop"-type of interface to help connect information users with the most relevant science generated from each of the projects and scientists
4. The final conclusion was that we need to create a regular meeting space for interaction among projects. Some of this is underway (often due to the fact that several faculty PI's participate in multiple projects), but it has largely been informal to date. The potential for coordinating with a venue such as PNW Climate Conference seemed to be the most realistic strategy for formalizing inter-project communication.

To meet these ends, the PNW Climate Conference was an important early step toward concerted orchestrated and relevant research, extension and teaching for climate change and agriculture.



The Long Term Experiments at Columbia Basin Agricultural Research Center

Steve Petrie and Stephen Machado

The dryland cropping system practiced in the intermountain Pacific Northwest is unique in North America because most precipitation is received in the winter months while summer months are hot and dry. This rainfall pattern, coupled with highly productive soils, is conducive to the production of high winter wheat yields under the summer fallow cropping system. Unfortunately summer fallow systems have been associated with excessive soil erosion and loss of soil organic matter.

Many management aspects of dryland cropping systems, such as variety development, fertilizer recommendations, and pest management, can be studied in short term experiments lasting a year or two. Results from these short term experiments form the backbone of our crop management recommendations.



Year Initiated	Experiment Name	Treatment Variables
1931	Grass Pasture	None
1931	Continuous Cereal	Fertility
1931	Crop Residue	Nitrogen, Manure, Burning
1940	Tillage-Fertility	Tillage, Fertility
1963	Wheat-Pea	Tillage
1982	No-Till Wheat	Nitrogen
1997	No-Till Continuous Cereal	Tillage
2002	Sherman Station LTE	Tillage, Crop Rotation

The Long Term Perspective

In contrast, studying the effects of crop management practices on soil biological, chemical, and physical properties requires many years of research because the changes occur very slowly and are only evident after many years. The Columbia Basin Agricultural Research Center (CBARC) is home to several on-going Long Term Experiments (LTEs) with the oldest dating back to 1931 while the most recent was established in 2003. The trials are located at the CBARC Pendleton (OR) Station except for the most recent trial which was established as the CBARC Sherman Station near Moro, OR. All trials have a documented history of crop variety, tillage practices used, nutrient applications, date of seeding, and grain yield. The studies are representative of most of the cropping systems in the Pacific Northwest intermountain cereal region that receive less than 18-inches of precipitation. The trials are summarized in the table at bottom left.

Why are LTE's important?

These trials are an invaluable resource since changes in soil organic matter and other fundamental characteristics of the soil often take 10 or 20 years, or even more, to become evident and measurable. For example, it took 30 years for the results from the Crop Residue study to reveal that applying one ton of pea vines per acre did not maintain soil organic matter. It is now clear that only the application of 10 tons of manure per acre will maintain soil organic matter. The results from the continuous cereal research has shown that continuous winter wheat (no fallow) is a viable practice when the rainfall is 16 inches or greater.

Now, these LTE's are being used to study the impact of crop production systems on greenhouse gas emissions and carbon sequestration, concepts that did not even exist when the oldest trials were established in the 1930's.

Upper right: Wheat-Pea long term experiment.

Lower right: Seeding the crop residue on the Long Term Experiment at the Pendleton Station.

Table: Summary of the long-term research experiments at CBARC.

REACCHing Out to Stakeholders: The Culture of Agriculture

Leigh Bernacchi and Stephanie Kane

Farming is an occupation of patience, self-determination, and the kind of wisdom that works within the constraints and opportunities of what cannot be controlled—especially weather. According to author Eric Hoffer, this is the definition of creativity: “Creativity is the ability to introduce order into the randomness of nature.”

In order to understand the creative capabilities for the Pacific Northwest, University of Idaho Rural Sociologist J.D. Wulfhorst, post-doctoral researcher Leigh Bernacchi and Social Science Research Unit (SSRU) project manager Stephanie Kane focused on two groups within agriculture cycle: producers and consumers.

For producers, a mail survey will be fielded in the winter of 2012-2013. This study covers primarily:

1. awareness and observation of changes in weather and climate, and
2. their ability and willingness to creatively adapt and respond their farm management practices to changes in weather and climate in the region.

Additionally, the Social Science Research Unit is wrapping up data collection for the telephone survey of residents in Idaho, Oregon, and Washington. This phone survey assessed residents’ perceptions related to climate change and agriculture. Over 1,200 completed interviews have been conducted, and the study will conclude on November 16, 2012.

What does this mean for you? Some of the same questions asked of the general public will also be asked of producers, allowing us to discern similarities and differences among producers and consumers and across the three states, and all with respect to agriculture’s relationships to climate change. By getting these results in the second year of the project, REACCH researchers will have a clearer picture of what we need to learn and who their work serves—everyone from the producer to the consumer and back again.

Announcements and Updates!

Calling All Middle and High School Teachers

You are Invited to an Upcoming Teacher Webinar

Comparing biological categorization methods in the classroom: A discussion of taxonomy and functional groups. We’ll introduce functional group categorization and share activities that describe classifying organisms and relating their densities to processes and management in agroecosystems.

Wednesday December 5th, 3:30-5:30pm

Register online:

www.reacchpna.org/resources/conferences

Open to Middle and High School Teachers across the Inland Northwest.

Hold the Date!

The second REACCH Annual Meeting will be held in **Portland, OR Feb. 13-15, 2013** at the Courtyard by Marriott Portland City Center.

Watch the reacchpna.org website for updated information and agenda. We have a full schedule planned for stakeholders, students and researchers. Hotel reservations must be made by Jan. 29. Phone 1-800-606-3717 and ask for the REACCH group rate, or online and enter the group code:

www.myfavoritecourtyard.com

Group Code: “REAREAA” or REAREAB”

See you in the City of Roses!

For more information about the Pacific Northwest Climate Conference discussed in Chad’s article, please visit:

pnwclimateconference.org

Have you noticed our school pride? Each issue features the school colors of our contributing universities: **Beaver Orange**, **Cougar Crimson**, and **Vandal Gold!**

The OutREACCH

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