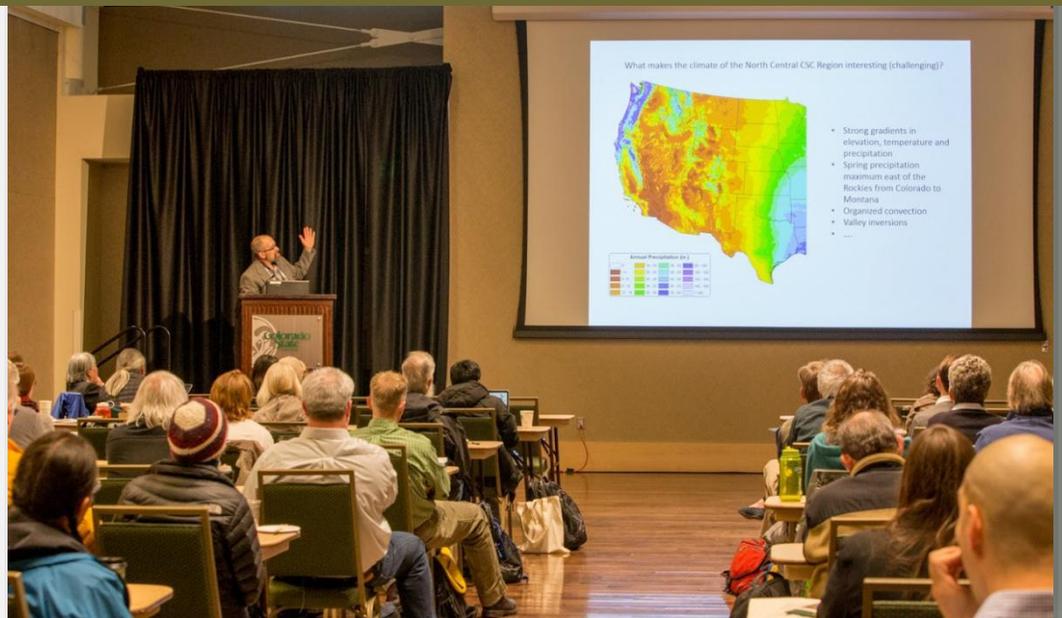


2015

NC CSC Open Science Conference Summary Report





2015 OPEN SCIENCE CONFERENCE

*Integrating Research and Management of Change
from the Mountains to the Plains*

2015 NC CSC Open Science Conference Summary Report

May 20-22, 2015 – Lory Student Center, Colorado State University

The 2015 Open Science Conference at CSU offered research scientists and stakeholders the opportunity to actively engage with the North Central Climate Science Center. The conference brought the topics of western science, indigenous perspectives, and land management needs together to both assess what the North Central Climate Science Center has achieved and chart a path forward to build on successes and fill gaps in our current understanding. This was one step in many used to help inform the ReVAMP framework and advance the mission of the center to bring the best available climate to bear on land management actions in the region.

In addition to the conference, the NC CSC offered a **two-day training session, May 18th & 19th**, for graduate students, postdocs, and early career scientists and managers from the North Central region. This training introduced the ~20 attendees to the foundational science areas and tools used at the NC CSC.

A number of key themes emerged from the conference, including: producing actionable science and making research useful and usable by resource managers; collaboration that incorporates the end user from the first stages of research; creating climate-smart plans for drought planning and management in partnership with our indigenous colleagues; recognizing and working through climate uncertainty; and understanding the context of on-the-ground management.

Attendance

- ~120 attendees
- Representation
 - from Colorado: 70, other states: ~50
 - from NCUC institutions: CSU, Montana State, Iowa State, University of MT, CU, University of NE, University of WY
 - managers/government agencies/NGOs: 46
 - students: 27
- Wide array of disciplines represented
- It was a struggle to get managers to attend (time and money considerations), although many attendees would have liked to see more of them there.

Expenses and Revenue

Expenses

poster rental	\$260.00
LSC room charges	\$1,867.50
conference services	\$5,963.70
LSC AV/rental needs	\$931.21
Catering	\$9,907.46
alcohol/bartending expenses	\$378.95
materials/conference packet	\$1,415
abstract management	\$1,000
logo design/advertising	\$425
Printing	\$400.95
Supplies	\$151
gifts (Red Alert books)	\$61
travel support*	\$12,285.38
Bull Bennett honorarium	\$500
stipends for CPD students	\$240
conference services printing	\$120
conference services credit card fee	\$567
	<hr/>
	\$36,474

Revenue (registration fees): \$19,385

Amount covered by NC CSC accts: \$17,089

Agenda and presentations

The conference program included a mix of invited plenary sessions, contributed oral sessions, contributed poster sessions and breakout group discussions. Keynote speakers included Dr. Ben Bobowski (National Park Service), Dr. Jennifer Gimbel (Assistant Secretary for Water and Science, DOI) and Dr. Dan Wildcat (Haskell Indian Nations University).

The conference opened with a keynote speech from Jennifer Gimbel, who commented on the importance of considering climate change holistically and at appropriate ecological scales. She highlighted the importance of context in understanding the reality that resource managers plan and execute decisions inside of, and concluded by stating that the NC CSC's solicited management projects represent the type of "partnerships that are needed all over the country."

The second day of the conference opened with a presentation by Ben Bobowski who discussed the need for science to be directly applicable to management on the ground. He commented on the fact that managers, like M*A*S*H* units, work in a day-to-day reactionary mode to ensure safety and the effective operation of programs in their regions. He went on to mention that through meaningful

collaboration with climate scientists, decision-makers are able to plan for long-term changes and consider more broad and far-sighted objectives.

Thursday concluded with a compelling banquet dinner and conversation with Dan Wildcat. Dr. Wildcat discussed the need for a change in perspective on how we consider the environment around us as a “resource” for consumption, and continued to mention the indigenous thinking that has influenced his own perceptions of how to prepare for a changing climate.

Science needs

On the final day of the conference, conference attendees split up into break-out groups to discuss outstanding science needs related to climate change and its impact in the region. The break-out groups were divided by ecosystem type – Rocky Mountains/High Elevation, Great Plains Terrestrial, and Wetlands/Streams/Riparian Areas. Each group was asked to brainstorm a list of unanswered science needs from their perspective. These lists of science needs were then compiled and sent out to all NC CSC Foundational Science leads and funded PIs to catalogue which research groups are working on which needs (either as a primary focus or indirectly) to see if we are meeting the needs of our stakeholders with our research projects, and to see if there are gaps in our research questions that stakeholders would like us to investigate. Interestingly, all science needs from all three groups are being addressed either directly or indirectly by at least one funded project. Appendix A contains the science needs and summary of how many funded projects are addressing that need.

What was learned?

When post-conference evaluation respondents were asked what the single most valuable thing they learned at the conference was, there were a variety of responses. Eight of 36 comments pertained to the benefits of a deeper understanding or interaction with tribal/indigenous knowledge. Other valuable knowledge included: increased information of how LCCs are approaching climate change; cultural considerations in research and how to collaborate across disciplines; greater knowledge of the NC CSC and what work is being done, as well as climate datasets and resources that are available; greater knowledge about the current and future work, priorities, goals and direction of all CSCs; the importance of communication between scientists, practitioners and stakeholders; the extent of on-the-ground adaptation efforts; networking and who is doing what; actionable science projects; usefulness of climate outlooks and models; uncertainty in decision making processes; scenario planning advances; climate and hydrological modeling and downscaling; dilemmas and views of managers working in the field; viewpoints of researchers looking at climate change issues from many fields; including climate projections and research into decision making; and the breadth and depth of ongoing work on climate change.

Social science research in region (from review of accepted conference abstracts)

As the NC CSC has committed to building a better understanding of the social-ecological context of climate change and land management issues, it is worth noting that a portion of the conference pertained to this theme. There were 14 contributed oral presentations at the conference that included

social science and nine poster presentations. The focus of the social science research was varied and included:

- Assessing adaptive capacity to climate-induced disturbances (water governance)
- Development and use of narrative climate scenarios
- Research on responses to climate scenarios (how managers interpret climate information)
- Delivering management relevant climate science (assessing needs)
- Climate change and invasive species impacts on the cultural expression of an indigenous culture
- Vulnerability and risk assessment and response capacities to drought (decision support tools)
- Renewable energy in tribal communities (community-led adaptation planning)
- Findings from 3rd National Climate Assessment – Indigenous Peoples, Lands and Resources
- Landscapes by Design: integration of climate change information into the co-management of shared conservation priorities
- Decision support tools for water managers (water system management)
- Learning about stakeholder needs and enhancing adaptive capacity (WWA review)
- Developing usable climate tools for land managers
- Multi-sectoral adaptation planning (wildlife, watersheds and livelihoods)
- Making climate research useful for decision-makers
- Understanding climate sensitivities and needs of decision-makers and natural resource managers (adaptation barriers)
- Human and natural systems research in US emergency management frameworks (effective adaptation)
- Development of regional climate summaries and scenario planning workshops
- Interdisciplinary drought risk research – physical drought and risks to stakeholders (water management conflict)
- Engaging stakeholders to assess capacity for increased water storage
- Sustainable farming – farm business planning, adaptation ecology

Evaluations

Overall conference attendees were satisfied with the conference. Ninety-eight percent of respondents to the post-conference evaluation reported that they were very or somewhat satisfied with the conference. Ninety-eight percent of respondents also reported that the information presented at the conference was very or somewhat useful and relevant. Evaluation respondents would have liked to see more on best practices for climate change assessments, more social science, as well as more hard science, more on the solutions side of research, more connections to similar efforts, a working session to develop new projects or initiatives in partnership with the center, more semi-structured discussions and question and answer time, a session on news or new developments, and less of a federal government perspective and more at the state and local level, on the ground work.

Conclusion

Overall, the conference was well attended by a good mix of land managers, tribal professionals, and academics. There was also a good mix of early, mid and more seasoned professionals. Respondents to the survey indicated some very positive outcomes and high satisfaction. Therefore it seems appropriate and useful for the NC CSC to invest in this type of conference and the NC CSC will considering conducting another similar conference in the future. However, due to administrative and logistic burden, coupled with the interest in accruing further experience, the NC CSC will like wait until 2017 or beyond for such an event.

Appendix A: Science Needs

Rocky Mountains

	Does your project address this science need as a primary focus?	Does your project address this science need indirectly?	Total
How do we understand multiple, interacting stressors, and what metrics exist for measuring them?	4	2	6
How do we deliver temporally and spatially scaled information in a timely and relevant manner?	5	1	6
What are some future achievable conditions for systems impacted by climate change?	5	0	5
How do we achieve effective communication between government, scientists, and community members?	4	2	6
How do we quantify and represent a range of possible outcomes?	7	2	9
What are ecological responses to climate stressors?	6	2	8
How do we understand and incorporate knowledge of special non-linear dynamics into climate change research?	3	2	5
What are the pros and cons of examining single species vs. holistic management approaches?	3	1	4
How are mountain and Front Range communities with small populations impacted by climate change?	2	1	3
How do we improve climate models at the regional scale?	0	4	4
What are public perspectives of climate change and how do we influence them?	1	3	4
What tools and resources exist for increased climate monitoring?	3	1	4
How do mountain types effect water use for agriculture?	1	1	2
How can we quantify the effects of local populations on climate processes?	0	1	1
What do we use as reference conditions for ecological processes?	2	3	5

Great Plains Terrestrial

	Does your project address this science need as a primary focus?	Does your project address this science need indirectly?	Total
What adaptation options are robust & practical for people to do on the ground?	3	3	6
What kinds of ecological and social tipping points do we expect to cross in 5, 10 yrs?	1	3	4
What are the effects of climate change on convective precipitation?	1	1	2
Quantitatively estimate changes in the water budget due to CC vs. land use change (magnitude)	1	1	2
Mismatch between spatio-temporal scale of ag. Decision making and climate model data (at the local level); Quality of existing info	2	1	3
How will climate change affect snowpack formation and runoff?	2	1	3
How do the economic systems connected to agriculture respond to climate change?	2	1	3
How can we provide 3, 5, 10, and 20 yr projections on climate?	2	1	3
How will climate change affect aquifer recharge?	0	2	2
What are the dynamics and possibilities for network-distributed agricultural systems?	0	1	1
How do we understand and communicate the benefits of CMIP-5 projections relative to CMIP-3?	1	1	2
How will disease vectors be influenced by climate change, and what will the effects be for livestock and wildlife populations?	0	2	2
What are the baseline physiological and environmental thresholds of key species likely to be affected by climate change?	1	3	4
How will natural habitat structure change?	3	2	5
How do we make transparent processes of model choice, and which models are best for management purposes?	2	3	5
What are the possible benefits and drawbacks of diverting urban organic waste to agricultural uses?	0	1	1

Streams/Riparian Areas/Wetlands

	Does your project address this science need as a primary focus?	Does your project address this science need indirectly?	Total
How will climate change impact ecosystems in ways that have impacts on local and regional hydrology?	3	1	4
What are the incentives for actors engaging with climate change?	1	4	5
How do we quantify and characterize natural water storage strategies?	0	2	2
How do we address barriers related to data gathering when private, public, and other land-ownership types are intermixed across a landscape?	1	1	2
How can we develop techniques and tools for scenario planning regarding future water use that take into account a broad range of end uses? (consumptive, non-consumptive, energy production, industrial, etc.)	2	0	2
How do we transition away from a carbon-based economy?	0	1	1
What is our knowledge of sustainable agricultural practices, and what are the economic considerations to be examined when aiming to transition towards such models?	0	1	1
How will evapotranspiration affect the overall water balance?	3	1	4
How will climate change affect groundwater movement and aquifer recharge?	0	2	2
How do we scale up the impact of local interventions?	1	1	2
What models exist for examining coupled human and natural systems, and how can we improve them?	1	4	5
What is the most meaningful temporal scale when examining vegetation responses in riparian and other areas?	2	1	3
How do we breakdown climate projection data into micro-climatic zones?	1	1	2
How do we understand and hope to explore as yet unidentified thresholds when considering systems impacted by climate change?	1	1	2