COLORADO FOREST RESTORATION INSTITUTE | COLORADO STATE UNIVERSITY

"It's about the people": a reflection and reading list

Traditional ecological knowledge

There are multiple ways of knowing. Traditional Ecological Knowledge (TEK) is "a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes et al. 2000). Indigenous communities use TEK to manage natural systems, as conventional land managers use scientific ecology. TEK and scientific ecology may be complementary (Tengo et al. 2014), especially as we seek to adaptively manage landscapes. As Native American educator Gregory Cajete points out, humanity has a role in the perpetuation and sustainability of natural processes—humanity is not a mere observer of the natural world. Both TEK and adaptive management paradigms acknowledge "that environmental conditions will always change, requiring societies to respond by adjusting and evolving. Adaptive management, like some traditional knowledge systems, emphasizes processes (including resource use) that are part of ecological cycles of renewability…nature cannot be controlled, and yields cannot be predicted." (Berkes et al. 2000).

Incorporating the perspectives of people who live on the landscapes that researchers seek to understand can improve the resulting science. Both climate change researchers and Inuit communities have a strong interest in the dynamics of sea ice (Laidler 2006). Though these groups approach this issue from different perspectives, their insights could be combined to strengthen both. *In situ* Inuit perspectives could address some of the fine-scale, community-specific data that atmospheric climate models and predictions often lack, while technologies such as remote sensing can bring larger-scale information to people on the ground. Communication between these groups can help make science more locally relevant and useable.

Science is a structured process for asking and answering questions, but it is a myth that science is acultural. No human system of knowledge is acultural, and the scientific academy in the West is currently reckoning with the fact that part of its culture has been the exclusion of many perspectives. Conventional scientific ecology has often failed to incorporate the voices of those populations most likely to be affected by the impacts of climate change and other environmental pressures. Approaching complex questions from multiple perspectives, and honoring multiple ways of knowing incorporates more voices, and gives us the opportunity to answer more questions more fully.

Read:

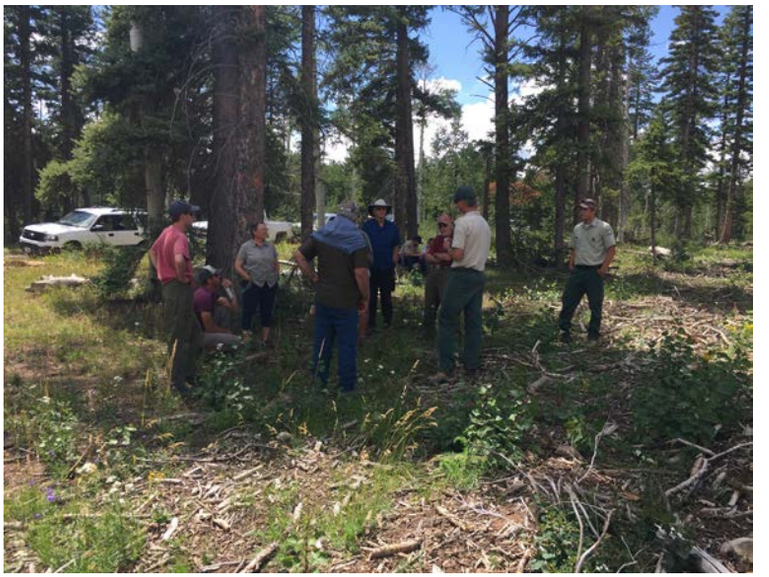
Berkes, F, Colding, J, & Folke, C (2000). Rediscovery of Traditional Ecological Knowledge as Adaptive Management. *Ecological Applications, 10*(5), 1251-1262

Tengo, M, Brondizio, ES, Elmqvist, T, Malmer, P, Spierenburg, M (2014). Connecting Diverse Knowledge Systems for Enhanced Ecosystem Governance: The Multiple Evidence Base Approach. *AMBIO, 43*(5), 579-591.

Laidler, G (2006). Inuit and Scientific Perspectives on the Relationship Between Sea Ice and Climate Change: The Ideal Complement? *Climate Change, 78*(2), 407-477.

Cajete, G (1994). *Look to the mountain: an ecology of indigenous education.* Skyland, North Carolina, Kivakí Press.

Collaboration as a path forward



How do we incorporate more voices into conversations about ecology and natural resource management? Collaborative groups that include land managers, scientists, non-profits, and community stakeholders can be an important force for improvement. On Colorado's Uncompaghre Plateau, a collaborative group in which CFRI was involved identified some of the mechanisms behind their cooperative successes (Knapp, 2010). Getting the collaborative group out into the forest kept participants grounded in the specific landscape of concern. In one case, an on-the-ground conversation created compromise between managers and conservationists; conservationists stated that they were willing to support some logging in one area to pay for restoration in another. On another transformative fieldtrip, participants helped collect data and learned firsthand what the forest had looked like in the past. As one participant stated, "The fact that the people were involved in gathering the data and then saw how the data was collected and analyzed let them buy in to the ecological justification for restoration." Collaboration and learning opportunities like these build trust, reduce litigation, and create the foundation for future cooperation.

Collaboration is challenging, and bringing diverse interests together while maintaining enthusiasm and commitment is a huge accomplishment. Challenges for collaborative processes include lack of funding, the time it takes to plan collaboratively, and potentially contentious debates. Lack of capacity for land management staff, unmet expectations, and bureaucracy and implementation hurdles can lead to frustration for members of collaborative groups. Defining expectations and metrics for success can help mitigate these difficulties.

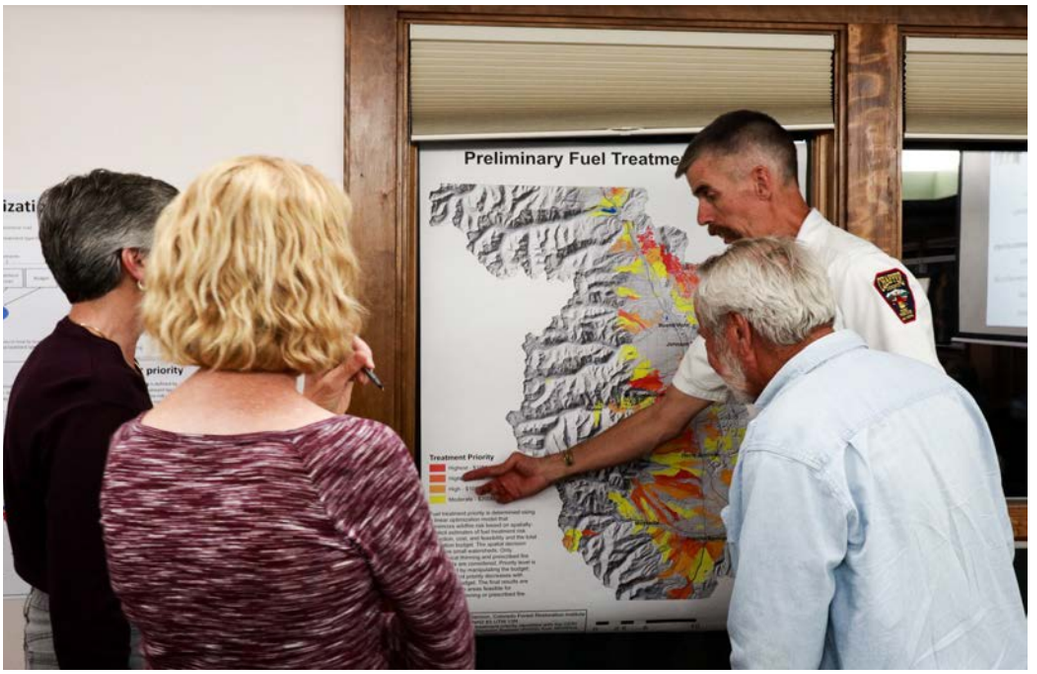
Read:

Knapp, C. (2010). Uncompahgre Mesas Forest Restoration Project: Collaborative Case Study. Colorado Forest Restoration Institute. https://cfri.colostate.edu/wp-content/uploads/sites/22/2018/03/2010_UPMesasCollaborationCaseStudy.pdf

Albrecht, M, John Buckley, J, Severson, G (2015). Understanding and Addressing Emerging Frustration Among Citizens' Collaborative Groups Interacting with the USDA Forest Service. *White Paper.* https://acconsensus.org/wp-content/uploads/2016/03/UnderstandingEmergingFrustration_Albrecht_Buckley_Severson.pdf

Using science to inform collaborative processes

Science that incorporates the views of people on the ground can empower collaboration. For example, wildfire risk assessment efforts that incorporate community perspectives about the values that are actually important to them can build consensus and encourage compromise. It is impossible to prioritize all areas of a landscape for wildfire risk reduction treatment, and it is vital to incorporate the perspectives of those living on the landscape into planning. CFRI spatial analytical capacity recently supported such an effort in Chafee County, CO. During meetings, members of the Envision Chaffee County collaborative group were given the opportunity to weight their values (life safety, infrastructure, homes, water, wildlife habitat, and recreation areas). Experts in these fields discussed likely impacts to these values from wildfire, and identified trade-offs between priorities. CFRI was able to continuously provide visual maps of these values and priorities in real time, until a compromise could be reached. Participants were able to see their values represented, and also accept trade-offs made to empower other priorities. The wildfire protection plan that was the result of this collaborative, science-based effort was adopted unanimously by the Chaffee County Commissioners in February, 2020.



Social science is also important component of collaboration, as it can identify potential stakeholders and their disparate interests. For example, one study in Utah identified the concerns that different populations have about water supply in the state (Flint et al. 2017). Interestingly, religion plays a key role in water concerns in some areas where LDS affiliation is strong. LDS respondents to the survey were more likely to be concerned about flooding, but were less likely than non-LDS respondents to be concerned about water shortage, water quality, and climate change impacts. Human responses to scientific information in natural resource contexts do not exist in a vacuum. Social science and incorporation of the human beings involved in decisions is part of a holistic strategy of land management that is necessary to avoid contention and litigation. Federal agencies are mandated to include the "best available science" in decision making around natural resources. This "best available science" should also include social science that enriches biophysical science and helps everyone ask the right questions, then do the right work in the right places.

Read:

Envision Chaffee County (2020). Next Generation Community Wildfire Protection Plan: Community Summary. https://centralcoloradoconservancy.org/land/wp-content/uploads/Wild-Fire-Protection-Plan.Review.1.10.pdf

Gannon BM. (2019). Chaffee County Wildfire Risk Assessment. CFRI-1913. https://cfri.colostate.edu/wp-content/uploads/sites/22/2020/02/Gannon_2019_Chaffee_RA_Methods.pdf

Gannon BM. (2019). Chaffee County Fuel Treatment Prioritization. CFRI-1914. https://cfri.colostate.edu/wp-content/uploads/sites/22/2020/02/Gannon_2019_Chaffee_FTP_methods-1.pdf

Flint, CG. Dai, X. Jackson-Smith, D, Endter-Wada, J, Yeo, SK, Hale, R, Dolan, MK (2017). Social and Geographic Contexts of Water Concerns in Utah. *Society & Natural Resources, 30*(8), 885-902. DOI: 10.1080/08941920.2016.1264653.

Charnley, S, Carothers, C, Satterfield, T, Levine, A, Poe, MR, Norman, K, Donatuto, J, Breslow, SJ, Mascia, MB, Levin, PS, Basurto, X, Hicks, CC, García-Quijanok, G, St. Martin, K. (2017). Evaluating the best available social science for natural resource management decision-making. *Environmental Science and Policy, 73*, 80-88. http://dx.doi.org/10.1016/j.envsci.2017.04.002.