INFORMATION ITEM

Lead Scientist Report

Summary

This month's Lead Scientist Report summarizes a recent publication from a special issue of the Proceedings of the National Academy of Science (PNAS) focused on climate change in California. In the article, Dr. Don Hankins of California State University, Chico, highlights the critical roles of indigenous knowledge in stewardship of natural resources, particularly with respect to climate resilience.

Article summary: Climate Resilience Through Ecocultural Stewardship

Don L. Hankins. 2024. Climate Resilience Through Ecocultural Stewardship. PNAS 121 (32). https://doi.org/10.1073/pnas.2310072121

The 2024 Bay-Delta Science Conference, co-hosted by the Delta Stewardship Council and U.S. Geological Survey, was honored to have Dr. Don L. Hankins of California State University, Chico, speak about ecocultural stewardship at the plenary session. Dr. Hankins also recently contributed to a special issue of the Proceedings of the National Academy of Science (PNAS) focused on California climate change. The 2024 PNAS paper is titled *"Climate Resilience through Ecocultural Stewardship"* and emphasizes the critical role of Indigenous stewardship in building climate resilience. Ecocultural refers to the interconnected relationship between ecosystems and Indigenous cultural practices, emphasizing that ecological health and cultural practices are interdependent.

Indigenous peoples, though comprising only a small percentage of the global population (6%), steward a significant portion of the world's biodiversity (~80%). Dr. Hankins attributes this disproportionate responsibility for biodiversity stewardship to historical injustices and displacement of Indigenous peoples from their ancestral

lands, which in turn meant a loss of access to and connection with their “country.” Dr. Hankins describes the term “country” as “increasingly used by Indigenous peoples to describe connections to place, encompassing lands, waters, and the broader storyscape connecting peoples and kinship (e.g., plants and wildlife) across regions.” Despite their crucial role as stewards of much of the world’s biodiversity, Indigenous peoples have historically been excluded from conservation planning efforts, which are often short-term in focus compared to the multi-generational perspective of Indigenous planning. This paper demonstrates that Indigenous knowledge and ecocultural stewardship practices are essential in adapting to climate change and enhancing both social and ecological resilience. California serves as a key example of how these practices have historically maintained biodiversity and climate resilience.

California is unique in that it is home to both significant biodiversity and a high concentration of Indigenous cultural diversity. At the same time, it faces pressing climate challenges, such as wildfires, droughts, and biodiversity loss. In the article, Dr. Hankins describes how these crises are deeply tied to the severed connections of Indigenous peoples and their country, and limited Indigenous practices such as cultural burning, multispecies kinship, reading the landscape, and water stewardship, all of which has led to a loss of land stewardship.

The article highlights fire stewardship, or cultural burning, as one of the most significant keystone processes that was suppressed. Indigenous peoples in California used fire for millennia to promote biodiversity by controlling vegetation, creating a mosaic of habitats, improving water systems, and reducing the risk of large-scale wildfires. The restoration of Indigenous fire stewardship offers a way to mitigate the wildfire crises California now faces and support ecosystem recovery. Cultural burning is also recognized for its ability to sequester carbon and produce fewer emissions than uncontrolled wildfires. There are currently early-stage collaborations between the California government and Indigenous communities to reintroduce fire as a method of wildfire management.

Dr. Hankins also uses the concept of “ʔelelte,” the Plains Miwok language word for “reading” when discussing the practice of "reading the landscape." This practice

uses sensory and spiritual awareness to understand the needs of the land and its inhabitants. This holistic approach offers unique insights into environmental stewardship that Western scientific methods often miss. The paper states that combining Indigenous knowledge with modern tools, such as remote sensing and environmental modeling, can enhance climate resilience strategies.

According to Dr. Hankins, a key difference between Western restoration and ecocultural restoration is that ecocultural restoration focuses not only on restoring ecosystems but also on revitalizing the cultural practices and knowledge systems that Indigenous peoples have used to sustain these environments for millennia. By integrating Indigenous knowledge and fostering relationships with the land and its species, ecocultural restoration supports both ecological and cultural resilience. Recognizing Indigenous sovereignty and involving traditional cultural practitioners in land stewardship is essential for achieving long-term socio-ecological resilience and sustainable management. Moreover, restoring these practices helps heal both the ecological damage and the cultural trauma caused by colonization, allowing for a more holistic recovery of both the land and the people who care for it.

Delta Science Program Activities

2024 Bay Delta Science Conference

The 2024 Bay-Delta Science Conference was held at the SAFE Credit Union Convention Center (1401 K Street, Sacramento, CA 95814) on September 30 through October 2, 2024. Approximately 800 attendees from over 228 organizations participated in the three-day, in-person event. The plenary session featured opening remarks from Delta Stewardship Council Chair Julie Lee, Assemblymember Lori Wilson, and State Water Resources Control Board Chair Joaquin Esquivel, and presentations from:

- Diana Almendariz, Cultural Practitioner of Maidu/Wintun, Hupa/Yurok Traditions, Heritage and Experiences
- Don Hankins, Professor at California State University, Chico
- Karen Morrison, Chief Deputy Director and Science Advisor for the California Department of Pesticide Regulation

The program included up to six concurrent sessions with 243 presentations, 100 posters, and 15 art submissions. A Town Hall on October 1 was organized by Delta Science Program staff led by Tricia Lee, and utilized a "Jeopardy" game show style event with Delta Science Plan trivia.

This year's theme - "Cultivating Connections in a Dynamically Changing Environment" - recognized the need for diverse perspectives to confront the multiple challenges in a dynamically changing environment such as the Sacramento-San Joaquin Delta. To cultivate this more holistic approach for conservation, sessions featured a wide variety of disciplines such as the use of traditional knowledge, identifying contaminants within and around the watershed, identifying needs of a variety of taxa, and exploring ways to mitigate climate change impacts, among other topics. Visit the conference website for more event details, including the full event program (https://www.baydeltascienceconference.com/).

Delta Science Tracker Webinar

The Delta Science Program hosted an informational webinar to share information about the Delta Science Tracker on October 8, 2024. The Delta Science Tracker provides a comprehensive platform for tracking, summarizing, and communicating about scientific research and monitoring activities in the Bay-Delta (https://sciencetracker.deltacouncil.ca.gov/). The webinar will provide an opportunity for Delta Science Program staff to highlight the tool's key features and demonstrate various uses and applications, including how the tool is being used by Delta Science Program staff to summarize implementation of the 2022-2026 Science Action Agenda. Whether you are a researcher, resource manager, or just generally interested in science-related activities in the Delta, the webinar will provide valuable insights into how the Delta Science Tracker can be used to discover the latest research insights, track funding sources and expenditures on various science and management topics, and make connections with other members of the Delta science community.

A recording of the webinar is available here: https://youtu.be/QN8rQk86Na4.

On Your Radar

Delta Science Tracker office hours

The Delta Science Tracker project team will host open office hours to answer questions and provide assistance with navigating and contributing projects to the tool (https://sciencetracker.deltacouncil.ca.gov). Upcoming dates for these office hours include:

- October 31: 11:00am – 12:00 pm
- November 6: 11:00 am – 12:00 pm
- November 21: 10:00 – 11:00 am
- December 5: 10:00 – 11:00 am

For the most up-to-date information about office hour schedules and meeting links, visit the Delta Science Tracker "Getting started" page (available here: https://sciencetracker.deltacouncil.ca.gov/get-started-delta-science-tracker).

Delta Plan Interagency Implementation Committee Restoration Subcommittee

On November 13th in collaboration with the Delta Conservancy and Restore the Delta, the DPIIC Restoration Subcommittee will host their fall meeting, which will be an in-person field tour open to the public. This tour will focus on restoration opportunities in the South Delta, which has seen the slowest rate of restoration progress in the system. The group will visit areas where restoration is currently being planned and scoped, with an emphasis on multi-benefit restoration opportunities in Stockton.

By the Numbers

Science Program staff will summarize current numbers related to Delta water and environmental management. The summary (Attachment 2) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management issues.

List of Attachments

Attachment 1: Visual Summary of Article

Attachment 2: By the Numbers

Contact

Dr. Lisamarie Windham-Myers

Delta Lead Scientist

Phone: (916) 275-6888