INFORMATION ITEM

Lead Scientist Report

Summary

Although equitable access to and use of water is a goal held by many water resource agencies, there is a lack of understanding and consensus about how to operationalize equity. In this paper, four main barriers to operationalizing equity are identified, along with pragmatic approaches for overcoming those barriers. This study is relevant to the environmental justice concerns identified as a priority in the 2019 Delta Plan Five-Year Review and highlighted in the Council's Environmental Justice Issue Paper (Objective: Identify environmental justice issues within the Sacramento-San Joaquin Delta, Delta Watershed, and areas that use Delta water).

Operationalizing equity for integrated water resources management

Cydney K. Seigerman, S. Kyle McKay, Raul Basilio, Shelly A. Biesel, Jon Hallemeier, Andressa V. Mansur, Candice Piercy, Sebastian Rowan, Bruno Ubiali, Elissa Yeates, and Donald R. Nelson. Journal of the American Water Resources Association (2022) https://doi.org/10.1111/1752-1688.13086.

Inequitable water management, planning, and policy making (*management*) have been increasingly recognized as a key hindrance to effective and fair water access and use. Despite this recognition, equity is rarely incorporated systematically into management, and vulnerable communities continue to be excluded from the management process. As socio-ecological processes like climate change and water privatization continue, it is expected that the effects of inequity will be exacerbated and felt most by vulnerable communities who will bear the brunt of negative impacts. To address this, it is important to both identify key equity barriers and outline options to diminish these barriers.

The research team convened a group of anthropologists, environmental scientists, and civil and environmental engineers from around the US who identified four main barriers to equity in management:1) vague definitions of equity, 2) the erroneous belief that there are no equity metrics that can be qualitatively or quantitively analyzed, 3) difficulty in linking equity to the current standard project management frameworks, and 4) a lack of clear examples of equity being incorporated in management. To address these barriers, the research team developed a systematic way of classifying equity considerations, evaluated how current management practices meet (or do not meet) those considerations, and developed examples of how to measure different types of equity considerations through metrics.

The team broke the concept of equity into three interconnected dimensions: distributional (distribution of benefits and harms), procedural (access to decision-making processes), and recognitional (recognition of different experiences and ethics). The three dimensions build upon each other like a tree, with recognitional equity serving as the roots (*see* Seigerman et. al. visual summary). To wholly address equity, each dimension must be addressed within management project goals, with the use of tangible metrics. Examples of metrics include population demography as site screening criteria (distributional), accessibility of informational content (procedural), and inclusion of diverse ideas within the technical approach (recognitional). To address the third and fourth barriers, Seigerman's team divided the management process into four phases: "pre-project", planning, execution, and life cycle management. For each phase, the team identified areas where common inequity issues could arise and "bright spots" which provide examples of successfully overcoming the associated issues.

In summary, Siegerman and colleagues provided a set of practical pathways for entities to equitably approach water resource planning and management. Importantly, the team noted that operationalizing equity requires systematic, collaborative, and adaptable change across local, state, and federal levels. These findings, emerging from a national-scale conversation, have direct applicability as

the Council considers next steps resulting from the Environmental Justice issue paper.

Delta Science Program Activities

Delta Residents Survey

We are excited to announce that the Delta Residents Survey research project the Delta Science Program is funding is now LIVE and should be arriving in Delta residents' mailboxes this week and next. The surveyor is aiming to reach a demographically and geographically representative sample of Delta residents and is focused on assessing residents' well-being, sense of place, and climate change experiences. All households in the rural Delta (primary zone) and a random 25% sample of households in the urban and suburban parts of the Delta, will receive invitations to participate. The invitations include instructions on how to access the survey online or how to request a hard copy be sent by mail. Council members and any members of the public are asked to please spread the word on the survey and encourage Delta residents to respond. The survey research team will use this data to build a baseline understanding of what Delta residents think about various Delta issues, how they connect to the Delta as a unique place, and how they are experiencing and adapting to climate changes. The research is being conducted by a collaborative team across CA Sea Grant, Sacramento State University Institute for Social Research, UC Davis, UC Berkeley, and Oregon State University, with leadership from Dr. Jessica Rudnick, Social Science Extension Specialist at the Council; any questions can be directed to Dr. Rudnick, and more information about the survey can be found on the Delta Science Program's social science webpage. Dr. Rudnick will be presenting an update on social science integration efforts at the Council's February meeting, where she will provide a status update on the survey.

Welcoming to the 2023 CA Sea Grant Fellows

The Delta Science Program is excited to welcome five new team members from the 2023 cohort of California Sea Grant Policy Fellows! This year we will be joined by Samantha Pyros, Pooja Balaji, Eduardo Martinez, Kiara Wallace, and Charnelle Wickliff.

Fellow joining in January

Samantha Pyros joined the IEP Lead Scientist and the Science Program January 10th and will be working on the structured decision-making models (i.e., a process for developing models with collaborative engagement from stakeholders) and process for management of smelt and salmon in the Estuary. Sam may also assist with the sturgeon sampling review to improve management efforts.

Fellows joining in February

Pooja Balaji will join the Science Communication, Synthesis, and Decision-Support unit in February 2023. Pooja received a bachelor's degree in Ecology and Conservation Biology at the University of Leeds and recently completed a master's degree in Marine Biology from the Scripps Institution of Oceanography at the University of California, San Diego, for which they studied dolphin population distributions in the eastern tropical Pacific Ocean. Among many achievements over the last decade, Pooja has provided leadership to several diversity and inclusion initiatives, served as a research assistant at the United Arab Emirates Dolphin Project, and participated in the first school team to join the International Antarctic Expedition. At the Delta Science Program, Pooja will work on a variety of projects supporting the unit's focus on science communication and synthesis, including working with Dr. Laurel Larsen on the monthly lead scientist report to the Council.

Eduardo Martinez will be joining the CSPR unit on February 1st. Eduardo received his master's and bachelor's degrees in civil engineering from California State University Los Angeles. He has worked at the Environmental Sustainability and Pollution Control Laboratory at Cal State LA and at the Origins and Habitability Laboratory at NASA/JPL. He is interested in mineral/material synthesis and in chemical (nutrient and organic) transport in groundwater, soils and sediments, and other porous media. His Master's research focused on understanding the interactions between nitrate and phosphate on synthetic iron (oxy)hydroxide minerals as a possible technique for groundwater remediation. He has also worked on understanding the interactions of organics on iron (oxy)hydroxide and iron sulfide minerals in a planetary science context. He hopes to use his scientific background to develop science backed guidelines and policy.

Fellows joining in March

Kaira Wallace will be joining the Adaptive Management Unit March 6th, 2023. She will be working to support the Delta Independent Science Board and core projects of the Adaptive Management Unit such as the biennial Adaptive Management Forum and an assessment of public-agency activities that create inroads for Native American Tribes to use their own Traditional Knowledge to inform Delta decision-making. Kaira has a Bachelors in Earth Science from UC Santa Barbara with an emphasis in Climate and Environment and a master's from the Scripps Institution of Oceanography in Climate Science and Policy.

Charnelle Wickliff will be joining the Planning Division as a Fellow starting in March 2023. Charnelle recently graduated from California State University, Monterey Bay (CSUMB) with a master's degree in Marine Science. While at CSUMB, Charnelle carried out research at the Moss Land Marine Laboratories using drones to quantify algae cover as well as impacts caused by moored ships. She brings a wealth of technical skills, including programming, Geographic Information Systems, and robotics. Charnelle will be based within the Ecosystem, Land Use, and Science Integration unit.

Welcome Fellows!

On Your Radar: 2023 Modeling Workshop

The Delta Science Program will host a two-day workshop titled "One Delta, One Science, One Modeling Framework," starting on February 28. The workshop addresses pervasive and persistent challenges in models that are used for planning and anticipating the future: 1) natural resource management models are difficult to access, understand, and use, and 2) differences in modeling approaches and assumptions (e.g., use of different climate projections) across agencies hinder achievement of the vision of "One Delta, One Science."

Objectives of the workshop are: 1) to work toward consensus on components of a common modeling framework, 2) to achieve a common understanding of recent technological developments that support open-science modeling communities elsewhere, and 3) concretely identify the potential benefits of an investment in a

collaborative modeling framework by understanding the perspectives and constraints faced by agency leadership and science managers and exploring use cases, or examples of management challenges for which the resources of a "Collaboratory" would be transformational.

The workshop will begin with a set of plenary presentations by and moderated conversations with agency leadership. The afternoon session will feature breakout discussions on potential use-cases and information sharing about technological resources. Day 2 will feature technical discussions to seek consensus on common components of a modeling framework and identify concrete next steps. A subset of participants will convene for an optional third day focused on strategies for funding the next steps.

Registration will soon be available on the Council's website and announced via listserv.

By the Numbers

Science Program staff will provide a summary of current numbers related to Delta water and environmental management. The summary (Attachment 1) will inform the Council of recent counts, measurements, and monitoring figures driving water and environmental management issues.

List of Attachments

Attachment 1: By the Numbers

Attachment 2: Visual Summary of Seigerman et. al. (2022)

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