

STRATEGY 10

Increase communication among water users, administrators, managers and academics about GDEs

Why this strategy is needed

Research has shown that polycentric approaches (e.g., co-management) that enable participants to develop rules and organizations at multiple levels can be effective for governance of common pool resources like water (Ostrom and Cox 2010), especially when different actors can find common interests; can agree on common practices, share social, economic or other ties; and share information (Kark et al. 2015). To facilitate changes for sustainability, Steger et al. (2021) argue for the incorporation of actor diversity (i.e., scientists from multiple disciplines and practitioners or stakeholders from diverse sectors and backgrounds), reflexivity (i.e., examining and questioning one’s beliefs, values, assumptions and understandings), and mutual learning (i.e., participants explore current knowledge, exchange and generate new knowledge, and understand how knowledge interacts with social and cultural contexts). Fillmore (2017) notes how traditional values and cultures of indigenous communities have often not been considered in hydrologic and environmental models but can be helpful perspectives for considering uncertainty in natural environments the indigenous communities have been resilient to for generations. Maintaining communication about ongoing and future work and new data, knowledge and tools, while building collaborative relationships, can be beneficial for managing and sustaining GDEs.

Examples of actions associated with this strategy

- Promote communication between different levels of agencies (i.e., local, state, federal, tribal), organizations, land-owners and the public to coordinate management
- Interact with Indigenous communities while respecting sovereign ownership of knowledge (Fillmore 2017)

Challenges and considerations

It can be challenging to communicate in ways that diverse stakeholders can understand and translate into action. If sharing data is an objective, combining data from multiple sources into a cohesive dataset may be difficult, especially when integrating several ways of knowing. It is important to include coordination with Tribes, ideally from the beginning of a coordinated process to consider cultural perspectives on GDEs and because indigenous knowledge can be a great source of information and potential actions. Coordination among different entities on data collection and management (e.g., a monitoring network) could enable pooling of resources and could be more effective at determining where impacts are occurring or what actions could be done to reduce impacts. As with policy strategies, it may be hard to get buy-in from senior water right holders to share information if potential actions might appear to challenge prior appropriation. This strategy could be important for moving Sci-

ence and Monitoring, Policy, and Management strategies forward, however it may be difficult to establish milestones and measure impacts of this strategy because it may need to be ongoing.

Qualitative assessment of the effectiveness of Strategy 10’s ability to reduce the impacts of each GDE stressor and threat.

STRESSOR RISK	EFFECTIVENESS
S1: Groundwater pumping status	
S2: Declining groundwater level trends	Somewhat Likely
S3: Current climate	
S4: Ungulate impacts	Somewhat Likely
S5: Non-native species presence	Somewhat Likely
S6: Surface diversions	Somewhat Likely
S7: Urbanization	
THREAT RISK	EFFECTIVENESS
T1: Appropriation status	
T2: Potential withdrawal proximity to GDEs	Somewhat Likely
T3: Future climate	Somewhat Likely
T4: Non-native species spread	
T5: Future urbanization	Somewhat Likely

