2026 CAP LTER Conference Poster Abstract

Kanter, J.[1] ***Reimagining the Central Arizona Project as Hybrid Social–Ecological Infrastructure*****.**

The Central Arizona Project (CAP) is a defining component of the region's urban–ecological system, lifting Colorado River water nearly 3,000 feet and making it Arizona's single largest energy user. As interest grows in decarbonizing water infrastructure, canal-spanning solar arrays have emerged as a promising strategy to reduce operational emissions while minimizing land-use conflicts associated with utility-scale solar development[2]. Pilot projects in California and the Gila River Indian Community demonstrate both the feasibility of canal solar and the challenges of siting and governance.

Beyond water delivery, the CAP functions as a significant hydrological and ecological barrier in the desert landscape. Constructed in part above grade, it creates berm-like conditions that interrupt surface movement and shape vegetation patterns along its edge[3]. This poster presents an interdisciplinary research project that moves beyond engineering optimization to reimagine the CAP as hybrid social–ecological infrastructure.

This project outlines design strategies to integrate canal-spanning solar, habitat enhancement, and recreational and educational programming. A central focus is a strategic redirection of water saved by solar-covered canals to strengthen riparian ecologies, connectivity, and wildlife-human corridors along the aqueduct. The research further explores frameworks for co-design, co-management, and shared ownership among regional stakeholders, advancing models of long-term stewardship. Together, these strategies align decarbonization with ecosystem functioning, governance innovation, and human wellbeing in arid urban regions.

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[2] McKuin, B. et al., 2021. Energy and water co-benefits from covering canals with solar panels. *Nature Sustainability 4*, 609–617.

[3] Hamdan, A., Stromberg, J.C., 2016. Changes in riparian plant communities due to a canal barrier traversing ephemeral stream channels in the Sonoran Desert. *Journal of Arid Environments 125*, 1–7.