

TEN STRATEGIES FOR CLIMATE RESILIENCE IN THE COLORADO RIVER BASIN

Stretching along the spine of the Rocky Mountains, across the Colorado Plateau, and within the Sonoran and Mojave Deserts, the Colorado River Basin is uniquely vulnerable to a wide range of hydrological, ecological, social, and economic impacts from climate change. Over the past two decades, the Colorado River Basin has experienced an ongoing decline in stream flows, record-setting heat, some of the driest years ever recorded, and previously unimaginable catastrophic fires. The scale and pace of climate-related changes pose an increasing risk to the reliability of water supplies that support humans and the environment.

The recently released report *Ten Strategies for Climate Resilience in the Colorado River Basin* offers an integrated path to increase water-related climate resilience and to spark action towards proactive, coordinated, and results-oriented watershed scale projects. The ten investment strategies shift the focus from managing water supply and demands in the context of drought, to implementing actions that directly adapt to, respond to, and mitigate the steady, compounding, and extreme risks of climate change to economies, communities, landscapes, and the water resources that support them.

The ten investment strategies range from well-demonstrated, to emerging, to untested at scale and address four resiliency questions.



Urban Conservation & Re-Use	Upgrading Agricultural Infrastructure & Operations	Forest Management & Restoration	Natural Distributed Storage	Covering Reservoirs & Canals
EXPERIENCED	EMERGING	EMERGING	EMERGING	THEORETICAL
Industrial Conservation & Re-Use	Cropping Alternatives & New Market Pathways	Regenerative Agriculture	Coal Plant Retirement Water	Reducing Dust on Snow

1. Could the investment strategy help the Basin *adapt to on-going climate shifts?*

Adaptation is an iterative risk management process that includes identifying vulnerabilities, project planning, implementation, and monitoring results throughout municipal sectors, agricultural operations, tribal lands, forests, and watersheds.

2. To what extent would the investment strategy *reduce pressure on existing water supplies?*

This resilience question takes a more traditional focus on augmenting supply, improving watershed yield, or reducing demand as pathways to increasing the buffer between current conditions and a future crisis.

3. Would the investment strategy help *mitigate climate change?*

While global-scale reductions in greenhouse gas emissions are necessary to address the magnitude, speed, and scale of climate change dynamics, watershed-scale investment actions can reduce regional contributions to carbon emissions and foster local practices that remove carbon dioxide from the atmosphere.

4. Could the investment strategy *strengthen economic resilience in communities?*

This question is about bolstering the sustainability or profitability of existing economic sectors or creating new jobs and businesses linked to restoration and/or infrastructure improvements.



adapt**reduce****mitigate****strengthen****Summary of Ten Investment Strategies and Benefits**

Strategy		Benefits for Climate Resilience
Forest Management & Restoration	Prioritize forest management and restoration to maintain system functionality and biodiversity	<p>Regulate snow melt runoff</p> <p>Sequester carbon</p> <p>Create jobs and reduce emergency costs</p>
Natural Distributed Storage	Restore degraded natural meadow systems to improve local aquifer recharge and water retention, reconnect historic floodplains, and support productive meadows and riparian ecosystems	<p>Build resistance to and support recovery from extreme weather events</p> <p>Sequester carbon</p> <p>Improve land value and ranch economics</p>
Regenerative Agriculture	Promote farming and ranching principles and practices that enrich soils, enhance biodiversity, restore watershed health, and improve overall ecosystem function and community health	<p>Build resistance to extreme weather events</p> <p>Enhance water-holding capacity of soils</p> <p>Sequester carbon</p> <p>Improve farm and ranch economics</p>
Upgrading Agricultural Infrastructure & Operations	Upgrade diversion, delivery, and on-farm infrastructure and operations, including irrigation systems	<p>Increase water efficiency</p> <p>Reduce consumptive use</p> <p>Sequester carbon or reduce greenhouse gas emissions</p> <p>Improve farm economics</p>
Cropping Alternatives & New Market Pathways	Develop on-farm operational shifts, as well as market and supply chain interventions, to incentivize water conservation, e.g. shifting to lower water-use crops	<p>Provide options for producers experiencing impacts to crop productivity</p> <p>Reduce consumptive use</p> <p>Reduce greenhouse gas emissions</p> <p>Improve economic viability of farms</p>
Urban Conservation & Reuse	Incentivize conservation technologies, indoor and outdoor conservation programs, and direct and indirect potable reuse	<p>Increase water efficiency</p> <p>Reduce consumptive use</p> <p>Reduce greenhouse gas emissions</p> <p>Create jobs and limit rate shocks and impacts of water shortages</p>
Industrial Conservation & Reuse	Incentivize modifications and upgrades to reduce water use and increase energy efficiencies	<p>Increase water and energy efficiency</p> <p>Reduce consumptive use and/or offset water use</p> <p>Reduce greenhouse gas emissions</p> <p>Support water-smart economic development</p>
Coal Plant Retirement Water	Purchase or reallocate water rights from closed or retiring coal plants to be used for system or environmental benefits, or other uses	<p>Dedicate water to system or environmental benefit</p> <p>Repurpose water (e.g. drinking water)</p> <p>Reduce greenhouse gas emissions</p>
Reducing Dust on Snow	Improve land management practices to reduce the dust on snow effect—which controls the pace of spring snowmelt that feeds the headwaters of the Colorado River	<p>Improve snowmelt and runoff dynamics</p> <p>Improve water yields</p>
Covering Reservoirs & Canals	Implement solutions to reduce evaporation from reservoirs and conveyance systems	<p>Reduce system loss and improve system efficiency</p> <p>Increase water supply availability</p> <p>Create cost savings</p>

Access the full report at: www.tenstrategies.net

Next Steps and Opportunities

Three near-term next steps to moving the ten investment strategies forward include:

1. Demonstration Projects & Investments. Identifying and implementing demonstration projects and shovel-ready investments that generate place-based and regional benefits and build knowledge on the applicability, scalability and co-benefits of each investment.

2. Financing. Designing a financing strategy for a diversified and coordinated project portfolio to support the implementation and monitoring of on-the-ground projects within each of the strategies.

3. Research. Developing an action-oriented research scope that monitors and tracks pilot projects to explore outcomes for the ten strategies including water supply gains, adaptation benefits, and climate mitigation potential.

As on-the-ground projects and implementation experience continue to inform how the strategies can provide cost-effective and meaningful results, developing **cross-sector partnerships** and **basin-wide funding** for such investments will be necessary to implement the strategies at a scale commensurate to the challenge. While it is too early to say precisely how such a coordinated funding approach might be sourced



and governed, there are existing federal and state programs that could be applied in a synchronized fashion with a clear water-related climate resilience goal for the Colorado River Basin. Philanthropic and private funding could be used to match or leverage these federal and state dollars. Development of such an integrated approach to water-related climate resilience funding is particularly timely for several reasons:

1. Congress, the federal administration and several Basin states are focused on bolstering climate mitigation and climate resilience, and water and watershed resilience can and should be at the cutting edge of those efforts;
2. The Basin states, tribes, and most major water providers and users in the Basin acknowledge the risks associated with climate change and are beginning to look for ways to address the risks;

3. Over the next few years, the operational guidelines for the River will be renegotiated, and the effects of climate change will be central to that negotiation. While the guidelines' negotiations are not necessarily the forum for structuring investments in these ten strategies, the guidelines' process brings a clear focus to the challenges facing the Basin and may serve to motivate a more coordinated approach to resilience; and

4. Most importantly, there is no time to waste. The effects of climate change, as manifested in a year like 2020, are here now. Many of the resilience strategies will take time to be scaled-up and produce results across the Basin's watersheds.