

# Memorandum

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**To:** Amy Woodrow, Monterey County Water Resources Agency  
**From:** Claire Sheridan and Janet Clements, One Water Econ  
**Date:** March 22, 2026  
**Re:** Economic Impacts and Ecosystem Service Benefits of MCWRA Infrastructure

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## Background

The Monterey County Water Resources Agency (MCWRA) would like One Water Econ to conduct a forward-looking, comprehensive assessment of the economic impacts and public benefits generated by the water infrastructure it has developed and manages. This assessment will focus on how these benefits accrue broadly to the public, with a particular focus on the residents of Monterey County. The goals of this effort include:

- Assess current and future economic activity supported by MCWRA infrastructure.
- Value the ecosystem service and environmental benefits supported by MCWRA infrastructure.
- Inform the allocation and recovery of costs across beneficiaries.
- Ensure consistency with parallel / related analyses that have been commissioned by MCWRA and partner agencies.

This memorandum outlines One Water Econ’s scope of work for completing this assessment.

Throughout this project, as directed by the Agency, our team will continue to coordinate with team members from parallel efforts by the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA)/ERA Economics and MCWRA/Vega Economics to ensure mutual understanding, align data inputs and analyses, and coordinate recommendations related to cost allocation and recovery mechanisms.

## Scope of Work

MCWRA’s infrastructure provides essential water supply reliability for a predominantly agricultural region. Reliable water supplies during dry periods sustain agricultural growers, ranchers, farm and ranch workers, and the broader local economy. In addition, MCWRA’s infrastructure and the water resources it manages provide a range of public benefits, including habitat provision, recreation, power generation, and other ecosystem services.

The Nacimiento and San Antonio Reservoirs, along with the Castroville Seawater Intrusion Project (CSIP) and the Salinas River Diversion Facility (SDRF), support surface water flows and ground water recharge; this analysis will not differentiate the benefits of water by source.

### Task 1: Project Management

Project management activities will ensure clear communication, efficient coordination, and timely delivery of all work products. Key tasks include:

- Virtual kick-off meeting to review this scope of work and ensure all parties are aligned with the approach, timeline, and data needs.

- Virtual participation in two (2) meetings per month with the MCWRA project manager to communicate progress, submit data requests, and update timelines, assuming a total of 16 project meetings (April – December, 2026). One Water Econ staff will coordinate scheduling of meetings, providing agendas and notes.
- Virtual participation in up to two (2) public meetings virtually, with the possibility of in-person attendance as needed. The attached budget includes one (1) in-person meeting attendance for two (2) One Water Econ personnel.
- Prepare and submit monthly invoices and progress reports.

## Task 2: Economic Impacts of MCWRA Infrastructure

Under Task 2, One Water Econ will quantify the economic activity supported by MCWRA’s management of local water resources and infrastructure. This task focuses on economic impacts—the direct, indirect, and induced economic activity associated with enhanced agricultural production and other water-dependent activities. In contrast, Task 3 evaluates economic benefits, including ecosystem services and non-market values.

### Task 2.1 Agricultural Impacts

Reliable water supplies supported by MCWRA infrastructure allow farmers to avoid crop losses during drought, maintain or improve crop quality and yields, and in some cases extend the growing season. Agriculture, in turn, drives employment, tax revenues, food-processing activity, and broader economic ripple effects across Monterey County and the region. Without reliable water, irrigated agriculture would produce less during dry years, and growers would likely shift to lower-value crops or fallow land during extended drought.

To quantify these impacts, One Water Econ will evaluate how reduced water availability affects crop yields and grower behavior across crop types. The ongoing Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) analysis (led by ERA Economics) provides a strong foundation for understanding farm-level responses to water scarcity. We will coordinate closely with the SVBGSA team to streamline data gathering, avoid duplication, and ensure alignment of data inputs and assumptions.

In addition, under this task our team will:

- Review relevant literature, such as the Monterey County Agricultural Commissioner’s November 2025 report, *Economic Contributions of Monterey County Agriculture*, which provides a strong, sector-wide baseline.
- Conduct interviews with five to seven agricultural growers and other knowledgeable experts identified by MCWRA staff to understand how reduced water supply affects production levels, crop quality, and growing season.
- Compile spatial data and reports on irrigated agriculture and rangeland and use historical weather data and climate forecasts to estimate how often MCWRA infrastructure will likely prevent reductions (or changes) in irrigated crop production in future years.

All data/analyses will be organized by DWR Bulletin 118 subbasins to reflect current management units. Modeling results from the SVBGSA analysis will inform assumptions about grower responses to reduced water availability and help establish the “no infrastructure” scenario. One Water Econ will apply crop-specific assumptions about

irrigator behavior under different water conditions and scale these assumptions based on irrigated acreage in Monterey County. MCWRA and key stakeholders will review and refine assumptions before economic modeling begins.

To quantify the economic impacts of enhanced water supply reliability for agriculture, we will use IMPLAN for Monterey County and surrounding counties. IMPLAN is an industry-standard input-output model that allows us to estimate the “ripple effects” (i.e., indirect and induced impacts) of an economic event within a local economy. In this case, we will use IMPLAN to estimate how reduced agricultural production under a “no MCWRA management alternative” would affect local economic output, employment, labor income, spending, and tax revenues. In addition to capturing impacts to sectors that supply the agricultural industry, IMPLAN recently introduced a forward linkages model, allowing us to better capture impacts on local industries that rely on Monterey County agricultural products. IMPLAN is a county level model; One Water Econ will tailor the model, as necessary, to match agricultural production within the Salinas Valley specifically.

### Task 2.2 Water Dependent Industries Impacts

A recent analysis by SVBGSA indicates that domestic, municipal, commercial, and industrial sectors also face challenges from declining groundwater levels and seawater intrusion. Under this subtask, we will extend the water supply reliability analysis beyond agriculture to evaluate how other economic sectors dependent on reliable water supply respond to changes in water availability and/or quality.

This work will include:

- Reviewing relevant literature to understand how reduced water availability affects business operations, employment, and investment decisions across Monterey County.
- Quantifying the economic output, jobs, and tax revenues MCWRA infrastructure facilitates by providing clean and reliable water supplies.

One Water Econ has conducted similar analyses at the national and local levels, using data inputs from IMPLAN as well as relevant literature on the impacts of water supply disruptions to water dependent industries. We will adapt these methods to Monterey County’s industrial and commercial landscape to estimate the economic ripple effects of water reliability across non-agricultural sectors.

### Task 2.3 Recreation Impacts

Nacimiento and San Antonio reservoirs generate significant economic activity by supporting recreation. Visitors pay entry fees, stay in local hotels, dine in restaurants, purchase fuel, and buy recreational equipment. Data collected for the 2024 Historical Benefits Analysis (HBA) Report—including visitation, visitor expenditures, and activity types—can be used as inputs to IMPLAN to estimate the economic impacts of lake-based recreation in Monterey County, including output, jobs, wages, and tax revenues generated annually.

This valuation focuses on economic activity and differs from the consumer welfare analysis described in Task 3.3, which will estimate recreational benefits from a broader public-value perspective.

### Task 3: Ecosystem Services and Environmental Benefits associated with MCWRA Infrastructure/Management

The purpose of Task 3 is to quantify and describe the ecosystem service and environmental benefits supported by MCWRA infrastructure. These benefits extend beyond direct economic activity (described under Task 2) and include the public value of agricultural landscapes, habitat and fisheries, recreation, and hydropower-related improvements.

#### Task 3.1: Benefits of Irrigated Agriculture and Rangeland

MCWRA infrastructure supports a stable and productive agricultural economy, and the agricultural landscapes it sustains provide a wide range of public benefits. Several agricultural communities in California have quantified the values of agricultural conservation easements, such as the Sonoma County Ag + Open Space [Healthy Lands & Health Economies](#) report; similar reports exist for agricultural lands in Santa Cruz and Santa Clara Counties. Our team will conduct a similar analysis, adapting methods and findings to Monterey County’s agricultural landscape.

Interviews with agricultural growers and other experts in Task 2 will inform the range of benefits provided by MCWRA infrastructure. To supplement this information, our team will conduct three to five additional interviews with local and state government entities that have evaluated agricultural benefits, such as the California Department of Food and Agriculture’s (CDFA’s) Office of Environmental Farming and Innovation (OEFI), and the Resource Conservation District of Monterey County. These interviews will help identify the full suite of potential benefits associated with irrigated farmland and pasture and support the selection of at least five priority benefits for quantitative evaluation. Benefits not amenable to quantification will be described qualitatively.

Agriculture-related benefits that may be evaluated include:

- **Wildlife habitat** – farmland and pasture can provide habitat for resident and transient wildlife (e.g. migratory birds)
- **Recreation and cultural** – farmland can provide a scenic backdrop and/or specific places for wildlife viewing, nature walks, outdoor recreation, entertainment, and educational experiences
- **Pollinator support** – farmland can provide habitat for pollinators that can help pollinate wild and cultivated plants
- **Nutrient cycling** – farmland can provide buffers that can help sequester and cycle nutrients such as nitrogen and phosphorus
- **Carbon storage** – farmland can store carbon over time, including when cultivated with specific conservation practices that encourage carbon storage
- **Wildfire protection** – agricultural areas can help protect people and property from wildfires
- **Soil Structure, Stability and Fertility** – maintaining healthy soils can reduce erosion, prevent landslides, suppress pathogens, sequester carbon, and purify water

Results from a high-level screening analysis will be presented to MCWRA during a regularly scheduled management call to prioritize and establish appropriate and desired benefits to be valued. The selected benefits will be quantified using willingness-to-pay studies, avoided cost approaches, and standard benefit transfer methods. Where relevant, values will be estimated under different water-availability conditions.

### Task 3.2: Benefits Biodiversity and Habitat from Fish Flows

Evaluating the habitat and fisheries benefits of MCWRA infrastructure requires a distinct analytical approach. Rather than comparing conditions with and without infrastructure, we will compare the value of habitat created under the fish-flow prescription instituted in 2010 to the habitat that would have been lost without these releases.

Our team has previously researched the value of fish flows for steelhead and salmon in California and will apply those findings to the Salinas Valley using a benefits transfer approach, as relevant. We also review willingness-to-pay/non-market valuation studies related to fish flows, fish habitat, and riverine preservation in this region. These studies will help estimate the value that residents place on living in a region that supports functioning fish habitat and healthy river ecosystems.

### Task 3.3: Benefits of Recreation at Nacimiento and Antonio Reservoirs

Nacimiento and Lake San Antonio provide significant recreational value to residents of Monterey County and surrounding communities. Activities such as camping, boating, fishing, hiking, swimming, and picnicking generate benefits to participants that exceed park entry fees.

For the 2024 HBA Report, One Water Econ evaluated the historical recreational benefits at both reservoirs. This analysis can be readily updated using current visitation data, applying the previous valuation framework to estimate the benefits generated by maintaining recreational amenities. To ground the analysis in present-day conditions, we will interview at least one staff member from the Monterey County Parks Department to understand current visitation patterns.

This analysis will estimate an average annual benefit value, and project ranges of possible future values to support long-term planning and cost-allocation discussions.

### Task 3.4: Hydropower generation and associated improvements to air quality

Hydropower generated at Nacimiento Dam provides a clean and inexpensive source of energy for the Bay Area Regional Transit System. By avoiding the cost of traditional gas or coal powered energy, the generation of hydropower improves air quality and reduces the costs associated with pollutant-related health outcomes. One Water Econ valued historical power generation and the benefits of avoided emissions for the 2024 HBA Report; we can estimate these benefits into the future using recent energy pricing data and projected increases. The analysis will report average annual benefit values to align with the other analyses, and project these annual benefit values forward to support long-term planning and cost-allocation discussions.

## Task 4: Cross Analysis Collaboration - Translating Benefits to Cost Recovery Allocation

MCWRA faces rising costs as its dam infrastructure ages and requires increasingly expensive maintenance. A cost-allocation framework will provide a systematic method for distributing a portion of these costs across beneficiary groups based on the benefits they receive. Findings from the economic impact and benefits analyses (Tasks 2 and 3) will inform the identification and characterization of these beneficiaries.

Vega Economics is leading the cost allocation/rate analysis for MCWRA. As directed by MCWRA, we will work with Vega and other consultants conducting parallel efforts to understand the results of their studies and determine what portion of those costs could be recovered from external sources. Our team will participate in up to five (5) meetings with other consulting teams to coordinate closely, ensuring our assumptions and recommendations

align. If our frameworks diverge in assumptions or findings, we will clearly document the basis for those differences.

### Task 5: Report & Presentations

For the final task, One Water Econ will prepare a comprehensive report describing the methods and results of the analyses conducted in Tasks 2 and 3, along with recommendations developed under Task 4. The draft report will include:

- An executive summary
- Figures and tables presenting estimates of economic impacts and monetized benefit values
- A discussion of implications for cost-recovery and allocation, developed in collaboration with other consulting teams

MCWRA staff will have the opportunity to review the draft report and provide feedback. Our team will also prepare a presentation that MCWRA can use to communicate study findings to stakeholders and decision-makers. Based on feedback from MCWRA, other consulting teams, and relevant stakeholders, One Water Econ will revise the draft and submit a final report

### Schedule and Budget

Figure 1 presents the anticipated timeline for each project task, including key deliverables and coordination meetings, with the final report scheduled for completion by the end of 2026. One Water Econ proposes delivering a full draft analysis and report to MCWRA in late October, with time for MCWRA staff and other stakeholders to review the draft in late October and early November. This allows our team time to revise the report based on comments received.

The timing of public meetings and any desired in-person meetings will be determined in consultation with MCWRA. We will work closely with the Agency to adjust the schedule as needed to align with project priorities and the timelines of related consulting efforts.

Task	2026												
	April	May	June	July	Aug	Sept	Oct	Nov	Dec				
Task 1. Project Management	★	★	★	★	★	★	★	★	★	★	★	★	★
Task 2. Economic Impacts													
Task 3. Economic Benefits													
Task 4. Collaboration/Cos Allocation													
Task 5: Reporting / Final Deliverables										★			★

★ Meetings    ★ Interim/Draft Deliverables    ★ Final Deliverables

Table 1 presents our proposed budget based on our understanding of project expectations and deliverables. We are happy to adjust the budget and associated level of effort to best meet MCWRA’s needs.

**Table 1. Proposed Budget**

Task	Description	Clements	Sheridan	Associate	Henderson	Subtotal Hours	Subtotal Cost
		\$290	\$200	\$140	\$242		
<b>1</b>	<b>Project Management</b>					<b>82</b>	<b>\$18,284</b>
	Kick Off	2	4	0	2	8	\$1,864
	Meetings with MCWRA	8	16	0	8	32	\$7,456
	Internal meetings & admin	6	16	8	12	42	\$8,964
<b>2</b>	<b>Economic Impacts</b>					<b>297</b>	<b>\$55,134</b>
2.1	Data Gathering & Interviews	0	32	36	7	75	\$13,134
2.2	Agricultural Impacts	20	20	60	10	110	\$20,620
2.3	Water Dependent Industries	10	10	30	0	50	\$9,100
2.4	Recreation	4	10	20	0	34	\$5,960
	Quality Assurance/Control	8	20	0	0	28	\$6,320
	<b>Benefits Generated by MCWRA</b>						
<b>3</b>	<b>Infrastructure</b>					<b>242</b>	<b>\$52,180</b>
3.1	Agriculture Lands	2	20	40	90	152	\$31,960
3.2	Fisheries	0	20	0	5	25	\$5,210
3.3	Recreation	0	10	0	0	10	\$2,000
3.4	Hydropower	0	10	0	5	15	\$3,210
	Quality Assurance/Control	20	20	0	0	40	\$9,800
<b>4</b>	<b>Cross Analysis Collaboration</b>					<b>35</b>	<b>\$8,110</b>
	Working sessions	5	10	0	5	20	\$4,660
	Develop recommendations	5	10	0	0	15	\$3,450
<b>5</b>	<b>Report and Presentation</b>					<b>150</b>	<b>\$33,252</b>
	Draft Report	20	40	20	40	120	\$26,280
	Presentation	4	6	0	2	12	\$2,844
	Final Report	4	10	0	4	18	\$4,128
	<b>Labor Total</b>	<b>118</b>	<b>284</b>	<b>214</b>	<b>190</b>	<b>806</b>	<b>\$166,960</b>
	Optional Travel Expenses						\$2,000
	IMPLAN Purchase						\$10,000
	<b>Proposed Total Budget</b>						<b>\$178,960</b>