



Morro Bay National Estuary Program
Bipartisan Infrastructure Law (BIL)
Semi-Annual Report
April 1, 2023 to September 30, 2023
(FY22-23 Workplan)

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1. Introduction

Bipartisan Infrastructure Law

On November 15, 2021, President Biden signed the Bipartisan Infrastructure Law (P.L. 117-58), also known as the “Infrastructure Investment and Jobs Act of 2021” (IIJA) or “BIL.” The law includes \$50 billion to the U.S. Environmental Protection Agency (EPA) for water infrastructure, the single largest investment in water that the federal government has ever made. The BIL provides \$132 million in funding for the 28 longstanding National Estuary Programs (NEPs) for fiscal years 2022 through 2026. This funding will be evenly distributed to the NEPs, annually providing each with approximately \$900,000 in BIL funds. Funding through the BIL provides a historic investment to the NEP, more than doubling the current base funding of \$750,000 per estuary annually.

A core emphasis of the NEP BIL funding is the acceleration of environmental and community restoration goals within the Comprehensive Conservation and Management Plans (CCMPs). The substantial increase in NEP funding appropriated in the BIL is expected to significantly enhance NEP capacity to do this work, as well as enable the NEPs to develop and strengthen partnerships necessary to make the most effective use of these new funds.

Environmental justice (EJ) and addressing climate change are key EPA priorities reflected in the Agency’s Fiscal Year (FY) 2022–2026 EPA Strategic Plan, which provides the framework for EPA to integrate EJ considerations into its programs, plans, and actions, and to ensure equitable and fair access to the benefits from environmental programs for all individuals. The Strategic Plan’s first two goals are to:

- “Tackle the Climate Crisis” by reducing emissions that cause climate change and accelerating resilience and adaptation to climate change impacts; and
- “Take Decisive Action to Advance Environmental Justice and Civil Rights” by promoting EJ and protecting civil rights at the federal, state, and local levels.

EPA is embedding these goals in its programs, policies, and activities, including the implementation of the NEP BIL funds. NEP projects funded through BIL should seek to:

- Accelerate and more extensively implement CCMPs
- Ensure that benefits reach disadvantaged communities
- Build the adaptive capacity of ecosystems and communities
- Leverage additional resources

Morro Bay National Estuary Program (Estuary Program)

In early 2023, the Estuary Program completed administrative grant requirements to initiate activities in the BIL FY22/23 Workplan. This workplan was approved by the US Environmental Protection Agency and the Estuary Program's Executive Committee on August 17, 2022. Our BIL spending under the grant (Grant Number 4T-98T47301) as of March 31, 2023, were \$538,037.

The Estuary Program requests EPA's continued participation on the Executive Committee and assistance with meeting relevant administrative and programmatic grant conditions. During this period, the Estuary Program continued to coordinate with EPA staff to get relevant BIL administration information, particularly related to the development of an equity strategy and BIL reporting metrics in NEPORT.

The following report summarizes activities and deliverables completed during the first period of BIL funding.

2. NEP BIL Priorities

A core emphasis of BIL funding is the acceleration of goals and actions in the Estuary Program's Comprehensive Conservation and Management Plan (CCMP). Additionally, the EPA has specified goals to be addressed by BIL-funded projects and activities. This section highlights several activities that incorporate EPA goals for BIL funding that were completed or in process during this period. These activities are specified in the Estuary Program's approved BIL FY22/23 Workplan.

Accelerate and more extensively implement the Estuary Program's CCMP

- Recruited and hired staff to support BIL projects and CCMP implementation.
- Initiated planning and early phases of several workplan tasks.

Ensure that benefits reach disadvantaged communities

- Developed an EPA approved Equity Strategy to guide BIL project prioritization and measure benefits to communities.
- Began updates to the nature center to provide increased educational opportunities.
- Developed partnerships with local environmental education organizations to increase opportunities for disadvantaged communities to access field trips and camps.
- Conducted teacher training events in partnership with Cal Poly and Project WET.

Build the adaptive capacity of ecosystems and communities

- Initiated several projects that address sea level rise and flooding impacts.
- Developed initial planning to pursue a study and concept design to restore riparian habitat by addressing a fish passage barrier modification.
- Coordinated with stakeholders and partners to begin prioritizing potential stormwater improvement projects.
- Expanded drought monitoring efforts to identify potential water conservation project opportunities.

- Acquired sensor systems to collect high-resolution water parameters to support the Central and Northern California Ocean Observing System (CeNCOOS) program that will inform changing conditions and research/modelling in the Bay.

Estuary Program Definition of Regionally Disadvantaged Communities

The Estuary Program has an EPA-approved Equity Strategy that utilizes a comprehensive and regionally applicable definition of disadvantage, through comparison of indicators across a variety of screening tools and datasets. These indicators were selected for use in identifying disadvantaged communities within the MBNEP and adjacent regions and consideration was given to the following priorities:

- Geographic scale at which data is available
- Social indicators that highlight burdens facing communities in the MBNEP region
- Indicators that demonstrate variance across the MBNEP region
- Environmental indicators with potential to be influenced by Estuary Program activities

Additional information on the Estuary Program’s definition of regionally disadvantaged communities is available in the Equity Strategy.

3. Project updates

The following section provides updates to BIL projects and activities by workplan task: capacity building, environmental monitoring and research, habitat restoration and planning, water infrastructure, and education and outreach.

Capacity Building

Capacity-1: Capacity Building

Project Status: ongoing

Objective: Increase and maintain staff capacity to support all programmatic areas including BIL administration and implementation.

Description: The addition of BIL funding requires additional staff capacity to administer and implement projects. Staff will support the administration of BIL funding, reporting, and grant/contract management. Additionally, staff will support restoration, monitoring, and education/outreach needs. This task includes increasing associated technology needs such as equipment and software to perform programmatic tasks. General monitoring and restoration equipment and supplies that can support multiple program efforts are included in this task. This activity also includes professional development training opportunities for staff.

Progress Towards Milestones: The Estuary Program successfully recruited and hired staff to build capacity to support the implementation of BIL projects. A part-time Monitoring Technician and Administrative Assistant were selected and hired. BIL funding supported a full-time Restoration Coordinator, Education & Outreach Specialist, and Monitoring Technician part-time

positions supported by the BIL funding included two Monitoring Technicians, and a Planning Intern.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: BIL-funded staff directly support BIL projects and implementation of the CCMP.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: The Estuary Program will continue to support positions and recruit a full-time Monitoring Technician.

Pending Deliverables: None.

Capacity-2: BIL Management and Equity Strategy Development

Project Status: new

Objective: Support BIL planning, management, and implementation.

Description: Conduct strategy planning for BIL projects and develop an Equity Strategy. Develop and implement reporting metrics and performance tracking methods for BIL projects and CCMP actions.

Progress Towards Milestones: The Estuary Program worked with a contractor to develop an Equity Strategy using EPA guidance. The Equity Strategy was approved by EPA Region 9 and EPA Headquarters in September 2023. Additionally, staff finalized a long-term BIL strategy that was approved by the program's Management Conference and submitted to EPA in June 2023.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: These efforts directly support the task outcome of effectively managing BIL funding and developing the Equity Strategy to guide program EJ efforts.

Problems Encountered: None.

Deliverables: Approved Equity Strategy and Long-term BIL Strategy.

Activities Planned for the Next Six Months: The Estuary Program will implement the Equity Strategy and long-term BIL strategy to support BIL workplan development and implementation.

Pending Deliverables: None.

Environmental Monitoring and Research

Monitoring-1: Tracking Bay Health

Project Status: ongoing

Objective: Collect high quality data set to support understanding of estuary health.

Description: A primary goal of the Estuary Program is to conduct monitoring to understand changing conditions. The program will continue tracking key environmental indicators, working with partners to develop and implement monitoring efforts, and collecting data related to the impacts of climate change. Efforts included purchasing and maintaining continuous monitoring sensors as part of the Central & Northern California Ocean Observing System (CeNCOOS) buoy network; supporting the Estuary Program's long-running monitoring in the bay of indicator bacteria to safeguard swimming and shellfish farming; and monitoring nutrients in the bay's waters to better understand impacts to eelgrass and other aquatic life.

Progress Towards Milestones: Staff worked with Cal Poly to purchase a third set of sensors, a meteorological station, and data logging equipment for the CeNCOOS network. Staff recruited, trained, and coordinated Cuesta College students to conduct monitoring in the bay for indicator bacteria. The volunteers are collecting high quality bacteria data from the bay to support safe swimming and shellfish farming efforts. The community college student volunteers are at the same time gaining real-life field and lab skills that may help open doors to future career pathways. The indicator bacteria data is being shared via the California Environmental Data Exchange Network (CEDEN), a State Water Resources Control Board data portal and with partners to facilitate resource management and support efforts to safeguard human health. The Estuary Program is coordinating with Cal Poly faculty and students to collect monthly nutrient samples from bay shoreline sites. To better understand bay tidal prism, staff collaborated with a Cal Poly researcher to purchase a tide height sensor to provide data to further refine the existing tidal prism calculations for the bay.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities for this task involved collecting and sharing high quality data that increases understanding of the long-term trends in ambient water quality in the estuary, promotes safe swimming and aquaculture, and supports identification of projects to address bacteria and nutrient pollution.

Problems Encountered: None.

Deliverables: Example of monthly indicator bacteria memos shared with partners. Data for [front bay](#) and [back bay](#) sites available via CeNCOOS data dashboard. [Bay Health Memo for 2022](#). Activities as described in semi-annual reports.

Activities Planned for the Next Six Months: Continue data collection and coordination with partners.

Pending Deliverables: Data managed in an Access-based system for submittal to the California Environmental Data Exchange Network (CEDEN). Monthly bacteria result memos. Bay Health Memo for Water Year (WY) 2023 summarizing indicator bacteria results.

Monitoring-2: Tracking Creek Health

Project Status: ongoing

Objective: Collect high quality data to support our understanding of watershed creek health.

Description: A primary goal of the Estuary Program is to conduct monitoring to understand changing conditions. The program will continue tracking key environmental indicators, working with partners to develop and implement monitoring efforts, and collecting data related to the impacts of climate change. Efforts will include monitoring of: bacteria indicators in watershed creeks to determine safe swimming and impacts to creek water quality; low flow conditions to assess drought impacts; creek water quality in areas impacted by agriculture; and extended deployments for water quality monitoring in creeks.

Progress Towards Milestones: Staff conducted monitoring to track key environmental indicators in the watershed. We worked with partners to complete installation of water level sensors to expand our surface flow monitoring network throughout the watershed. Staff are now collecting data for the development of rating curves. Staff developed and implemented monitoring efforts, including coordination with the Central Coast Ambient Monitoring Program (CCAMP) and the Stream Pollution Trends Monitoring Program (SPoT) to prepare for sediment and water toxicity monitoring. Sampling of surface waters and sediment was conducted in the spring, and samples were sent to a lab for toxicology analysis. Staff are currently preparing for the wet season toxicity monitoring effort. Staff worked with volunteers to monitor cross-sectional profiles in creeks throughout the watershed to track erosion and sedimentation. Staff worked with Cuesta College volunteers to collect and analyze creek samples for indicator bacteria. Staff shared the bacterial indicator results on CEDEN and via monthly bacteria memos sent to partners, agencies, land managers, and landowners. Staff conducted expanded nutrient and water quality parameter monitoring. Staff and volunteers conducted bioassessment monitoring at eleven sites in the watershed. Efforts are also underway to develop a pesticide monitoring effort in conjunction with existing toxicity and bioassessment monitoring efforts. Staff have been coordinating with the CCRWQCB and the California Department of Pesticide Regulation to develop a monitoring effort. Staff purchased water quality equipment and deployed it throughout the watershed to expand our continuous monitoring data set.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities for this task involve working with partners to develop and implement monitoring efforts to increase understanding of the long-term trends in ambient water quality in the watershed.

Problems Encountered: None.

Deliverables: A quality data set that meets the parameters outlined in the Quality Assurance Project Plan (QAPP). [Creek Health Memo for 2022](#). Monthly indicator bacteria memo (see example).

Activities Planned for the Next Six Months: Continue data collection. Submit data to CEDEN.

Pending Deliverables: Monthly bacteria memos. Data submittal to CEDEN. Creek Health Memo for WY2023 summarizing data for nutrients, oxygen, and temperature.

Monitoring-3: Eelgrass Monitoring and Research

Project Status: ongoing

Objective: Conduct eelgrass monitoring to determine distribution in the bay as well as bed health.

Description: Eelgrass is a valued habitat type in Morro Bay, providing multiple benefits. It enhances water quality and water clarity, reduces erosion, and provides habitat for wildlife. Morro Bay's eelgrass has undergone rapid changes recently, with a steep decline in acreage from 2007 to 2017 and a rebound after that. Baywide mapping of eelgrass allows for tracking of bed health and indicates when there is a need for restoration efforts. Projects will include a baywide eelgrass map in 2023 and the implementation of a macroalgae monitoring effort to understand impacts to eelgrass habitat.

Progress Towards Milestones: The selected contractor conducted drone and sonar mapping in the spring. Analysis of the imagery is underway, with a baywide map of intertidal and subtidal eelgrass expected in early 2024. MBNEP staff developed a macroalgae monitoring protocol, which was implemented in the spring. Staff are currently planning for another round of macroalgae monitoring in the fall. Staff are coordinating with Cal Poly for a drone flight of the bay in winter 2023 to collect high resolution imagery that allows for tracking eelgrass extent and health.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Monitoring and planning for mapping efforts as well as working with research partners all support the outcome of better understanding of eelgrass stressors and dynamics. This improved understanding directly supports the outcome of development of eelgrass monitoring and restoration.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: Contractor will complete the baywide eelgrass map, expected in early 2024. Macroalgae monitoring will occur in fall 2023. High-resolution drone imagery will be collected in winter 2023.

Pending Deliverables: 2023 bay-wide map of eelgrass in Morro Bay. 2023 Eelgrass Report.

Monitoring-4: Data Analysis and Management

Project Status: Ongoing

Objective: Analyze and maintain data in state-compatible format.

Description: The Estuary Program compiles and analyzes program-generated data to assess long-term trends and project-specific effects on water quality and other indicators of environmental quality. These analyses are shared with program partners, local landowners, and

the public to help inform decision-making. Data must be available in the correct format for analysis and must be maintained in a data management system that allows for easy sharing of results. Projects include: calculation of California Stream Condition Index (CSCI) scores with the program's bioassessment data to determine the relative health of a site in comparison to other areas; and updates to the program's database for storing and outputting data.

Leads, Partners, and Roles: The lead is the Estuary Program, with partner support from the CCRWQB and SWRCB who as users of the data and provide input on data collection, analysis, and sharing.

Progress Towards Milestones: Staff attends meetings of the SWRCB CEDEN staff to stay abreast of updates to the CEDEN system. Staff works directly with SWRCB staff to ensure our data is being properly loaded to CEDEN. Staff determined the necessary updates to the Access data management system and identified an appropriate contractor. CSCI analysis was completed for the 2023 bioassessment data, and analysis of the data is underway.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities such as storing and submitting data accomplished the outcome of making available to the public and state a high-quality data set that supports TMDL analysis, 303(d) assessment, land management, etc.

Problems Encountered: None.

Deliverables: Bioassessment data, including CSCI scores, were submitted to CEDEN to be shared via the publicly-available portal.

Activities Planned for the Next Six Months: Continue to work with SWRCB on CEDEN updates. Complete Access database work.

Pending Deliverables: Bioassessment Memo for WY2023.

Habitat Restoration and Protection

RESTORATION-1: Invasive Species Management

Project Status: new

Objective: Prioritize, manage, and implement invasive species management in the estuary and watershed.

Description: Identify locations and remove invasive giant reed (*Arundo donax*) within the Morro Bay watershed to support native riparian plant species. Support monitoring, possible mapping, and removal of invasive plants such as ice plant (*Carpobrotus*), salt cedar (*Tamarisk ramosissima*), cobweb bush (*Plechostachys serpylliflora*), and purple pampas grass (*Cortaderia jubata*) on the Morro Bay sandspit and adjacent estuary habitats. Explore the possibility of conducting sensitive species surveys on sandspit before invasive management. Support weed management on the restored floodplain area of the Chorro Creek Ecological Reserve (CCER).

Progress Towards Milestones: A consultant is scheduled to map *Arundo donax* and up to 19 other priority invasive species within the Chorro Creek watershed in Spring 2024. Invasive species mapping at Camp SLO has already occurred with partner funding. A survey of Morro shoulderband snails on the sandspit was completed with a consultant and Estuary Program staff to support ice plant removal permitting. Staff completed a restoration plan approved by US Fish & Wildlife Service (USFWS) for permitting to remove ice plant in the estuary. Staff coordinated with the California Coastal Commission to acquire a permit waiver to manage ice plant on the sand spit. A contract has been established to conduct the invasive ice plant management on the sand spit.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: These tasks are on schedule. Ice plant removal can only occur outside of snowy plover breeding season and is scheduled for November and December 2023. Weeding of Chorro Creek Ecological Reserve also typically occurs in the April to October timeframe.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: Complete pre-project monitoring (e.g., vegetation, Morro shoulderband snails) and ice plant removal on the sandspit. Work with the California Conservation Corps (CCC) to complete weeding of the Ecological Reserve floodplain restoration site.

Pending Deliverables: None.

RESTORATION-2: Habitat Restoration and Climate Planning

Project Status: new

Objective: Support research and planning that furthers understanding of climate impacts to estuary and watershed habitats. Implement restoration projects to improve habitat acreage or conditions.

Description: Model estuary habitat conditions under multiple sea level rise scenarios and consider adaptation actions with stakeholder involvement. Conduct a historical ecology study of the estuary and parts of the watershed to inform restoration planning, prioritization, and outreach. Finalize a Conservation Planning Initiative report that identifies relevant habitat types and key species in the Morro Bay watershed, incorporates climate change vulnerability, and prioritizes restoration/conservation efforts with measurable objectives. Continue baseline oyster surveys on the shoreline of the estuary. Further planning and designs of additional habitat restoration projects within the watershed and estuary.

Progress Towards Milestones: Staff conducted tidal marsh sediment field and lab work in partnership with USGS to inform sea level rise planning, with monitoring from January to March and again in June to September. A subaward was developed with USGS for this monitoring and modeling effort to study sea level rise impacts on tidal marshes. A partnership with the San Francisco Estuary Institute (SFEI) has been developed to establish a subaward to complete the historical ecology project. An outline of the Conservation Planning Initiative report and a mapping assessment have been completed. Match funding has also been provided to the Coastal San Luis Resource Conservation District (CSLRCD) for a State Coastal Conservancy (SCC) grant to model storm and sea level rise flood vulnerability and adaptation measures along lower Chorro Creek.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Tidal marsh sediment monitoring has been completed. USGS has initiated modeling of sea level rise scenarios and marsh impacts.

Problems Encountered: Delays due to development of subaward administrative and contractual requirements.

Deliverables: None.

Activities Planned for the Next Six Months: A draft of the Conservation Planning Initiative report will be completed. Initial modeling results of the USGS sea level rise vulnerability study will be shared.

Pending Deliverables: To be determined as contracts are completed over the next six months.

RESTORATION-3: Fish Habitat Monitoring and Improvement

Project Status: new

Objective: Support research and monitoring to increase understanding of fish habitat conditions and populations. Prioritize and further implementation of fish passage barrier improvement projects.

Description: Conduct baseline fisheries monitoring in the estuary to understand response in abundance and diversity after recent eelgrass expansion. Conduct juvenile steelhead growth and habitat use surveys in Chorro Creek watershed. Conduct pre-assessment studies to further planning of San Luisito Creek Fish Passage Barriers at Adobe Rd. in conjunction with Highway 1.

Progress Towards Milestones: A consultant was selected to complete baseline fish monitoring in the estuary in September 2023. The fall round of fish monitoring was conducted, and planning is underway for a repeat of the effort in the spring. A consultant was selected and contracted for the juvenile steelhead growth and habitat use surveys. Staff also selected a contractor for the San Luisito Creek Fish Passage Barrier monitoring and alternative assessment.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Project tasks are so far on schedule.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: Summarize and report on results of the baseline estuary fish monitoring. Complete juvenile tracking and growth study utilizing PIT tags in October 2023. A consultant will complete pre-design tasks (e.g., geomorphology, hydrology, alternatives analysis) for the Adobe Rd. barrier.

Pending Deliverables: Summary report on baseline fisheries monitoring in the estuary and juvenile steelhead growth and habitat use survey in the Chorro Creek watershed.

RESTORATION-4: Open Space Habitat and Access

Project Status: new

Objective: Further plans and implementation to restore habitat and improve conditions at coastal access sites.

Description: Collaborate with community stakeholders and partner organizations to further plans to restore habitat and improve conditions at coastal access sites. Evaluate Pasadena Point for habitat restoration opportunities and access improvements including completing a cultural resources survey. Support habitat restoration opportunities and access improvements at Sweet Springs Nature Preserve and other established and protected open spaces in the watershed. Consider further acquisitions or conservation easements for the protection of habitats.

Progress Towards Milestones: Fencing was installed at the Sweet Springs Nature Preserve to protect sensitive habitats. Estuary Program staff consulted with a landowner and The Land Conservancy of San Luis Obispo County (LCSLO) on a possible easement along the floodplain of Chorro Creek.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Staff implemented one open space access improvement with the Morro Bay Audubon Society and continue to collaborate with partners to prioritize projects.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: Coordinate with LCSLO and private landowner on possible easement and funding allocated, if needed. Work with SLO County on Pasadena Point habitat project.

Pending Deliverables: None.

RESTORATION-5: Implement BMPs in Watershed

Project Status: new

Objective: Implement best management practices (BMPs) in the watershed to support improved water quality and quantity.

Description: Collaborate with partners and landowners to prioritize and implement BMPs. A range of BMPs will be completed including improvements to gully erosion areas, roads, fencing, culverts, and others. Install fencing along riparian corridors to limit grazing. Support Cuesta College's sustainable agriculture program to install a water tank, interior fencing, and complete road improvements.

Progress Towards Milestones: MBNEP staff have a subaward with CSLRCD to complete riparian fencing and off channel watering on private lands. A draft subaward with Cuesta College has been completed to install fencing and off channel watering.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The Cuesta College final subaward agreement is slightly delayed and is expected to be finalized in the next few months.

Problems Encountered: No further problems.

Deliverables: None.

Activities Planned for the Next Six Months: Complete subaward with Cuesta College for installing agriculture program infrastructure. CSLRCD will complete the private landowner contract and share results.

Pending Deliverables: None.

Water Infrastructure

WATER-1: Stormwater Improvement

Project Status: new

Objective: Prioritize and further implementation of stormwater improvement projects that improve the health of the bay.

Description: Engage stakeholders on further planning, data collection, and prioritizing stormwater projects that could be supported with BIL funding. Further planning designs and/or permits for selected stormwater improvement project(s) in Los Osos, Morro Bay, and/or Camp SLO.

Progress Towards Milestones: MBNEP staff hired a consultant to support review of existing stormwater projects to focus on identifying those with the most benefits given costs. Staff hired a consultant to complete project planning at Camp SLO and the CCC Center, including a hydrology delineation, groundwater study, and prioritization for upcoming stormwater enhancement projects. The Estuary Program supported implementation of the Calaveras Ave. stormwater improvement project on Camp SLO, which occurred in September 2023. The project had to be slightly scaled back due to more utility infrastructure in the project area than expected.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Project is just getting underway.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: The Estuary Program will be supporting additional aspects of the Calaveras Ave. stormwater project. Results of the planning study at Camp SLO and CCC Center will be shared. BIL funding will also support partial designs on a chosen stormwater project in the watershed.

Pending Deliverables: None.

WATER-2: Groundwater Monitoring

Project Status: new

Objective: Support monitoring of groundwater for the community of Los Osos.

Description: Increasing drought and groundwater supply is a major issue, in particular for vulnerable communities. The community of Los Osos depends primarily on groundwater for its water supply. Water withdrawals are leading to saltwater intrusion into the lower aquifer. To halt this threat to the aquifer, the Los Osos Basin Management Committee and the Los Osos Community Services District (LOCSA) are planning to install monitoring and municipal wells farther to the east. This project involves supporting the installation of a monitoring well and

rehabilitation of existing well(s) to provide crucial water quality data to all purveyors in the basin.

Progress Towards Milestones: Staff worked with the LOCSO to develop a subaward agreement for the installation of a monitoring well. LOCSO completed procurement processes to select a consultant and a well drilling contractor for the project. Planning was conducted, and well installation is poised to begin. The well installation project is expected to be completed by the end of 2023.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The project supports the outcome of expanding monitoring of groundwater for the community of Los Osos to ensure access to clean safe drinking water.

Problems Encountered: None.

Deliverables: None.

Activities Planned for the Next Six Months: Complete well installation and reporting. Begin planning for well rehabilitation project for existing wells.

Pending Deliverables: None.

Education and Outreach

E&O-1: Communications

Project Status: Ongoing

Objective: Implement a communications strategy and develop multi-media content to share the story of the Estuary Program, highlight projects, and engage a variety of audiences.

Description: Enhance and develop the Estuary Program’s website, media content, and library to effectively communicate projects, highlight progress on the CCMP, and engage a wide variety of audiences.

Progress Towards Milestones: Regularly updated webpages on the Estuary Program’s website, added new pages for field trips, major CCMP projects, and educational resources, and updated photos. Community Science projects have been updated on the website. The website had 36,778 visits in the second half of FY23. Staff are continuing to develop more communication on CCMP progress for the website. A new seasonal/quarterly newsletter, *Between the Tides*, was published in August 2023 and highlighted stories from the Estuary Program field staff and education and outreach events. The newsletter is posted on the website and sent out to subscribers via email. Communications via social media have been utilizing multi-media content including five educational Reels on Instagram that had over 86,700 combined views.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Progress towards updating the Estuary Program’s website.

Problems Encountered: None.

Deliverables: Communications statistics shared in the semi-annual report (see above).

Activities Planned for the Next Six Months: Continue to update website and improve the user-friendliness of the site. Continue the quarterly newsletter and increase its reach. Develop and share more stories on CCMP progress.

Pending Deliverables: None.

E&O-2: Environmental Education

Project Status: New

Objective: Provide environmental watershed and estuary-based education opportunities for students and teachers.

Description: Develop relationship with local outdoor education organizations to support bay field trips and curriculum. Develop and implement watershed and estuary-based curriculum and projects in schools and within the watershed. Partner with local education programs to implement watershed-based teacher training to benefit students across the county through professional development opportunities for teachers.

Progress Towards Milestones: Solidified education partnerships with One Cool Earth, Camp Ocean Pines, California State Parks, and Cal Poly. Staff coordinated and hosted three teacher training workshops that focused on the Morro Bay estuary and watershed in FY23: Project WET, Project WILD, and How to Teach Nature Journaling. In total, 64 educators attended the training workshops: 29 were traditional school teachers, eight worked in the outdoor and environmental education field, and the remaining 27 were a combination of informal educators, docents, volunteers, or other categories. In the second half of FY23, we hosted seven field trips that reached 185 students. Of these field trips, 75 students were from Kings County, an inland county whose students have historically had minimal exposure to the coast.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Development of education partnerships increased educational opportunities for students and teachers and resulted in curriculum development.

Problems Encountered: None.

Deliverables: Environmental education statistics shared in semi-annual report (see above).

Activities Planned for the Next Six Months: Working on educational panels for a watershed model at Monarch Grove, a local Title I elementary school. Planning a set of three teacher training workshops in spring of 2024. Continuing to offer field trips to school groups. Working on a dedicated “watershed week” of curriculum with local nonprofit One Cool Earth to deliver to their approximately 30 schools in the county.

Pending Deliverables: None.

E&O-3: Nature Center

Project Status: Ongoing

Objective: Design and install new exhibits, upgrade and maintain exhibits, and support education and outreach programming for the Nature Center.

Description: Upgrade and redesign exhibits in the Nature Center, as well as establish education and outreach programming for the Nature Center. Integrate more technology and interactive exhibits to engage with various age groups in the Nature Center. Implement and design rotating displays. Integrate climate change and environmental justice into exhibits. Upgrade and maintain the Nature Center, including signs, flooring, paint, and display cases. Implement strategies to advertise for the Nature Center to draw more visitors. Update and maintain the virtual Nature Center on the Estuary Program website.

Progress Towards Milestones: Staff installed two new interactive exhibits including an Augmented Reality Topographic sandbox to show how water moves in a watershed with different landscapes, and a touchscreen kiosk to display additional information about the Nature Center and posters. Artwork was created for the new Nature Center entrance and a new logo was made. Staff held a series of three Storytime educational events in the Nature Center over the summer that had 37 attendees in total. The topics included sea otters in Morro Bay with Sea Otter Savvy, Mutts for the Bay messaging with Woods Humane Society, and beavers in watersheds with the SLO Beaver Brigade. The Nature Center had 12,000 visitors in the second half of FY23.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Nature Center updates support the task outcomes to create engaging exhibits and develop supplemental programming that will increase annual visitation.

Problems Encountered: None.

Deliverables: Nature Center statistics shared in the semi-annual report (see above).

Activities Planned for the Next Six Months: Staff plans to continue programming in the Nature Center and bringing field trip groups to the space. Staff will work on adding new interactive exhibits and continue space maintenance and infrastructure updates. Staff will also create a communications and advertising plan to bring in more visitors to the Nature Center.

Pending Deliverables: Programming statistics and Nature Center usage statistics.

E&O-4: Community Engagement and Stewardship

Status: New

Objective: Provide community engagement and stewardship opportunities by hosting events and partnering with environmental organizations.

Description: Partner with local nonprofit ECOSLO to implement an adopt-a-spot program in Los Osos and the Embarcadero. Establish recurring clean-up events to engage the community and address marine debris and nonpoint source pollution. Organize habitat restoration events for community volunteers to participate in project activities. Co-develop community project with indigenous tribal communities.

Progress Towards Milestones: Staff opportunistically partnered with organizations to engage the community including Woods Humane Society, Surfrider Foundation Cal Poly, Creek Lands Conservation, Camp Ocean Pines, El Camino Homeless Organization, Sea Otter Savvy, LCSLO, California State Parks, and more. Staff hosted six cleanup events at various locations in the Morro Bay watershed that cumulatively picked up approximately 75 pounds of litter. Staff implemented a new talk series called “Science on Tap” that will be hosted quarterly at different places around the watershed and county to engage with the community and share science. The first event in San Luis Obispo had approximately 30 attendees. Staff began tabling at the Downtown SLO Farmers Market and downtown Morro Bay Farmers Market approximately quarterly. Tabling at farmers markets in the second half of FY23 reached approximately 500 people. Other community engagement events that staff participated in included the Cal Poly Surfrider film festival, Beaver Fest, California State Parks family fun days and campfire programs, Boys and Girls Club camp, Snapshot CalCoast, and more.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities conducted support the workplan task outcomes of increasing volunteer engagement and developing the infrastructure to keep the estuary free of litter.

Problems Encountered: The Adopt-a-Spot program with ECOSLO has been delayed due to staffing issues at ECOSLO. Targeting an Earth Month start to the program for Los Osos and Morro Bay.

Deliverables: Event statistics included in the semi-annual report (see above).

Activities Planned for the Next Six Months: Planning and implementing Adopt-a-Spot in Los Osos and Morro Bay.

Pending Deliverables: Event statistics and amount of trash picked up.

4. Subaward Reporting

The Estuary Program utilizes subawards to manage BIL funding projects. The following efforts with partners were initiated as subawards during FY23:

- Cuesta College: Sustainable Agriculture Educational Program Support
- USGS: Salt Marsh Monitoring and Modeling to Plan for Future Sea Level Rise Impacts
- Los Osos Community Services District: Groundwater Monitoring Well Installation
- San Francisco Estuary Institute: Historical Ecology Study

As spending on these efforts are just beginning, there are not yet any financial overview results to share. Planning is underway to manage reporting for these subawards. The process will be as follows:

- Each subawardee will be contacted to determine the fiscal year under which they operate and the timing of their next financial audit that will include the subaward funds.
- Estuary Program staff will develop tracking and reporting forms for use with subawardees to review the results of any financial auditing and review for their organization.
- Estuary Program staff will develop the subaward reporting content for inclusion in upcoming BIL semi-annual reports.

5. Lab Competency Documentation

The Estuary Program utilizes laboratories that have met the certification requirements for their technical area. During FY23, the following labs were used:

For Water Quality: Following numerous struggles with Pace Analytical, staff decided during the summer of 2023 to switch analytical labs to Fruit Growers Laboratory (FGL). In 2023, we primarily used three labs, Pace Analytical (formerly BC Laboratories), FGL, and County of SLO Public Health Laboratory. All three labs maintained Environmental Laboratory Accreditation Program (ELAP) certification during this time period. The certification for Pace Analytical is available [online](#). Documentation for the county lab is [available online](#). The certification for FGL is [available online](#). Note that the state has been slow to update the certification status online. Staff contacted the labs to confirm that their certifications are still current.

For Bay Nutrient Analysis: The University of California, Santa Barbara (UCSB) Marine Sciences Laboratory conducts analysis of Morro Bay waters for nutrients. Although the laboratory is not ELAP certified, it undergoes similar steps to ensure data quality. Their detailed QA manual was provided and reviewed by Estuary Program staff, and the lab's QA activities were deemed sufficient to ensure data quality.

6. Budget Overview

Tables 1 and 2, represent costs associated with BIL activities since the beginning of the BIL grant agreement on December 12, 2022. An amendment was approved by the Executive Committee and EPA on March 16, 2023. These costs are associated with the workplan and budget for BIL funding for FY22 and FY23. The Estuary Program has a waiver for the match requirement for this workplan. Future BIL workplans will have match waived as our Equity Strategy has been approved.

Budget Overview

Table 1: Costs expended during this semi-annual report period (April 1, 2023 – September 30, 2023). These costs represent cumulative costs since the initiation of BIL activities.

Category	Subcategory	BIL FY22-23 Period 2 Funds	Total Cumulative Funds
Personnel	Salaries	\$ 100,554	\$ 153,546
	Fringe	\$ 9,732	\$ 16,613
	<i>Subtotal</i>	\$ 110,286	\$ 170,159
Supplies	Computers, software	\$ 7,904	\$ 11,407
	Monitoring supplies	\$ 14,493	\$ 36,520
	Education and Outreach supplies	\$ 16,093	\$ 17,182
	<i>Subtotal</i>	\$ 38,490	\$ 65,110
Equipment	Monitoring equipment	\$ 43,483	\$ 140,031
	<i>Subtotal</i>	\$ 43,483	\$ 140,031
Contractual	Capacity Building	\$ 24,729	\$ 24,729
	Monitoring	\$ 42,751	\$ 47,668
	Restoration	\$ 6,344	\$ 6,344
	Water Infrastructure	\$ 7,333	\$ 7,333
	Education and Outreach	\$ 5,501	\$ 5,501
	<i>Subtotal</i>	\$ 86,657	\$ 91,574
Other	Training, Prof. Dev.	\$ 3,181	\$ 3,939
	Restoration Subawards	\$ 65,748	\$ 65,748
	Water Infrastructure Subawards	\$ 1,477	\$ 1,477
	<i>Subtotal</i>	\$ 70,406	\$ 71,164
TOTAL		\$ 349,322	\$ 538,037

Table 2: Costs by Program Area and Task for BIL funding (FY22 and FY23)

Program Area	Workplan Task	BIL FY22-23 Period 2 Funds	Total Cumulative Funds
Capacity Building	Capacity-1: Capacity Building	\$ 121,370	\$ 185,504
	Capacity-2: BIL Management and Equity Strategy Development	\$ 24,729	\$ 24,729
	<i>Subtotal</i>	\$ 146,099	\$ 210,233
Environmental Monitoring and Research	Monitoring-1: Tracking Bay Health	\$ 47,225	\$ 143,773
	Monitoring-2: Tracking Creek Health	\$ 51,038	\$ 76,600
	Monitoring-3: Eelgrass Monitoring and Research	\$ 2,464	\$ 2,464
	Monitoring-4: Data Analysis and Management	\$ 0	\$ 0
	<i>Subtotal</i>	\$ 100,728	\$ 222,837
Habitat Restoration and Protection	Restoration-1: Invasive Species Management	\$ 3,227	\$ 3,227
	Restoration-2: Habitat Restoration and Climate Planning	\$ 61,470	\$ 62,852
	Restoration-3: Fish Habitat Monitoring and Improvement	\$ 3,118	\$ 3,118
	Restoration-4: Open Space Habitat and Access	\$ 0	\$ 0
	Restoration-5: Implement BMPs in Watershed	\$ 4,279	\$ 4,279
	<i>Subtotal</i>	\$ 72,092	\$ 73,475
Water Infrastructure	Water-1: Stormwater Improvement	\$ 7,333	\$ 7,333
	Water-2: Groundwater Monitoring	\$ 1,477	\$ 1,477
	<i>Subtotal</i>	\$ 8,810	\$ 8,810
Education and Outreach	E&O-1: Communication	\$ 0	\$ 0
	E&O-2: Environmental Education	\$ 2,810	\$ 3,410
	E&O-3: Nature Center	\$ 17,745	\$ 17,841
	E&O-4: Community Engagement and Stewardship	\$ 1,039	\$ 1,432
	<i>Subtotal</i>	\$ 21,594	\$ 22,683
TOTAL		\$ 349,322	\$ 538,037