



Semi-annual Report: October 2021 – March 2022

The Morro Bay National Estuary Program (Estuary Program) is moving forward on completing new and ongoing tasks in the Fiscal Year (FY) 2022 workplan. All workplans are approved by the Environmental Protection Agency and the Estuary Program’s Executive Committee. The budget report shows that our Section 320 expenses under the grant (Grant Number 98T25101) in the first half of the fiscal year were \$178,112. As of March 31, we have expended 25% of the 320 grant (started in FY22). The Estuary Program has met 60% of its match requirement for the cumulative grant with cash match and estimated current in-kind contributions (at approximately \$423,464).

The Estuary Program requests EPA’s continued participation on the Executive Committee and assistance with meeting relevant administrative and programmatic grant conditions. During this reporting period, the Estuary Program continued to address the final Program Evaluation (PE) letter, which was completed at the end of FY2020. The Estuary Program also requests participation from the EPA Project Officer in providing feedback as the update process for the Comprehensive Conservation and Management Plan (CCMP) is finalized.

The following report summarizes activities and deliverables completed during the semi-annual report period. As the Estuary Program does not have any subawards under this federal grant, a reporting of subaward monitoring activities carried out under 2 CRF 200.331(d) does not apply.

Habitat and Water Quality Protection and Restoration

Land Conservation

Objective: Conserve land to achieve Management Plan goals as opportunities arise.

Status: Ongoing task

Progress Toward Milestones: The Estuary Program has worked with The Land Conservancy of San Luis Obispo County (LCSLO) to explore easement projects in the watershed. Staff time was spent to develop these opportunities, conduct landowner outreach, and support LCSLO efforts. A conservation easement on a ranch in the San Bernardo Creek watershed is nearing completion. The project is expected to be funded with a combination of federal funding, landowner donation, and Estuary Program Restoration Fund monies in summer 2022.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: These efforts directly support the task outcome of completing land conservation projects as opportunities arise.

Problems Encountered: None.

Deliverables: None.

Activities Planned for Next Six Months: The Estuary Program plans to coordinate with the LCSLO to continue outreach to landowners and support new easements as opportunities arise.

Pending Deliverables: Updated map tracking protected lands included in next State of the Bay report. NEPORT reporting.

Restoration Maintenance and Monitoring

Objective: Conduct maintenance and complete monitoring for conservation easements and restoration projects, as necessary.

Status: Ongoing task

Progress Toward Milestones: The Estuary Program conducted flow monitoring on Pennington Creek following a project to remove a fish passage barrier and improve a water diversion. Data are submitted to Trout Unlimited on a regular basis to manage the flow diversion and comply with water rights.

The California Conservation Corps monitors plant installations success rates at the Chorro Creek Ecological Reserve (CCER) once a quarter to meet permit requirements.

Tenera Environmental, Inc. completed eelgrass restoration site monitoring at one, three, and six months depending on individual sites and when sites were planted in spring 2021.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The accomplished tasks directly support the outcomes of conducting easement monitoring and maintaining landowner communications. Efforts also support the outcome of meeting eelgrass restoration targets.

Problems Encountered: None.

Deliverables: Pennington Creek data submitted to the California Environmental Data Exchange Network ([CEDEN](#)) and shared with partners. Six-month post-planting eelgrass monitoring results submitted to California Department of Fish & Wildlife (CDFW). Tenera Environmental Eelgrass Restoration Monitoring reports.

Activities Planned for Next Six Months: The Estuary Program plans to continue post-transplant eelgrass monitoring for the spring 2022 restoration efforts. We will monitor an easement in the San Bernardo Creek watershed. We will also work with partners to address any needed restoration maintenance.

Pending deliverables: None.

Eelgrass Restoration

Objective: Develop eelgrass restoration goals based on ongoing monitoring, restoration, and research efforts with various partners.

Status: Ongoing task

Progress Toward Milestones: The Estuary Program conducted eelgrass restoration monitoring through a Restore America's Estuaries (RAE) Coastal Watersheds Grant (CWG) to fund monitoring, research, and restoration for 2021. Funding from the US Fish & Wildlife Service (USFWS) for up to five years (starting in 2020) was used to plant two additional eelgrass restoration sites at the end of March.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Estuary Program activities under this workplan task supported the long-term outcomes, which are monitoring for results to inform future recovery actions and work toward achieving numeric targets for eelgrass.

Deliverables: Activities documented in the Semi-annual report (see above).

Problems Encountered: None.

Activities Planned for Next Six Months: Spring 2022 transplanting is partially completed, and post-transplant monitoring will continue. Staff will communicate restoration results with project partners to support future research and restoration efforts.

Pending Deliverables: CDFW permit reports for 2022 restoration effort. USFWS reports for grant funding for 2022 restoration. 2021 Eelgrass Report. NEPORT Habitat submittal.

Chorro Creek Ecological Reserve Restoration Phase 4

Objective: Complete implementation of the Chorro Creek Ecological Reserve Restoration Project.

Status: Ongoing task

Progress Toward Milestones: In the first half of FY22, efforts included monitoring the site for plant survival. Additional time was spent on site to replace plant cages damaged during storm events.

The California Conservation Corps is providing labor and materials for planting and irrigating the site under the California State Coastal Conservancy (SCC) grant. The CDFW grant has closed.

The post-construction work included establishing the monitoring required by the project permits. This includes the following monitoring activities:

- Frequency and extent of side channel activation: Side channel flows will be monitored with field cameras and temperature loggers on site. Adequate flows occurred during December 2021 storms to trigger the side channels.
- Success of native plantings: Revegetation efforts are being monitored through direct counting of plantings quarterly to track success over the next three to five years. There has been some reduction in planting survival, but we are still meeting permit targets two years after planting.
- Fish entrapment: Side channels will be monitored during specific flows to assess the potential for fish stranding. No fish strandings have occurred so far.

Deliverables: Progress reports for SCC funding.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Efforts conducted under this task directly support the outcome of supporting climate ready estuary goals including floodplain restoration.

Problems Encountered: None.

Activities Planned for Next Six Months: Existing plantings continue to meet target survival requirements. Plant success monitoring will continue under an SCC grant through June 2022 and then through Estuary Program funding for another year and a half. Post-project monitoring as required by the project permits will be conducted.

Pending Deliverables: Final project report for SCC grant.

Other Restoration Efforts

Objective: Engage in other restoration efforts that arise to help achieve Management Plan goals.

Status: Ongoing task

Progress Toward Milestones: The Estuary Program participated in numerous efforts to meet Management Plan goals. These included participation in the following efforts:

- San Luis Obispo (SLO) County and Caltrans effort to replace the bridge over Los Osos Creek on South Bay Boulevard.
- Collaboration and support of Coastal San Luis Resource Conservation District (CSLRCD) restoration of their Los Osos Wetland project.
- Caltrans and SLO County effort to address two fish passage barriers on San Luisito Creek.
- Integrated Regional Water Management (IRWM) stakeholder meetings.
- Local invasive management efforts, including managing eradication of an invasive sea lavender in the estuary.
- Working with the Coastal San Luis Resource Conservation District (CSLRCD) on monitoring results from ice plant removal on the Morro Bay sandspit.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The Estuary Program met the anticipated outputs and outcomes by staying involved in partner efforts related to the estuary as opportunities arise that support CCMP implementation and partner projects.

Deliverables: Activities described in Semi-annual report (see above).

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue work on the Conservation Planning Initiative and to continue to participate in the local restoration and management efforts listed above. Staff is also developing a project for a sea level rise vulnerability and adaptation strategies assessment, which would inform future management actions to protect estuarine habitat into the future.

Pending Deliverables: Final conservation planning document. Ice plant monitoring result summary.

Conservation and Restoration Project Development

Objective: To develop projects and funding for conservation and restoration.

Status: Ongoing

Progress Toward Milestones: Staff continues to participate in the IRWM effort at the county level, which covers issues related to stormwater management, water supply issues, water quality issues, and potential implementation projects.

In FY19, the Estuary Program completed a grant from the Resource Legacy Fund to work with the CSLRCD to educate private landowners on conservation practices such as rotational grazing, keyline ploughing, etc. and identify potential projects. With support from the Estuary Program, CSLRCD was awarded a state grant to implement a subset of these projects. CSLRCD is also adding two stormwater/sediment reduction projects sites on Army National Guard Base Camp San Luis Obispo (Camp SLO) property to address sediment sources to Chorro Creek. With increased coordination with Camp SLO, the Estuary Program financially supported project development and full designs for another stormwater project at the facility.

The Estuary Program partnered with the US Geological Survey (USGS) to develop a project to study tidal marsh habitats in the face of sea level rise and is seeking funding for the project.

Estuary Program staff supported SLO County planning efforts to improve the coastal access point at Pasadena Point in Los Osos. This access point is popular for launching kayaks and paddleboards from the beach. Because the access is through soft sand, users have been walking over salt marsh habitat to avoid the sand. The County is looking to improve the original access area to protect the marsh habitat from trampling. An initial grant wasn't funded but staff are considering tying another adjacent property into a possible access and habitat improvement project in the future.

Deliverables: Activities described in this Semi-annual report (see above).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Working with partners such as the CSLRCD to provide resources to private landowners with the end goal of implementing projects to improve water quality.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to work with partners to further the progress of stormwater management and water conservation projects. The Estuary Program will work with the CSLRCD to implement projects described above. The Estuary Program will also work with Camp SLO on stormwater implementation projects.

State Park Marina Stormwater Management Project

Objective: To implement a stormwater management project at State Park Marina.

Status: Ongoing

Progress Toward Milestones: The project is a partnership with California State Parks and California Marine Sanctuary Foundation to implement a grant from California Ocean Protection Council (OPC) for a stormwater improvement project at the Morro Bay State Park Marina parking lot. Staff developed and managed a contract to conduct pre-construction stormwater runoff monitoring. Staff worked with State Parks and other partners to make progress on the construction plans, bidding, and contracting. Construction began in early 2022 and was completed by in March.

Deliverables: 2020 and 2021 monitoring data submitted to California Environmental Data Exchange network (CEDEN).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Anticipated output is installed stormwater BMPs. Anticipated outcome is improved water quality of stormwater entering the bay.

Problems Encountered: Construction was delayed due to the withdrawal of the selected contractor and the need to select a new one. Construction is now completed, which meets the deadline for the funding source. The grant agreement has been amended to allow for an extension to conduct post-project monitoring in fall 2022 and winter 2023.

Activities Planned for Next Six Months: Post-construction and end of project reporting will be completed. Planning for post-construction stormwater monitoring.

Pending Deliverables: Final completed project report. Data submitted to CEDEN.

Aquatic Invasive Species Management

Objective: To implement management actions for pikeminnow populations in an effort to improve habitat for native steelhead.

Status: New

Progress Toward Milestones: The first year of a three-year state grant was implemented in fall 2021 to conduct pikeminnow management. Permit processing, project planning, implementation (management in creek and reservoir), and reporting were completed.

Deliverables: Annual report for 2021 pikeminnow management efforts completed by Stillwater Sciences.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Anticipated output is control of the invasive pikeminnow population and a better understanding of sustainable ratios of pikeminnow to steelhead that allow for steelhead recovery.

Problems Encountered: None.

Activities Planned for Next Six Months: The California Conservation Corps and Stillwater Sciences will be planning for pikeminnow management efforts in fall 2023.

Pending Deliverables: None.

Environmental Monitoring and Research

Monitoring Program Coordination

Objective: Continue coordination of the Monitoring Program and collect data that meets Quality Assurance Project Plan guidelines.

Status: Ongoing

Progress Toward Milestones: Staff conducted monitoring in the watershed and estuary to track long-term ambient trends and project implementation effectiveness. During the first half of FY22, the following occurred:

- While the COVID situation remained stable, staff continued to work with long-time volunteers to conduct monitoring to support understanding of bay and creek health. Staff and volunteers were able to conduct the following monitoring in the first half of FY22: 42 monitoring trips for bay water quality, 90 for bacteria, and 59 for creek water quality.
- Staff coordinated with the California Department of Public Health and local shellfish growers on monitoring related to storm flows and bacteria. This includes monitoring bacteria in Chorro Creek and monitoring freshwater seeps along the bay to track improvements in bacteria and nitrates since the Los Osos Water Reclamation Facility has come on line.
- Staff continued long-term partnership with Cuesta College, providing lecture and class materials for an oceanography course.
- Staff began working with Cuesta College Biology Department to develop a bacteria monitoring partnership that would continue the Estuary Program's long-running ambient bacteria data set while providing monitoring and research opportunities for community college students.
- Staff monitored sites watershed-wide for nutrients every other month to track long-term trends.

Deliverables: A quality dataset that meets the parameters outlined in the Quality Assurance Project Plan (QAPP). Activities described in Semi-annual report (see above).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities for this task involved collecting and sharing data, resulting in an increased understanding of the long-term trends in ambient water quality in the watershed and estuary.

Problems Encountered: None.

Activities Planned for Next Six Months: Expansion of volunteer involvement is planned for the spring, assuming that the public health situation allows us to safely work with new volunteers. The Estuary Program plans to conduct the following types of monitoring: creek water quality, creek and bay bacteria, bay water quality, seeps water quality, bioassessment, and flow.

Pending Deliverables: Creek Health memo for Water Year (WY) 2021. Sediment monitoring report for 2020 and 2021.

Monitoring Program Reporting and Analysis

Objective: Analyze data and share results with grantors, partners, local landowners, and the public.

Status: Ongoing

Progress Toward Milestones: Estuary Program staff compiled data in formats appropriate for various audiences, including academic classes, landowners, and the general public. Staff responded to requests for program-generated data. Several blog posts on monitoring-related topics were created over the year, including popular monthly “Field Updates” posts that provide a rundown of what staff have been up to in the estuary and watershed. Analysis is underway of creek and bay water quality data.

Staff completed work with a consultant to conduct California Stream Condition Index (CSCI) analysis for our historic bioassessment data. These scores are the metric now being used by the state and others to assess the impacts of water quality on the biota. The analysis was completed, and staff are conducting analysis with the metrics.

Deliverables: Activities described in Semi-annual report (see above). [Bay Health Memo 2021](#). Example monthly bacteria memo.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities conducted under this task involved analyzing data and sharing data and results with partners, landowners, and the general public. These activities directly support the task outcome of making analysis available for others to support their own efforts to protect and restore Morro Bay and its watershed.

Problems Encountered: None.

Upcoming Activities: The Estuary Program plans to respond to requests for data, create blog posts to share data, and compile bioassessment, bacteria, and water quality data to share monitoring results.

Pending Deliverables: Sediment Report for 2020 and 2021. Creek Health memo for WY 2021.

Monitoring Program Data Management

Objective: Maintain data in Surface Water Ambient Monitoring Program (SWAMP)-compatible format.

Status: Ongoing

Progress Toward Milestones: Estuary Program staff have been preparing monitoring data and submitting to CEDEN. Staff participates in State Water Resources Control Board (SWRCB) meetings to discuss updating of CEDEN. Staff worked with the SWRCB on submittal of our bioassessment and water quality data.

Deliverable: Activities described in Semi-annual report (see above).

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.

Activities Planned for Next Six Months: The Estuary Program will continue working with the SWRCB to upload data for WY 2021 and 2022 to CEDEN.

Pending Deliverables: Submittal of WY 2021 and 2022 data to CEDEN.

Monitoring Program Quality Assurance

Objective: Update and submit a Quality Assurance Project Plan (QAPP), work with reviewers to approve document, and implement necessary quality assurance measures.

Status: Ongoing

Progress Toward Milestones: The Estuary Program continues to implement the quality assurance measures contained in the QAPP to ensure data quality. A draft QAPP was submitted to EPA in September. Staff accepted the plan with no comment and the document was finalized. Staff then submitted the document to the Office of QA for the State Water Resources Control Board and the Regional Water Quality Control Board. Both entities reviewed and approved the plan.

Deliverables: Activities as described in this Semi-annual report (see above). QAPP for 2021.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: An accurate and up-to-date QAPP document directly supports the task outcome of producing a high-quality data set with data to support efforts throughout the watershed, including 303(d) and TMDL assessment.

Problems Encountered: None.

Activities Planned for Next Six Months: Staff will conduct the QA measures needed to ensure the quality of program-generated data. Staff will begin updating the 2022 QAPP.

Pending Deliverables: QAPP update for 2022.

Project Effectiveness Monitoring

Objective: Complete monitoring to show project effectiveness for various restoration projects.

Status: Ongoing

Progress Toward Milestones: Staff conducted monitoring of the freshwater seeps at the bay's edge to assess the impacts of the Los Osos Water Reclamation Facility. The Estuary Program conducted monitoring for a project on Pennington Creek to assess the impacts of a water diversion improvement project. Staff also conducted monitoring of eelgrass conditions in the bay.

Deliverables: Activities as described in the Semi-annual report (see above).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The activities under this task support the outcome of conducting monitoring and developing analysis that informs future management and restoration efforts.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue monitoring the seeps. Staff will coordinate with Cal Poly researchers on future monitoring and potential publications. Staff will also communicate with project partners to share data results and coordinate efforts.

Pending Deliverable: None.

Eelgrass Monitoring and Research

Objective: Monitor eelgrass to determine its condition and distribution in the bay.

Status: Ongoing

Progress Toward Milestones: Staff coordinated with Cuesta College faculty on their eelgrass research efforts. Staff completed the 2020 eelgrass report. California Polytechnic State University San Luis Obispo (Cal Poly) flew their drone in December 2021 to collect baywide imagery for creation of an eelgrass map. Analysis of the imagery is currently underway to create a baywide eelgrass map. Planning is underway for the spring bed condition monitoring. Our Restore America's Estuaries (RAEP Coastal Watersheds Grant (CWG) is underway, with eelgrass mapping and water quality research occurring throughout the year. Cal Poly is conducting water quality monitoring in the bay as part of this grant. Estuary Program staff is planning for permanent plot eelgrass monitoring in the spring.

Deliverables: Monitoring activities documented in the Semi-annual report (see above). RAE CWG semi-annual reports. [2020 Eelgrass Report](#).

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 eelgrass stressors and dynamics. This improved understanding directly supports the outcome of development of restoration strategies and goals.

Problems Encountered: None.

Activities Planned for Next Six Months: Staff continues to analyze the drone imagery collected by Cal Poly at the end of 2021 to create a baywide eelgrass extent map. Staff will coordinate with project partners to share our findings. Staff will continue conducting eelgrass monitoring and related water quality research for the Coastal Watershed Grant.

Pending Deliverables: 2021 Morro Bay Eelgrass Report. RAE CWG grant final report.

Partner Research Efforts

Objective: Support science partners in pursuing research efforts relevant to the goals of the Estuary Program.

Status: Ongoing

Progress Towards Milestones: Estuary Program staff coordinated and collaborated with Cal Poly, CDFW, the National Oceanographic and Atmospheric Administration (NOAA), Cuesta College, the Army Corps of Engineers (ACOE), the city of Morro Bay, and other project partners to research the causes of eelgrass decline and related water quality issues. Staff studied eelgrass monitoring and restoration methods in other areas and reached out to other researchers. Staff sought results of research efforts in Morro Bay and other areas on the west coast related to nutrients, maroalgae, sedimentation, ocean acidification, and other water quality data. Staff coordinated with Cal Poly on ocean acidification monitoring efforts in the bay. Staff collaborated with partners such as Cal Poly and USGS on future research efforts related to eelgrass, climate change, and marsh habitat. Staff worked with Cal Poly to complete the baywide eelgrass map from fall 2020, collect imagery for the 2021 map, and analyze imagery for the 2021 map. The Coastal Watersheds Grant, which began in spring 2021, funds Cal Poly and Estuary Program research, restoration, and monitoring efforts to better understand eelgrass and water quality conditions that help build coastal resiliency.

The Estuary Program continued supporting a neighboring watershed whose stakeholders are interested in creating a bioassessment monitoring effort. Estuary Program staff is mentoring the group, including Cal Poly researchers and the City of San Luis Obispo. Staff assisted in development of a project and worked with partners to select sites, review equipment, and discuss logistics. This will expand the use of this assessment tool as well as provide data for comparison to our watershed. Regional comparative data provides useful context for Morro Bay data; in addition, the mentorship role of the Estuary Program supports existing partnerships and strengthens the reputation of the Estuary Program as a reliable provider of science in our region.

Research efforts conducted in the Morro Bay estuary and watershed include:

- USGS tidal marsh elevation impacts from sea level rise (SLR).
- Cal Poly research into impact of crabs on eelgrass.
- Cal Poly research on impact of brant grazing on eelgrass.
- Cal Poly research on marine mammal relationships with eelgrass.
- Cal Poly research on bay phytoplankton populations.
- Cuesta College research on impact of *Labyrinthula spp.* wasting disease on eelgrass.
- Cal Poly research on ocean acidification in Morro Bay, in partnership with Central and Northern California Ocean Observing System (CeNCOOS).
- Synthesis report of 2021 Coastal Dunes for Resilience Workshop.
https://www.resilientcoastlines.com/files/ugd/9fc273_73eecb9787104ad1a898cb6f2dbba3b6.pdf

We also track research that is occurring elsewhere but is relevant to Morro Bay, including nutrient target development in Elkhorn Slough and pathogen TMDL development in Southern California.

Deliverables: Water quality data collected by Cal Poly partners and shared on CeNCOOS web portal for the [front bay](#) and [back bay](#).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Coordination with research partnership efforts directly supports the task outcome of improving understanding of resources in order to better target efforts such as monitoring and restoration.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to coordinate with monitoring and research partners to share data, methods, and knowledge. These partners include Cal Poly, NOAA, CDFW, USGS, EPA, the Water Board, Cuesta College, the city of San Luis Obispo, and Elkhorn Slough National Estuarine Research Reserve (NERR).

Pending Deliverables: 2021 eelgrass report. 2021 baywide eelgrass map from drone imagery.

State of the Bay Analysis

Objective: Analysis of trend and project effectiveness data for the triennial State of the Bay environmental report card.

Status: New

Progress Towards Milestones: Estuary Program staff began gathering data and conducting analysis for the 2023 State of the Bay (SOTB) report card. Staff consulted the Water Board and other experts for support in statistics and analysis.

Deliverables: None.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Conducting analysis for the report card directly supports the task outcome of sharing the results of monitoring by the Estuary Program and its partners, with the goal of increasing education on nonpoint source pollution, climate change, restoration, etc.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to complete the analysis and assist in development of the text, infographics, and other materials needed for the report card. They will also work to gather additional information for the online version of the report.

Pending Deliverables: 2023 SOTB report card (printed and online versions).

Public Participation, Education and Outreach

Communications

Objective: Communicate with a variety of audiences using presentations, printed materials, online presence, social media, and other venues.

Status: Ongoing

Progress Toward Milestones: Estuary Program staff regularly conducted the following communications tasks:

- Created regular weekly blog posts that were shared via email, website, and social media. 462 subscribers receive the blog via email each week. The blog is posted on Facebook and Twitter, and corresponding content is posted to Instagram when appropriate for the platform. Popular blog posts have as many as 1,500 reads, not including subscribers. Updated the website to share program news and upcoming digital events.
- Continued to increase the number of followers on Facebook to 2,497 users. Utilized two-way communication with these users, such as recognition of rain gauge network and cleanup participants.
- Maintained a Twitter feed that currently has 614 followers.
- Maintained an Instagram feed that currently has 2,485 followers. Launched a new Mutts for the Bay Instagram account with 69 followers.
- Maintained a LinkedIn account with 197 followers.
- Two news stories were published that covered Estuary Program-specific content and projects in the watershed. One press release was issued.
- Updated the program website to improve security. Redesigned the online library.
- Printed Clean Boating materials for distribution.
- Translated two popular brochures into Spanish and conducted graphic design and printing.
- Provided information about the impacts of marine debris and other trash and used social media and blog posts to encourage locals and visitors to participate in self-directed cleanups in the Morro Bay watershed. Participants filled out an online Trash Tracker form. We now have two groups who participate in COVID-safe cleanups at least every other week and track their data.

Deliverables: Blog posts published typically on a weekly basis at www.mbnep.org/blog. Website and social media statistics (see above). Relevant news stories available online and press releases submitted at www.mbnep.org/news.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The activities listed above enhanced communication with residents, visitors, and the general public. This works toward the task outcome of increasing their understanding of their roles as stewards of the estuary and encouraging behaviors that protect clean water.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue the communications tasks outlined above.

Pending Deliverables: Weekly blog posts. Social media statistics included in semiannual report. News stories posted to website.

Education

Objective: Develop formal education partnerships and services and continue to maintain the Nature Center and other education efforts.

Status: Ongoing

Progress Toward Milestones: Efforts to support Education included the following:

- Maintained the Nature Center and its exhibits and had 8,212 visitors during the first half of FY22. The Nature Center was open during the reporting period. The content for our Estuary Science Kiosk, which can be accessed via the internet, had about 371 users with 394 sessions and about 427 page views.
- Collaborated with SLO and Monterey Marine Protected Area (MPA) Collaboratives to print and ship a marine education focused coloring book and activity book that covers stewardship and estuarine ecology content. Both books were printed in Spanish and English and shipped to all the MPA Collaboratives statewide. They are available online in English at <https://www.mpacollaborative.org/project/mpa-coastal-explorer-guide-english-v2/> and in Spanish at <https://www.mpacollaborative.org/project/a-descubrir-areas-marinas-protegidas-guia-del-explorador-costero-de-california-2/>
- Morro Bay National Estuary Program staff also provided information, feedback, and other guidance for five undergraduate- and graduate-level student presentations focused on estuarine health and stewardship that reached 100 students.
- The Estuary Program continued discussions with staff from the Morro Bay State Park Natural History Museum on developing our educational partnership.

Deliverables: Estuary Science Kiosk statistics (see above). Fieldtrip and presentation statistics (see above in the Communications section).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The activities under this task directly support the outcome of providing formal education partnerships to share estuary-related messaging with local students.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue the Education tasks outlined above, including developing new education partnerships.

Pending Deliverables: None.

Nature Center Update

Objective: Update the content and displays in the Nature Center.

Status: Ongoing

Progress Toward Milestones: We have finished work on the design phase of a hands-on exhibit that teaches kids about the lifecycle of steelhead trout in the Morro Bay watershed and are moving on to the production phase. Staff have changed the freshwater tank to a saltwater tank and are working on permitting for the collection of species native to the Morro Bay estuary. When finished, this display will allow visitors to see species that are commonly found directly outside the Morro Bay Estuary Nature Center. Estuary Program staff will develop CCER outreach material for the Nature Center with SCC funding. Ongoing maintenance and upkeep was conducted to keep the Nature Center functioning smoothly.

Deliverables: User statistics for the Nature Center kiosk (see above in the Education section).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The updates to the Nature Center conducted as part of this task directly support the outcome of providing a learning center for the estuary that contains updated and engaging exhibits.

Problems Encountered: During this time period, the program's long-time Communications & Outreach Coordinator left the position, and a new coordinator joined the program. This transition in staff resulted in delays for this task during the reported period.

Activities Planned for Next Six Months: The Estuary Program will develop content and seek funding to update additional exhibits in the Nature Center, including plans to feature species common to the estuary in the newly updated salt water fish tank.

Other E&O Tasks/Community Partner Projects

Objective: Support outreach projects in the community that further goals of the Management Plan.

Status: Ongoing

Progress Toward Milestones: Efforts to support outreach projects in the community included:

- Partnered with ECOSLO to plan adopt-a-spot cleanups across San Luis Obispo County. ECOSLO will be creating and distributing cleanup kits to serve participants in their efforts to keep marine debris out of the waters of San Luis Obispo County. The Estuary Program will be the organizational liaison for any adopt-a-spot cleanup groups formed in Morro Bay or Los Osos.
- Participated in ECOSLO's Eco Talks program as a co-presenter with the Marine Mammal Center of Morro Bay to discuss marine debris, toxics, and other pollutants and their effects on the watershed and native wildlife.
- Working with Morro Bay State Parks staff, Creek Lands Conservation, and other community groups to create a Watershed Protectors educational activity booklet for kids.
- Working with the Monterey and SLO MPA Collaboratives on community forums discussing wildlife and recreation concerns as well as possible solutions.
- Partnered with MPA Collaborative of San Luis Obispo, MPA Collaborative of Monterey, and Statewide MPA Collaborative to develop and write a grant for upcoming projects related to the health of MPAs.
- The MPA Collaborative received funding from the Resource Legacy Fund to support regulatory signage. The project is just getting underway.

- Assisted California State Parks staff with redesign of an estuary and eelgrass-focused exhibit that will be created and displayed at the Morro Bay Museum of Natural History.
- Worked with SLO and Statewide MPA Collaboratives on educational signage related to responsible recreation. Signs are still in the design phase.
- The remotely-operated vehicle (ROV) was used in trainings and video-gathering projects by the Bureau of Land Management, the Statewide and SLO MPA Collaboratives, and Morro Bay State Park.

Deliverables: Outreach statistics (see above).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities conducted under this task directly support the outcome of coordinating with partner organizations on developing and sharing key messages.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program will continue working with the MPA Collaborative to manage the ROV for use by partners. Staff will also work with the MPA Collaborative on the Resource Legacy Fund project to produce and install regulatory signage. We will work with ECOSLO to manage the Los Osos and Morro Bay groups of adopt-a-spot cleanup crews. We will also continue working with partners on the Watershed Protectors educational activity booklet and the MPA Collaborative on assorted projects.

Pending Deliverables: ROV checkout statistics. Cleanup statistics. Watershed Protectors educational activity booklet.

Mutts for the Bay

Objective: Support pet waste management program to prevent bacterial contamination in the bay.

Status: Ongoing

Progress Toward Milestones: The Estuary Program continued its work managing the program, which included accepting and managing donations, installing and maintaining dispensers, and coordinating volunteers. In 2018, the program received a grant from a private foundation to fund staff time and related costs for three years. In March 2021, the grant was extended and will now support the Mutts for the Bay Program through 2025. The grant also funds developing outreach materials and sharing them with pet owners. In the first half of FY22, 33 dispensers were maintained. More than 175,000 bags were given away to pet owners. This number of bags prevents an estimated 43,000 pounds of pet waste from negatively impacting the estuary. The Estuary Program also started a Mutts for the Bay Instagram account (see above in Communications). Estuary Program staff distributed educational curriculum on the negative impacts of pet waste and distributed it to more than 150 teachers across SLO County and in the Central Valley. This content was optimized for online learning to better serve teachers and students who were not on campus due to the COVID-19 restrictions.

Deliverables: Mutts for the Bay program statistics (see above). [Curriculum](#) available online.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities under this task directly support the outcome of encouraging responsible behavior by pet owners to reduce bacterial loading to the estuary, thus improving water quality and protecting beneficial uses such as shellfish farming and recreation.

Problems Encountered: The city of Morro Bay has opted to stop providing financial support for the Mutts for the Bay program. Their contributions previously helped fund pet waste bag purchases for dispensers located along the Embarcadero. This effort has been supported in part by a private foundation which has since stepped in and revised our grant to make up the budget shortfall.

Activities Planned for Next Six Months: Staff will continue its financial and coordinating activities to maintain the program. Efforts will also continue on developing outreach materials and delivery methods for pet owners.

Pending Deliverables: Reporting for the private foundation grant. Outreach materials.

State of the Bay Planning

Objective: Planning for the triennial state of the Bay report and events.

Status: New

Progress Toward Milestones: Every three years, the Estuary Program hosts a SOTB event series to share knowledge of the health of the estuary and watershed. Initial planning is underway for report design and printing, potential events, and possible partnerships.

Deliverables: None.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities under this task directly support the outcome of sharing the results of monitoring by the Estuary Program and its partners, with the goal of increasing education on nonpoint source pollution, restoration, etc.

Problems Encountered: None.

Activities Planned for Next Six Months: Staff will continue planning for report production, advertisements, event coordination, etc. for the spring 2023 SOTB events.

Pending Deliverables: SOTB report, posters, advertisements, website, etc.

Program Management

Manage Committees and Build Partnerships

Objective: Hold quarterly meetings and support partnerships.

Status: Ongoing

Progress Toward Milestones: Staff compiled meeting materials and coordinated quarterly meetings of the Executive Committee (EC) throughout the year. Technical Advisory Committee (TAC) members were called on as needed for review of Community Project applications, eelgrass efforts, water quality monitoring, data analysis, pikeminnow management, and technical plans. Membership was updated for the EC and TACs. A new Agricultural Seat member was welcomed to the EC.

Partnerships are also supported through collaborative project development and technical support. The Estuary Program continues its work on partnership projects developed and implemented in collaboration with partner organizations. These include:

- The Estuary Program was awarded a USFWS grant through the Pacific Marine and Estuarine Fish Habitat Partnership (PMEP) to fund restoration efforts over the next two years. Staff coordinated with PMEP to conduct eelgrass restoration in 2021.
- CSLRCD initiated construction of a wetlands restoration project at their Los Osos Wetland property. The Estuary Program is an essential partner in this project, providing technical expertise and outreach components.
- The Estuary Program is a partner on the Santa Monica Bay National Estuary Program's vessel pump-out monitoring program, monitoring three pump-outs three times a year and providing data through a statewide publicly accessible app.
- The Estuary Program partnered with Cal Poly on a Coastal Watersheds Grant, which began in 2021. The work focuses on eelgrass monitoring and restoration as well as research into water quality impacts of eelgrass.
- The Estuary Program is partnering with USGS to develop a project looking at tidal marshes and rising sea levels.
- The Estuary Program is working with Caltrans, SLO County, and other partners to study the feasibility of removing a fish passage barrier on San Luisito Creek.

Deliverables: Minutes, agendas, staff reports, and materials completed for each meeting. List of partnerships and project activities (see above).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The activities conducted under this task directly supported the task outcome of providing input and direction for the program and ensuring that partnerships are well supported.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue to coordinate quarterly meetings and work with Management Conference members. We will continue to work with the TACs to develop projects, funding, and collaborations. We will continue to partner with the CSLRCD to seek funding to implement projects developed with Resource Legacy Funding and support work at the Los Osos Wetland property.

Grants and Contracts Administration and Financial Management

Objective: Develop workplan, administer grants, and complete annual financial management tasks.

Status: Ongoing

Progress Toward Milestones: Staff worked on financial reporting, progress reports to the EPA and the Management Conference, and participation in NEP conference calls and committees. We coordinated with EPA to provide required materials for oversight of the 320 grant and managed numerous grants to the Estuary Program to support our project work. Staff managed the workplan and budget for FY22, both of which were approved by the Management Conference. Staff supported the annual financial audit, which was completed in early 2022.

Deliverables: Minority Business Enterprises-Women Business Enterprises (MBE-WBE) submitted to EPA Region 9 Grants Office. Semi-annual report for FY21 rollover funding.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: Activities under this task directly supported the outcome of conducting grant administration and financial management tasks in a timely and accurate manner.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program will implement the FY22 Workplan and conduct reporting for the FY22 grant. Staff will develop the FY23 workplan and budget.

Pending Deliverables: Annual FFR and MBE-WBE. FY23 Workplan. Semi-annual report for the second half of FY22.

General Administration and Human Resources Management

Objective: Maintain accurate financial and human resources records and manage personnel.

Status: Ongoing

Progress Toward Milestones: Staff maintained the ongoing financial and administrative functions, including recordkeeping, filing, bookkeeping, and equipment and office space upkeep, as well as interacting with the general public. In addition, the Director spent time managing staff performance and workplan progress. Other HR tasks included training, professional development, recruitment, and keeping all personnel policies and procedures up to date. Staff responded to the COVID-19 situation. Protocols addressing fieldwork, staff use of the office, etc. were developed, and training was provided. COVID-19 protocols were regularly reviewed and updated based on new state and federal guidance as well as changes in local restrictions. The Estuary Program hired a Monitoring Coordinator, field technicians, an Executive Director, and a Communications & Outreach Coordinator during the first half of FY22.

Deliverables: Summary of task activities (see above). Bookkeeping and other recordkeeping tasks contribute to the completion of the deliverables included for the previous tasks (financial management).

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The administrative and human resources management tasks conducted in the first half of FY22 directly supported the outcome

of providing the administrative support that allows the program to function smoothly so that staff can focus on attaining the goals of the organization.

Problems Encountered: None.

Activities Planned for Next Six Months: Staff will conduct all bookkeeping and recordkeeping tasks required for grant management. Staff will conduct all HR tasks including training and professional development.

Tracking Implementation of the CCMP and Workplan

Objective: Keep track of Workplan and Comprehensive Conservation and Management Plan (CCMP) implementation.

Status: Ongoing

Progress to Date: Tracked progress on CCMP implementation through biannual reports to the Executive Committee. Began planning for a website to share the status of CCMP Action Plans with the public.

Deliverables: Semi-annual report to EPA submitted Fall 2021. Biannual Executive Committee reports.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The tasks completed directly support the outcome of conducting tracking to ensure that tasks are completed in a timely and accurate manner.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to report to the Executive Committee on Workplan progress.

Pending Deliverables: None.

Management Plan Update/Revision

Objective: Update the CCMP per EPA guidance.

Status: Ongoing

Progress Toward Milestones: Staff submitted a response to EPA comments on the CCMP update at the end of FY21. EPA comments on the Monitoring, Communication, and Finance Plans have been resolved, and those documents are ready to proceed through the EPA approval process. Staff are working with EPA to finalize their comments on the CCMP update.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The tasks conducted directly support the outcome of working toward a Management Plan that is up-to-date, relevant, and complies with EPA's guidance.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to work with EPA to finalize the CCMP.

Pending Deliverables: Management plan and ancillary document update.

Community Projects

Objective: Provide support for Community Projects that further the goals of the Management Plan and engage the community.

Status: Ongoing

Progress Toward Milestones: Under the Community Projects program, staff worked with multiple partners to develop potential projects. Two project ideas were submitted for FY22, and staff worked with these partners to present these ideas to the Management Conference for consideration.

Two projects were selected for funding for FY22:

- Morro Bay Harbor Department Spill Response Program: For this project, the Harbor Department purchased approximately a four-year supply of oil absorbent pads for an exchange program with local boaters. This approach means that boaters always have free spill cleanup materials available to them. Additionally, when boaters bring back the used pads and pick up clean ones, city staff are distributing Estuary Program Clean Boating materials to them and taking the opportunity to share clean boating messages.
- Camp KEEP Watershed Education Program: Camp KEEP, a Kern County outdoor education organization, will restore the outdoor watershed model that the Estuary Program helped fund over twenty years ago. Camp KEEP will also purchase two table top watershed models to use in classrooms or onsite with students.

Two Community Projects were recently completed:

- California State Parks received funding for a watershed education project to design curriculum and build a learning station to demonstrate soil health. The station has been built and is being used at the Morro Bay Natural History Museum to educate students and the general public on watersheds.
- The CSLRCD worked with volunteers to conduct habitat restoration for pollinators and monarchs in the Sweet Springs Nature Preserve. An educational sign was designed and manufactured for installation at the site.

One project funded in FY21 is still ongoing due to COVID delays. Dr. Nikki Adams of Cal Poly implemented a microplastics monitoring effort in Morro Bay. She and her students conduct monthly monitoring of microplastics in the sediment in different regions of the bay. Education and outreach materials will be developed based on the work. The project is expected to be completed in the fall of 2022.

Deliverables: Final Reports for the Watershed Demonstration Station project and the Monarch and Pollinator habitat project.

Comparison of Actual Accomplishments with Anticipated Outputs/Outcomes: The activities conducted under this task included working with existing funding recipients and coordinating with partners to develop new projects that support CCMP goals and Action Plans. These activities directly supported these goals, thus meeting the task outcomes of developing and completing projects that meet program guidelines on community involvement and CCMP nexus.

Problems Encountered: None.

Activities Planned for Next Six Months: The Estuary Program plans to continue to work with partners on ongoing Community Projects. Staff will work the EC and TAC to develop projects for FY23.

Pending Deliverables: Final reports for completed Community Projects.

Lab Competency Documentation

The Estuary Program utilizes laboratories that have met the certification requirements for their technical area. During FY22, the following labs are being used:

For Water Quality: We primarily use two labs, Pace Laboratories (formerly BC Laboratories) and County of SLO Public Health Laboratory. Both maintained Environmental Laboratory Accreditation Program (ELAP) certification during this time period. The certification for Pace Laboratories is available [online](#). Documentation for the county lab 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 Bioassessment: The Estuary Program uses one lab, EcoAnalysts, Inc., for analysis of our bioassessment samples. Bioassessment labs certify their individual taxonomists rather than the lab as a whole. They provided their taxonomists' certifications. Any of the taxonomists listed could be assigned to our projects. The list of taxonomists' certifications is provided with the deliverables for this semi-annual report.

For Bay Nutrient Analysis: The University of California, Santa Barbara (UCSB) Marine Sciences Laboratory will be conducting analysis of Morro Bay waters for nutrients as part of the Coastal Watersheds Grant that will be occurring over the next two years. 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.

Budget Overview

Table 1: Costs expended during this semi-annual report period (October 1, 2021 – March 31, 2022) and cumulative since the beginning of the grant in October 2021.

Category	Subcategory	FY22 Period 1	FY22 Period 1	FY22 Period 1	Cumulative	Cumulative	Cumulative
		320 Funds	Cash Match	TOTAL	320 Funds	Cash Match	TOTAL
Personnel	Salaries	\$130,577	\$2,799	\$133,376	\$130,577	\$2,799	\$133,376
	Fringe	\$11,931	\$186	\$12,117	\$11,931	\$186	\$12,117
	Management Conference	\$0	\$0	\$0	\$0	\$0	\$0
	<i>Subtotal</i>	\$142,508	\$2,985	\$145,493	\$142,508	\$2,985	\$145,493
Travel	<i>(category includes local mileage)</i>	\$493	\$0	\$493	\$493	\$0	\$493
Supplies	Software	\$120	\$0	\$120	\$120	\$0	\$120
	Monitoring supplies	\$657	\$315	\$972	\$657	\$315	\$972
	Misc. office supplies, computers	\$1,326	\$0	\$1,326	\$1,326	\$0	\$1,326
	<i>Subtotal</i>	\$2,103	\$315	\$2,418	\$2,103	\$315	\$2,418
Contractual	Audit/Taxes/Accounting/Fees	\$9,213	\$3,775	\$12,988	\$9,213	\$3,775	\$12,988
	Education and Outreach	\$1,980	\$0	\$1,980	\$1,980	\$0	\$1,980
	Monitoring and Research	\$631	\$5,796	\$6,427	\$631	\$5,796	\$6,427
	Restoration and Protection	\$122	\$61,316	\$61,438	\$122	\$61,316	\$61,438
	<i>Subtotal</i>	\$11,946	\$70,887	\$82,833	\$11,946	\$70,887	\$82,833
Other	Rent	\$14,496	\$0	\$14,496	\$14,496	\$0	\$14,496
	Utilities	\$591	\$0	\$591	\$591	\$0	\$591
	Postage	\$58	\$0	\$58	\$58	\$0	\$58
	Copying, Printing	\$533	\$0	\$533	\$533	\$0	\$533
	Training, Prof. Dev.	\$945	\$0	\$945	\$945	\$0	\$945
	Telephone, Internet	\$954	\$0	\$954	\$954	\$0	\$954
	Repairs and Maintenance	\$3,391	\$0	\$3,391	\$3,391	\$0	\$3,391
	Insurance	\$0	\$0	\$0	\$0	\$0	\$0
	Vehicle maintenance, fuel	\$94	\$0	\$94	\$94	\$0	\$94
	Community Projects	\$0	\$5,927	\$5,927	\$0	\$5,927	\$5,927
	<i>Subtotal</i>	\$21,062	\$5,927	\$26,989	\$21,062	\$5,927	\$26,989
	TOTAL	\$178,112	\$80,114	\$258,226	\$178,112	\$80,114	\$258,226

Table 2: Costs by program area and task. Match numbers do not include in-kind match.

Program Area	Project	FY22 Period 1 320 Funds	FY22 Period 1 Match	FY22 Period 1 TOTAL	FY22 Overall TOTAL
Education and Outreach	Communications	\$1,440	\$0	\$1,440	\$1,440
	Bay Friendly Recreation	\$0	\$0	\$0	\$0
	Education and Nature Center	\$375	\$0	\$375	\$375
	Community Volunteer Program	\$0	\$0	\$0	\$0
	State of the Bay	\$0	\$0	\$0	\$0
	Other E&O Tasks	\$165	\$0	\$165	\$165
	<i>Subtotal</i>	\$1,980	\$0	\$1,980	\$1,980
Monitoring and Research	Benthic Invertebrate Monitoring	\$0	\$0	\$0	\$0
	Stats	\$0	\$0	\$0	\$0
	Water Quality Monitoring	\$631	\$5,796	\$6,427	\$6,427
	Eelgrass Monitoring & Analysis	\$0	\$0	\$0	\$0
	<i>Subtotal</i>	\$631	\$5,796	\$6,427	\$6,427
Habitat Protection and Restoration	Restoration & Conservation Planning	\$0	\$0	\$0	\$0
	Eelgrass Restoration	\$0	\$0	\$0	\$0
	Chorro Creek Ecological Reserve	\$57	\$26,593	\$26,650	\$26,650
	Restoration Project Maintenance	\$65	\$0	\$65	\$65
	Other Restoration*	\$0	\$0	\$0	\$0
	State Park Marina Stormwater Project	\$0	\$34,178	\$34,178	\$34,178
	Invasive Species Management	\$0	\$545	\$545	\$545
<i>Subtotal</i>	\$122	\$61,316	\$61,438	\$61,438	
Program Administration	Community Projects	\$0	\$5,927	\$5,927	\$5,927
	TOTAL	\$2,733	\$73,039	\$75,772	\$75,772