



WRAMP EcoAtlas Training and Outreach Plan

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Key Terms

Below is a table of key terms and acronyms used in this Training and Outreach Plan.

Key Term	Description	Acronym
Dredge and Fill and CWA 404 Programs	The California Water Boards regulate discharges of dredged or fill material to waters of the state under section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act ¹ . The US Army Corps of Engineers has authority to regulate discharges of dredged or fill material to waters of the United States under section 404 of the Clean Water Act.	401/404
Aquatic Resources	Areas having physical, chemical, and/or biological conditions resulting from the presence of surface water and/or shallow groundwater, along with the aquatic support areas.	
California Environmental Data Exchange Network	Central location to find and share information about California's water bodies, including streams, lakes, rivers, and the coastal ocean. Many groups in California monitor water quality, aquatic habitat, and wildlife health to ensure good stewardship of our ecological resources. CEDEN aggregates these data and makes it accessible to environmental managers and the public. www.ceden.org	CEDEN
California Wetland Monitoring Workgroup	A workgroup of the California Water Quality Monitoring Council. Its mission is to improve the monitoring and assessment of wetland and riparian resources by developing a comprehensive stream, wetland, and riparian area monitoring plan for California, and through increasing coordination and cooperation among local, state, and federal agencies, tribes, and non-governmental organizations. More information	CWMW

¹ Waste Discharge Requirements (WDRs) are issued under the Porter-Cologne Water Quality Control Act. For Waters of the U.S., it is concurrent with the issuance of the 401 Certification, but for Waters of the State that are not Waters of the U.S., WDRs are issued without the 401 Certification.

Key Term	Description	Acronym
Central Coast Wetlands Group	Coordinates the advancement of wetland science and management on the Central Coast. https://mlml.sjsu.edu/ccwg/	CCWG
Dredge and Fill Procedures	State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State adopted by the SWRCB in April 2019. More information	
Implementation Team	The WRAMP Training Program Implementation Team will be composed of Statewide Mapping (Level 1), CRAM (Level 2), and Level 3 Committee and CWMW members, and an implementing entity to coordinate the program development and implementation.	
Monitoring: Ambient, Compliance, and Effectiveness	Ambient: increase knowledge about the status and trends in wetlands and streams Compliance: evaluate if permittees, grantees, and contractors are complying with their permits and meeting their objectives Effectiveness: evaluate if policies, programs, and projects are achieving their long-range goals	
San Francisco Estuary Institute	SFEI is a science institute that provides scientific support and tools for decision-making and communication through collaborative efforts. For 25+ years, SFEI staff have been collaborating on creating wetland protection, monitoring and assessment programs and tools. www.sfei.org	SFEI
Southern California Coastal Water Research Project	Public research and development agency that develops and applies next-generation science to improve management of aquatic systems in Southern California and beyond. SCCWRP	SCCWRP

Key Term	Description	Acronym
	<p>develops strategies, tools and technologies to protect and enhance the ecological health of Southern California's wetlands and watersheds.</p> <p>www.sccwrp.org</p>	
State Water Resources Control Board and the nine Regional Water Quality Control Boards	<p>State agencies that develop and implement the Dredge and Fill Procedures and Dredge and Fill Program.</p> <p>Note: "State Water Board" refers to the State Water Board, and "Water Boards" refers to the State and Regional Water Boards.</p> <p>www.waterboards.ca.gov/</p>	State Water Board and Water Boards
United States Environmental Protection Agency	<p>One way US EPA protects and restores ocean and wetland ecosystems at the federal level is by promoting watershed-based management, including developing and instituting standardized science-based monitoring and assessment of aquatic resources by our state, tribal, and other partners.</p>	US EPA
Watershed Approach	<p>Analytical process for evaluating the environmental effects of a proposed project and making decisions that support the sustainability or improvement of aquatic resources in a watershed. The watershed approach recognizes that the abundance, diversity, and condition of aquatic resources in a watershed support beneficial uses. Diversity of aquatic resources includes both the types of aquatic resources and the locations of those aquatic resources in a watershed. Consideration is also given to understanding historic and potential aquatic resource conditions, past and projected aquatic resource impacts in the watershed, and terrestrial connections between aquatic resources. The watershed approach can be used to evaluate avoidance and minimization of direct, secondary (indirect), and cumulative project impacts. It also can be used in determining compensatory mitigation requirements (from the CA Dredge and Fill Procedures line 613-622).</p>	

Key Term	Description	Acronym
	More information	
Wetland and Riparian Area Monitoring Plan	A plan for comprehensive monitoring and assessment of aquatic resources using a watershed or landscape context. More information	WRAMP
WRAMP Toolset	Standardized, scientific environmental methods, models, datasets, and online interactive summaries and data download access that support WRAMP.	WRAMP Toolset

Goal of Training and Outreach Plan

The goal of this Training and Outreach Plan is to increase the overall awareness and use of the WRAMP datasets and tools in support of wetland resource planning, management, and project performance tracking in California. Specifically, a near-term goal is to develop modular training sessions that can be linked together in different ways to customize how the datasets, monitoring methods, and online tools might be used for different purposes. [Figure 1](#) provides a graphical overview of the core WRAMP framework and tools, and a roadmap of key components of this Training and Outreach Plan.

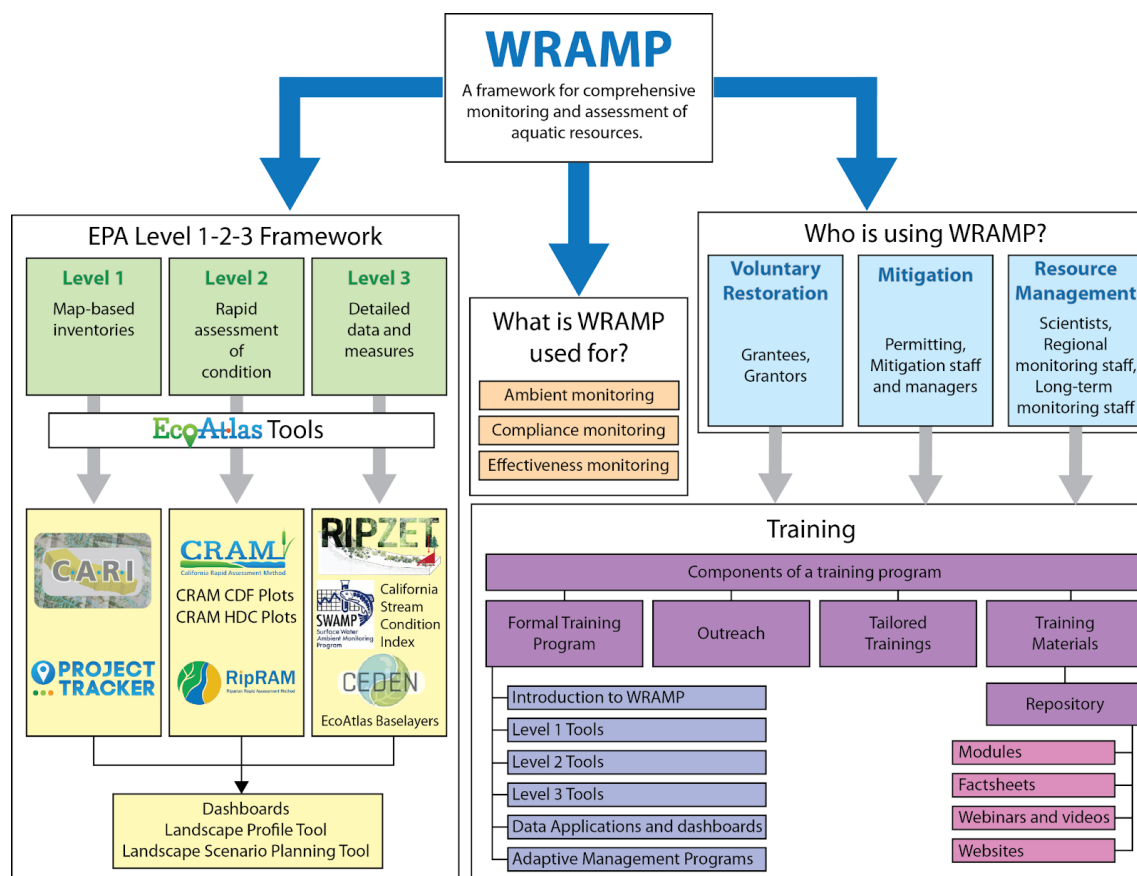


Figure 1. Schematic for WRAMP Training and Outreach Plan

The WRAMP framework and tools are useful for a variety of applications and regulatory purposes depending on who you are and what you are doing. For this reason, SFEI has been conducting one-on-one training sessions to support the use of tools by specific users including Resource Conservation Districts, water districts, regional water board staff, state agencies (such as DWR and Caltrans), federal agencies, and select private environmental consulting entities (at the request of public entities). These varied user groups have requested training on tools, such as Project Tracker, the Landscape Profile Tool, CARI maps, RipZET model, and water quality data. This Training and Outreach Plan aims to adapt what we have learned over the years from those focused training sessions into an integrated, more robust training and outreach program that supports the statewide Dredge and Fill Program, as well as local and regional resource management and monitoring programs.

A successful Training and Outreach Program is a critical step in formalizing the consistent use of WRAMP tools throughout the State and requires a well-thought-out plan. This WRAMP Training and Outreach Plan (Plan) outlines a vision for such a program, recommends a phased development approach, and provides additional training and outreach materials that can be implemented in the short-term. We recognize that development and adoption of a formal WRAMP Training and Outreach

Program will require interagency collaboration and discussion on this vision with oversight from the CWMW.

Overview of WRAMP Framework and WRAMP Tools

California's Wetland and Riparian Area Monitoring Plan² (WRAMP) is a framework for comprehensive monitoring and assessment of aquatic resources using a watershed or landscape context. WRAMP, like US EPA's three-tier monitoring and assessment framework, includes three levels of assessment that work together in the analysis of the overall distribution, condition, and viability of aquatic resources within a watershed, region, or state. Although WRAMP has been applied to support a watershed approach to wetland and stream protection in California, the framework can be adjusted to broadly support **ecosystem and habitat planning, assessment, monitoring, and reporting**.

The three tiers of monitoring and assessment include:

- **Level 1** assessments consist of digital map-based inventories of aquatic resources, including wetlands, rivers, streams, and riparian areas, plus related geographical data that have a direct effect on the distribution and abundance of aquatic resources. Level 1 maps may serve as the basis for landscape and watershed profiles that characterize the abundance and distribution of aquatic resources, and can also be used as the base maps for Level 2 and/or Level 3 protocols and assessments.
- **Level 2** assessments are rapid, field based assessments that provide data on overall aquatic resource condition. In California, the California Rapid Assessment Method (CRAM) is the baseline for Level 2 data collection. Other Level 2 assessments exist (e.g., RipRAM) and may also be used when needed. Level 2 assessments can cost-effectively extend the spatial area in which condition is known.
- **Level 3** assessments are usually more intensive measures of specific resources that address specific regulatory requirements (e.g., water quality monitoring), or specific topics of concern or research. For example, plant species composition, nesting bird surveys, fish spawning success, and groundwater recharge rates are examples of Level 3 data types.

WRAMP is intended to be used for at least three basic kinds of environmental monitoring: **ambient monitoring** to increase common knowledge about the status and trends in wetlands and streams, as affected by large-scale, pervasive forces of

²https://www.mywaterquality.ca.gov/monitoring_council/wetland_workgroup/docs/2010/tenetsprogram.pdf

environmental change, such as the economy, human demography, and climate; **compliance monitoring** to evaluate if permittees, grantees, and contractors who are required to protect/restore wetlands and streams are complying with their permits and meeting their objectives; and **effectiveness monitoring** to evaluate if policies, programs, and projects are achieving their long-range goals. It is unlikely that anyone will use all three assessment levels all the time. Project planners should apply the parts that fit best for their project, using the guidance provided by the California Wetland Monitoring Workgroup (CWMW) on the *Elements of Wetland and Riparian Area Monitoring Plan (WRAMP)* [web page](#).

As called for in the State's 401 Water Quality Certification and Wetlands Program's *State Wetland Definition and Procedures for the Discharge of Dredged or Fill Material to Waters of the State* (effective May 2020³), WRAMP incorporates **tools** designed to implement the watershed or landscape approach to project siting and design, project tracking, project assessment, aquatic resource mapping, ambient monitoring design, and synthesis and reporting of aquatic resource condition. **The term "WRAMP toolset" in this training plan refers to standardized, scientific environmental methods, models, datasets, and online interactive summaries and data download access that support WRAMP.**

Need for WRAMP Toolset Training

The WRAMP toolset continues to grow with ongoing guidance from the user community. [Table 1](#) lists the current WRAMP tools and datasets and the general kinds of uses for each (natural resource mapping, standardized habitat assessment, and/or lands and waters characterization and planning). The US EPA wants to support continued and increased use of the WRAMP framework and online tools, especially to support **voluntary restoration, mitigation projects, and resource management programs** by employing a watershed or landscape approach to planning and project performance tracking.

A recent survey of 61 resource agency staff and wetlands scientists gathered information on their level of familiarity with WRAMP tools, which tools they use, how often they use them, and what barriers exist that prevent them from using the tools more often ([Appendix A](#)). The survey revealed that there is a wide range of levels of familiarity with the tools, ranging from people that use the tools weekly to monthly, to 30% that know about the tools but have never used them. The most commonly used tools are CRAM, CARI, EcoAtlas maps and summaries, EcoAtlas dashboards, and Project Tracker. The respondents are most often using the tools for grant solicitation and deliverables, alternatives analysis, performance tracking, permitting, and mapping wetland area change. Despite the variety of uses by the respondents, many (including those that regularly use the tools) indicated that additional training would provide an

³ https://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.html

entryway for those that do not know how to use the tools, and would provide greater comfort and confidence for those already using the tools. Finally, respondents indicated that illustrations of specific uses directly applicable to their work and tasks would be beneficial and would likely increase their usage of the tools.

Table 1. Current WRAMP Tools and Datasets

Table includes the general use for each tool/dataset, e.g., natural resource mapping, standardized habitat assessment, and/or lands and waters characterization and planning.

Name	Description	General Use
California Aquatic Resource Inventory (CARI)	Online Surface waters mapping to intensify NHD and NWI with local detail at any spatial scale. https://www.sfei.org/cari	Natural Resource Mapping
California Rapid Assessment Method (CRAM)	Rapid field assessment of wetland and stream condition. A cost-effective and scientifically defensible method for monitoring wetland condition. The assessment focuses on the stream or wetland itself, and includes a portion of the feature's riparian area. https://www.cramwetlands.org	Standardized Habitat Assessment
California Riparian Rapid Assessment Method (RipRAM)	Rapid field assessment of riparian areas. A cost-effective and scientifically defensible method for monitoring and assessing stream riparian condition. The assessment focuses on the stream's full riparian area, rather than on the active stream channel (as in CRAM). https://mlml.sjsu.edu/ccwg/ripram/	Standardized Habitat Assessment
CRAM Cumulative Distribution Function (CDF) Plots	Cumulative distribution function estimates (CDFs) are developed from probabilistic ambient field surveys that employ both CARI (as the sample frame) and CRAM (as the monitoring method). CDFs estimate the relative abundance of stream miles (or wetland areas) within a surveyed geographic extent that is likely to have conditions below (or above) any particular CRAM score. CDFs can be developed for any geographic extent, from large wetland project areas to watersheds, eco-regions, or statewide. CRAM project scores or other targeted assessments can be compared to CDF curves of wetlands of the	Standardized Habitat Assessment

Name	Description	General Use
	<p>same type in the same geographic area. This information helps inform management actions.</p> <p>https://www.ecoatlas.org/about/#cram-cdf</p>	
CRAM Project Habitat Development Curves (HDC)	<p>Wetland Habitat Development Curves (HDCs) are used to evaluate project performance through time based on CRAM condition scores. HDCs have been developed for three wetland types: estuarine, depressional, and vernal pool systems. Projects that are well designed for their location and setting, and well managed tend to be on or above the curve. In general, as projects age, their overall ecological condition should mature and their CRAM scores should increase at a similar rate as the HDC. Comparing project Index and/or Attribute scores to the expected level on HDCs can help identify general ecological functions that are performing well, or that may warrant additional Level 3 monitoring and/or the need for corrective action.</p> <p>https://www.ecoatlas.org/about/#hdc</p>	Standardized Habitat Assessment
EcoAtlas	<p>Visualization tool with an interactive map that displays the standardized California Aquatic Resources Inventory dataset along with options to overlay, view, and summarize many other environmental datasets including: SSURGO Hydric Soils, CALVEG Habitats, Basin Plan Beneficial Uses, CRAM, CSCI, Protected Areas (CPAD, and CCED), and restoration and mitigation projects (from Project Tracker, CIWQS, and other sources).</p> <p>Developed in 1999, EcoAtlas has been continually improving and gaining additional functionality through individual projects with many entities.</p> <p>https://ecoatlas.org/</p>	Natural Resource Mapping; Lands and waters characterization and planning
EcoAtlas Dashboards	<p>Summarized information about restoration, mitigation, conservation, and acquisition projects at both the regional and programmatic level.</p> <p>https://ecoatlas.org/dashboards</p>	Lands and waters characterization and planning

Name	Description	General Use
EcoAtlas Landscape Profile Tool (LPT)	<p>Automated online tables and graphs that summarize land use and natural resource abundance and diversity, habitat conditions, and wetland connectivity for user-defined watersheds or other landscape extents. Develop a Watershed Profile by running the Landscape, Condition, and Connectivity Profiles to assess impacts and mitigation in the watershed context, pursuant to Dredge and Fill Procedures.</p> <p>https://www.ecoatlas.org/about/#landscape-profile</p>	Lands and waters characterization and planning
Landscape Scenario Planning Tool	<p>Desktop ArcGIS Pro toolbox for evaluating proposed land use scenarios to compare alternative conservation plans and designs for user-defined watersheds or other landscapes in the Sacramento-San Joaquin Delta.</p> <p>https://www.sfei.org/projects/delta-landscapes-scenario-planning-tool</p>	Lands and waters characterization and planning
Project Tracker	<p>Online mapping and documentation of permitted, on-the-ground environmental impacts and projects.</p> <p>https://ptrack.ecoatlas.org/</p>	Natural Resource Mapping
Riparian Prioritization Data Layers	<p>Recommended actions for prioritizing California's watersheds. GIS layers based on model outputs which identify riparian management needs (protect, restore, manage, monitor) down to the individual reach level for the entire state.</p> <p>Summary map of statewide recommended actions and recommended Actions 2021 (Raw Data)</p>	Lands and waters characterization and planning
Riparian Zone Estimator Tool (RipZET)	<p>Modeled estimates of riparian zone width and length for user-defined watersheds or other landscapes.</p> <p>https://www.sfei.org/projects/ripzet</p>	Natural Resource Mapping

Status of WRAMP Usage and Training

Who is using the WRAMP Tools?

Since the creation and introduction of WRAMP in 2010, the total number of people using WRAMP tools remains relatively low and variable in composition, but the use of the tools continues to grow across programs and agencies. Nonetheless, continued outreach, education, and the implementation of pilot projects, in addition to the inclusion of WRAMP into grant funding programs and wetland and stream mitigation and restoration permits, has expanded the use of the tools by a number of user groups even though they are not consistently used across the state. Current WRAMP tool users fall into three main **user group categories**:

- **Voluntary Restoration**
 - **Grantees** (e.g., NGOs, water agencies, cities, consultants) that receive grants for voluntary **restoration or enhancement** projects. Tools are primarily used in siting, planning, and permitting (e.g., watershed profile) and monitoring and reporting. Grantees typically practice compliance monitoring as described above.
 - **Grantors** (e.g., State agency staff) that provide the grants. Tools are primarily used in project review and tracking program goals and objectives. Grantors can practice both compliance monitoring and effectiveness monitoring as described above.
- **Mitigation**
 - **Permitting staff** (e.g., Dredge and Fill Program and CWA 404 Program staff) that are permitting mitigation projects. Tools are used in initial permit review decisions, mitigation ratio negotiation, and long-term monitoring and project performance assessments. In 2020, the State Water Resources Control Board held three regional trainings for permit staff, where SFEI showed the Dredge and Fill Program staff how to use the EcoAtlas toolset to access environmental datasets and the Landscape Profile Tool to support permit review and negotiations. A Technical Memo brings together many years of statewide coordination to support the State's wetland protection policies and provides a specific example of how to use EcoAtlas tools to complete an US Army Corps of Engineers Site Evaluation Checklist (SFEI 2017).
 - **Mitigation Project Staff and Managers** (e.g., consultants, local agency staff, or mitigation bankers) that are implementing mitigation as a permit

requirement for a project or to create a bank to sell credits. Tools are primarily used in project siting, alternatives analysis, design, compliance/ambient monitoring, and reporting.

- **Resource Management**

- **Scientists** (e.g., NGO, resource management programs, and local agency staff) that are primarily using the tools to analyze and track resources in their area of interest, answer scientific questions, and monitor/track trends.
- **Regional Monitoring Staff** (e.g., Regional Board or Monitoring Program staff) that are primarily using the tools to design, organize and implement a monitoring and assessment program.
- **Other long term monitoring program staff** (e.g., local agency staff).
- These users practice effectiveness monitoring and ambient monitoring.

The strength of the EcoAtlas tools is the streamlined ability to access and analyze broad levels of information, such as:

- **Visualization and Data Access:** Provides interactive access to standardized environmental data and map filtering tools.
 - Analyze cumulative impacts and change over time in resource extent and condition.
 - Interactive, public access to view, filter, and download environmental data.
 - Map, track, and view projects in the context of other habitat projects.
 - Use a watershed approach to summarize data using the Landscape Profile Tool.
 - View impact and mitigation sites on a common map in the context of other habitat projects.
- **Regional Coordination:** Supports mitigation/restoration project siting, planning, permitting, monitoring, and reporting.
 - Develop regional plans to identify and avoid known aquatic resources in current and future projects.
 - Enable common and standardized data entry, management, display, and access.
 - Integrate with projects from other programs by having a common, online tool to access and summarize project information across watersheds, regions, and statewide.

- Provide landscape and project information for the CWA 404 Program's mitigation checklists.
- Support coordinated project design, permitting, and assessment.
- Track the receipt of required project monitoring reports.
- Track and report on program goals, restoration costs, and funding needs.
- Summarize progress for individual projects or at regional scales.

To-date, use of the WRAMP tools has been largely voluntary, as individual users or groups of users see the application and benefit of these tools in their programs. Here are **examples of WRAMP usage** by specific groups:

- The **State Coastal Conservancy** uses WRAMP to help evaluate the potential benefit and effectiveness of wetland restoration projects. They require project proponents to use the Project Tracker tool, and collect and submit condition data using CRAM. As a program, they monitor the effectiveness of their grant program through the monitoring data and the dashboards available in EcoAtlas.
- The **Ocean Protection Council** uses CARI and EcoAtlas to track progress towards meeting their goals to (1) safeguard coastal and marine ecosystems and communities in the face of climate change and (3) enhance coastal and marine biodiversity, as outlined in their [Strategic Plan to Protect California's Coast and Ocean 2020-2025](#).
- **Caltrans** has been using WRAMP within their Willits Bypass Project, in Willits, CA. Mitigation for the new highway construction employed several WRAMP tools, including entering project details in Project Tracker, using CRAM to monitor baseline and post-project wetland resource conditions, and using the framework to organize the detailed Level 3 data.
- **Santa Clara Valley Water District (Valley Water)** has been using WRAMP tools since 2010 as a part of their ambient monitoring of streams in five watersheds within Santa Clara County, CA. They use Level 1 and Level 2 tools including the CARI basemaps, RipZET, and CRAM to determine the overall distribution, abundance of streams and wetlands, and the overall ecological condition of their stream in their watersheds. They are currently conducting repeat ambient stream condition surveys to assess change through time. They are now also able to compare individual restoration and mitigation projects to the watershed ambient survey cumulative distribution function estimates (CDFs), which provide detailed data to the permitting agencies and help the water agency employ a watershed approach to resource management and planning.
- **Montezuma Wetlands Restoration Project, LLC** has been using Project Tracker to support public access to general project information, project

monitoring reports, maps, and other files. The project also employs CRAM to assess the condition of existing vernal pools and recently restored tidal wetlands in its extensive and ongoing tidal wetland restoration project located in Suisun Bay in the San Francisco Bay Area.

- **California's Dredge and Fill Procedures** (Procedures) recommend a watershed approach to project planning and performance tracking. Although the Procedures do not specifically call out WRAMP, they do require specific elements that are components within WRAMP. For example, for compensatory mitigation plans, the Procedures require using a watershed approach that includes a Watershed Profile, an assessment of the overall condition of aquatic resources using an assessment method approved by the permitting authority, and a description of no net loss. For ecological restoration and enhancement projects (voluntary), the Procedures require assessment of overall condition using an assessment method approved by the permitting authority.
- Several **wetland monitoring and assessment programs** use the WRAMP tools, including: the [Southern California Wetlands Recovery Project](#), [Santa Clara Valley Water District's Safe, Clean Water and Natural Flood Protection Program](#), [San Francisco Estuary Wetlands Regional Monitoring Program](#) (WRMP), and [Russian River Regional Monitoring Program](#) (R3MP).
- To facilitate **regional coordination of multi-benefit habitat restoration and adaptation projects** in the San Francisco Bay Area, the [San Francisco Bay Restoration Authority](#) (SFBRA), [San Francisco Bay Joint Venture](#) (SFBJV), [San Francisco Bay Restoration Regulatory Integration Team](#) (BRRIT), and [Shoreline Adaptation Project Mapping](#) (SAPMAP) require projects to be added to EcoAtlas.
- The WRAMP framework has been used to **evaluate the effectiveness of major projects**, including: Caltrans' I-5 Corridor Project, High Speed Rail Authority's Project, California Department of Water Resources' Delta Conveyance Project, and a number of Southern California's solar and electric transmission projects and wetland restoration projects (Stein et al. 2007; Solek and Stein 2012).
- **Inclusion of WRAMP within major Statewide Grant programs**, such as the State Coastal Conservancy and the California Department of Fish and Wildlife's Proposition 1 Grant programs, that require projects they fund to be entered into Project Tracker.
- Use of the **California Aquatic Resources Inventory (CARI)** map as the best-available standardized map of aquatic resources in the State. Recent updates to CARI include the integration of updated NWI mapping, completion of mapping for the Delta, improvements to coastal watersheds through the Ocean

Protection Council, improvements to the mapping within San Diego Regional Water Quality Control Board boundary, integration of updated vernal pool mapping in the central valley, and improvements to mapping baylands in the San Francisco Bay Area.

- **WRAMP framework demonstration projects** in several regions intended to build state capacity for employing WRAMP including: Lahontan Regional Water Quality Control Board supported demonstration in the Upper Truckee River and Third Creek Watersheds within the Tahoe Basin (SFEI 2013), a North Coast demonstration in the Santa Rosa Plain (SFEI 2014), California's Wetland Demonstration Program Pilot - a statewide demonstration of the Level 1-2-3 framework for riverine wetlands including specific watershed scale assessments in the Napa River, Morro Bay, and San Gabriel Watersheds, as well as a statewide estuarine wetland ambient survey (SCCWRP 2008). Another recent demonstration project built State capacity to protect and restore vernal pool systems in the Central Valley by developing a regional HDC and CDF (SFEI 2022).

Existing Training for WRAMP Toolset

No standardized comprehensive WRAMP Training Program currently exists in California. Despite the lack of a formal WRAMP Training Program, a significant amount of training has occurred, although largely in a piecemeal manner. The majority of outreach and informal trainings to date have been focused on single elements of WRAMP, such as EcoAtlas and CRAM. Many of the EcoAtlas trainings and outreach meetings have occurred between SFEI and an individual or a small group from a single organization. Typically, a group will reach out directly to SFEI and request a demonstration on one or more EcoAtlas tools to their staff. This one to two hour training typically meets the needs of the group, although sometimes it leads groups to ask for additional detailed training or for training on another tool. This style of training has been occurring for the past 15+ years on an as-needed basis. In contrast, CRAM training is run through the CWMW's Level 2 Committee and is implemented via a formalized statewide training program with annual public trainings available throughout the State. Each CRAM training includes an overview of the US EPA's Level 1-2-3 framework. In addition, in many of the formal CRAM trainings, the participants are given a 45-minute introduction to WRAMP and its supporting tools, largely consisting of live demonstrations of the EcoAtlas toolset.

Due to the length of time that this ad-hoc WRAMP training has been occurring, a significant body of training materials have been developed. Existing materials are listed in [Appendix B](#), and include a large number of training slide decks customized to a specific audience, varying from a simple overview of WRAMP and the EcoAtlas toolset to specific 'how-tos' on individual tools. They also include conference or workshop presentations that focus either on the overall value of WRAMP and how it might be

utilized, or specific demonstration projects that employ the WRAMP framework for a single area or a single wetland type. For CRAM practitioner and resource manager trainings, a single presentation provides an overview of WRAMP, and a brief snapshot of core tools, with a specific focus on how CRAM is integrated into the toolset. Two older videos were produced and are available online providing an overview of EcoAtlas, and a step-by-step tutorial on how to enter projects into Project Tracker. While dated, those videos still provide useful information to users. In addition, there are a handful of dated factsheets and conference posters about EcoAtlas and CRAM. Finally, a number of state and federally funded WRAMP framework development and demonstration project reports have been completed over the past decade that help explain WRAMP and illustrate specific uses of the tools. However, these reports are scattered across several different websites (e.g., CWMW, WRP, SCCWRP, CRAM, SFEI, CCWG), and there is no formal repository that systematically organizes them to make them publicly available online to both the statewide WRAMP training implementation team and to the broader public user community.

One of the primary obstacles to date for developing a formal and consistent WRAMP Training Program has been the lack of dedicated funding. Informal trainings conducted by SFEI, SCCWRP, CCWG, and others have largely been unfunded. However, individual grants and projects have provided some support for this external training. This model is not sustainable in the long-term, and does not support the development of an organized and effective training program. For example, a one-hour customized training for Project Tracker and the Landscape Profile Tool costs approximately 8-10 hours of an expert's time, including preparation, training, and follow-up. While these costs may seem small on an individual meeting basis, the cumulative cost is large, given the large number of users and potential users that exist across the State.

Finally, despite the relatively large number of materials that have been developed, none of the materials have been developed with a [specific user group](#) (e.g., those described above) in mind. These materials would likely be more effective if they were specifically tailored to the uses of each individual user group.

WRAMP Lessons Learned

A number of lessons, specific to WRAMP training, have been identified over the past decade. First, there is a need for WRAMP training, as we see a direct correlation in actual tool usage with those that know they exist and understand how to use them. Training is the primary avenue for increasing WRAMP usage. Second, the current practice of providing individual trainings has been effective and provides uniquely personalized service and support. But this method is not as effective at reaching large numbers of people, and is likely not sustainable for the long-term due to the lack of dedicated funding. Third, there is a need to develop materials for each individual tool, so that materials can be used when needed, or customized for any particular user

group to see how the tools fit into their day-to-day process and can benefit workflow. The training needs to be very transparent about how WRAMP can directly help, in order to ensure that more people use the tools.

The need for a more formal training program for WRAMP has been known for many years. For example, in 2016 the State Water Resources Control Board conducted a survey of resource managers, regulatory agency staff, and other potential WRAMP users specifically asking about their usage of CRAM, which is just one component of WRAMP. The survey was completed by almost 400 individuals, including trained CRAM practitioners and staff from multiple agencies. Survey responses revealed many **interesting findings**, such as:

- More consultants have CRAM field experience as compared to regulators, and the primary use of CRAM was for the evaluation of pre- or post-project restoration or mitigation sites.
- 38% of respondents with CRAM experience had used EcoAtlas in the past year, 55% had not used EcoAtlas, and 7% did not know about EcoAtlas.
- The greatest CRAM-related use of EcoAtlas was to enter CRAM data, but the second most common use was creating landscape profiles, completed most often by regulators.
- To increase the use of CRAM for regulatory purposes, specific training targeted to its specific usage should be developed.
- EcoAtlas is an important analytical and communication tool for regulatory permitting. It provides a standardized platform for coordination among agencies and transparency with the general public interested in surface water protection, restoration, and conservation. But it is not fully utilized by the CRAM community.
- A stable funding source needs to be established for CRAM and its associated tools to allow for continued development and improvement. This funding could be either through legislation or through an agency so these tools can continue to bridge the communication gap between agencies, the regulated community, and the general public.

It is important to remember that this survey was conducted in 2016, and an additional seven years of program development, training and outreach have occurred since then. But many of these survey results still hold true, and match our understanding of current usage and potential users' opinions on CRAM and the larger suite of WRAMP tools and the ease/difficulty of learning how to use them ([Appendix A](#)). Key examples of successful uses and applications are included in [Appendix B](#).

Vision for Comprehensive California WRAMP Program

As mentioned previously, development and usage of the WRAMP toolset have been variable throughout the State, and a comprehensive Training and Outreach Program is warranted for effective use of these vital tools to meet the collective desire to improve wetland outcomes in our programs. Such a program would have several key goals.

Aspirational Goals of WRAMP Training and Outreach Program

The WRAMP framework provides a mechanism to enhance communication and collaboration among wetland professionals, including ecologists, hydrologists, and others who are involved in wetland assessment and management by providing a consistent, standardized, science based approach, and a publicly available set of tools.

There are several long-term aspirational goals for the WRAMP Training and Outreach Program. These are described below, along with potential high-level, quantifiable benchmarks to track the Program's success. These performance measures are intentionally vague, **since they will need to be further defined, vetted, and implemented by the CWMW and its partners.**

1. **Encourage utilization of the WRAMP toolset:** Promote greater utilization of the WRAMP toolset in wetland assessments and management decisions through training and outreach to regulators, developers, and other stakeholders.

This goal could be assessed by several example performance metrics:

- Consistent implementation of the WRAMP tools by X partners;
 - Requirement to use the WRAMP tools (e.g., Project Tracker and CRAM) included in X regulatory permits;
 - Requirement to use the WRAMP tools (e.g., Project Tracker and CRAM) by X grant programs and funding agencies;
 - X agencies trained and actively using the WRAMP tools; and
 - Successful use of EcoAtlas to further data analysis by X agencies and programs.
2. **Increase the accuracy and consistency of wetland assessments:** Improve the quality of wetland assessments by training individuals on best practices for wetland assessment methods. This could involve providing guidance on the use

of appropriate tools and techniques for measuring key wetland conditions, as well as offering hands-on training sessions to reinforce these skills.

This goal could be assessed by conducting x standardized audits and intercalibration exercises among practitioners.

3. **Refine wetland assessment methods:** Support the development of new and refinement of existing wetland assessment methods to improve the accuracy and efficiency of wetland assessments, address data gaps, and reach our monitoring goals.

Performance of this goal requires secure, regular funding for the enhancement and maintenance of the WRAMP tools.

Proposed Strategic Plan for Training and Outreach

The long-term success of the WRAMP Training and Outreach Program (Program) will depend on eventually formalizing the governance of the program. Initially, the Program Implementation Team⁴ will coordinate annually with the CWMW to ensure the training goals align with statewide needs. We highly recommend a CWMW annual retreat be held to effectively brainstorm, plan, and review both near- and long-term WRAMP Program elements. An annual WRAMP Strategic Planning retreat (e.g., a 2-day, in-person meeting) would support coordinated implementation of the Training and Outreach Plan and long-term program development tasks, such as: review training materials and priorities for the year, identify and prioritize near-term and longer-term user group outreach needs, as well as review and adjust the Program's strategic plan as needed. This section describes the proposed *initial* strategic plan for implementing the WRAMP Training and Outreach Program. As funding for the Program becomes available, the Plan may be adjusted by the Implementation Team.

The **benefits of a formal WRAMP Training and Outreach Program** include consistent understanding and use of the WRAMP methodology and tools across diverse user groups. This would ideally result in a feedback loop for the WRAMP Program whereby input is provided and used to improve existing tools and identify new tools and features. Similarly, a comprehensive and robust Training and Outreach Program would create an informed user community that could expand the visibility of WRAMP through documented use and project/program benefits.

⁴ The WRAMP Training Program implementation team will be composed of Statewide Mapping (Level 1), CRAM (Level 2), and Level 3 Committee and CWMW members, and an implementing entity to coordinate the program development and implementation.

We recommend the WRAMP Training and Outreach Program be tailored to three user groups: voluntary restoration, mitigation, and resource management. These groups are described in more detail in the section above on [Who is Using the WRAMP Tools?](#). While these user groups are using much of the same data, their questions and reporting needs are often different. Therefore, the Training and Outreach Program could have the same format for each user group, while being tailored to each group's specific needs with relevant examples.

Recommended Training Format

An effective Training and Outreach Program must include a variety of approaches to communicate the target information with the goal of reaching a broad audience. The WRAMP Program could include options for independent learning, as well as instructor led education. Key formats include summary information, such as in-person and virtual trainings, factsheets, reference materials, demonstration videos and exercises, as well as the potential for tailored trainings. The following section provides a brief summary of each of the primary training and outreach formats listed in order of increasing complexity and user time commitment.

Due to the wide variety of uses of the WRAMP framework, we envision two potential options for new users to learn about WRAMP and the specific WRAMP tools: (1) **in-person or remote trainings**, and (2) **recorded video presentations**. The recent 2022 user survey ([Appendix A](#)) indicated that most people do not have time or funding to attend lengthy training events. This feedback influenced our decision to develop both in-person trainings, as well as shorter recorded materials that could be completed at the user's own pace. Despite these two options, we strongly encourage new users to attend in-person or remote trainings in order to better address specific user needs and questions. The program should develop a recommended schedule for training frequency, including periodic "refresher" trainings that highlight recent changes and enhancements. To support users after initial training events, other materials can be developed and made publicly available online to support outreach, extended learning, and access to additional WRAMP information and tools, including factsheets, videos, documented guides, and websites.

We recommend **customizing the in-depth training** by selecting the relevant modules and components of the WRAMP framework that best fit the user group and intended audience. Below we propose semi-standardized core Training Modules, which could be used as needed to cover topics most relevant to the specific agency or resource group. Training sessions should be flexible as to the length of time. For example, it is expected that a high level management overview of the WRAMP Level 1-2-3 framework and EcoAtlas summary tools might take 1-2 hours, while a user training on how to upload projects into Project Tracker would be best suited to a hands-on, half-day workshop.

Training Modules

Based on the survey results and lessons learned from trainings to-date, below are several modules recommended for the Training and Outreach Program. While the topics are listed in sequential order based on US EPA's Level 1-2-3 monitoring and assessment framework, the modules are standalone and can be completed in any order depending on the needs of the user. This module list is not exhaustive, and some modules might be conflated or expanded in the future if suggested by the user community and/or regulatory stakeholders. Each module will include example use cases that will demonstrate the use of the tools for each of the three user groups. The development of [Module 1](#) and [Module 5](#) has been identified as a near-term action for implementation, and is currently underway.

Module 1: Introduction to WRAMP Level 1-2-3 Framework and Tools

The objective of this module is to provide an overview to the WRAMP framework. The WRAMP framework provides a method for organizing and analyzing environmental data and information to support stream and wetland project planning, monitoring, and assessment. This includes utilizing US EPA's recommended Level 1-2-3 framework, which is how EcoAtlas organizes its online tools and services. The WRAMP framework also includes a broad adaptive management framework for implementing stream and wetland monitoring and assessment programs at a regional or statewide scale. In addition, Module 1 will provide an introduction to EcoAtlas' WRAMP tools, including the use of the Level 1-2-3 data organization standards, and the monitoring and assessment summary tools that were developed to support voluntary restoration, mitigation, and resource management user groups.

Topics will include:

1. What is WRAMP and Level 1-2-3?
2. How can the WRAMP data organization standards be used?
3. What kinds of data might be accessed and summarized to help users with impact assessment, compliance monitoring, and effectiveness monitoring?
 - Introduction to EcoAtlas' standardized Level 1-2-3 data including: geospatial data layers, CRAM data access and project evaluation tools (CDFs, HDC), and CSCI and water quality data.
4. Use case examples using EcoAtlas to show the workflow different User Groups might take to:
 - use a watershed approach to planning the placement of a wetland project;
 - review a permittee's plan; and

- evaluate how a restoration/mitigation project is performing ecologically and compared to other nearby wetlands that also have CRAM assessments.

Module 2: *(Level 1, Map-based Inventory) Where are our wetlands and wetland projects?*

The objective of this module is to train users on the Level 1 tools available to answer the question of *Where are the wetlands and wetland projects in California*. Topics will include:

1. CARI basemap
 - How local datasets (regional aquatic resource inventories, e.g., DARI, BAARI) interface with the overall CARI dataset
 - How to edit the map using the CARI Editor Tool
2. Project Tracker
 - How to enter/edit projects
 - How to map impacts and the associated mitigation
3. EcoAtlas
 - How to use a project's Habitat Development Curve (HDC)
 - How to use the Landscape Profile Tool (LPT) to generate summaries for a user-defined area
 - How to visualize information on regional or programmatic dashboards
4. Use case examples based on the three User Groups

Module 3: *(Level 2, Condition Assessment) How are our wetlands doing?*

The objective of this module is to train users on the Level 2 tools available to answer the question of *How are California's wetlands doing*. Note: There is a separate [training](#) for learning how to conduct CRAM assessments.

Topics will include:

1. CRAM
 - What is CRAM and how was it developed
 - How does one get trained (requires formal training that has an in-person field component). There are two levels of training available: Practitioner and Manager. The Practitioner-Level training (5 days) is required for those that will be conducting assessments in the field, whereas the Manager-Level training (2 days) is available for those that simply need to understand what CRAM is, how the assessments are conducted, and how to interpret CRAM scores.
 - What do CRAM scores mean
 - How do you view and filter CRAM data
 - How to use a CRAM Cumulative Distribution Function (CDF)

- How to use CRAM to evaluate a project's Habitat Development Curve (HDC)
- 2. RipRAM
 - What is RipRAM and how was it developed
 - How does one get trained
 - How do you view RipRAM assessments
- 3. Use case examples based on the three User Groups

Module 4: (Level 3, Intensive Assessment) Using Field Measurements

The objective of this module is to train users on how to access and use available Level 3 data and tools. Topics will include:

1. How to access and visualize field measurements on EcoAtlas and other tools, e.g., CEDEN water quality and toxicity data, CSCI, and CD3
2. How other Level 3 data could/should be incorporated into using WRAMP
3. Use case examples based on the three User Groups

Module 5: Data Applications and Dashboards

The objective of this module is to train users on how to generate reporting summaries in EcoAtlas. Topics will include:

1. General overview of what is EcoAtlas
2. How the WRAMP tools can be used to answer adaptive management programs
3. How to view individual data layers
4. How to use the Landscape Profile Tool to generate summaries for a user-defined area
5. How to use the Landscape Profile Tool to generate a Watershed Profile
6. How to visualize information on regional or programmatic dashboards. Several programs have designed a dashboard for summarizing their activities and accomplishments. EcoAtlas dashboards summarize information about restoration, mitigation, conservation, and acquisition projects at both the regional and programmatic level (<https://ecoatlas.org/dashboards>).
7. Use case examples based on the three User Groups

Factsheets

Well-designed, high-level **factsheets** are a helpful outreach tool for providing a brief overview of a specific WRAMP tool, addressing a specific question, or quickly familiarizing someone with a topic. The factsheets are usually two pages and include links to more detailed information. Based on user survey results and interviews, below is a list of five prioritized ideas for the development of new factsheets. The development of factsheet 4 (How to use EcoAtlas to Generate a Watershed Profile) has been identified as a near-term action for implementation, and is currently underway.

1. What is WRAMP for Restoration Project Grants?

The Level 1-2-3 monitoring and assessment framework is a way to organize environmental management and monitoring questions and associated data to support local and regional protection, planning, and decision making about streams and wetlands. The WRAMP framework is supported by Level 1-2-3 tools.

2. Restoration/Mitigation Project Success Monitoring

Using WRAMP tools throughout the restoration and mitigation project lifecycle (planning/design/implementation/post) can help to define project goals and prioritize projects within the watershed context. The WRAMP tools provide standardized methods, standards that are repeatable within a project and across projects, reference conditions for comparison, and tools to share data and track/report on project success and development through time.

3. The Power of Investment in Long-term Regional Monitoring Using the WRAMP Framework

Regional monitoring is typically implemented (and funded) by local agencies and municipalities. The motivation for agreeing to invest in regional monitoring is typically to meet a regulatory requirement. Two things need to occur: 1) regulatory agencies need to be willing to require participation in regional monitoring as part of the permit-required monitoring and understand that regional monitoring can be used to inform site-specific decisions, and 2) regulated entities need to understand that regional monitoring can provide better information to address management questions in a more cost effective manner.

4. How to use EcoAtlas to Generate a Watershed Profile

Provide a step-by-step guide on how to generate a Watershed Profile report by running the Landscape, Condition, and Connectivity profiles in the EcoAtlas Landscape Profile Tool. EcoAtlas provides easy access to publicly available data to both project proponents and regulators and does not require GIS skills to use. The summarized information can be used to evaluate a proposed restoration or mitigation project and assist with project planning and permit review by regulatory agencies, such as Water Boards, State Water Board, USACE, California Coastal Commission, BCDC, CDFW, etc.

5. Project Tracker: Guide for Entering Mitigation and Impact Projects

Outline the high-level steps for entering and mapping impacts and their associated mitigation. Currently, project information is not consistently entered correctly across Programs. This lack of complete information prevents regions from being able to use the Tracking Net Change charts summarized in the EcoAtlas Landscape Profile Tool.

Other potential factsheet topics were identified in the survey results and during various stakeholder meetings, including:

- tracking no net loss of wetlands in California;
- discussing the role of CRAM and other Level 2 tools in regional/project monitoring;
- using Project Tracker throughout the planning, implementation, and monitoring of a project;
- explaining the various components and forms for entering information into Project Tracker; and
- using CARI and CARI Editor.

In addition, several factsheets already exist, but the content needs to be reviewed and updated since the WRAMP tools continue to evolve over time. Existing factsheets are listed in [Appendix B](#).

Training Webinars and Videos

A series of **online training videos and presentations** will be needed to further the adoption and implementation of the WRAMP toolset. These videos can serve to introduce a wide range of users to the WRAMP framework, address initial questions that may arise, and help potential users understand how and why the WRAMP toolset should be utilized. The benefit of developing a suite of training videos is the flexibility they offer to users to access the information at any time and review it at their own pace.

Initial training videos and online presentations should focus on the following topics:

- Overview of the EcoAtlas online system and its capabilities;
- Series of brief videos on why each WRAMP tool is useful;
- Series of brief videos for particular components/questions of Project Tracker;
- Introduction to California Rapid Assessment Method and its wetland modules; and
- Using WRAMP tools to perform climate analysis.

Videos already exist for several topics, but these will need to be reviewed and updated since the WRAMP tools continue to evolve over time. Existing training videos include:

- **CRAM Wetland Modules** (Bar-built Estuarine, Depressional, Estuarine, and Riverine):
<https://www.cramwetlands.org/documents#Online%20Training%20Videos>
- **EcoAtlas Dashboards:**
<https://www.youtube.com/watch?v=aZ5Z9vwQYsw&feature=youtu.be>

Websites

Websites provide access to both high level overviews to WRAMP and the WRAMP tools, as well as links to more detailed information provided in factsheets, training videos, and technical reports. The benefit of developing and maintaining websites is the information can be easily discovered and accessed through an online search at any time.

Several websites already exist, but the content will need to be reviewed and updated since the WRAMP tools continue to evolve over time. Existing websites include:

- **California Wetlands Monitoring Workgroup Website:** Includes a section on the WRAMP Framework. *Note: The CWMW website is being updated and will eventually include a web page for this Training and Outreach Plan.*
(https://www.mywaterquality.ca.gov/monitoring_council/wetland_workgroup/index.html)
- **CRAM Resources & Documents:** Provides access to CRAM field books, publications, and supporting materials
(<https://www.cramwetlands.org/documents>)
- **EcoAtlas About Page:** Describes tools available within EcoAtlas
(<https://www.ecoatlas.org/about/>)
- **EcoAtlas Overview:** Provides overview of EcoAtlas tools through question-driven tabs (<https://www.sfei.org/ecoatlas>)

Outreach Presentations

Outreach presentations include high level overviews and introductions to WRAMP or the WRAMP tools. These presentations are usually requested by agency or program staff who are interested in learning more about the WRAMP tools or are presented during conferences or workshops. The length of time for these presentations is usually one hour.

Tailored Trainings

Tailored trainings are usually provided to a small group of 1-3 individuals and focus on the use of a particular WRAMP tool, such as EcoAtlas or Project Tracker. Oftentimes, the training is guided by specific questions from the group. Length of time is variable and dependent on user needs.

Formal Trainings

Formal trainings are structured, repeatable sessions with a standard set of materials (both written and presentations). These trainings can be offered to the general public and also be available as a private training for a specific group or organization.

- Classes can be virtual or in-person depending on the audience, goals of the class, and general logistics/constraints.
- Ideal class size is between 10-20 individuals.
- 1-day classes are likely ideal to allow for adequate presentation, discussion, and demonstration.
- Training content can be general level and/or advanced level, with the advanced training focused on hands-on work/analysis by the trainee.

As the WRAMP training program takes shape, it could look towards the existing and well-established [CRAM training program](#) for guidance and lessons learned. For instance, CRAM has a formal group of trainers that are qualified to conduct trainings, and must stay up-to-date to remain qualified. Trainings are always held with a minimum of two trainers, to provide different perspectives and to help answer tough questions. Two types of trainings are offered: a) publicly-advertised “open registration” training where an individual can register and join an existing class, and b) “specialized” trainings held specifically for a group of people (often from the same organization) that requested a training. The cost structure is set in advance, and ensures that the trainers’ time and expenses are covered.

Formal Repository for Training Materials

A **formal repository** for both public and private access to training materials will be developed for the WRAMP Training and Outreach Program. The vast library of WRAMP development, demonstration, and training reports and materials will be made available on a **public facing repository** (e.g., CWMW website) to facilitate easier access to the wide variety of information about WRAMP and its associated tools and methods. For example, it is envisioned that the public facing website will include components of this strategic plan, links to upcoming training opportunities, a library of WRAMP development and demonstration project reports, training materials for extended learning, and direct links to the WRAMP resources, such as EcoAtlas, CRAM, RipRAM, and other websites and tools.

The **private, program-specific repository** website will be developed to support the program’s implementation team. This repository will house a common and consistent set of materials and only be accessible to the implementation team. Materials will include module training presentations and notes, hands-on exercises, documentation of training events, a record of lessons learned, and any other materials developed as part of the implementation of the WRAMP Training and Outreach Plan.

Suggested options for the public facing and private, program-specific repositories include:

- **Public facing WRAMP Training and Outreach:** California Wetland Monitoring Workgroup website with links to other websites/tools/document/materials hosted by the statewide implementation team entities. In addition, some of these entities have their own WRAMP web pages, such as the [Southern California Wetlands Recovery Project](#).
- **Private access to WRAMP Training Program Materials for the implementation team:** any cloud based storage system that can be accessed and easily edited by multiple users within the program's implementation team.

Next Steps for Implementing the Training and Outreach Program

This section describes potential strategies and key priorities for implementation of the Training and Outreach Program, and a recommended phased approach for near-, short-, and long-term actions for effective implementation. The level of effort and ability to successfully implement the proposed program is highly dependent on funding and the willingness of partners (e.g., CWMW agencies) to participate, in particular for the recommended short- and longer-term actions.

Recommended Phased Approach for Implementation

Near-term actions (within 1 year):

1. Develop webinars for Modules 1 and 5, including slide decks, hands-on exercises, and reference materials.
2. Hold a virtual training workshop with one user group utilizing the material developed for Module 1 and 5, along with existing materials. Record training workshop and post video links Modules 1 and 5 on a public website.
3. Provide links to other training items that are already developed.
4. Develop one new factsheet: Generating a Watershed Profile.
5. Post developed materials on the CWMW website (*CWMW action*).

Short-term actions (within next 1-3 years):

1. Convene annual retreats to strategize and support coordinated implementation of the Training and Outreach Plan.
2. Identify potential WRAMP champions within State agencies and organizations.
3. Gather existing information/materials and better organize the public facing repository under the CWMW webpage (*CWMW action*).
4. Secure additional development funding to develop additional modules (Modules 2-4).

5. Build a development schedule for the Program, including estimated timeframe, e.g., Item 1 should happen in the next 1-2 years.

Long-term actions for key components (within next 3-5 years):

1. Secure funding

- 1.1 Obtain long-term implementation and tool maintenance funding (e.g., securing a permanent funding source).
- 1.2 Using the EMPA Implementation Blueprint (empa.sccwrp.org) and the funding strategies outlined in the [EcoAtlas Business Plan](#) (Hale and Grosso 2017), develop an Implementation Blueprint for the WRAMP Training and Outreach Program.
- 1.3 Conduct fundraising through the CWMW and its partners.

2. Identify who develops and implements the Program

- 2.1 Use an existing Committee or form a new Committee to lead the development and implementation of the Program.
- 2.2 Identify who should staff the implementation team.
- 2.3 Identify implementation strategies, for example:
 - 2.3.1 Individual agencies use the Plan and train their own staff.
 - 2.3.2 CWMW distributes the Plan and sponsors occasional trainings.
 - 2.3.3 CNRA directs training for select state restoration agencies.
 - 2.3.4 Implement Training and Outreach Program through the State's Training Academy or an educational institution.

3. Identify how to administer the Training Program

- 3.1 Identify the trainers.
- 3.2 Determine the logistics for administering training (e.g., registration and payment for formal courses).

4. Develop any remaining materials

- 4.1 Develop content for additional modules.
- 4.2 Review existing factsheets and either sunset or update them.
- 4.3 Develop additional factsheets and training videos.

5. Increase user outreach and Program visibility

- 5.1 Identify potential EcoAtlas champions within respective agencies and organizations, as well as existing forums to tap into.
- 5.2 Identify new agencies and programs to target to increase usership.
- 5.3 Prepare a newsletter to provide regular updates via existing email listservs.
- 5.4 Convene targeted meetings with regulatory agencies to discuss how to incorporate CRAM in performance measures.

6. Foster connections to other tools, repositories, and datasets

- 6.1 Identify, track, and consider how other existing web-based tools, repositories and datasets could connect to current and future WRAMP tools and the Training and Outreach Program.

This will allow enhanced public access and dissemination of data through multiple venues, while simultaneously reducing the need to maintain updated versions of data in multiple locations. There are a variety of platforms hosting Level 3 monitoring data and tools, including:

- California Natural Diversity Database (CNDDDB)
- Contaminant Data Display and Download (CD3) tool provides access to CEDEN water quality monitoring data (cd3.sfei.org)
- Habitat abiotic measurements
- Marine Protected Area Monitoring Data Portals:
 - Estuaries (<https://empa.sccwrp.org/>)
 - Intertidal/Rocky reef (<https://marine.ucsc.edu/>)
 - Kelp forest (<https://www.piscoweb.org/>)
 - DataOne
(<https://search.dataone.org/portals/CaliforniaMPA>)
- [NOAA Essential Fish Habitat \(EFH\) Mapper](#)
- [Healthy Watershed Partnership](#) statewide prioritization effort to use the California Stream Condition Index (CSCI)/Algal Stream Condition Index (ASCI) to prioritize healthy watersheds
- SWAMP [Perennial Streams Assessment \(PSA\) Dashboard](#)
- Species population numbers and distribution
- Stormwater tools
- [USFWS Environmental Conservation Online System \(ECOS\)](#)

7. Develop performance measures to track and evaluate the success of the Program

- 7.1 Develop a method to track Program progress and success.

There have been several attempts to determine how the WRAMP tools are being used, however, we continue to have challenges to implement the consistent use of the tools by agencies. Once funded and implemented, a successful Training and Outreach Program in California could be measured by performance standards established by the CWMW.

Appendices

Appendix A. Survey Responses

A 10-question survey was distributed in July/August 2022 to 220 individuals and re-sent via the SWRCB's lysis list. There was a 28% response rate with 61 survey responses. Here are the [summarized survey results](#).

Appendix B. Existing Training Materials and Programs Using the WRAMP Framework

This appendix provides weblinks to existing factsheets, reports, program websites, and other materials that employ the WRAMP framework, datasets, and/or tools.

Websites and Existing Training Materials

- **EcoAtlas**
 - EcoAtlas Website: www.ecoatlas.org
 - [Factsheet](#): EcoAtlas and CRAM Factsheet (2014)
 - **General Information (Webpage)**: <https://www.sfei.org/ecoatlas>
 - [Memo](#): An Introduction to EcoAtlas: Applied Aquatic Science (2016)
 - [Memo](#): Applied Aquatic Science: A Business Plan for EcoAtlas (2017)
- **Project Tracker**
 - Project Tracker Website: <https://ptrack.ecoatlas.org/>
 - [Project Tracker Factsheet](#) (September 2015)
- **CRAM**
 - CRAM Website: www.cramwetlands.org
 - [Technical Bulletin](#): Using the California Rapid Assessment Method (CRAM) For Project Assessment as an Element of Regulatory, Grant, and Other Management Programs - Version 2.0 (2019)
 - [Memo](#): Enhancements to EcoAtlas' CRAM analysis tools: Habitat Development Curves and Ecoregional Cumulative Distribution Function plots (CDFs). 2016
- **RipRAM**
 - RipRAM Website: <https://mlml.sjsu.edu/ccwg/ripram/>

- [Poster](#): Mapping Riparian Corridors in Central CA as a Reference for Assessing Riverine Health
- [Poster](#): Piloting the Riparian Rapid Assessment Method in Four Central Coast Watersheds
- **Riparian Zone Estimator Tool (RipZET)**
 - RipZET Website: Includes User Manual & Tool Download - [A GIS-based Tool for Estimating Riparian Zones](#)
 - [Poster](#): A GIS-Based Decision Support Tool for Estimating Riparian Zones at the Watershed and/or Project Scale (2015)
 - [Factsheet](#)
- **Contaminant Data Display and Download Tool (CD3)**
 - CD3 Website: <https://cd3.sfei.org/>
 - CD3 About page: <https://www.sfei.org/rmp/data>
 - CD3 API: <https://cd3.sfei.org/api.php>

Programs Using the WRAMP Framework and Tools

- **California Estuary Marine Protected Area Monitoring Program (EMPA)**

This program aims to Assess the quality and condition of estuaries statewide using a standard, comprehensive function-based assessment framework to determine the health of California's estuaries and the efficacy of the Marine Protected Area (MPA) designation.

 - Program Website: <https://empa.sccwrp.org/>
 - A Framework for Condition Assessment and Monitoring of Estuary MPAs in California: [Project Description and Workplan](#).
- **San Francisco Estuary Wetlands Regional Monitoring Program (WRMP)**

This program is still under development and has employed the WRAMP's adaptive management and monitoring framework to develop the overarching program structure and core elements that are anchored in addressing core management and monitoring questions. The program has a well established governing body and the Phase I Science Advisory Team developed a list of prioritized monitoring indicators and the program is in the process of developing near-term monitoring plans.

 - WRMP Website: <https://www.wrmp.org/>

- Program Plan:
https://www.sfestuary.org/wp-content/uploads/2020/07/SFE_WRMP-Program-Plan_072820_Web.pdf

- **Santa Clara Valley Water District's (Valley Water) Safe, Clean Water and Natural Flood Protection Program**

The Program's Priority D5 Project: *Ecological Data Collection and Analysis* effort implemented a watershed approach to environmental monitoring and assessment using the WRAMP 3-level framework in 2010. Since then the D5 Project completed five watershed-wide baseline assessments to characterize the amount, distribution, and diversity of aquatic resources in five major watersheds within Santa Clara County, and also characterize the overall ecological conditions of streams in each watershed employing CRAM. The purpose of these assessments is to align the collection and analysis of ecological data with the needs of water resource decision-makers by collecting data that address specific management questions developed by Valley Water's resource managers. Each watershed will be reassessed every 10-15 years to begin to track change over time.

- Valley Water's Priority D5 Project Website:
<https://www.valleywater.org/project-updates/d5-ecological-data-collection-and-analysis-0>
- Valley Water's Watershed Assessment Reports:
<https://www.sfei.org/projects/santa-clara-valley-water-districts-watershed-condition-assessments>

- **Southern California Wetlands Recovery Project Regional Monitoring Program**

The Wetland and Riparian Area Monitoring Plan (WRAMP) was used as a guide in the development of the Southern California Wetlands Recovery Project's (WRP) Regional Monitoring Program (RMP) and the utilization of WRAMP tools (e.g., EcoAtlas' Project Tracker and the statewide estuarine CRAM HDC). In 2018 with funding from the US EPA, the WRP developed regional, quantitative restoration objectives for coastal wetlands and watersheds across southern California Bight in the [Wetlands on the Edge: Regional Strategy 2018](#) report. The Regional Strategy articulates long-term goals and specific implementation strategies to guide the efforts of the WRP and its partners. The RMP will integrate and build upon existing Level 3 monitoring frameworks by coordinating the WRP agencies

to select and agree upon Level 3 monitoring indicators for their own permitting and funding purposes.

The Southern California Wetlands Recovery Project (WRP) utilizes several tools in the WRAMP toolset to track habitat restoration activities in its region. The State Coastal Conservancy uses Project Tracker to input all of the WRP work plan project data and they are currently working on finalizing a dashboard in EcoAtlas to display those projects to assist in tracking regional goals. Most, if not all, State Coastal Conservancy wetland restoration projects require CRAM as part of their grant agreements.

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- Appendix A. Morro Bay:
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- Appendix B. San Gabriel:
http://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/572_Appendix2.pdf

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