

Appendix 4: Justification for Subregional Monitoring Installations

4-1: Water Surface Elevations

- **Suisun Slough Network:** The California Department of Water Resources operates fourteen water level gauges that are tidally influenced within the Suisun subembayment. As of March 2024, at two of these stations, the water level sensors are inoperational, although the remainder of sensors are still operational.
- **Napa-Sonoma Network:** The two only tide gauges near the vast marshes of the Napa-Sonoma baylands are the ones installed by the Napa County Flood Control District at the Brazos Bridge and in Downtown Napa in 2017 and 2018, respectively. The Brazos Bridge gauge is more than a mile upstream of Older Raccoon Island (Benchmark Site), roughly three-quarters of a mile downstream of Bull Island (Reference Site), and many miles from Project Sites at Pond 2A, Pond 3, Cullinan Ranch, and other CDFW and USFWS tidal wetland restoration sites. The nearest tide gauges with long-term records are the NOAA gauges at Port Chicago and Richmond, which are roughly 19 and 20 miles away (as the crow flies), respectively). The Downtown Napa gauge is even further from these sites.
 - **Proposal:** This region represents a considerable spatial and temporal gap in regional monitoring of water levels, inundation, and sea level rise. This gap makes it challenging for land managers and project proponents such as CDFW, USFWS, Ducks Unlimited, and the Sonoma Land Trust to understand if/how the region's many existing restoration projects are achieving target conditions, and to plan for future restoration and adaptive management. To fill these gaps, the WRMP proposes two new long-term tide gauge installations, and numerous short-term tide gauge installations. The opportunity to re-occupy former IRWM WSE monitoring sites at Older Raccoon Island, Bull Island, and Pond 2A is relatively unique among WRMP sites, and provides a valuable opportunity to leverage legacy data to develop new analyses of change over time.
 - **New long-term installations:** The WRMP will install a new long-term gauge at **Older Raccoon Island** to link proposed site-specific observations of accretion/elevation change, vegetation, and other key indicators (see Section 5) to inundation. Data from this sensor can also be compared to data from the Integrated Regional Wetland Monitoring (IRWM) deployment almost 20 years ago, to support analyses of multi-decadal trends in conditions at the site. The program will also install a new long-term gauge in **Dutchman Slough** to represent water levels in the lower Napa River basin, to provide an inundation reference for multiple existing and future Project Sites including **Pond 3** and **Cullinan Ranch**. This gauge will eliminate the need for those projects to install their own reference gauges to compare how tides in those sites compare with source tides. Finally, the WRMP will also install a long-term gauge at **Steamboat Slough**, to support planning and monitoring of tidal wetland restoration projects

that are likely to result from implementation of the Sonoma Creek Baylands Strategy.

- **New short-term installations:** The WRMP tide gauges at the **Bull Island** Reference Site and **Pond 2A** Project Site. These installations will be temporary, with an aim of collecting enough data to (1) compare data from the Bull Island and Pond 2A sensors to the former IRWM sensors to support analyses of multi-decadal trends in conditions at the site, and (2) determine if data from Napa Flood Control's Brazos gauge can serve as a surrogate for data from Bull Island.
- **Installations at anticipated future Project Sites:** The beneficial reuse (eastern) portion of **Cullinan Ranch** is expected to be restored to tidal action sometime in late 2024/early 2025. The WRMP will work with the Coastal Conservancy, USFWS, and Ducks Unlimited to install a tide gauge at this site before it's restored to tidal action. Data from this gauge will be compared with data from the proposed Dutchman Slough gauge to assess post-restoration hydrology.
- **Novato/Gallinas/West San Pablo Bay Network:** This network currently supports four long-term tide gauges: one at Gallinas Creek operated by SFBNERR, and two along Novato Creek (one at its mouth, one at the Rowland bridge) operated by the Marin County Flood Control District. Environmental Science Associates (ESA) also periodically installs tide gauges at the Hamilton Wetlands Project Site as part of permit-required monitoring for that project. Whenever ESA deploys gauges at Hamilton, they also deploy a gauge at the historic railroad bridge at the mouth of the Petaluma River to represent background water levels within San Pablo Bay.
 - **Proposal:** For the most part, existing monitoring at Gallinas Creek and Hamilton Wetlands provides suitable coverage for the Gallinas OLU and the southern portion of the Novato OLU. Existing monitoring along Novato Creek provides suitable coverage for the northern portion of the Novato OLU. Together, these gauges can represent reference WSEs for planned tidal wetland restoration projects at Bel Marin Keys Unit V and Inner McInnis Marsh. However, coverage for the many existing and proposed restoration projects in the lower Petaluma baylands is lacking. In addition, regulatory/resource agencies will likely require site-specific monitoring of WSEs within tidal restoration projects that have yet to be implemented.
 - **New short-term installation:** The WRMP will install a new short-term gauge at the **Carl's Marsh** Project Site to (1) assess mathematical differences between tides at the mouths of Novato Creek and the Petaluma River, and (2) support analyses of multi-decadal trends in conditions at the site through comparison with data from the site's Integrated Regional Wetland Monitoring (IRWM) deployment almost 20 years ago. Short-term installations at Carl's Marsh can be timed with ESA's deployment of gauges at Hamilton Wetlands, and eliminate the need for ESA to install a reference gauge for Hamilton at the railroad bridge.

If the TAC determines that tides at Carl's Marsh reflect tides at the Novato Creek mouth, then the latter can support monitoring of Project Sites at **Sonoma Baylands, Sears Point**, and perhaps even at **Bahia**, as well as select future tidal wetland restorations that may result from implementation of the Petaluma River Baylands Strategy. If the TAC determines that tides at Carl's Marsh are sufficiently different from tides at the Novato Creek mouth, then the TAC may decide to convert Carl's Marsh into a long-term installation.

- **Installations at anticipated future Project Sites:** The **Bel Marin Keys Unit V** and **Inner McInnis Marsh** Project Sites are still in their planning stages; the timelines for implementation of both are unclear. When these projects move forward, the WRMP will work with Marin County Parks, the Coastal Conservancy, and other partners to install tide gauges at these sites. Data from the BMKV and Inner McInnis gauges can be compared to data from the Carl's Marsh and China Camp gauges, respectively, to assess post-restoration hydrology.
- **Wildcat Creek Network:** The Wildcat Creek network of WRMP sites is separated from the long-term NOAA tide gauge at Richmond by the Potrero Hills of the Richmond shoreline, and is hemmed in by Point San Pablo to the south and Point Pinole to the north. The network does not currently support any long-term gauges of its own, despite significant tidal wetland restoration and living shoreline projects at the Dotson Family Marsh Project Site, and plans to restore and enhance tidal wetlands near the Wildcat Creek Marsh Reference Site. A USGS tide gauge at Point San Pablo installed in 1989 was discontinued in 2006.
 - **Proposal:** Tidal wetlands play an important role in protecting economically disadvantaged and environmental justice-impacted communities in North Richmond from flooding, so this network represents an important spatial and temporal gap in WSE monitoring that the WRMP can fill.
 - **New long-term installation:** The WRMP will install a new long-term tide gauge at the **San Pablo Creek Marsh Benchmark Site** in order to link site-specific observations of accretion/elevation change, vegetation, and other key indicators (see Section 5) to inundation. By comparing these data to data from the Richmond gauge, the WRMP can help to identify how flows from San Pablo Creek influence hydrology at the site. Data from this gauge can also help land managers and other WRMP partners to understand how sea level rise and related long-term landscape processes are affecting the Richmond shoreline.
 - **New short-term installation:** The WRMP will work with the Coastal Conservancy, East Bay Regional Parks, local NGOs, and other partners to periodically deploy a tide gauge at the **Dotson Family Marsh (Restoration)** Project Site. The duration and frequency of deployments will be tailored to address the specific needs of this site, including assessing the effects of offshore

subtidal habitat enhancement actions on nearshore waves and WSEs. These installations will also be designed to assess post-restoration hydrology at the site (tidal datums, etc.), and determine if data from the proposed San Pablo Creek Marsh gauge can serve as a surrogate for WSE data from the restoration site.

- **Installations at anticipated future Project Sites:** A broad coalition of program partners including the West County Wastewater District, East Bay Regional Parks District, San Francisco Estuary Partnership, and local NGOs are partnering to develop the North Richmond Shoreline Living Levee Project, an effort to expand the footprint of the Wildcat Creek Marsh Reference Site and design and build a subsurface wastewater seepage or “horizontal” levee between the West County Wastewater District’s treatment plant and the marsh. When this project is implemented, the WRMP can work with the living levee team to install a tide gauge in the restored tidal wetland and monitor its development over time.
- **Alameda Creek Network:** The Alameda Creek network is home to CDFW’s 5,500-acre Eden Landing Ecological Reserve, one of the three areas that comprise the South Bay Salt Pond Restoration Project (SBSPRP). Phase 1 of SBSPRP restored roughly 1,700 acres of former salt ponds north of the Old Alameda Creek channel to tidal action from 2006 through 2010; Phase 2 proposes to restore another 2,200 acres south of the creek to tidal action beginning in (hopefully) 2024. In 2020, to support the Nutrient Management Strategy (NMS), SFEI installed three multi-parameter (WSEs, salinity, DO, and more) sensors offshore of Eden Landing. Since 2020, USGS has periodically installed multiple tide gauges at the Whale’s Tail South Benchmark Site as part of a special study into tidally- and wave-mediated transport of sediment between the marsh and offshore tidal flats.
 - **Proposal:** The Alameda Creek network represents a considerable opportunity for the WRMP to add value to the many monitoring efforts being implemented by the SBSPRP and NMS, and reduce the amount of time, money, and staff resources that SBSPRP and CDFW invest in monitoring. To support monitoring and adaptive management of earlier Phase 1 restorations, and implementation/monitoring of Phase 2 restorations, the WRMP proposes two new long-term tide gauge installations at the **Whale’s Tail South Benchmark Site** and the **North Creek Marsh Project Site**. These two locations should roughly bracket tidal ranges and the influences of waves/storms within the Eden Landing complex, and will help provide context for site-specific observations of elevation change, vegetation, and other WRMP indicators at these marshes.
- **Santa Clara Valley Network:** The Santa Clara Valley network is home to the Alviso Ponds of USFWS’s Edwards National Wildlife Refuge¹, another of the three areas that comprise the South Bay Salt Pond Restoration Project (SBSPRP). Phase 1 of the SBSPRP restored 480 acres of tidal

¹ Pond A18 is owned by the City of San Jose.

habitat within Ponds A19, A20, and A21 (the Island Ponds) in 2006, and 462 acres of tidal habitat within Ponds A6 and A17 in 2010 and 2012, respectively. Phase 2 of the SBSPRP proposes further enhancement of tidal connections at the Island Ponds, as well as tidal restoration of 710 acres of tidal habitat within Ponds A1 and A2W (within the Stevens Creek OLU) beginning in 2023. The SBSPRP is also working with Valley Water on planned full tidal restoration of Pond A8 (currently muted tidal). Finally, the South Bay Shoreline Protection Project proposes to restore 2,900 acres of tidal habitats within Ponds A9 through A13, A15, and A18 over roughly 30 years. In 2015, SFEI installed three multi-parameter (WSEs, salinity, DO, and more) sensors in this network, at Alviso Slough, Guadalupe Slough, and the Pond A8 feeder channel. Additionally, USGS operates a gauge at mouth of Coyote Creek.

- **Proposal:** Like the Alameda Creek network, the Santa Clara Valley network represents a considerable opportunity for the WRMP to add value to the many monitoring efforts being implemented by SBSPRP, NMS, the South Bay Shoreline Protection Project, and other program partners in support of tidal restoration planning, implementation, and adaptive management. Given the already considerable investment in WSE monitoring in this region, the WRMP is proposing just one additional tide gauge installation, at Coyote Creek near the **Older Warm Springs Marsh** Benchmark Site and **Warm Springs Marsh** Project Site. Data from this site can help support site-scale observations of accretion, vegetation, and other WRMP indicators at these marshes.

Table A4.1. Existing and proposed WRMP tide gauge deployments. Blue cells reflect priority WRMP monitoring site networks; white cells reflect Operational Landscape Units (OLUs) that could comprise future priority monitoring networks.

Network, OLU, or Subembayment	Station Name	WRMP Site Type	Operating Entity	Existing Tide Gauge Installation
Alameda Creek Network	North Creek Marsh	project		New long-term tide gauge
Alameda Creek Network	Whale's Tail South	benchmark		New long-term tide gauge
Belmont - Redwood network	Redwood City		NOAA	
Carquinez South OLU	Martinez		CA DWR	
Central Bay Subembayment	Alcatraz		SFEI	
Corte Madera network	Bon Air Bridge		Marin FCD	
Gallinas - Novato network	China Camp	benchmark	SFBNERR	
Gallinas - Novato network	Gallinas Creek	feeder channel to China Camp (benchmark) and Outer McInnis Marsh (reference)	SFBNERR	
Gallinas - Novato network	Hamilton Marsh	project	ESA	
Gallinas - Novato network	Mouth of Novato Creek		Marin FCD	
Gallinas - Novato network	Rowland Bridge on Novato Creek	feeder channel to potential future project site (Deer Island Basin)	Marin FCD	
Gallinas - Novato network	Carl's Marsh	project		New short-term tide gauge
Gallinas - Novato network	Bel Marin Keys Unit V	future project		TBD
Gallinas - Novato network	Inner McInnis Marsh	future project		TBD
Golden Gate OLU	San Francisco		NOAA	
Montezuma Slough network	Beldon Landing	feeder channel to Rush Ranch (benchmark)	CA DWR	
Montezuma Slough network	Collinsville on Sacramento River		CA DWR	

Montezuma Slough network	Hunter Cut at Montezuma Slough		CA DWR	
Montezuma Slough network	Montezuma Slough at Roaring River	feeder channel to Montezuma Wetland Restoration (potential future project)	CA DWR	
Montezuma Slough network	National Steel	feeder channel to Montezuma Wetland Restoration (potential future project)	CA DWR	
Montezuma Slough network	Pelican Point at Roaring River		CA DWR	
Montezuma Slough network	Montezuma Wetlands		Montezuma Wetlands LLC	
Mowry OLU	Newark Slough		SFEI	
Mowry OLU	Old Dumbarton Bridge near Newark		USGS	
Napa - Sonoma network	Napa River at Brazos Drawbridge	feeder channel for Napa Plant Site (project) and Bull Island (reference)	Napa FCD	
Napa - Sonoma network	Napa River at Downtown Napa		Napa FCD	
Napa - Sonoma network	Dutchman Slough	feeder channel for multiple project sites		New long-term tide gauge
Napa - Sonoma network	Older Raccoon Island	benchmark		New long-term tide gauge
Napa - Sonoma network	Steamboat Slough	feeder channel for multiple future project sites		New long-term tide gauge
Napa - Sonoma network	Bull Island	reference		New short-term tide gauge
Napa - Sonoma network	Cullinan Ranch (east)	future project		New short-term tide gauge
Napa - Sonoma network	Pond 2A	project		New short-term tide gauge
Petaluma network	Petaluma Railroad Bridge		ESA	

Point Richmond OLU	Richmond		NOAA	
Richardson OLU	Coyote Creek, Tam Valley		Marin FCD	
Richardson OLU	Richardson Bay		SFBNERR	
San Leandro OLU	Alameda		NOAA	
San Leandro OLU	Hayward		SFEI	
San Leandro OLU	San Leandro Marina		SFEI	
San Leandro OLU	Shoal Buoy		SFEI	
Santa Clara Valley Network	Coyote Creek near Older Warm Springs Marsh and Warm Springs Marsh restoration	feeder channel to Older Warm Springs Marsh (benchmark) and Warm Springs Marsh (project)		New long-term tide gauge
Santa Clara Valley Network	Alviso Slough	feeder channel to Pond A6 (project)	SFEI	
Santa Clara Valley Network	Coyote Creek near Alviso	feeder channel to Calaveras Point (reference) and Pond A6 (project)	USGS	
Santa Clara Valley Network	Guadalupe Slough	feeder channel to Pond A6 (project)	SFEI	
Santa Clara Valley Network	Pond A8 Outlet		SFEI	
South Bay Subembayment	Dumbarton Bridge		SFEI	
South Bay Subembayment	San Mateo Bridge		SFEI	
South Bay Subembayment	Martinez-Amorco Pier		NOAA	
South Bay Subembayment	Sacramento River at Mallard Island		CA DWR	
Suisun Slough network	Cygnus-Cordelia Slough		CA DWR	
Suisun Slough network	First Mallard	feeder channel to Rush Ranch (benchmark)	SFBNERR	
Suisun Slough network	Goodyear Slough		CA DWR	
Suisun Slough network	Hill Slough	feeder channel to Hill Slough existing (reference) and Hill Slough restoration	CA DWR	

		(project)		
Suisun Slough network	Ibis		CA DWR	
Suisun Slough network	Second Mallard	feeder channel to Rush Ranch (benchmark)	SFBNERR	
Suisun Slough network	Sunrise Club		CA DWR	
Suisun Slough network	Volanti		CA DWR	
Walnut OLU	Port Chicago		NOAA	
Wildcat Creek Network	San Pablo Creek Marsh	benchmark		New long-term tide gauge
Wildcat Creek Network	Dotson Family Marsh (restoration)	project		New short-term tide gauge
Wildcat Creek Network	North Richmond Living Levee	future project		TBD

*SFEI moorings for the Nutrient Management Strategy record depth, temperature, salinity, dissolved oxygen, chlorophyll-a, and turbidity at 15-minute intervals.. All stations except Alcatraz record dissolved organic matter (DOM) fluorescence.

4-2: Salinity

- **Suisun Slough Network:** The Suisun Slough network of WRMP sites has excellent salinity data coverage due to the suite of sensors deployed and managed by DWR, USGS, and SFBNERR. The WRMP is not proposing new sensors in this network in the near-term. If new tidal restoration projects come online in this OLU that are not adequately covered by the existing suite of sensors, the WRMP will work with DWR, USGS, SFBNERR, and other partners to develop proposals for new salinity gauges.
- **Napa-Sonoma Network:** The Napa-Sonoma Network does not currently support any salinity gauges, despite the fact that the Napa River - Sonoma Creek estuarine subgradients are among the largest in SFE, and support regionally significant acreages of existing tidal wetlands, tidal habitat restoration projects, and future/planned restoration projects.
 - **Proposal:** This region represents a considerable spatial and temporal gap in regional monitoring of salinity, and like WSEs, this gap makes it challenging for land managers and project proponents such as CDFW, USFWS, Ducks Unlimited, and the Sonoma Land Trust to understand if/how the region's many existing restoration projects are achieving target conditions, and to plan for future restoration and adaptive management. To fill these gaps, the WRMP proposes new long-term salinity gauges at the following locations, co-located with tide gauges: Napa River at Brazos Bridge, **Older Raccoon Island** (Benchmark Site), Dutchman Slough, and Steamboat Slough. These locations will provide data coverage throughout the Napa River and Sonoma Creek estuarine subgradients, including for the **Bull Island** Reference Site, existing Project Sites at Napa Plant Site, **Napa Ponds 3, 4, and 5**, and **Cullinan Ranch**, as well as anticipated future Project Sites within the Sonoma baylands.
- **Gallinas/Novato/West San Pablo Bay Network:** The only current salinity gauge in this network is at the **China Camp** Benchmark Site. This monitoring location provides adequate salinity coverage for the **Outer McInnis** Reference Site and **Hamilton Wetlands** Project Site, which like the China Camp tidal marshes are largely disconnected from upland watershed sources and have hydrology dominated by San Pablo Bay tides. However, the China Camp salinity gauge will likely not provide adequate coverage for planned tidal wetland restoration projects in the Novato Creek baylands, including at the **Bel Marin Keys Unit V** and **Deer Island Basin** Project Sites that will receive significant freshwater inputs from the Novato Creek watershed. It also may not be adequate to describe salinity in the future **Inner McInnis** Project Site, which will be directly connected to Gallinas Creek and possibly Miller Creek.
 - **Proposal:** The WRMP will install a long-term salinity gauge at the **mouth of Novato Creek** (co-located with the existing tide gauge) to provide salinity data coverage for existing restoration projects in the region including **Carl's Marsh, Sonoma Baylands, and Sears Point**, as well as future restoration projects at **BMKV** and **Deer Island Basin**. When the Inner McInnis restoration project is implemented, the WRMP will work with

partners including the Coastal Conservancy and Marin Parks to discuss the need for a short- or long-term salinity gauge at this site.

- **Wildcat Creek Network:** This network is relatively close to the continuous USGS salinity gauge at the Richmond-San Rafael (RSR) bridge, however, due to the local influence of runoff from Wildcat and San Pablo Creeks, it's unclear how well data from this gauge reflects conditions at WRMP monitoring sites within the Wildcat Creek Network (**San Pablo Creek Marsh Benchmark Site**, **Wildcat Creek Marsh** and **Dotson Family Marsh [Existing]** Reference Sites, and **Dotson Family Marsh [Restoration]** Project Site).
 - **Proposal:** The WRMP will co-locate a salinity gauge with the proposed tide gauge at the **San Pablo Creek Marsh Benchmark Site** to assess if/how local salinity conditions (including at the nearby **Dotson Family Marsh Existing** and **Restoration** sites) deviate significantly from conditions at the USGS RSR gauge. If not, then the WRMP will discontinue monitoring salinity at this location.
- **Alameda Creek Network:** The restoring tidal wetlands of Phase 1 of the SBSPRP are directly connected to freshwater flows from Old Alameda Creek, and planned restoration in Phase 2 is expected to eventually include direct connections to the considerable freshwater flows in the Alameda Creek flood control channel. Though these freshwater sources likely exert a considerable influence on the condition and evolution of the OLU's tidal habitats, this network currently supports no continuous salinity gauges. This network therefore represents a considerable opportunity for the WRMP to add value to the many monitoring efforts being implemented by the SBSPRP and NMS, and reduce the amount of time, money, and staff resources that SBSPRP and CDFW invest in monitoring.
 - **Proposal:** The WRMP will install two continuous salinity gauges in this network, both co-located with proposed WSE gauges: One at the **Whale's Tail South** Benchmark Site, and one at the **North Creek Marsh** Project Site. These gauge locations will help bracket the relative influences of estuarine-derived (more saline) and watershed-derived (more freshwater) flows on the network's tidal baylands, and provide context for site-specific observations of accretion, vegetation, and other WRMP indicators.
- **Santa Clara Valley Network:** This network receives continuous freshwater inputs from the San Jose-Santa Clara Wastewater Pollution Control Plant at Artesian Slough, as well as winter storm flows and year-round urban runoff from Coyote Creek, Guadalupe River/Alviso Slough, San Tomas Aquino + Calabazas Creeks/Guadalupe Slough, and other local flood control channels. The salinity sensors installed by SFEI in the Lower South Bay in support of the NMS provide adequate spatial coverage for Reference Sites at **Calaveras Point** and **Coyote Triangle Marsh**, as well as Project Sites at **Ponds A6, A21, and A17**. The only priority locations in this network that are not well-represented by existing salinity gauges are the **Older Warm Springs** Benchmark Site and the **Warm Springs Marsh** Project Site, which represent an area with considerable freshwater influence from Coyote Creek.

- **Proposal:** The WRMP will co-locate a salinity gauge with the tide gauges proposed for Coyote Creek near the **Older Warm Springs** Benchmark Site and the **Warm Springs Marsh** Project Site. These gauge locations will help bracket the influence of freshwater flows from Coyote Creek on the network’s tidal baylands, and provide context for site-specific observations of accretion, vegetation, and other WRMP indicators.

Table A4.2. Existing and proposed continuous salinity loggers in SFE. Blue cells reflect priority WRMP monitoring site networks; white cells reflect Operational Landscape Units (OLUs) that could comprise future priority monitoring networks.

WRMP Site Network, OLU, or Subembayment	Site	WRMP Site Type	Existing Salinity Gauge Installation	Proposed WRMP Salinity Gauge Installation
Alameda network	North Creek Marsh	project site		New long-term salinity gauge
Alameda network	Whale’s Tail South	benchmark		New long-term salinity gauge
Carquinez South OLU	Martinez		CA DWR	
Central Bay Subembayment	Alcatraz		SFEI	
Gallinas - Novato network	Gallinas Creek	Outer McInnis Marsh (reference)	SFBNERR	
Gallinas - Novato network	China Camp	benchmark	SFBNERR	
Montezuma Slough network	Beldon Landing		CA DWR	
Montezuma Slough network	Collinsville on Sacramento River		CA DWR	
Montezuma Slough network	Grizzly Bay Buoy		CA DWR	
Montezuma Slough network	Grizzly Bay		CA DWR	
Montezuma Slough network	Grizzly Bay at Head of Montezuma Slough Buoy		CA DWR	
Montezuma Slough network	Honker Bay		CA DWR	

Montezuma Slough network	Hunter Cut at Montezuma Slough		CA DWR	
Montezuma Slough network	Montezuma Slough at Roaring River		CA DWR	
Montezuma Slough network	National Steel		CA DWR	
Montezuma Slough network	Suisun Bay – Cutoff Near Ryer		CA DWR	
Montezuma Slough network	Sacramento River at Channel Marker 5 at Collinsville		USGS	
Montezuma Slough network	Grizzly Bay at Suisun Slough near Avon		USGS	
Mowry OLU	Newark Slough		SFEI	
Napa - Sonoma network	Dutchman Slough	feeder channel to multiple project sites		New long-term salinity gauge
Napa - Sonoma network	Older Racoon Island	benchmark		New long-term salinity gauge
Napa - Sonoma network	Steamboat Slough	feeder channel to potential future project sites		New long-term salinity gauge
Richardson OLU	Richardson Bay		SFBNERR	
San Lorenzo OLU	Hayward		SFEI	
San Lorenzo OLU	San Leandro Marina		SFEI	
San Lorenzo OLU	Shoal Buoy		SFEI	
Santa Clara Valley network	Older Warm Springs Marsh	benchmark		New long-term salinity gauge
Santa Clara Valley network	Alviso Slough		SFEI	
Santa Clara Valley network	Alviso Slough DO	adjacent to Pond A6 (project)	SFEI	
Santa Clara Valley network	Guadalupe Slough		SFEI	
Santa Clara Valley network	Guadalupe Slough DO	adjacent to Pond A6 (project)	SFEI	

Santa Clara Valley network	Pond A8 Outlet		SFEI	
Santa Clara Valley network	Salt Pond A4		SFEI	
Santa Clara Valley network	Salt Pond A8		SFEI	
Santa Clara Valley network	Salt Pond A4 near Alviso		USGS	
South Bay Subembayment	Dumbarton Bridge		SFEI	
South Bay Subembayment	San Mateo Bridge		SFEI	
South Bay Subembayment	Sacramento River at Mallard Island		CA DWR	
South Bay Subembayment	Suisun Bay at Van Sickle Island near Pittsburg		USGS	
South Bay Subembayment	Suisun Bay at Channel Marker 16 near Port Chicago		USGS	
Suisun Slough network	Goodyear Slough		CA DWR	
Suisun Slough network	Ibis		CA DWR	
Suisun Slough network	Sunrise Club		CA DWR	
Suisun Slough network	Volanti		CA DWR	
Suisun Slough network	Cygnus-Cordelia Slough		CA DWR	
Suisun Slough network	Goodyear Slough Outfall @ Naval Fleet		CA DWR	
Suisun Slough network	Godfather li on Suisun Slough		CA DWR	
Suisun Slough network	Hill Slough	Hill Slough (Restoration) (project)	CA DWR	
Suisun Slough network	First Mallard	adjacent to Rush Ranch (benchmark)	SFBNERR	
Suisun Slough network	Second Mallard	adjacent to Rush Ranch (benchmark)	SFBNERR	

Suisun Slough network	First Mallard Branch near Fairfield	adjacent to Rush Ranch (benchmark)	USGS	
Wildcat network	San Pablo Creek Marsh	benchmark		New long-term salinity gauge

*SFEI moorings for the Nutrient Management Strategy record depth, temperature, salinity, dissolved oxygen, chlorophyll-a, and turbidity at 15-minute intervals.. All stations except Alcatraz record dissolved organic matter (DOM) fluorescence.

4-3: Suspended Sediment Concentrations

Table 4.3. Existing and proposed WRMP turbidity/SSC sensor deployments. Blue cells reflect priority WRMP monitoring site networks; white cells reflect Operational Landscape Units (OLUs) that could comprise future priority monitoring networks.

Network	Site	Site Type	Existing Sensor Deployment	Proposed WRMP Sensor Deployment
Carquinez North/South OLU, Walnut OLU	Benicia and Carquinez Bridge		USGS - Time series turbidity w/ SSC calibration	
Alameda Creek Network	Whale's Tail South	Benchmark		Time series turbidity w/ 36 SSC calibration samples
Alameda Creek Network	North Creek Marsh	Project		Time series turbidity w/ 36 SSC calibration samples
Napa-Sonoma Network	Older Raccoon Island	Benchmark		Time series turbidity w/ 36 SSC calibration samples
Napa-Sonoma Network	Brazos Bridge	Feeder channel to multiple sites (relatively more fluvial)		Time series turbidity w/ 36 SSC calibration samples
Napa-Sonoma Network	Dutchman Slough	Feeder channel to multiple sites (relatively more estuarine)		Time series turbidity w/ 36 SSC calibration samples
Napa-Sonoma Network	Tolay Bridge? Sonoma Creek?			
Belmont-	San Mateo		USGS - Time	

Redwood OLU/San Mateo OLU	Bridge at Foster City		series turbidity w/ SSC calibration	
San Francisquito OLU, Mowry OLU	Dumbarton Bridge	Other	USGS - Time series turbidity w/ SSC calibration	
Santa Clara Valley Network	Coyote Creek at Hwy 237	Feeder channel to Older Warm Springs Marsh Benchmark Site	USGS - Time series turbidity w/ SSC calibration	
Santa Clara Valley Network	Coyote Creek at Alviso Slough/Calaveras Pt	Feeder channel to multiple sites	SFEI - Time series turbidity deployment from 2015-2020	Re-occupy and calibrate to SSC?
Santa Clara Valley Network	Alviso Slough		SFEI - Time series turbidity	
Santa Clara Valley Network	Guadalupe Slough		SFEI - Time series turbidity	
Santa Clara Valley Network	Pond A8		SFEI - Time series turbidity	
Santa Clara Valley Network	Alviso Slough Feeder Channel		SFEI - Time series turbidity	
Suisun Slough Network	Rush Ranch	Benchmark	SFBNERR - Time series turbidity	
Gallinas/Novato/West San Pablo Bay Network	China Camp	Benchmark	SFBNERR - Time series turbidity	
Wildcat Creek Network	Richmond San Rafael Bridge	Other	USGS - Time series turbidity w/ SSC calibration	
Wildcat Creek Network	San Pablo Creek Mouth	Benchmark		Time series turbidity w/ 36 SSC calibration samples

4-4: Existing and proposed multi-sensor gauges in WRMP

Table 4.4. Full extent of gauge information at all WRMP sites. This table expands on the abbreviated Table 2 within the full text.

Network Name	Site Name	WRMP Site Type	Existing Data Collection Coverage	Existing Data Collection Coverage	Existing Data Collection Coverage	Existing Data Collection Coverage	Proposed New Long-Term WRMP Multi-Sensor Installation
Network Name	Site Name	WRMP Site Type	Water Surface Elevations	Surface Salinity	SSC/Turbidity	DO	Proposed New Long-Term WRMP Multi-Sensor Installation
Suisun: Suisun Slough			X	X	X	X	
Suisun: Suisun Slough	Hill Slough (Existing)	Reference	X	X	?	?	
Suisun: Suisun Slough	Peytonia Slough Marsh	Reference					
Suisun: Suisun Slough	Hill Slough (Restoration)	Project	covered by existing Hill Slough installation	covered by existing Hill Slough installation	covered by existing Hill Slough installation	covered by existing Hill Slough installation	
Suisun: Suisun Slough	Wings Landing	Project	X	X	?	?	
San Pablo Bay: Napa-Sonoma	Older Raccoon Island	Benchmark					W
San Pablo Bay: Napa-Sonoma	Newer Raccoon Island	Reference					
San Pablo Bay: Napa-Sonoma	Bull Island	Reference					covered by new Brazos Bridge installation
San Pablo Bay: Napa-Sonoma	Brazos Bridge	Feeder Channel	X				W
San Pablo Bay: Napa-Sonoma	Pond 6A	Project					

San Pablo Bay: Napa-Sonoma	Napa Plant Site	Project					
San Pablo Bay: Napa-Sonoma	Dutchman Slough	Feeder Channel					W
San Pablo Bay: Napa-Sonoma	Cullinan Ranch	Project					covered by new Dutchman Slough installation
San Pablo Bay: Napa-Sonoma	Pond 3	Project					covered by new Dutchman Slough installation
San Pablo Bay: Napa-Sonoma	Pond 2A	Project					
San Pablo Bay: Napa-Sonoma	Steamboat Slough/Ringstro m Bay	Feeder Channel/Be nchmark Site					W
San Pablo Bay: Napa-Sonoma	Tolay Creek	Feeder Channel					?
San Pablo Bay: Novato- Gallinas/West San Pablo Bay	China Camp	Benchmark	X	X	X	X	
San Pablo Bay: Novato- Gallinas/West San Pablo Bay	Outer McInnis Marsh	Reference					
San Pablo Bay: Novato- Gallinas/West San Pablo Bay	Hamilton Wetlands	Project	X	X	X	X	
San Pablo Bay: Novato- Gallinas/West San Pablo Bay	Novato Creek Mouth	Feeder Channel	X				W
San Pablo Bay: Novato- Gallinas/West San Pablo Bay	Carl's Marsh	Optional Project	potentially covered by Novato Creek				

			Mouth tide gauge				
San Pablo Bay: Novato-Gallinas/West San Pablo Bay	Sonoma Baylands	Optional Project	potentially covered by Novato Creek Mouth tide gauge				
San Pablo Bay: Novato-Gallinas/West San Pablo Bay	Sears Point	Optional Project	potentially covered by Novato Creek Mouth tide gauge				
San Pablo Bay: Wildcat Creek	San Pablo Creek Marsh	Benchmark					W
San Pablo Bay: Wildcat Creek	Wildcat Creek Marsh	Reference					
San Pablo Bay: Wildcat Creek	Dotson Family Marsh (Existing)	Reference					covered by new San Pablo Creek Marsh installation
San Pablo Bay: Wildcat Creek	Dotson Family Marsh (Restoration)	Project					covered by new San Pablo Creek Marsh installation
South Bay: Alameda Creek	Whale's Tail South	Benchmark					
South Bay: Alameda Creek	Cargill Mitigation Marsh	Reference					
South Bay: Alameda Creek	North Creek Marsh	Project					W
South Bay: Alameda Creek	Pond E9	Project					

Lower South Bay: Santa Clara Valley	Older Warm Springs Marsh	Benchmark					W
Lower South Bay: Santa Clara Valley	Warm Springs Marsh	Project					W
Lower South Bay: Santa Clara Valley	Calaveras Point	Reference	X	X	X	X	
Lower South Bay: Santa Clara Valley	Coyote Triangle Marsh	Reference					
Lower South Bay: Santa Clara Valley	Pond A21	Project					
Lower South Bay: Santa Clara Valley	Pond A17	Project					
Lower South Bay: Santa Clara Valley	Pond A6	Project	X	X	X	X	