

Sediment in the Sanctuaries



Coastal Resilience Sediment Plan

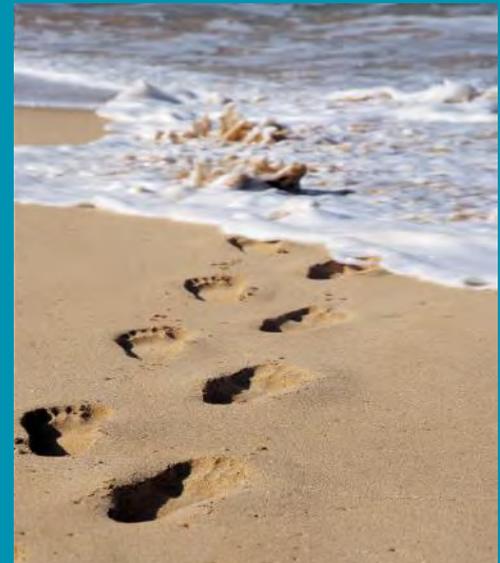
Joint GFNMS / MBNMS Advisory Council Meeting
Half Moon Bay, August 15, 2019

Sara Hutto and Wendy Kordesch

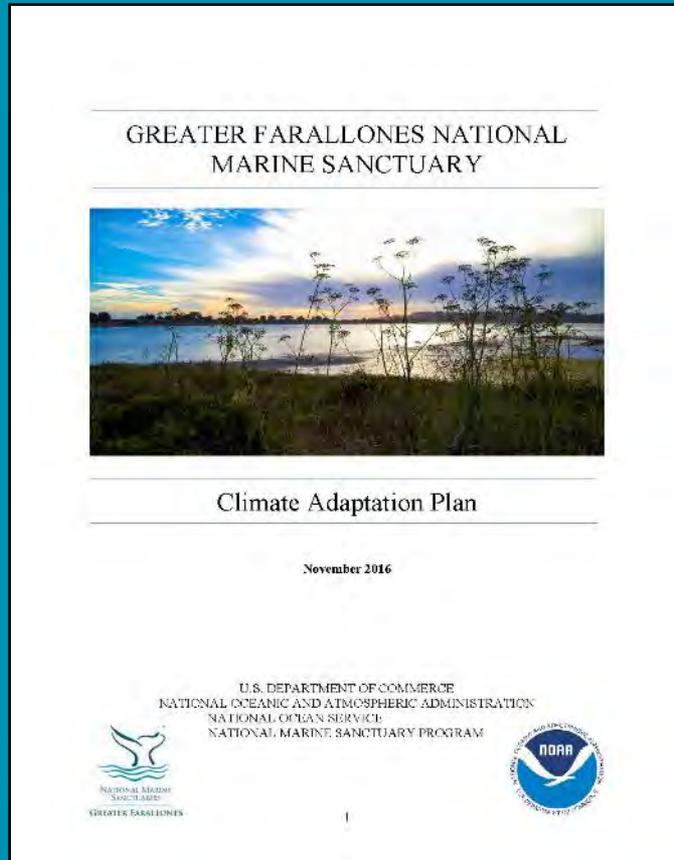
Greater Farallones Association

Max Delaney

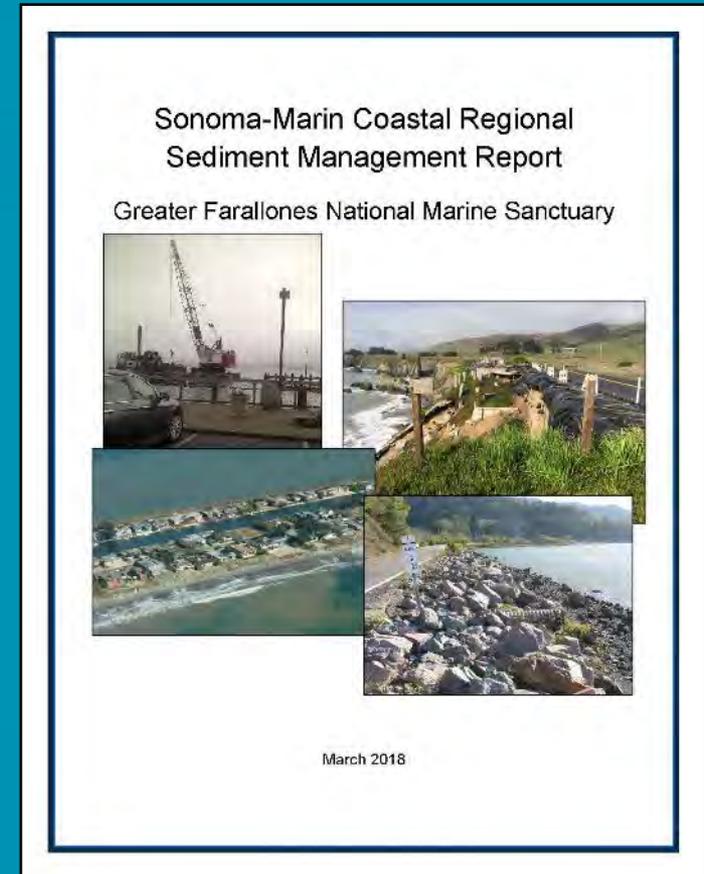
Greater Farallones National Marine Sanctuary



History of Sanctuary's Sediment Work



7 strategies call for enhanced sediment management, use, and science



Recommendations for sediment management at 29 sites across Sonoma/Marin

Four Coastal Regional Sediment Management Plans:



Gualala

Plan Area

San Francisco Central Bay

San Francisco Littoral Cell

Santa Cruz Littoral Cell

Point Año Nuevo

Coastal Resilience Sediment Plan

GOAL:

Identify and guide Sanctuary-focused approaches to sediment management for coastal resiliency

OUTCOMES:

- 6 common regional themes for sediment management across the North-central Coast
- 28 site-specific recommendations at 15 locations in the Sanctuary
- 3 Case studies
- A new multi-agency Sediment Coordination Committee



What are Sediment Management Strategies?

HARDSCAPING

- “Hold the Line”
- Groins/Jetties
- Cliff Stabilization
- Artificial Reefs
- Perched Beach

SOFTSCAPING

- Beach Nourishment/Restoration
- Living Shorelines
- Restoration of Dune/Upland/Marsh
- Dredging

OTHER

- Indirect Sediment Management
- Research
- Education
- Managed Retreat



MBNIMS



GFNMS



NPS

Regional Recommendations for the North-central Coast

- The four CRMSP/Rs list 39 recommendations
- GFNMS condensed these into 6 overarching themes



6 Regional Themes for the North-central Coast

1. Leverage Partnerships and Agency Coordination and Promote Information Sharing
2. Engage Communities and Stakeholders through Education and Outreach
3. Maintain and Expand Sediment Research and Monitoring Activities

6 Regional Themes for the North-central Coast

4. Restore Natural Habitats and/or Sediment Dynamics and Pursue Nature-Based Solutions to Avoid Hardening the Shoreline
5. Beneficial Reuse of Sediment
6. Watershed Approach

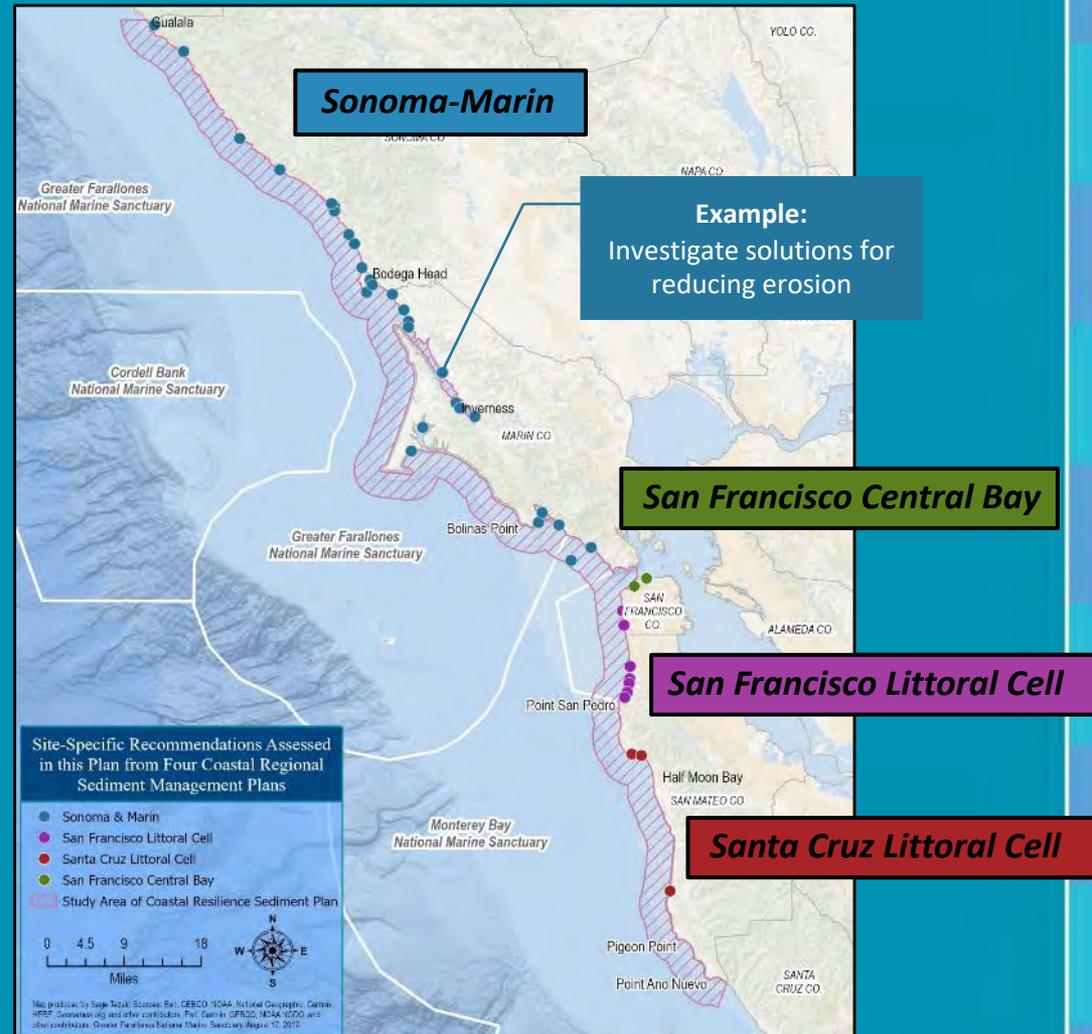


Site Level Recommendations

1

Compile recommendations from 4 plans

113 recommended strategies at 41 site locations from 4 plans in study area



Site Level Recommendations

1

Compile
recommendations
from 4 plans

2

Assess:
Feasibility & Fit

Does strategy support Sanctuary
goals and objectives?



Not a Fit

**Forward to
Agency Partner**

Implement

All Site Level Recommendations

1

Compile recommendations from 4 plans

2

Assess: Feasibility & Fit

		13 STRATEGIES												
		Coastal	Dredging	Managed Wetland	Restoration of Dunes/Polynoid Beaches	Beach Nourishment	Restoration	W/ Reef	Seawall	Beach	Recreation	Wetland Sediment Management	Dredging	
Sonoma-Marin	State Parks	Fwd											Fwd	
	Guadalupe River												Fwd	
	See Ranch	Fwd											Fwd	
	Salt Point State Park												Fwd	
	Fort Ross Historic Park	Fwd												
	Russian River - Driftwood Beach												Fwd	
	Russian River Estuary	Fwd											Fwd	
	Russian River	Fwd											Fwd	
	Wright's Beach	Fwd	Fwd										Fwd	
	Cleason Beach	Fwd	Fwd										Fwd	
	Saltman Creek		Fwd										MSSL	
	Boodega Harbor	Fwd											Fwd	
	Boodega Harbor	Fwd											Fwd	
	Doran Point	Fwd	Fwd	SSL										Fwd
	Estero de San Juan			SLLL										SLSL
	Estero de San Juan													MSSL
	Dillon Beach	Fwd												Fwd
	Dillon Beach	Fwd												Fwd
	Marshall													SSLH
	Chicken River			SLLL										SSLH
	Trinidad	Fwd												SLSL
	Pt Reyes State Park	Fwd												SSLH
	PRNS - Dillon Beach													Fwd
PRNS - Dillon Beach													Fwd	
Ducury River													SLSH	
Point Reyes State Park	Fwd	SSLH											Fwd	
Point Reyes State Park	Fwd	SSLH											SSLH	
Point Reyes State Park	Fwd	Fwd	SLLH										SSLH	
Point Reyes State Park	Fwd	Fwd											MLLH	
San Francisco State Park													Fwd	
Baker Beach			Fwd										Fwd	
Middle Ocean Beach	Fwd												Not Fit	
South Ocean Beach	Fwd												Not Fit	
Marin	Fwd												Not Fit	
Beach Blvd	Fwd												Not Fit	
Sharp Park	Fwd												Not Fit	
Rookaway Beach (Cove)	Fwd												Not Fit	
Linda Mar	Fwd												Not Fit	
Princeton - Princeton Harbor													Not Fit	
El Granada County (Surfer's) Beach	Fwd		SSLH										Not Fit	
Pescadero Lagoon - Butano Creek													Fwd	
Total		23	13	12	1	8	1	3	7	5	18	8	10	3

* The Sanctuary could consider allowing beach nourishment or dredging only for restoration purposes.
 **Bodega Harbor is not within Sanctuary Boundaries, however the Sanctuary would be involved in helping the beneficial reuse of material for restoration of beach/marsh habitat at sites that could be in the Sanctuary.



All Site Level Recommendations

1

Compile recommendations from 4 plans

2

Assess: Feasibility & Fit

County	Location	13 STRATEGIES												
		Managed Wetland	Restoration of Dune/Coastal	Beach Nourishment	Recreation	W/ Beach	Seawall	Education	Indirect Sediment Management	Dredging*	Re.	Ed.	Indirect	Dredging*
	State Parks	Fwd											Fwd	
	Guatala River												Fwd	
	See Ranch	Fwd											Fwd	
	Salt Point State Park											Fwd		
	Fort Ross Historic Park	Fwd												
	Russian River - Driftwood Beach												Fwd	
	Russian River Estuary	Fwd										Fwd	Fwd	Fwd
	Russian River	Fwd											Fwd	
	Wright's Beach	Fwd	Fwd											Fwd
	Cleason Beach	Fwd	Fwd											Fwd
	Saltman Cr.		Fwd									MSSL	MSSL	
	Boodega Pt	Fwd										Fwd		Fwd
	Boodega Pt	Fwd										Fwd	SSL	
	Doran Pt	Fwd	Fwd	SLLL								SLSL		
	Estero de San			SLLL								SLSL	MSSL	Fwd
	Estero de San											SLSL	MSSL	
	Dillon Beach	Fwd							Not Fit			Fwd		Fwd
	Dillon Beach		Fwd											
	Marshall											SLLH	SSLH	
	Chicken Pt		SLLL									SLLH	SSLH	
	Trinidad	Fwd										SLSL		Fwd
	Pt Reyes S		Fwd									SSL		
	PRNS - D											Fwd		
	PRNS - S		Fwd											
	Ducury R											SLSH		
	Boleina Crt	Fwd	SSL						Fwd					
	Boleina Lagoon		SSLH									SSLH	SLLH	SSLH
	Stinson Beach	Fwd	Fwd	SLLH								SSLH	SSLH	
	Muli Beach	Fwd										MLLL		
	San Francisco Gate North Beach											Fwd		
	Baker Beach			Fwd										
	Middle Ocean Beach	Fwd	Fwd	Fwd								Not Fit		
	South Ocean Beach	Fwd	Fwd	Fwd								Not Fit		
	Mariner	Fwd	Fwd	Fwd								Not Fit		
	Beach Blvd	Fwd	Fwd	Fwd								Not Fit		
	Sharp Park	Fwd	Fwd	Fwd								Not Fit		
	Rookaway Beach (Cove)	Fwd	Fwd	Fwd								Not Fit		
	Linda Mar	Fwd	Fwd	Fwd								Not Fit		
	Princeton - Pier Point Harbor		Not Fit	Not Fit					Not Fit			Not Fit		
	El Granada County (Surfer's) Beach	Fwd	SSLH						Not Fit					
	Pescadero Lagoon - Butano Creek		Fwd											Fwd
	Total	23	13	12	1	8	1	3	7	5	18	8	10	3

41 Site Locations



Not a fit:

- Hardscape

* The Sanctuary could consider allowing beach nourishment or dredging only for restoration purposes.
 ** Bodega Harbor is not within Sanctuary Boundaries, however the Sanctuary would be involved in helping the beneficial reuse of material for restoration of beach/marsh habitat at sites that could be in the Sanctuary.

All Site Level Recommendations

1

Compile recommendations from 4 plans

2

Assess: Feasibility & Fit

1 Recommendation in Sonoma-Marín Plan is not consistent with Sanctuary policies

County	Location	13 STRATEGIES													
		Managed Network	Restoration of Dunes/Coastal	Beach Nourishment	Pre.	M.	Gr.	Ch.	Wo.	Lik.	Re.	Seawall	Education	Indirect Sediment Management	Dredging*
	State Parks	Fwd												Fwd	
	Guadalupe River													Fwd	
	See Ranch	Fwd												Fwd	
	Salt Point State Park												Fwd		
	Fort Ross Historic Park	Fwd													
	Russian River - Driftwood Beach													Fwd	
	Russian River Estuary	Fwd											Fwd	Fwd	Fwd
	Russian River	Fwd											Fwd		Fwd
	Wright's Beach	Fwd	Fwd												Fwd
	Cleason Beach	Fwd	Fwd												Fwd
	Saltman Creek		Fwd										MSSL	WALL	
	Boodega Harbor	Fwd											Fwd	Fwd	SSL
	Boodega Harbor	Fwd											Fwd		Fwd
	Doran Point	Fwd	Fwd	SLLL								SLSL			
	Estero de San Pedro												SLSL	MSSL	Fwd
	Estero de San Pedro													MSSL	SLSL
	Dillon Beach	Fwd											Fwd		Fwd
	Dillon Beach	Fwd													Fwd
	Marshall Beach														
	Chicken River			SLLL									SLLH	SSLH	
	Trinidad	Fwd											SLSL	SSL	Fwd
	Pt Reyes State Park														
	PRNS - Dillon Beach														
	PRNS - Dillon Beach														
	Ducury River														
	Point Reyes State Park	Fwd													
	Bolinas Lagoon			SSSL											
	Bolinas Lagoon														
	Stinson Beach	Fwd	Fwd	SLLH											
	Mulholland Beach	Fwd													
	San Francisco Gate North Reach														
	Baker Beach			Fwd											
	Middle Ocean Beach	Fwd				Fwd									
	South Ocean Beach	Fwd				Fwd									Not Fit
	Marin	Fwd				Fwd									Not Fit
	Beach Blvd	Fwd				Fwd									Not Fit
	Sharp Park	Fwd				Fwd									Not Fit
	Rookaway Beach (Cove)	Fwd				Fwd									Not Fit
	Linda Mar	Fwd				Fwd									Not Fit
	Princeton - Miller Point Harbor					Not Fit	Not Fit								Not Fit
	El Granada County (Surfer's) Beach	Fwd				SSLH									Not Fit
	Pescadero Lagoon - Butano Creek														Fwd
	Total	23	13	12	1	8	1	3	7	5	18	8	10	3	

41 Site Locations

Not a fit: Dillon Beach Seawall



* The Sanctuary could consider allowing beach nourishment or dredging only for restoration purposes.
 **Bodega Harbor is not within Sanctuary Boundaries, however the Sanctuary would be involved in helping the beneficial reuse of material for restoration of beach/marsh habitat at sites that could be in the Sanctuary.

Sanctuary Site Level Recommendations

1

Compile recommendations from 4 plans

2

Assess: Feasibility & Fit

3

Compile Sanctuary strategies

STRATEGIES

CPSHP Site Number	Location	STRATEGIES					
		Restoration of Dune/Upland and Marsh Environments	Beach Nourishment for Restoration*	Living Shorelines	Research	Education	Dredging*
1	Salmon Creek Beach				MSSL	MSSL	
2	Bodega Harbor**				SLL		
3	Doran Park		SLL	SLSL			
4	Estero Americano	SLL			SLSL	MSSL	SLSL
5	Estero de San Antonio				SLSL	MSSL	
6	Marshall			SLLH	SLLH		
7	Chicken Ranch Beach	SLL			SLL		
8	Inverness			SLSL			
9	Pt Reyes Station – Bivalve				SLL		
10	Duxbury Reef and Off-shore Area				SLSH		
11	Bolinas Cliffs	SSSL					
12	Bolinas Lagoon	SLLH		SLLH	SLLH	SLLH	
13	Stinson Beach		SLLH		SLLH	SLLH	
14	Muir Beach				MLL		
15	El Granada County (Surfer's) Beach		SLLH				
Total		4	3	4	11	5	1

15 Site Locations

* The Sanctuary could consider allowing beach nourishment or dredging only for restoration purposes.
 **Bodega Harbor is not... would be involved in the beach/marsh habitat...



Implement:

- 28 Sanctuary-focused strategies
- Green shading: Implementation Feasibility (benefit/required resources/support/urgency)

Sanctuary Site Level Recommendations

1

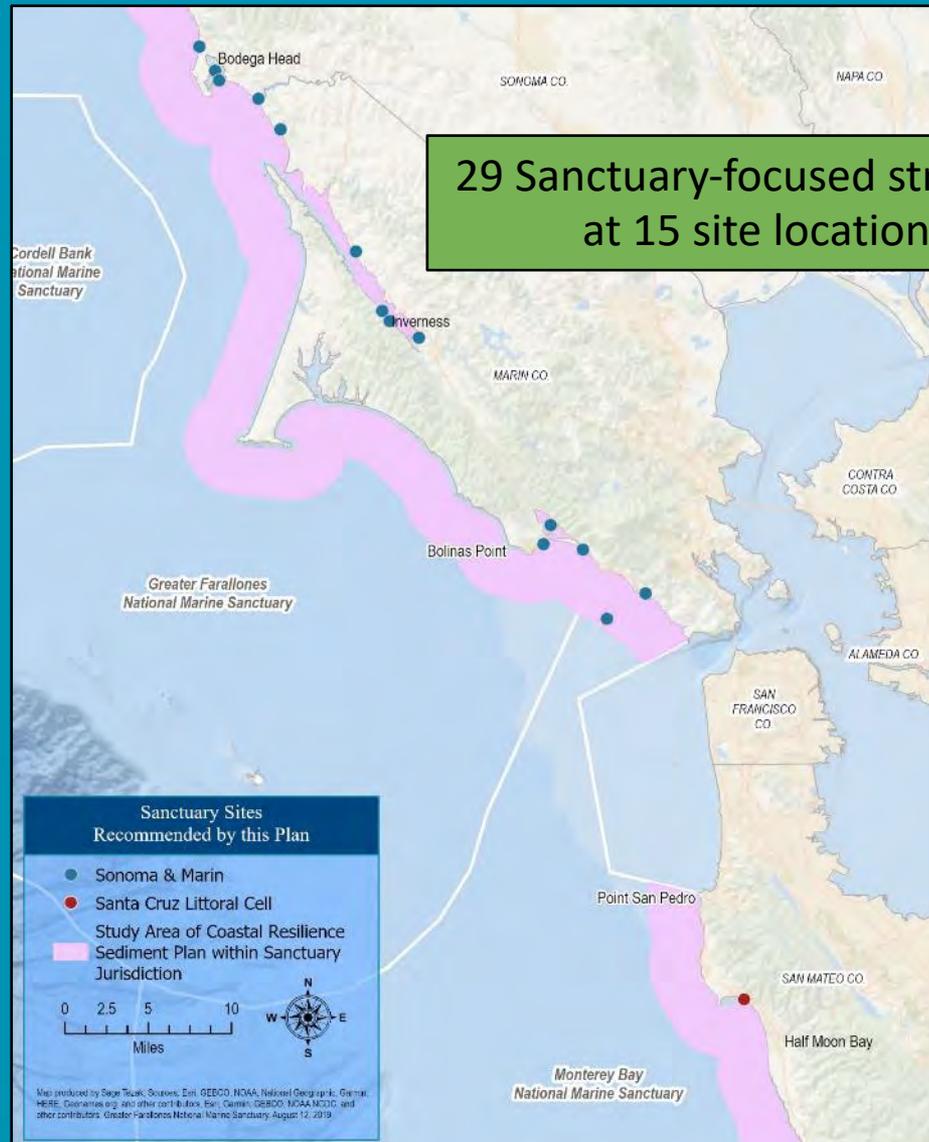
Compile recommendations from 4 plans

2

Assess:
Feasibility & Fit

3

Compile Sanctuary strategies



Sanctuary Site Level Recommendations

6. Marshall, Marin County

<i>Shoreline Characterization</i>	
General Setting	Geology: Qt, fsr Shoreline: Tidal Marsh, Beaches, Coastal Marsh, Hardened Shores
Shoreline Change	No data available
Primary Landowners	Audubon Canyon Ranch, National Park Service (GGNRA)
Critical Habitats	N/A
Public Access and Trails	1 Access Points: 1 City/Town No trails
Infrastructure	Roads: <1 km local roads Culverts: 8 Armor: none



Recommended Strategy(ies) from Table 3.7:

<i>Sanctuary Strategies</i>		
Location	Marshall	
Concerns	Scouring of mudflats and increased erosion - losing habitat (mudflats) and their protective capacity	
Goal	Erosion reduction, habitat preservation	
Management Strategy	Living Shorelines	Research
Implementation Feasibility	May be most easily implemented (SSLH)	May be most easily implemented (SSLH)
Timeframe	Near-term	Near-term
Strategy Detail	Explore pilot project for living shoreline using native oyster shells to reduce wave impacts	Investigate additional solutions for reducing erosion
Potential Agency Partners	USACE; EPA; NPS; CCC; SLC; Water Board; Resource Agencies	USACE; EPA; CCC; Water Board; SLC; State Parks; County
Notes	See C-SMART Marshall Conceptual Adaptation Options from Marin County	

How will this plan be used?

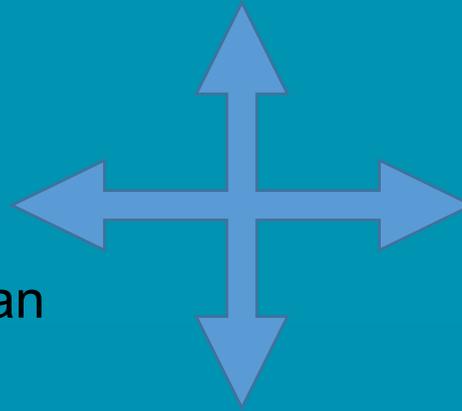


Roadmap:

GFNMS to plan and/or coordinate future projects

Resource:

Product for CSMW (CNRA) to further Sediment Master Plan



Resource:

Project development by partner Agencies

Resource:

Model for newly formed Sediment Coordination Committee planning

Next Steps



- Final Plan (Fall 2019)
- Present to North-central California Coastal Sediment Coordination Committee (Sept. 2019)
- Copies of final plan to be circulated to GFNMS and MBNMS SAC
- Online
 - GFA website
 - GFNMS Ocean Climate Storymap

CONTACTS:

Wendy Kordesch, Geological Oceanographer*

wendy.kordesch@noaa.gov

**Main contact for sediment*

Max Delaney, Permit Coordinator

max.delaney@noaa.gov

Sara Hutto, Climate Program Coordinator

sara.hutto@noaa.gov

