

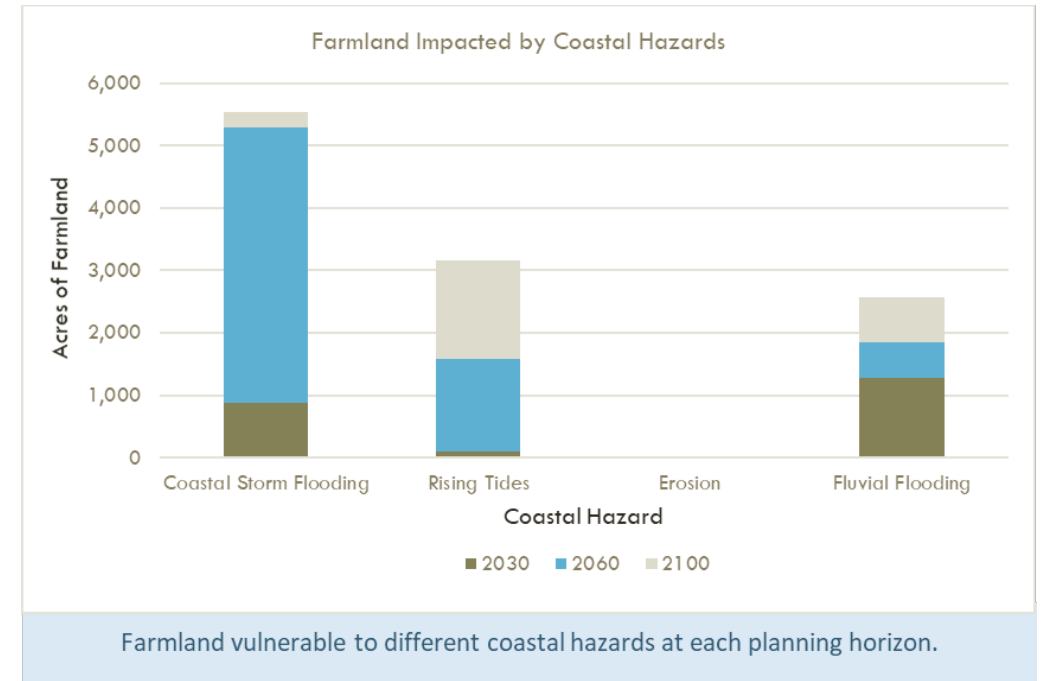
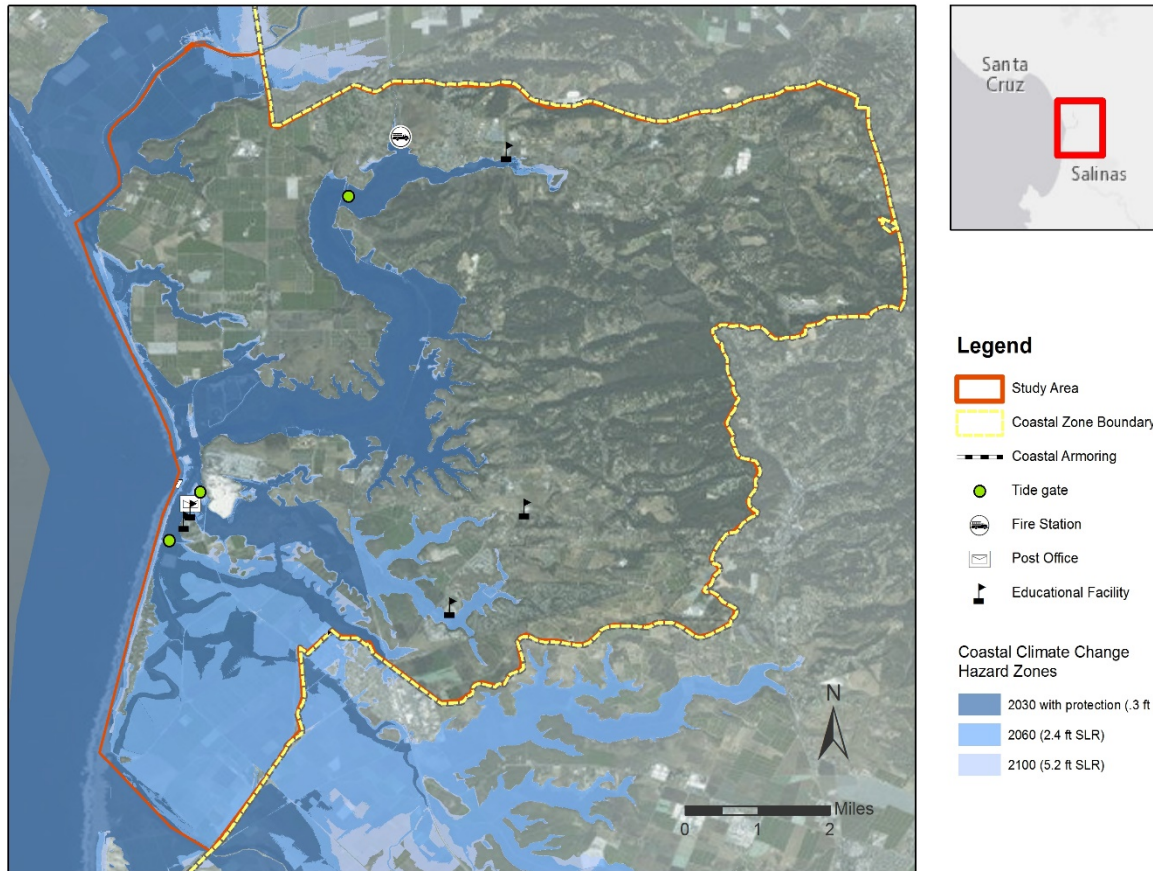


MONTEREY BAY CLIMATE VULNERABILITY & IRWMP RESILIENCY PLANNING

Ross Clark
Central Coast Wetlands Group
November 2021



MONTEREY SEA LEVEL RISE/CLIMATE VULNERABILITY



Regional
Collaboration

MB Climate Action Compact

Coastal Resilience Network

Central Coast Climate Collaborative

WCB GHG
funding

Local
Funding

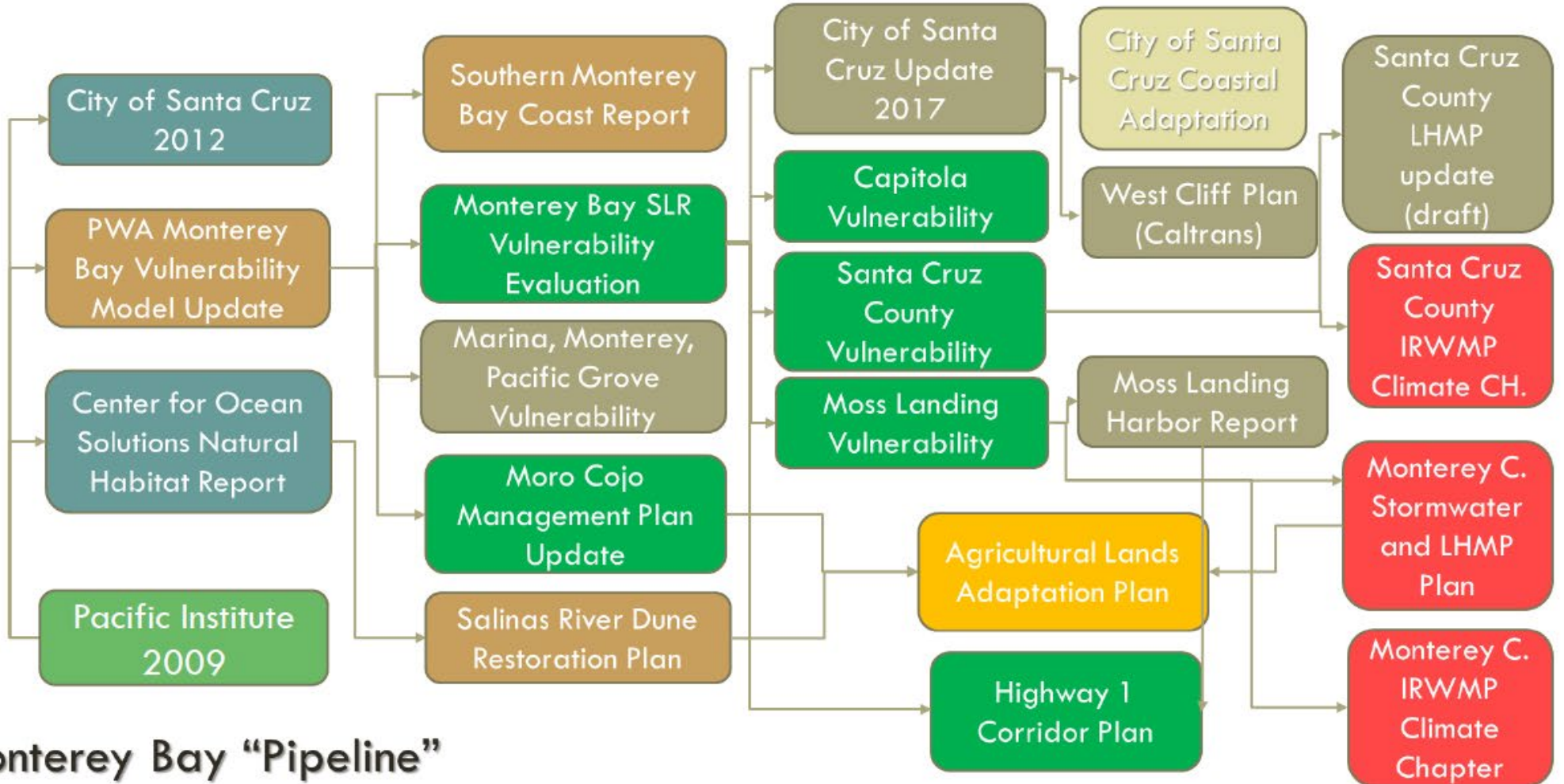
CCC LCP update
funding

OPC Planning &
Imp funds

DWR Planning
funds

SCC Planning &
Imp funds

Ten years
of
Adaptation
Planning

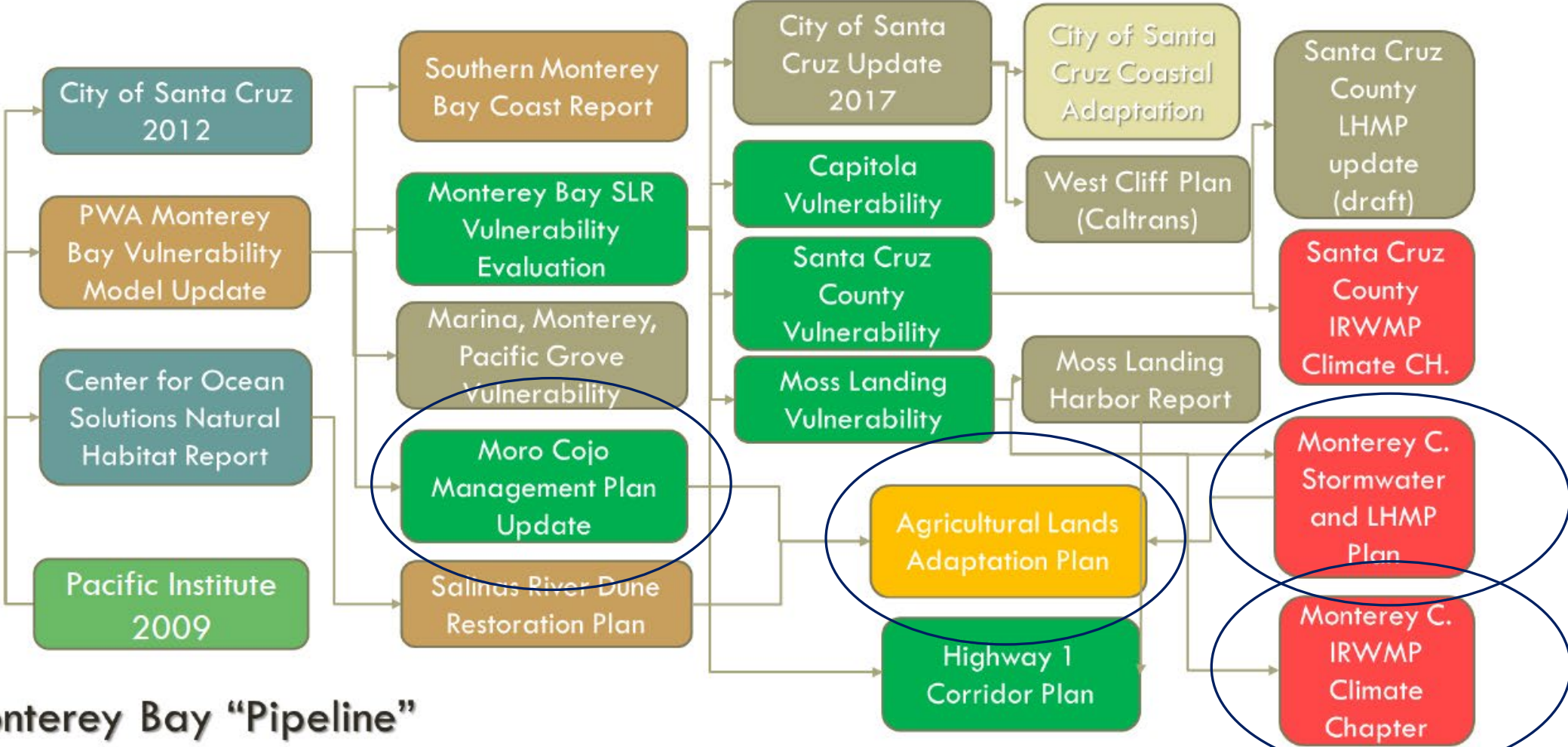


The Monterey Bay "Pipeline"

Regional MB Climate Action Compact Coastal Resilience Network Central Coast Climate Collaborative



Ten years of Adaptation Planning



The Monterey Bay "Pipeline"

GREATER MONTEREY IRWMP CLIMATE FINDINGS

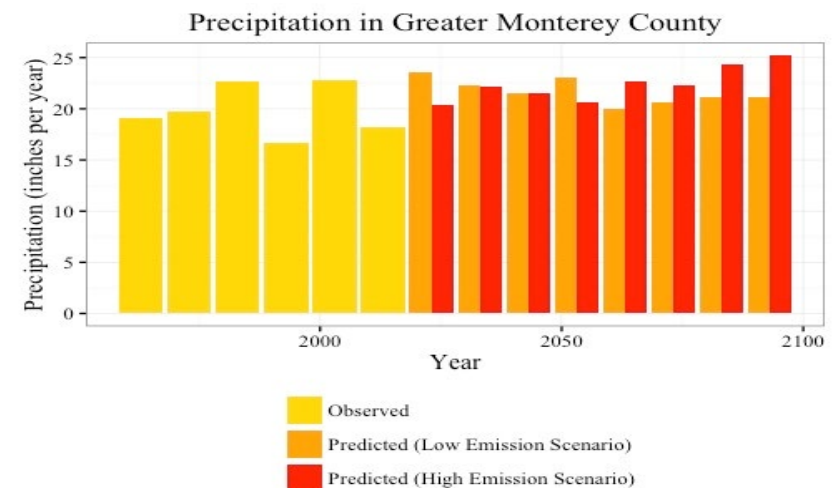
Asset	Hazard	Recommended Actions	Feasibility	Estimated Cost	Key Partners
Water and Utility Infrastructure					
Storm Drains	Storm and fluvial flooding	Install gates on vulnerable storm drains	Easy	Low	CCSD, MCWRA, Monterey County Public Works
	Rising tides	Estimate effective life using sea level rise predictions	Easy	Low	CCSD, MCWRA, Monterey County Public Works
	Storm and fluvial flooding	Evaluate options to reduce reliance on vulnerable storm drain infrastructure (LID, retention)	Easy	Low	CCWG, City of Salinas, CCSD, MCWRA, Monterey County Public Works
Culverts and Tide Gates	Rising tides	Evaluate necessary upgrade to existing structures	Moderate	Moderate	CCSD, MCWRA, Monterey County Public Works
	Fluvial flooding	Evaluate secondary overflow options	Moderate	Moderate	CCSD, MCWRA, Monterey County Public Works
	Fluvial flooding	Evaluate feasibility of installing additional pumps and control structures	Moderate	Moderate	CCSD, MCWRA, Monterey County Public Works
	Fluvial flooding	Evaluate drainage modifications (retention) in upper watershed that reduce downstream peak flows	Moderate	Moderate	CCWG, City of Salinas, Stormwater planning team, Salinas Valley GSA
Groundwater Wells	Coastal storm flooding, rising tides	Evaluate risk of contamination from surface flood waters	Moderate	Moderate	RWQCB, agriculture industry, MCWRA
Moss Landing Lift Station	Coastal storm flooding, rising tides	Evaluate upgrades, resiliency or relocation	Moderate	High	CCSD, MCWRA, Monterey County Public Works
Moss Landing Harbor	Sea level rise and coastal storm flooding	Draft a site specific SLR vulnerability and adaptation plan	Easy	Low	Monterey County Planning, Moss Landing Harbor District

CLIMATE DRIVEN SURFACE WATER HAZARDS

SALINAS VALLEY STORMWATER PLAN (2019)

Table 1. Increases in 100-year Discharge for the Reclamation Ditch System Relative to Historic Period (1950-2000)

EMMISSIONS SCENARIO	2030	2060	2100
Medium (RCP 4.5 5 th percentile)	20% Increase	40% Increase	60% Increase
High (RCP 8.5 90 th percentile)	140% Increase	210% Increase	275% Increase



Five Environmental Goals for Stormwater Plan

Water Quality Goal:

Improve water quality so that waters in the planning area are suitable for human and environmental uses.

Water Supply Goals:

Manage storm water to increase water supply for urban, agricultural and environmental uses.

Flood Management Goal:

Manage storm water systems to reduce surface water peak flows and flood risk.

Environmental Objectives:

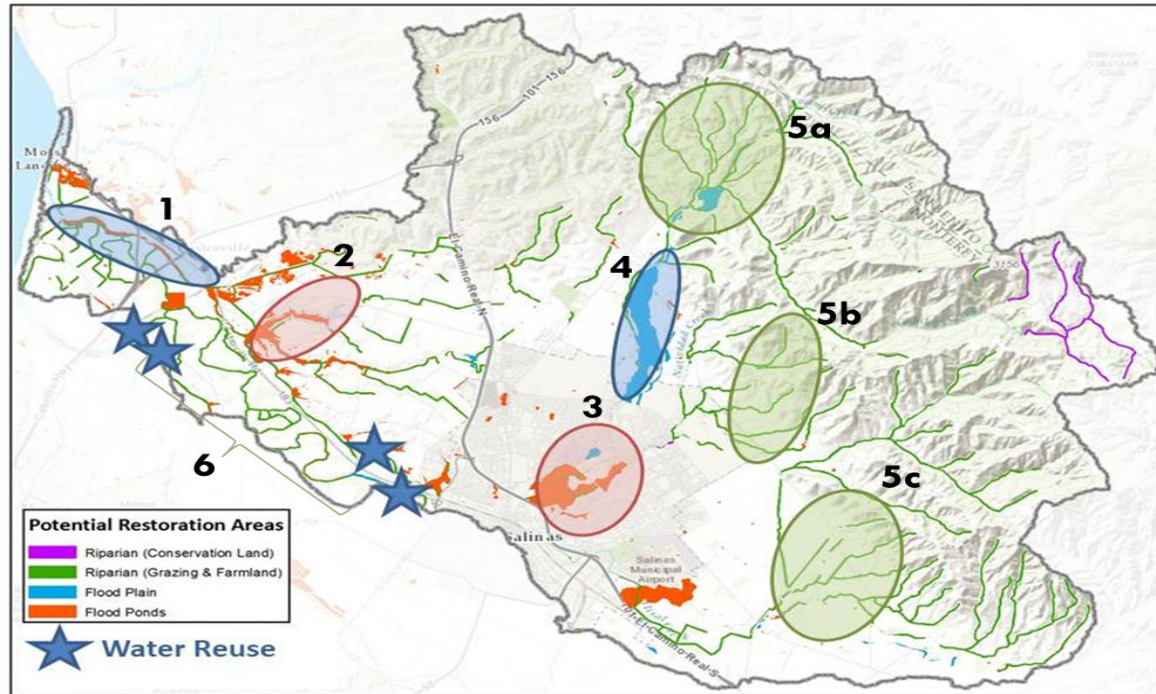
Protect, preserve, restore, and/or enhance watershed features and processes through storm water management.

Community Objectives:

Enhance economic prosperity and quality of life through improved urban spaces, availability of clean water, and related job creation and training.

**IRWMP STORMWATER GOALS
MANY PROJECTS SUPPORT MULTIPLE GOALS**

IRWMP STORMWATER PROJECT EXAMPLES



Flood Ponds – project type 2



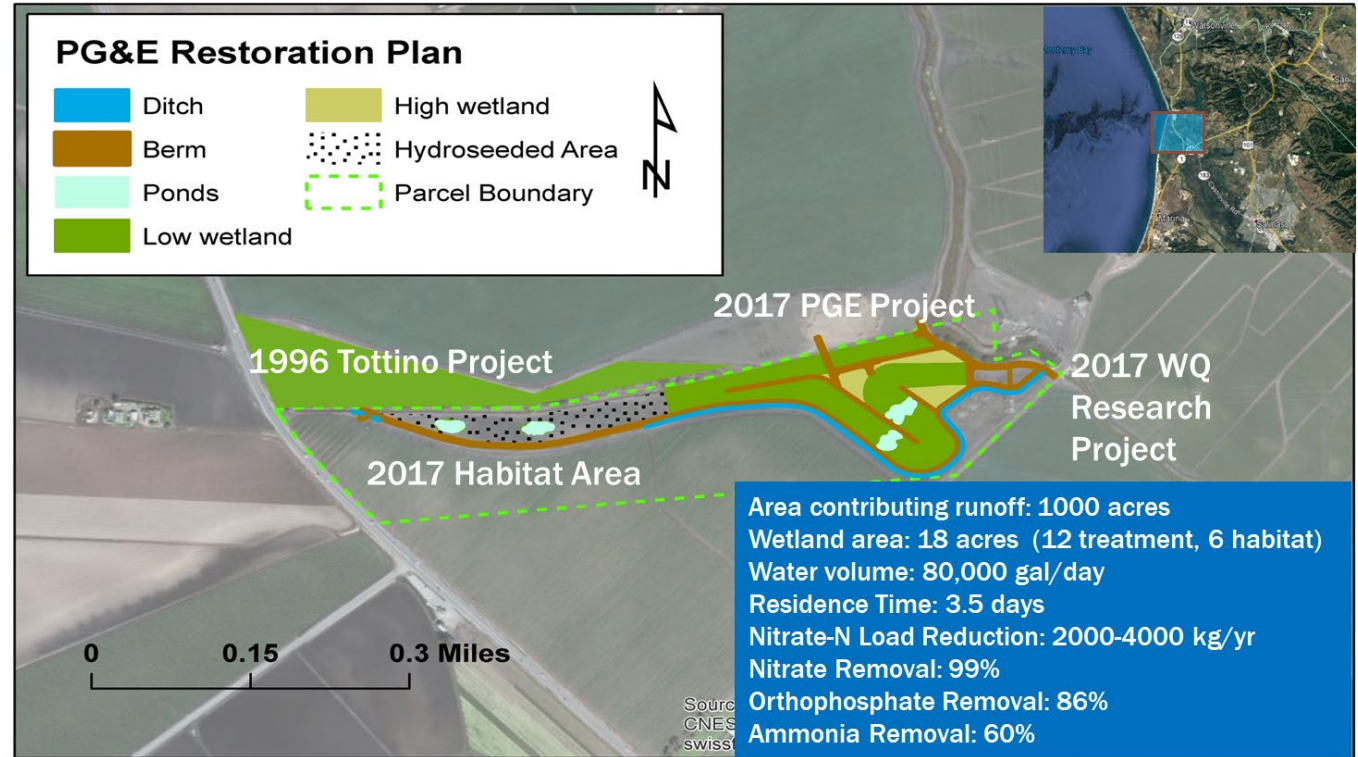
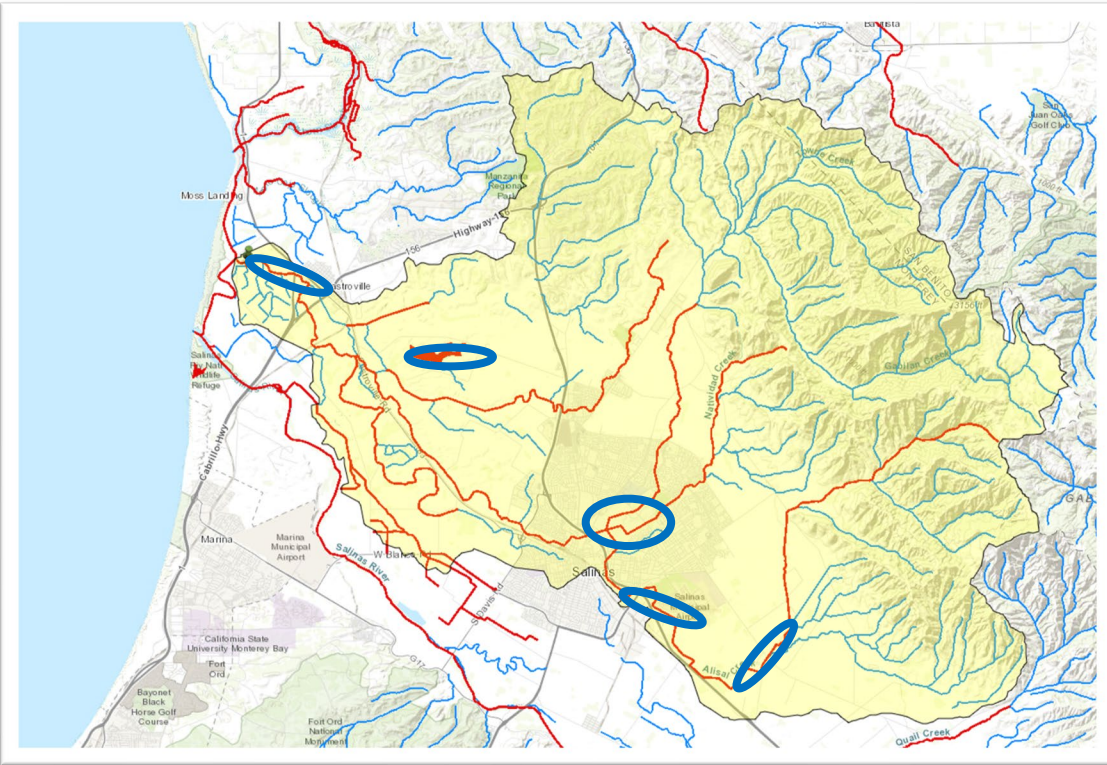
Floodplain Enhancement Project 1



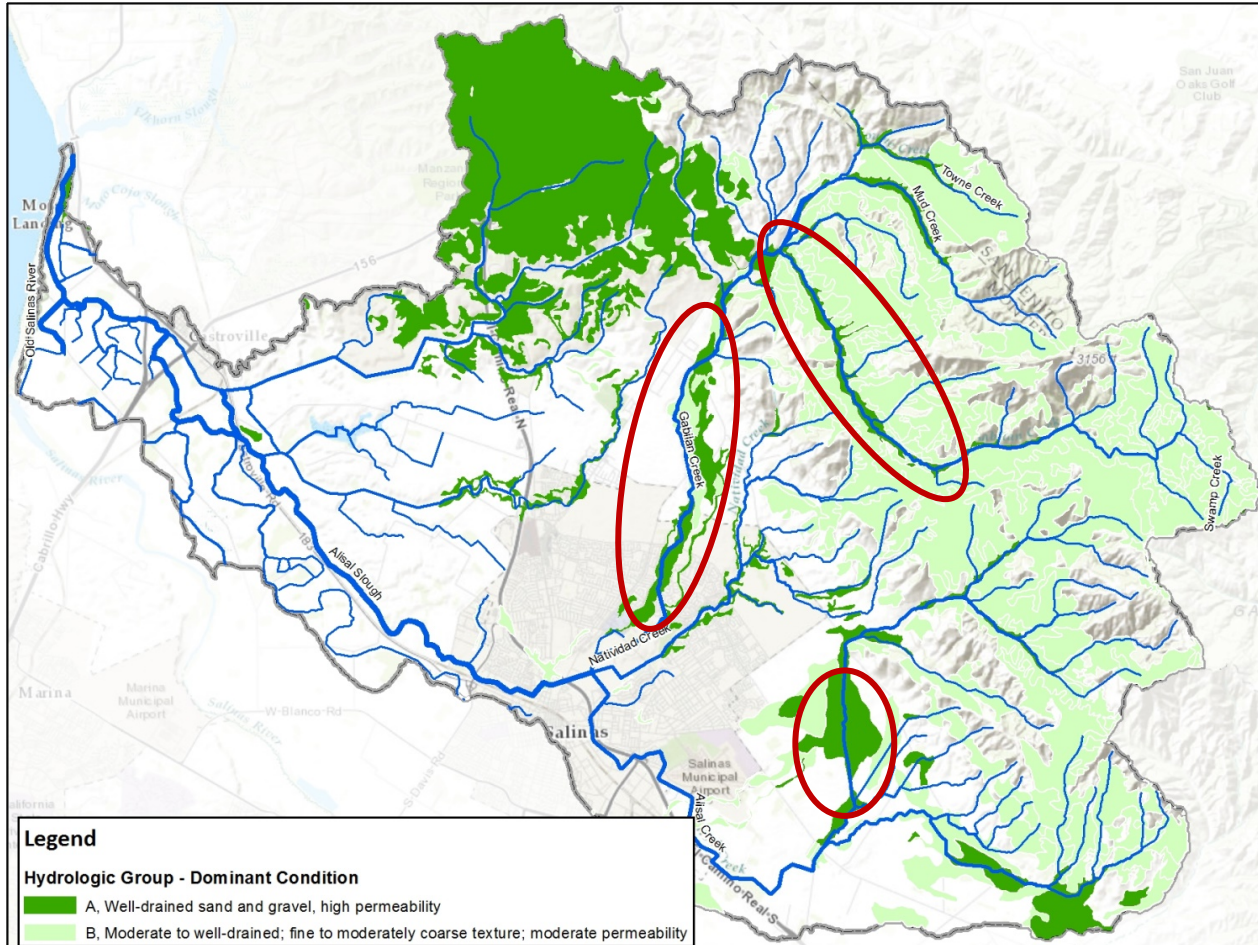
Site	Type	Modeling Approach
1, 2, 3	Flood ponds	Use water balance model to assess retention/infiltration potential
4	Floodplain	Extend hydraulic model and run 100-year event
5a, b, c	Riparian fencing	Modeling not applicable
6	Water extraction	Use water balance model to analyze effects of extraction

Water Quality Goal:

Improve water quality so that waters in the planning area are suitable for human and environmental uses – impaired water bodies

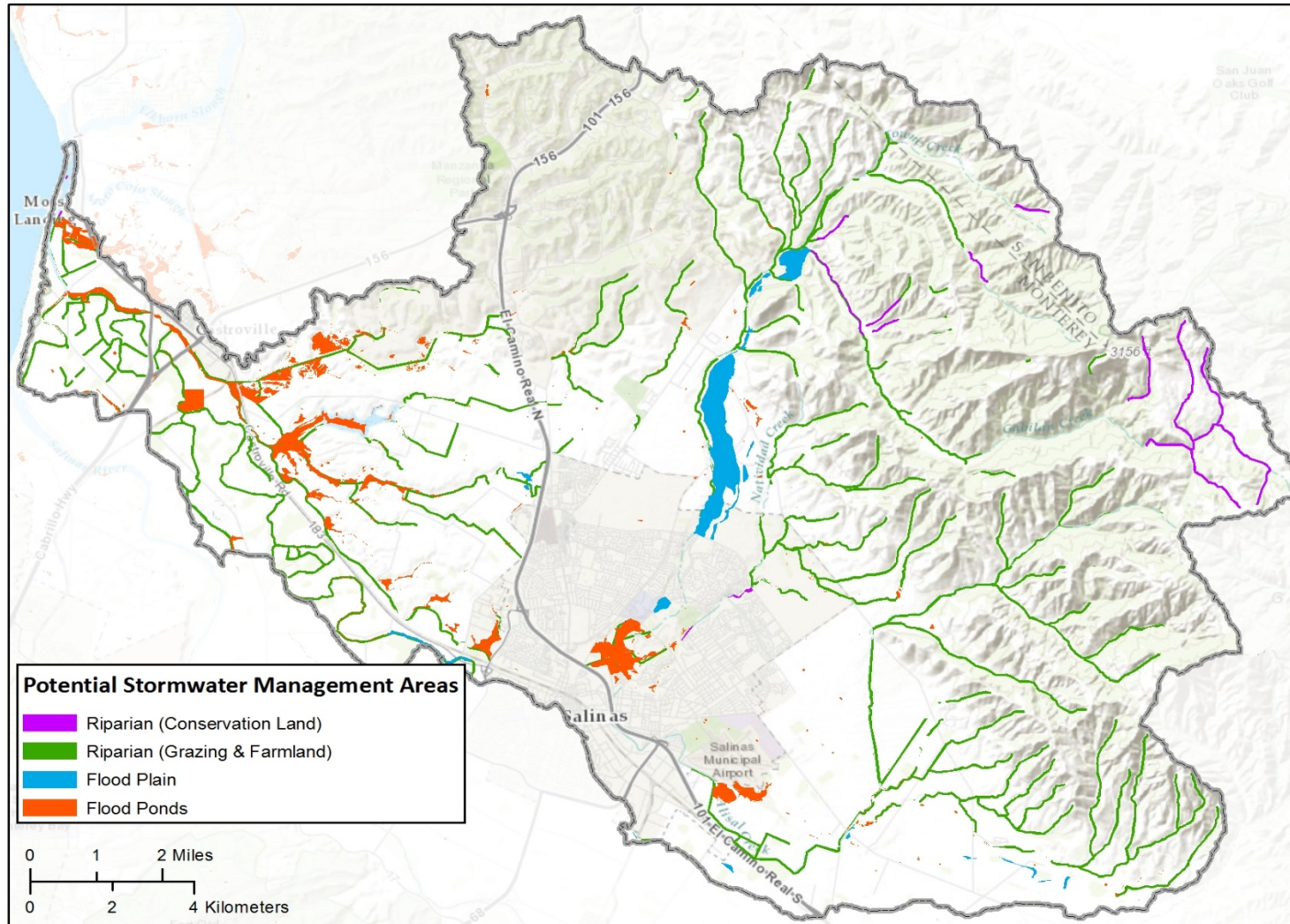


WATER SUPPLY GOAL: MANAGE STORM WATER TO INCREASE WATER SUPPLY FOR URBAN, AGRICULTURAL AND ENVIRONMENTAL USES - INFILTRATION AREAS



Water and Flood Management Goal:

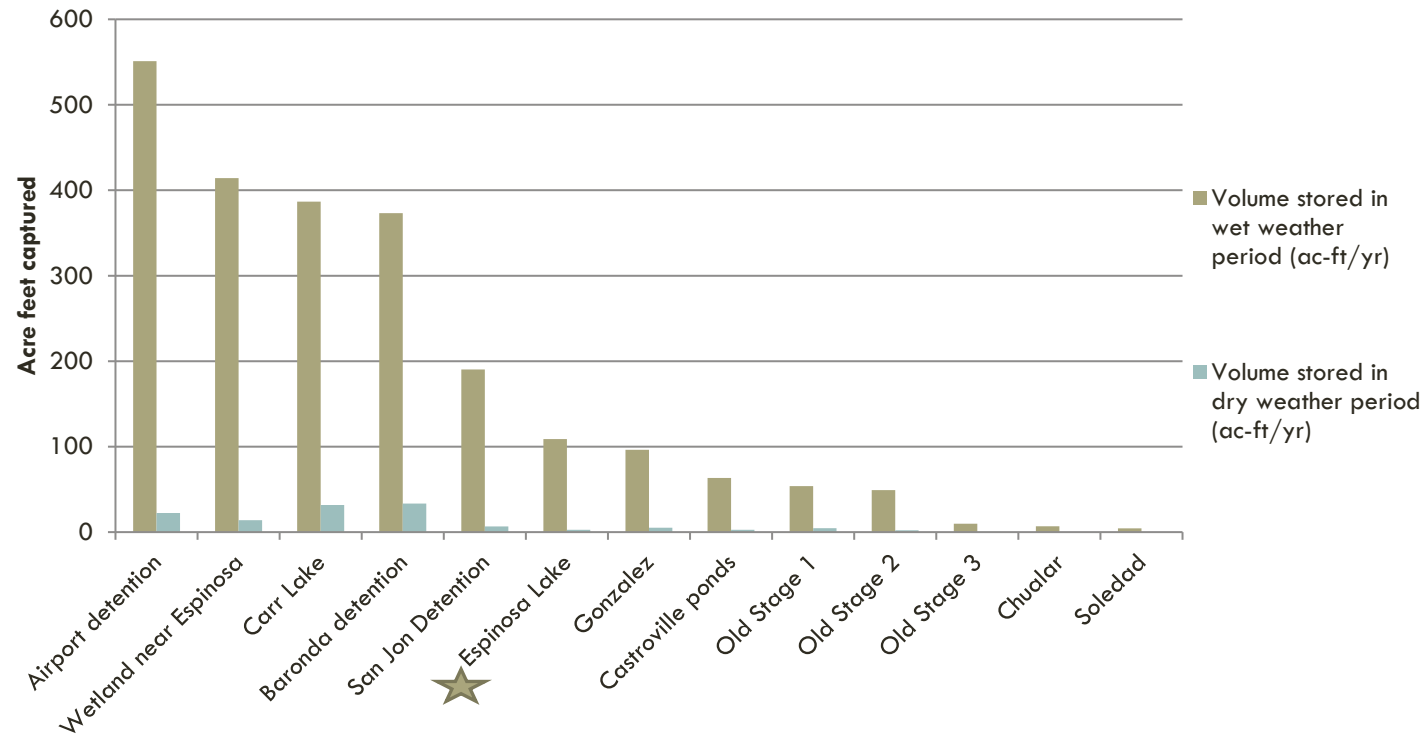
Manage storm water systems to reduce surface water peak flows and flood risk – increase storage and infiltration.



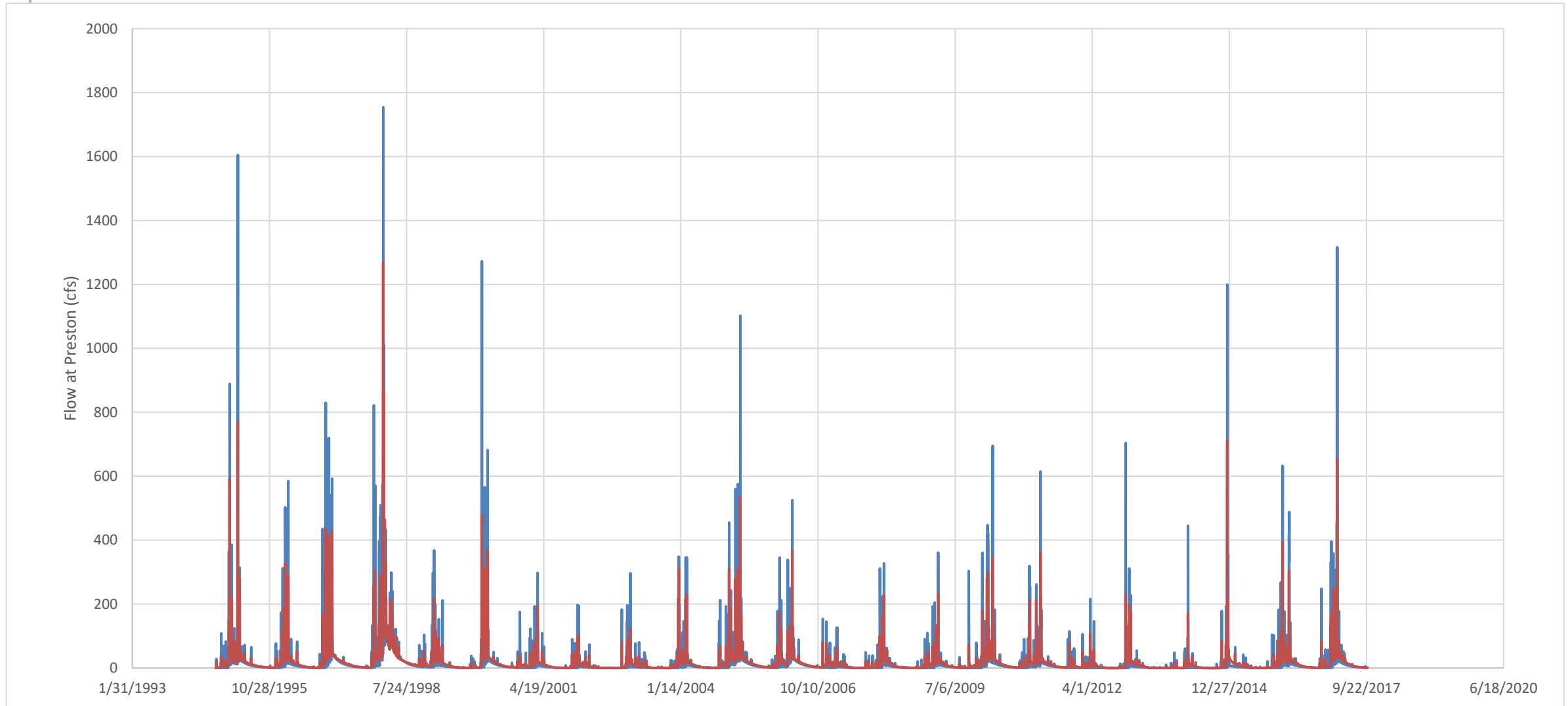
Cumulative Storm Water Benefits

Water Supply

Acre feet of water captured by each project



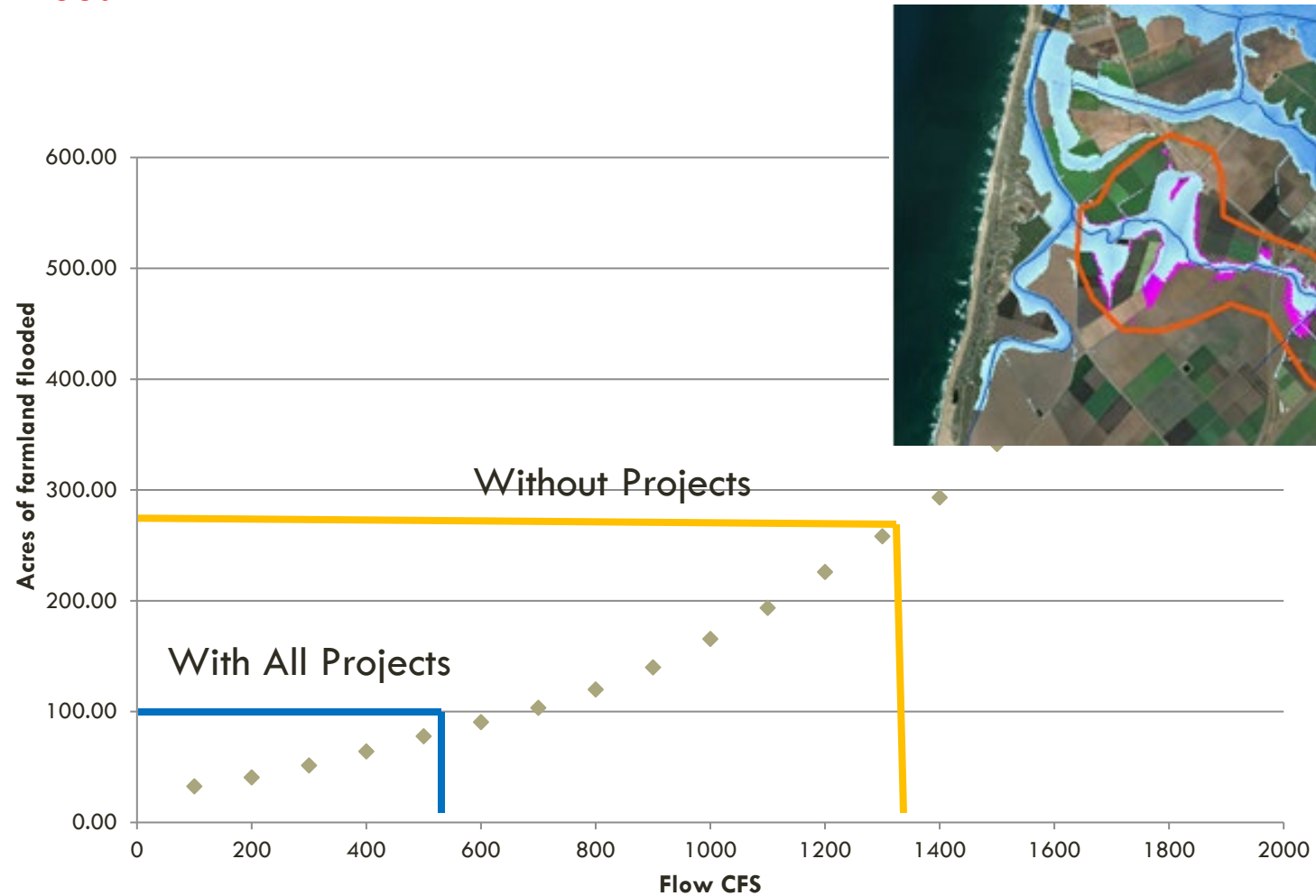
CUMULATIVE STORM WATER BENEFITS



CUMULATIVE STORM WATER BENEFITS

Model Outputs - Flood management

▪ **2017 flood**



CUMULATIVE ENVIRONMENTAL BENEFITS

Environmental Enhancement

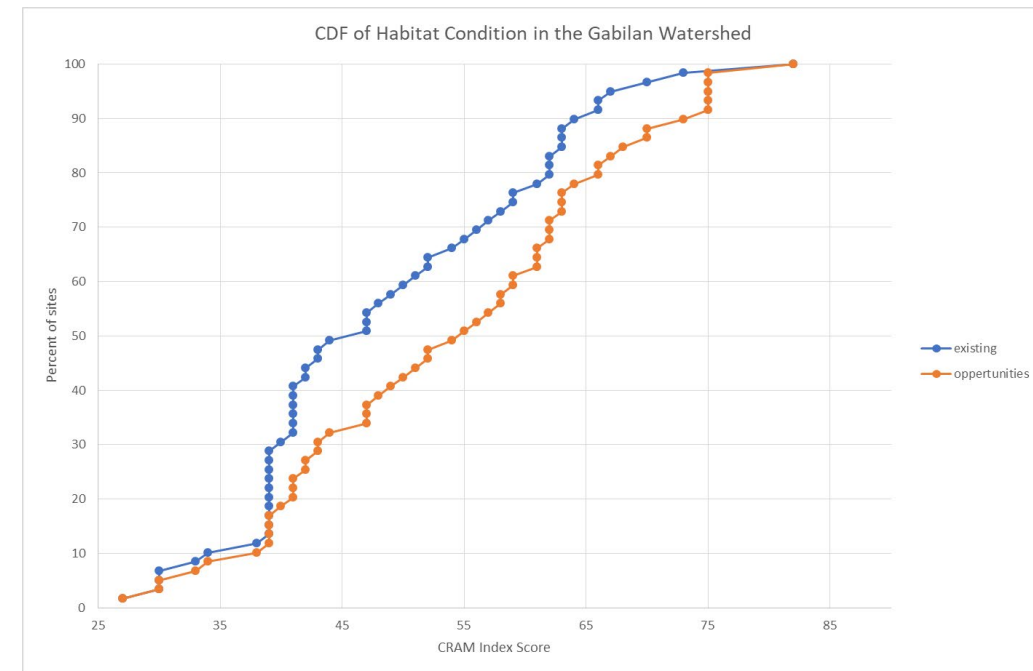
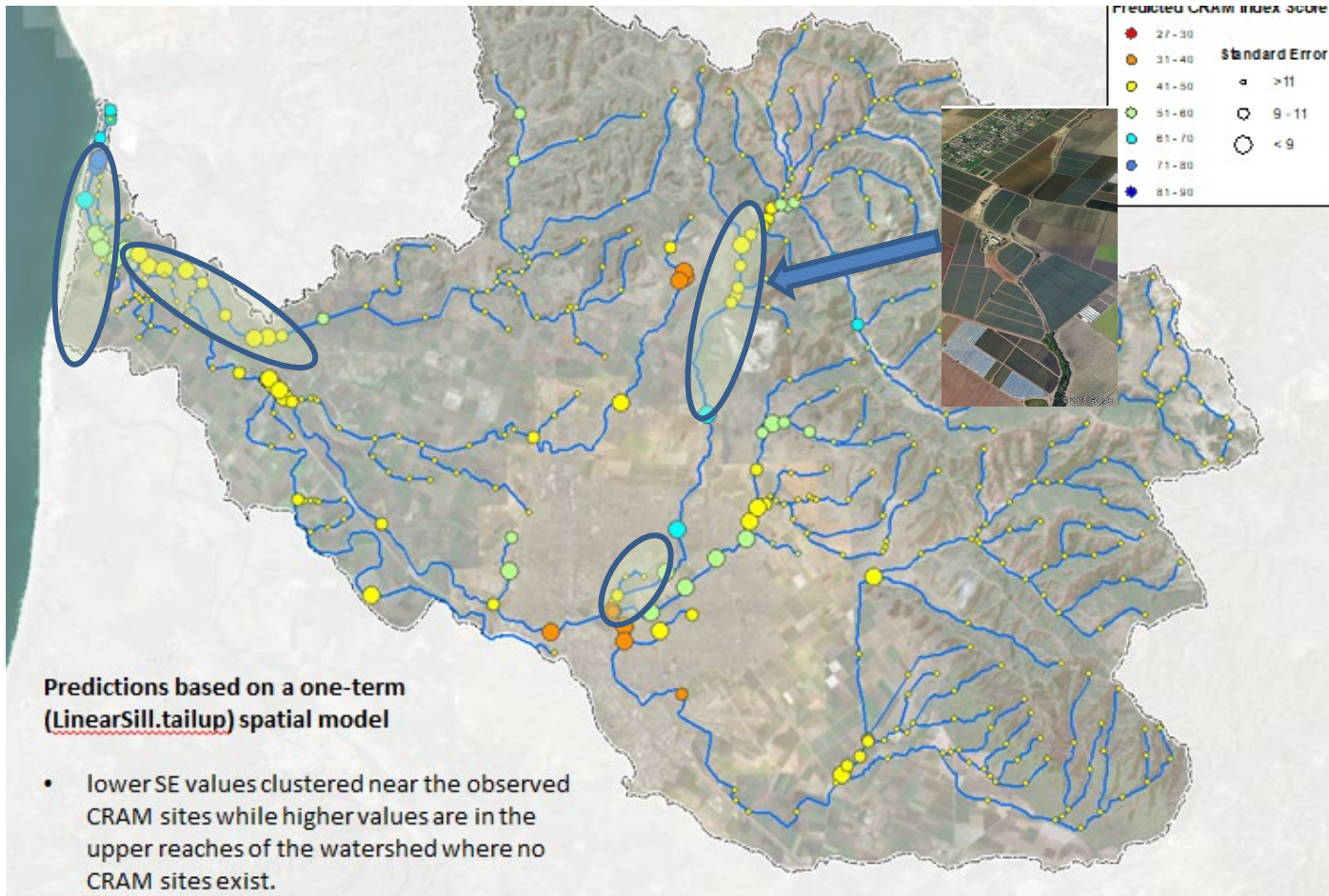


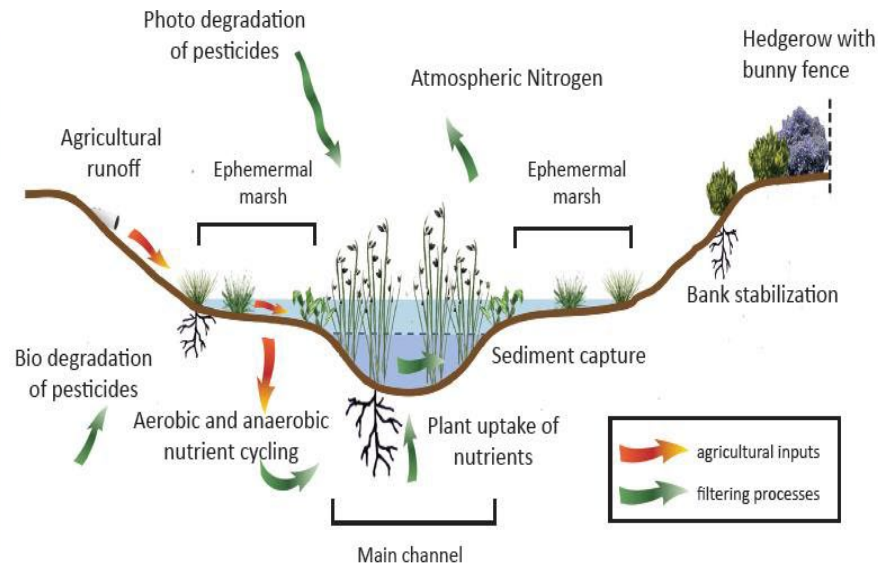


Table 6.1 Nitrate Load Reduction for Two Treatment Systems

Treatment	Percent	mg/L	g/day	Load Reduction (g/day) per 100 m ² of Treatment Area	Concentration Reduction (mg/L) per 100 m ² of Treatment Area
Bioreactor (Cool Wood Chips)	45%	14.9	225	563	37
Treatment Wetland (Estimate)	35%	11.4	164	273	19



Aerial view of Blanco Drain Treatment Wetland

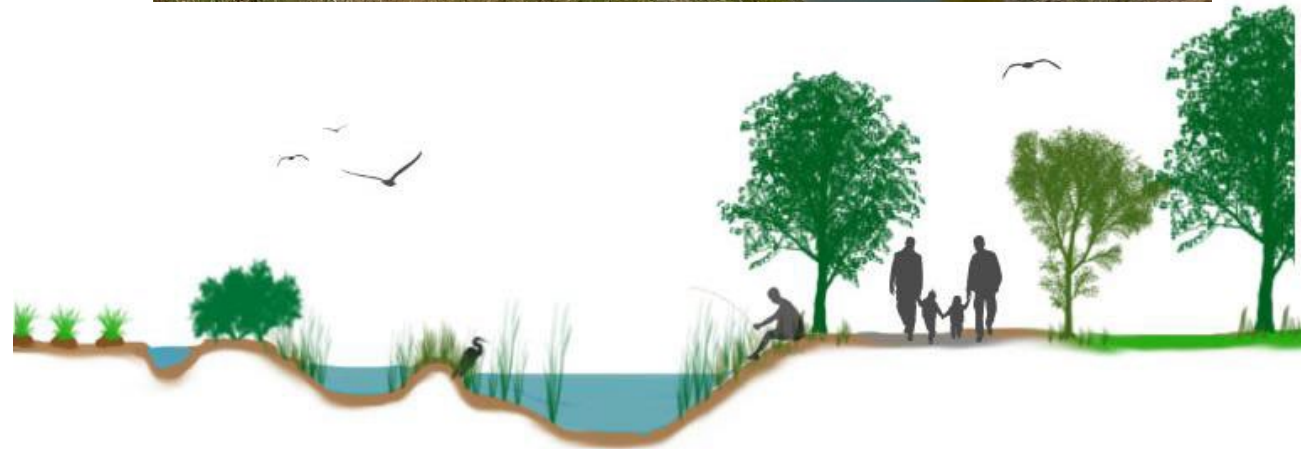
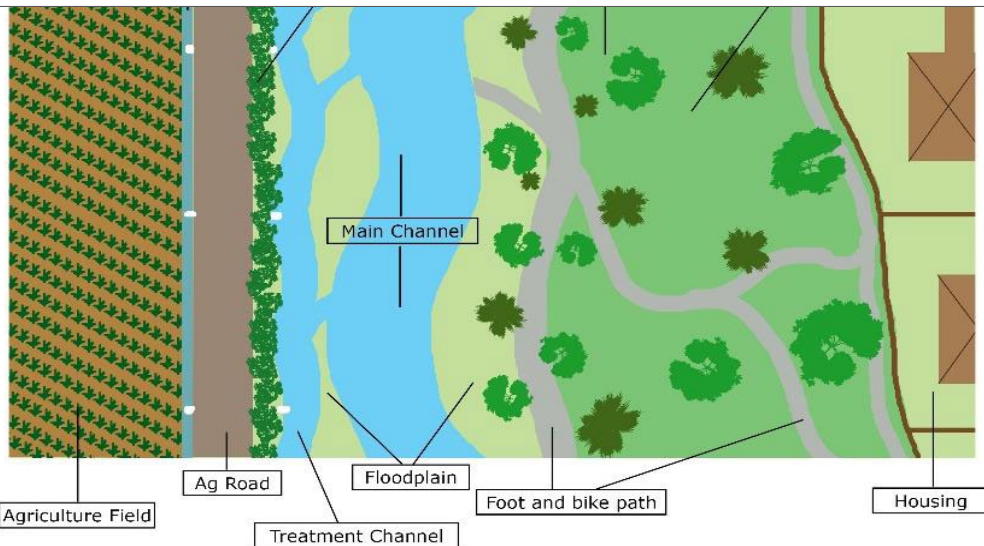


The physical, chemical, and biological processes that occur in wetlands help filter out pollutants

Table 6.4 Nitrate Annual Load and Load Exceedences in 10 Sub-Watershed Basins in the Gabilan Watershed

Sub Watershed Basin	Watershed treatment basin	TMDL category	Allowable concentration mg/l Wet (Nov 1 - April 30)	Allowable concentration mg/l Dry (May 1 - Oct 31)	Total allowable annual load (kg/yr)	Total Load (kg/yr)	Load Exceeded (kg/yr)
1	Espinosa Wetland	Tembladero	8	6.4	9,908	21,124	11,216
2	Espinosa Lake	Espinosa	8	6.4	1,945	15,104	13,159
3	SanJon Detention	Rec Canal	8	6.4	4,510	33,163	28,653
4	Boronda	Rec Canal	8	6.4	6,222	5,321	-901
5	Natividad Rd.	Gabilan	8	2	0	30,787	30,787
6	Old Stage	Natividad Creek	8	2	898	545	-353
7	Old Stage South	Alisal	8	2	1,180	2,715	1,535
8	Old Stage Lower	Alisal	8	2	476	3,012	2,536
9	Castroville Pond	Tembladero	8	6.4	12,163	39,734	27,571
10	Carr Lake	G/N/A	8	2	28,936	158,876	129,940
11	Airport	Alisal	8	2	9,866	75,709	65,843

ENVIRONMENTAL EQUITY -CASTROVILLE TO THE COAST (FLOOD RESILIENCE AND PUBLIC ACCESS)



ONGOING PROJECTS AND NEXT STEPS

Lower Salinas Valley floodway management

- **Watershed Coordinator Position Funded!**
- Castroville to the Coast
- Salinas Valley Stormwater Plan
- GSA watershed planning and coordination
- Salinas River State Beach Management Plan

Moss Landing Community Plan

- Integrate hazards
- Identify infrastructure upgrades
- Update the Moro Cojo Slough Management and Enhancement Plan
- Coordinate Coastal Resiliency efforts with
State Parks, Moss Landing Harbor District, CalTrans, MBARI



Image 1.
February
20th, 2017
flooding of
lower Salinas
Valley (note
similarities
with hazard
map Fig. 16)
(Photo: KSBW
drone footage)

THANK YOU



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Moss Landing Marine Labs
www.centralcoastwetlands.org

