CITY OF VENTURA

Special STUDIES for Santa Clara River Estuary

PRESENTATION

August 2011

carollo
Engineers...Working Wonders With Water®

Stillwater Sciences

Intent of the special studies is to answer…

…What is the best use of the treated water resources from the Ventura Water Reclamation Facilities to protect the health of the Santa Clara River Estuary?

Agenda for the day

- Introductions
- Status updates
- Estuary Subwatershed Study
  - Brief review of previously presented major findings
  - Characterization of comments received
  - New information to be added to the report
- Stakeholder input on alternatives
- Stakeholder input on data gaps to be filled
- Questions and Next Steps

Introductions/ Status Update

Please introduce yourself…

- Name
- Organization Representing
- Interest

Status Update - Since the last Stakeholder Workshop in February 2011:

- Time extension on comments
- Comments received
- Time extension on revised report
- Outstanding lawsuits settled

City has agreed to optimize the discharge

- Ventura Water wants to go beyond enhancement
  - Identify and implement the best feasible discharge alternative
  - On balance promotes beneficial uses,
  - Protects listed species and Estuary habitat as required by the Endangered Species Act
  - Provides more water for reclaimed water uses

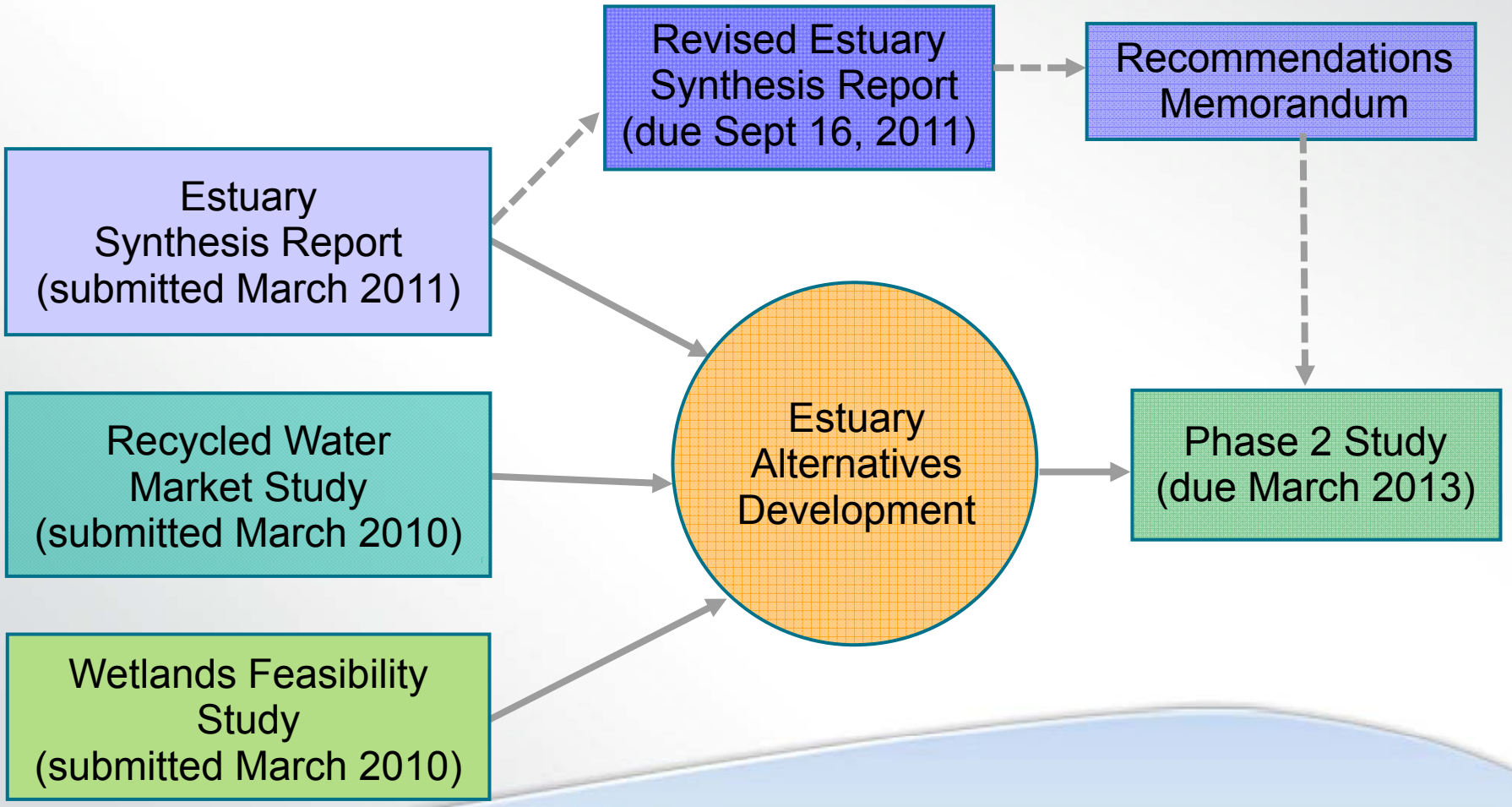
Settlement Agreement and Phase 2 Study

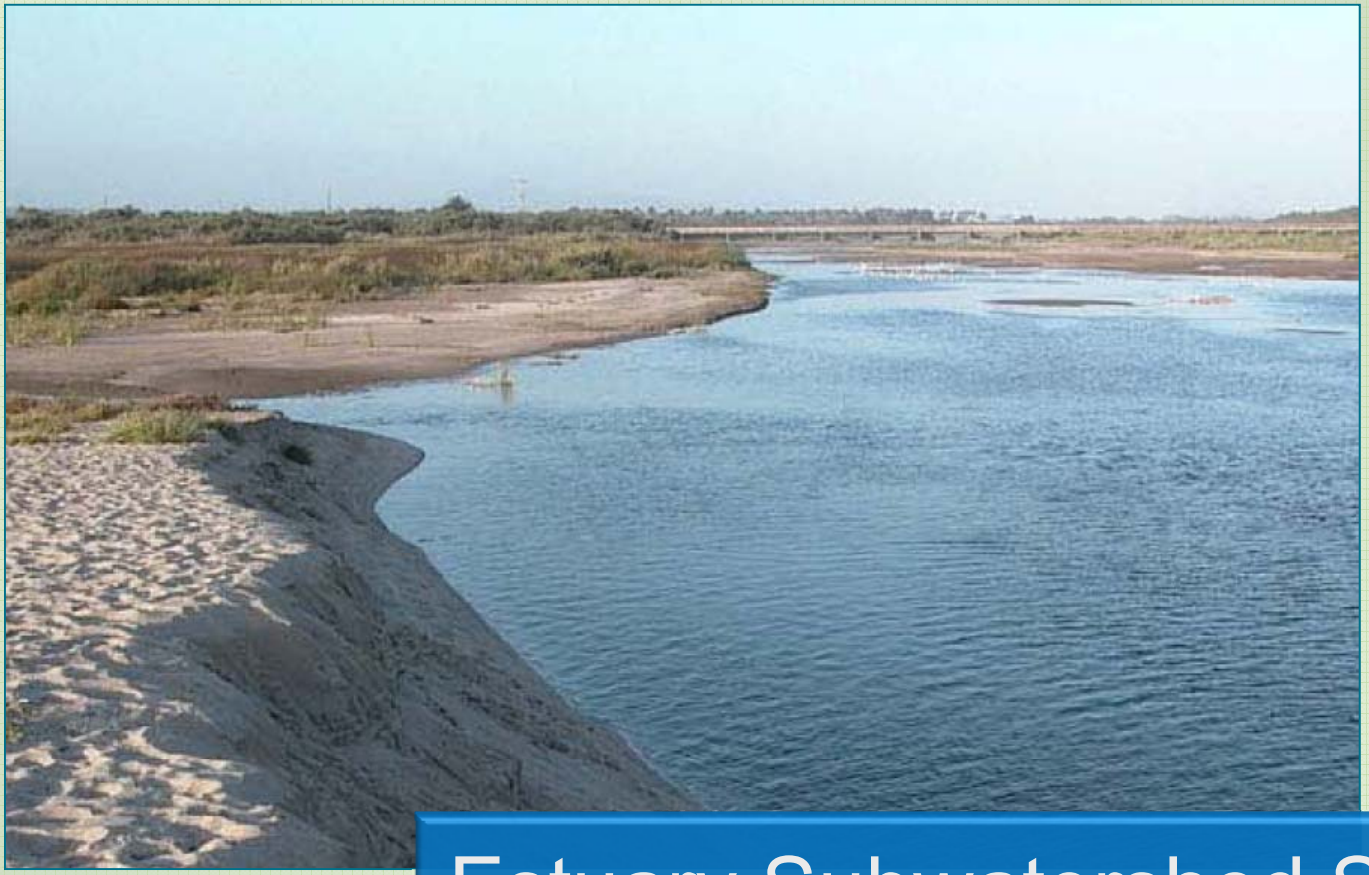
- Provides a framework and schedule for attaining the optimization goal with extensive stakeholder input
- Recognizes the critical nature of ongoing stakeholder input and consensus, as well as the regulatory and permitting authority of the Resources Agencies (NMFS, USFWS, CDFG, RWQCB, etc.)

Project Schedule has been revised

Task Description	2009	2010	2011
			J F M A M J J A S O N D
Estuary Subwatershed Study			
Recycled Water Study (Phase1)			
Treatment Wetlands Feasibility Study			
Stakeholder Workshops			

The three studies required by the NPDES permit lead to the next step (Phase 2)





Estuary Subwatershed Study - Final Synthesis Report

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Estuary Subwatershed Study Approach

Data Review and Collection

Estuary Water Balance

Estuary Physical/Biological Condition

Estuary Ecosystem Function

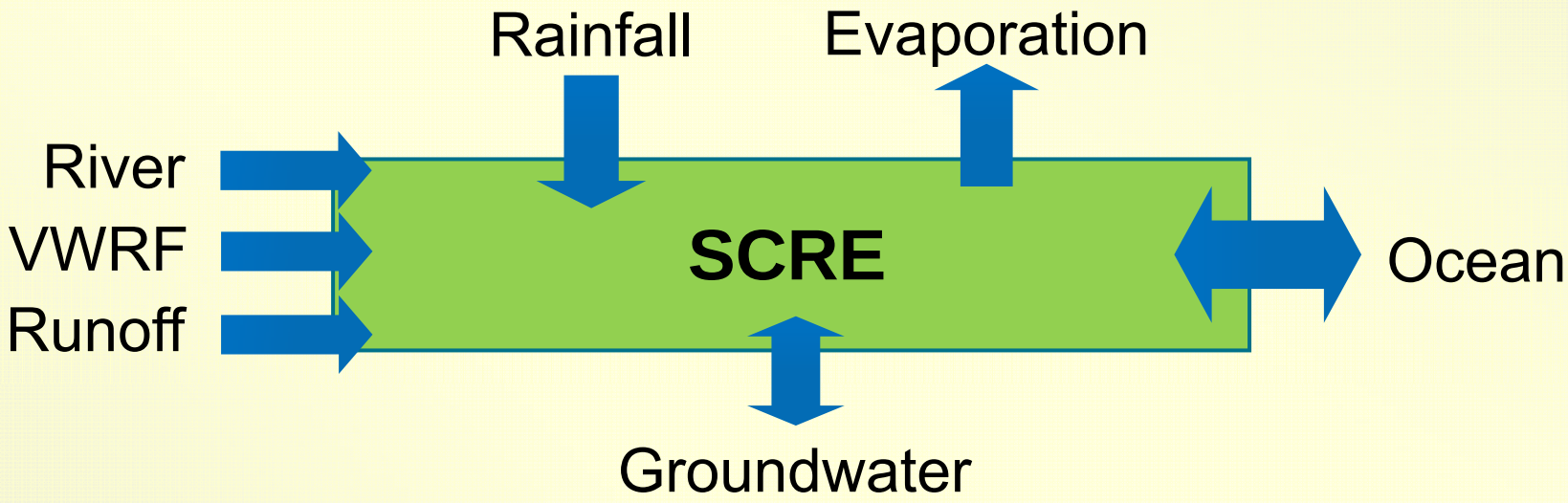
Climate Change

Develop/Optimize Discharge Scenarios

Discharge scenarios were developed based on stakeholder input

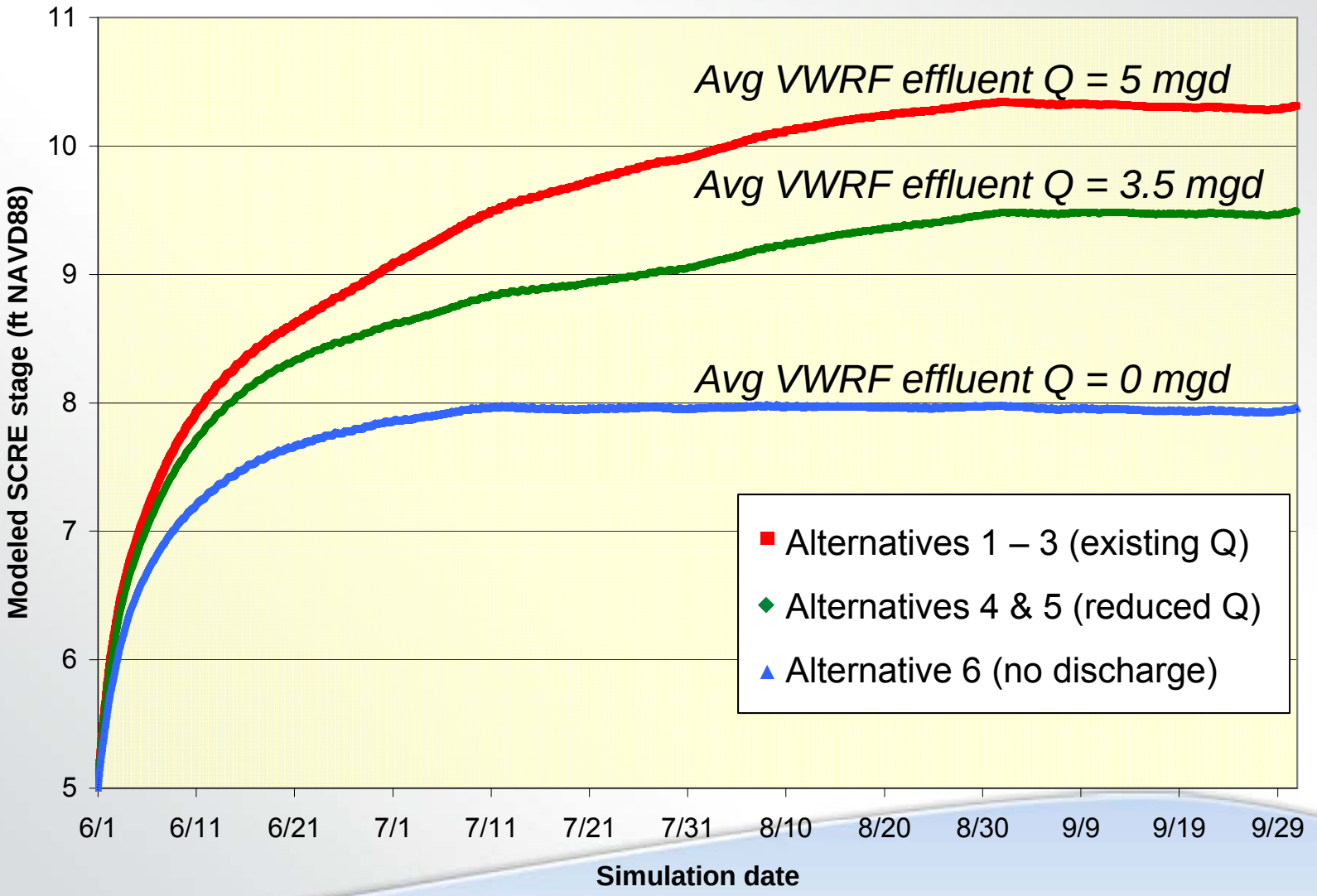
	VWRF Effluent Discharge			VWRF Effluent WQ			
	Existing	Reduced	None	Existing	Planned Upgrades	Enhanced Denitrification	None
Alternative 1	✓			✓			
Alternative 2	✓				✓		
Alternative 3	✓				✓	✓	
Alternative 4		✓			✓		
Alternative 5		✓			✓	✓	
Alternative 6			✓				✓

Estuary stage and habitat area was modeled using the water balance

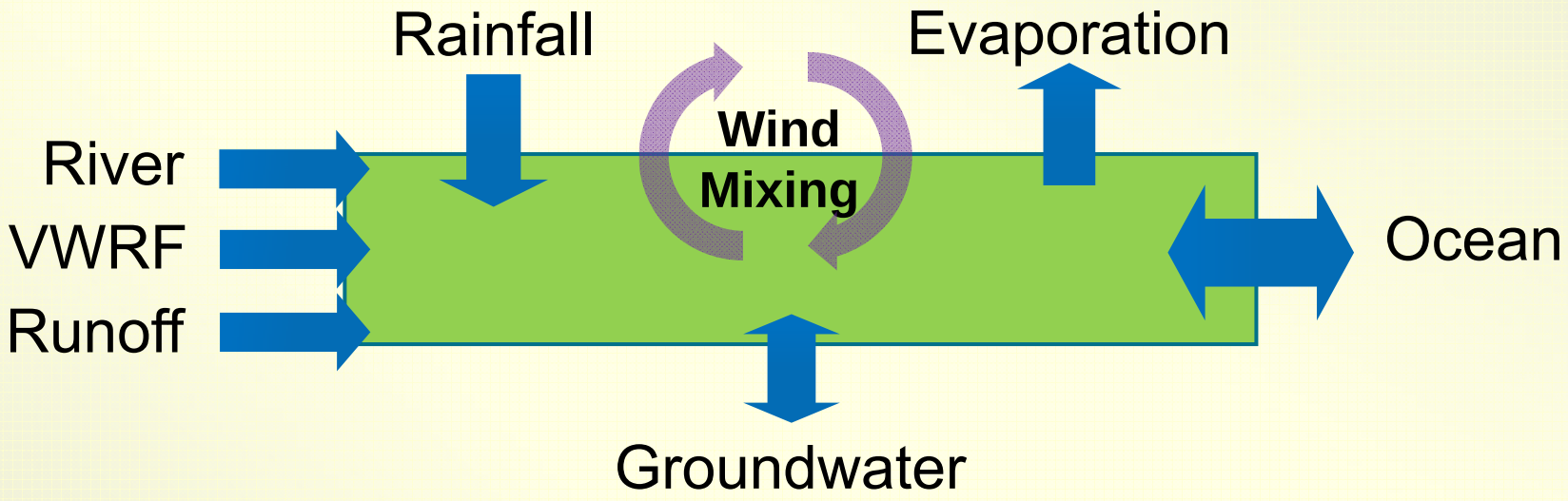


Estuary Volume → Stage (Depth) → Habitat Area

Modeled estuary stage for each alternative



Water quality was estimated using the nutrient balance model



Concentration = [River + VWRF + Runoff + Rain + GW(in) – GW(out) – Ocean]/Volume

Modeled N conc. for each alternative

	SCRE Area, Acres	Total N load, ppd	Natural N uptake, ppd	Estimated range of N, mg/l
Alternative 1	174	750	78 - 160	10 - 15
Alternative 2	174	500	78 - 160	4 - 9
Alternative 3	174	300	78 - 160	2 – 6
Alternative 4	151	390	68 – 140	3 – 9
Alternative 5	151	200	68 – 140	2 – 6
Alternative 6	131	30	63 – 130	2 – 6

Alternatives Assessment

	Focal Species Habitat					Recreational Opportunity
	Habitat Area				Water Quality Conditions	
	Tidewater goby	Steelhead	Plover & Tern Nesting	Tern Foraging		
Alternative 1 Existing Conditions	=	=	=	=	=	=
Alternative 2 Planned upgrades	=	=	=	=	↑	=
Alternative 3 enhanced dentirification	=	=	=	=	↑↑	=
Alternative 4 flow reduction	=	↓	↑	=	↑	↑
Alternative 5 flow reduction with enhanced dentirification	=	↓	↑	=	↑↑↑	↑
Alternative 6 Complete effluent removal	=	↓↓	↑	=	↑↑↑	↑↑

What can we conclude from the report?

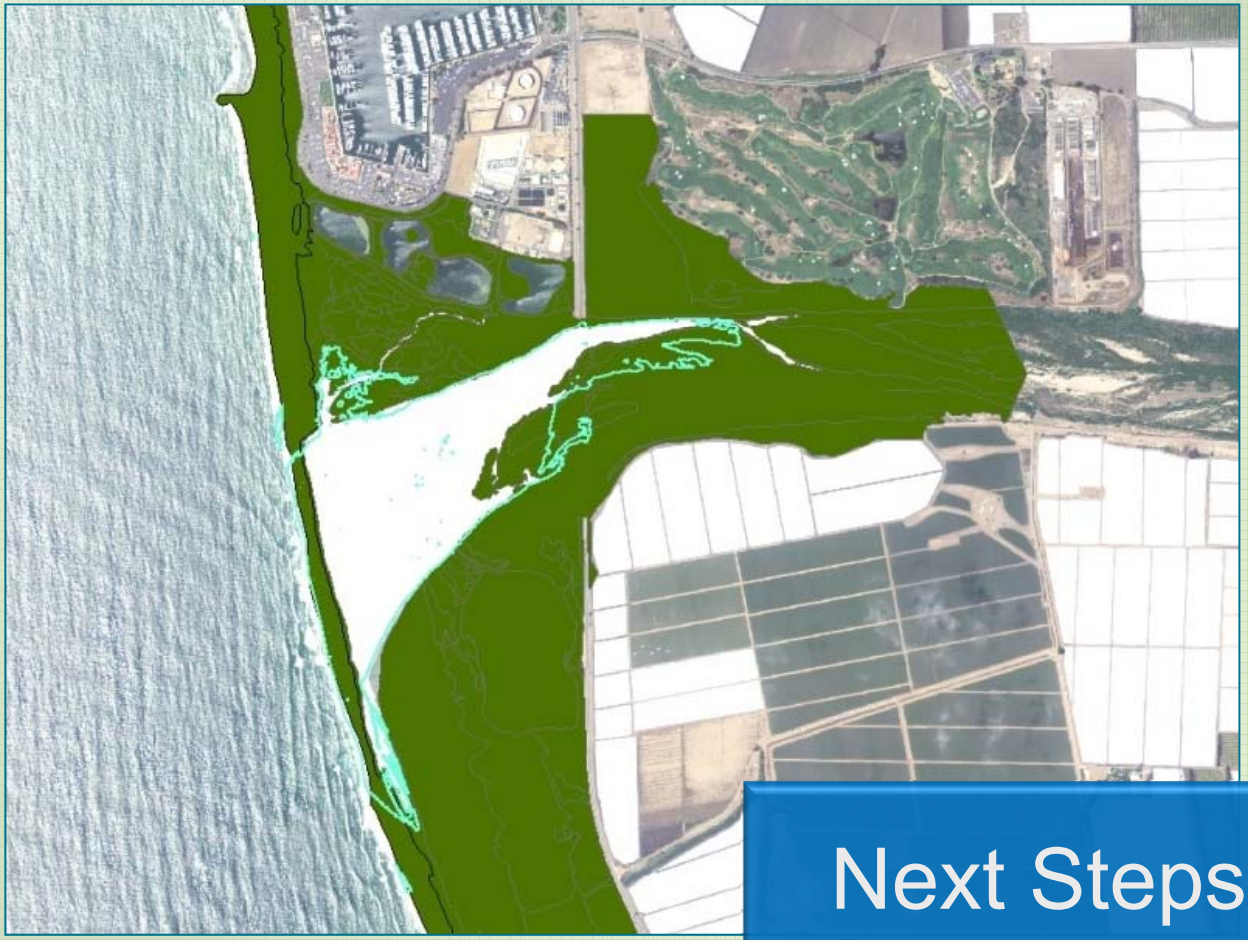
- Question of enhancement:
  - Definition of enhancement: is any beneficial use improved with discharge as compared to absence of discharge?
  - Steelhead beneficial use affected by absence of discharge (less habitat provided and less depth)
- What can be done to optimize the discharge regime and volume?
  - Less flow in summer to reduce unseasonal breeching
  - Improve water quality to reduce nutrients
- Others?

Comments received on Synthesis Report fell into several categories:

1. Species evaluated and habitat needs for those species
2. Water balance issues
   - Breaching
   - Confidence in model and data
3. Water quality as pertains to suitable habitat
4. Preference for particular alternatives
5. Additional data needs/other recommendations

Updated Estuary Study

- Text additions/clarifications
- Measured and modeled water depths
  - Relationship between stage and average depth
  - Water depth range for given stage
- Model sensitivity
  - Modeled SCRE stage for decreased mouth berm length and estuary area (i.e., more ‘average’ conditions)



Next Steps

Next steps

- Updated Estuary Study due Sept. 16, 2011:
  - *Updated text revisions* and clarifications to March 2011 submission draft of the "Final Synthesis Report"
  - *Responses to Comments* on March 2011 submission draft of "Final Synthesis Report"
  - *Recommendations/Next Steps Memo*
    - To list the additional data needs/next steps for Phase 2 Study
    - Based on Comments on March 2011 submission draft of "Final Synthesis Report and **Input from YOU**
    - Another stakeholder meeting to discuss recommendations memo – date TBD

Next Steps

- Phase 2 Study Report due Feb 10, 2013 per NPDES permit
  - Two Stakeholder Workshops budgeted
  - Should additional time and workshops be added given optimization goal?
  - Workplan may need to be revised per Memo of Recommendations

Stakeholder Input

We want your input for Phase 2 ....

1. What can we do to reach consensus on optimal discharge regime and competing goals reflected in comments on the "Final Synthesis Report."
   a) Which alternatives do you want to pursue?
   b) What modifications or new alternatives would you support considering?
   c) What additional information do you need to see to increase your confidence in determination of the optimal discharge regime?
2. What "Safety Measures" or "Time and Manner" restrictions for implementing optimal discharge should be explored

Extra Slides

Recycled Water Market Study

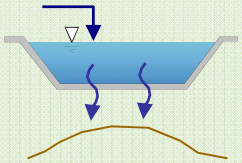
NPDES Permit and Work Plan goals for Phase 1 Recycled Water Study:

- Address macro-level supply and demand issues and their impact on a local recycled water market
  - expansion of the City's service area
  - other areas within five miles of the VWRF.

Types of recycled water considered:

Urban Irrigation

Agricultural Irrigation



Recharge

Existing recycled water pipeline extends from harbor to golf course

Summary of opportunities and challenges to implementing reuse

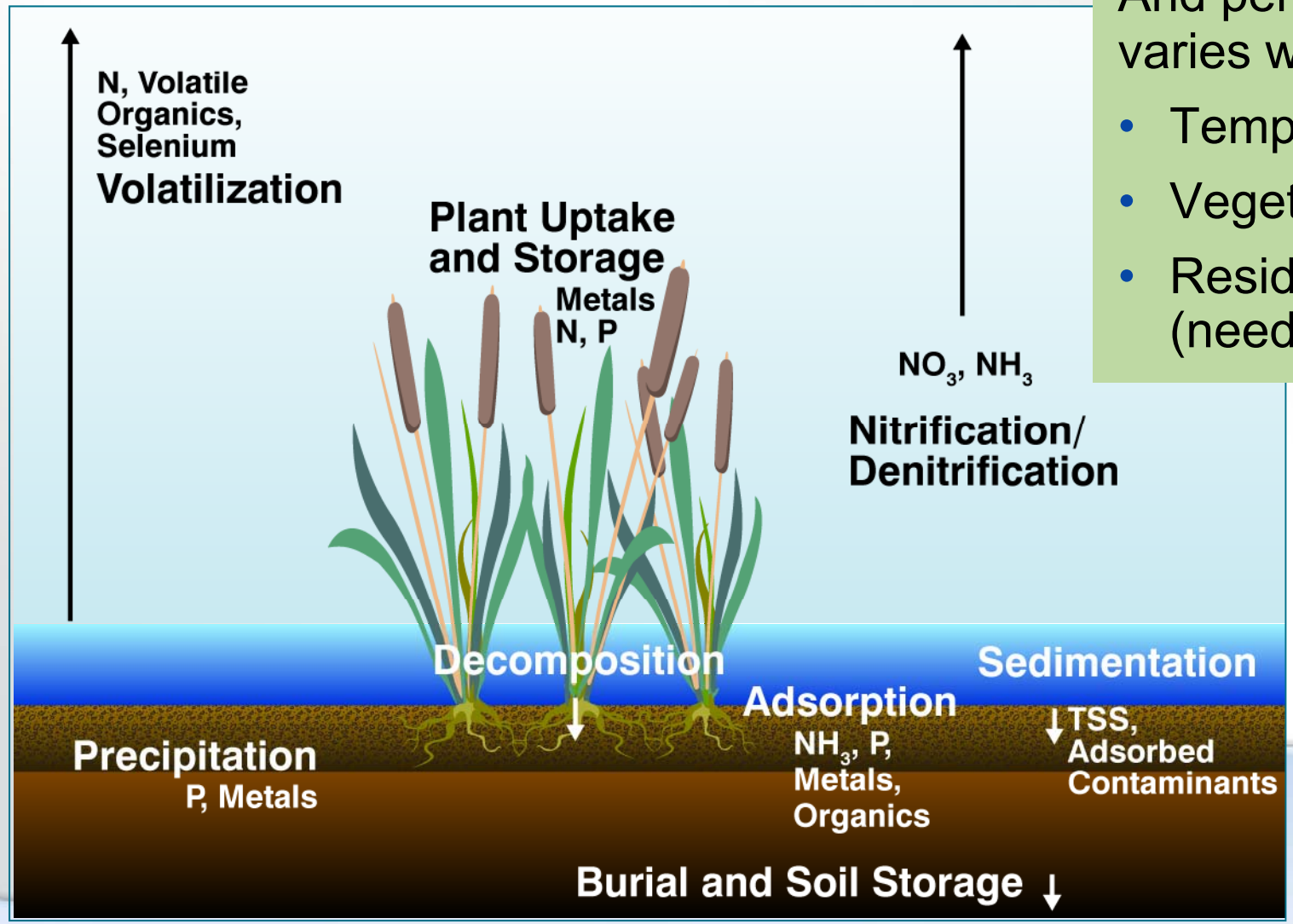
Alternative	Opportunity	Challenge
Urban Users	• Potential demand varies seasonally from 1.1 to 3.7 mgd • No additional treatment	• Cost = $62 Million (Pipes, pump stations) • Extensive pipe network • Feasibility of serving Oxnard golf course unknown (~1 mgd annual average demand)
Agricultural Users	• Potential demand (north of Estuary) varies seasonally from 1.6 to 11 mgd	• Cost = $145 Million (Pipes, pump stations, MF/RO) • Requires additional treatment and brine disposal • Requires conversion of ponds to storage or construction of alternative storage • Requires agreement by growers
Groundwater Recharge	• Potential seasonal demand up to 12 mgd	• Cost = $36 Million (Pipes, pump stations) – Does NOT include treatment costs • Regulatory feasibility uncertain • Additional treatment may be required • Requires agreement with UWCD

Treatment Wetlands Feasibility Study

Work Plan goals for Treatment Wetlands Feasibility Study

- Identify and evaluate a potential location, treatment capability, and cost of a treatment wetland for water quality improvement purposes within proximity of the VWRF discharge.

Based on water quality, reduction of nitrates is primary goal for wetlands



And performance varies with:

- Temperature
- Vegetation
- Residence time (need 4-12 days)

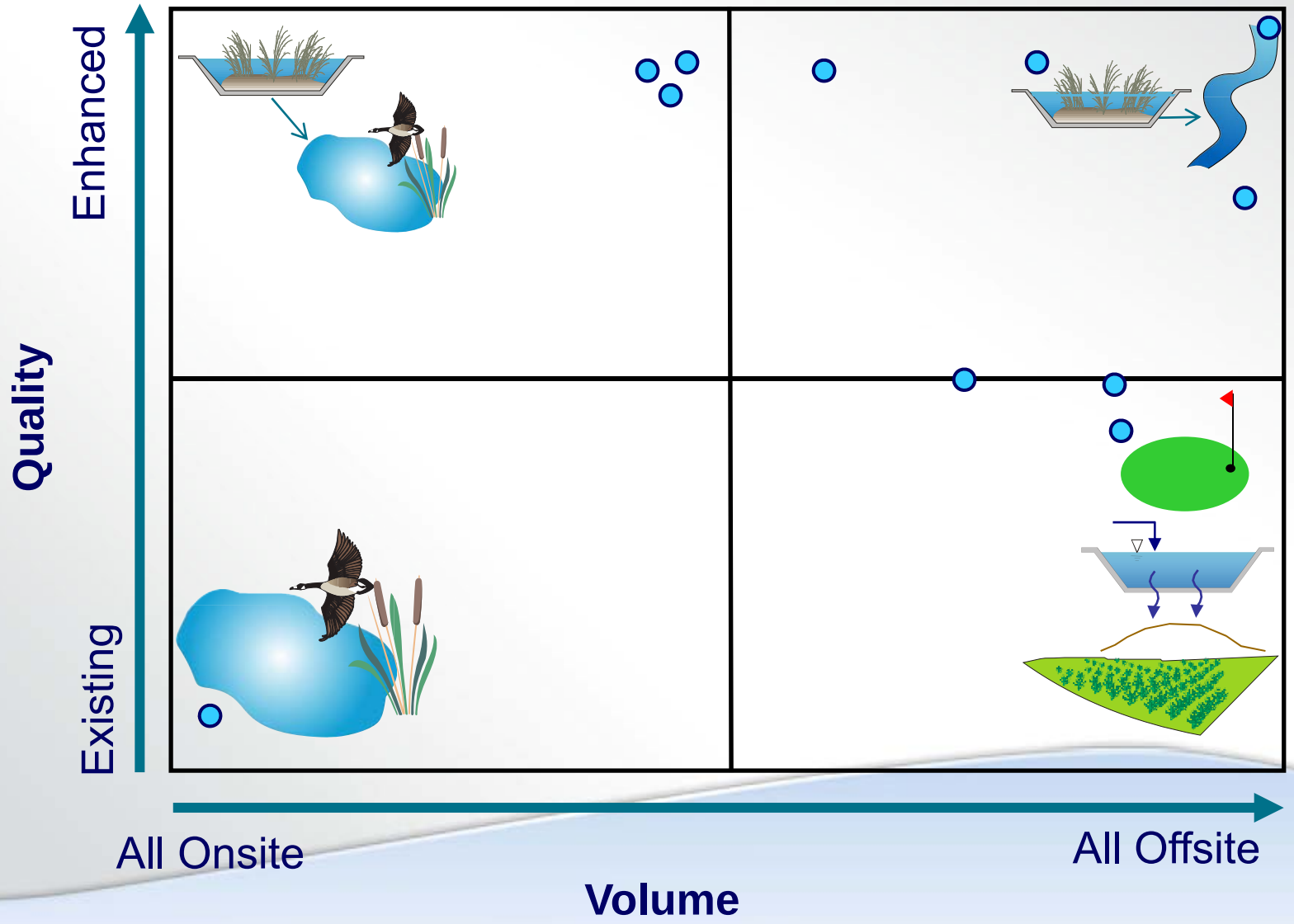
Onsite and offsite opportunities were identified as potential treatment wetland sites

Summary of the potential onsite and offsite treatment wetland opportunities

	Wet Area at 85% Use, acres	HRT, days[1] (existing to future flow)	Total Project Costs, millions
Onsite (Ponds 1 & 2)[2]	12.4	1.7 to 0.9	$2.8
Offsite[3]			
City-Owned	29	4.9 to 2.3	$11.4
Berry	92	15.6 to 7.3	$30.3
McGrath/TNC	120	20.4 to 9.5	$44.6

1. Assumes average water depth of the offsite opportunities is 2.5 feet.
2. Existing flow to onsite = 5.9 mgd and future flow = 11.4 mgd.
3. Existing flow to offsite (less evaporation from ponds) = 4.8 mgd, future = 10.3 mgd.

Stakeholders provided input on alternatives for recycled water and wetlands treatment



And the preferred locations for the potential treatment wetlands…