

And the 1-2-3 Framework for Comprehensive Monitoring of Wetlands, Streams, and Riparian Areas

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To assess the performance of State and local programs, policies, and projects intended to protect and restore wetlands, streams, and riparian areas.



Public Investment 8 YEARS AND 2.5 MILLION CASH

USEPA	OWOW, ORD, Region 9
USMSA	Coastal Impact Assistance
NOAA	Coastal Services
Ca WCB R	iparian Habitat Joint Venture
SWRCB Surface Water	Ambient Monitoring Program
	Non-Point Source Program

Plus hundreds of experts from dozens of federal, State, and local agencies, tribes, academia, science NGOs, and the private sector.

Primary Questions

- Where are the wetlands, streams, riparian areas?
- What is their condition or health?
- What about the policies, programs, and permitted activities – are they working?

Monitoring Framework



Monitoring Framework



Aquatic Resource Base Map

Statewide definitions and mapping standards

- Deepwater, wetland, channel, aquatic support area, riparian, permitted projects
- Updates federal maps
 - USGS NHD
 - USFWS NWI
- Integrated with VegCAMP
- Online Mapping / Local Data Stewardship
- Base Map for "My Water Quality Website"



Aquatic Resources Base Map Natural and Artificial Channels



Aquatic Resources Base Map Wet Meadows



Aquatic Resources Base Map Depressional Wetlands





Aquatic Resources Base Map Tidal Wetlands

Aquatic Resources Base Map

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Riparian Mapping Tool

- Different functions have different widths
 - Bank or shoreline stability
 - Allochthanous input and shading
 - Hillslope processes
- One function per module
- Modules can be added
 - Flood control
 - Groundwater recharge
 - Potential riparian

Monitoring Framework



Level 3 Tools

- Few statewide protocols
 - Periphyton IBI
 - Stream flow and tide height
 - SWAMP water and sediment quality
 - CDFG P-Hab and Benthic Macroinvertebrate IBI
 - Some regional initiatives
 - MeHg Bio-sentinel Species
 - Wadeable stream hydro-geomorphology
 - Difficult to prioritize
 - Choosing between species
 - Choosing between physical functions

Monitoring Framework



California Rapid Assessment Method (CRAM)

www.cramwetlands.org



Geographic Scope of CRAM All Wetlands in California

- Lakes and Lagoons
- Estuaries
- Wadeable Channels
- Slope Wetlands

- Depressional Wetlands
- Vernal Pools
- Playas
- Seeps and Springs
- Wet Meadows ?

What is CRAM?

- Expert "walk and talk" diagnostic tool
- Less than 3 hrs field time, team of 2-3
- Required expertise comparable to jurisdictional delineation, PFC
- Leave the field with final data
- It's simple, but not easy

Reference Concepts

Metrics are scored as percent of best achievable condition, as defined by BPJ and statewide ambient surveys.



Development of CRAM

1. Develop a strategic plan

- Build State capacity
- Issue guidance
- Encourage implementation

2. Establish State & Regional Teams

- 1 module per wetland type
- Involve user community

3. Develop conceptual models

- Other RAMs
- Wetland form and function
- Assumptions and tenets of CRAM

Development of CRAM

4. Verify method

- Calibrate to BPJ
- Field test across range of condition

5. Validate method

- Correlate scores to L3 data
- Test repeatability within and among teams

6. Implement

- Through existing State programs
- Through new regional programs
- Provide regular review and revision

Precision

Repeatability within and among Teams

Precision	Precision Achieved			
Target 10%	Estuarine	Riverine		
Same Team Different times	10%	6%		
Different Teams Same time	8%	10%		

10-point differences between overall scores are meaningful

Validation CRAM Correlation to Level 3 Data



CRAM vs. Benthic IBI

CRAM vs. Invasive spp Richness

Do correlations fit conceptual models? Well enough.

Peer Review

- Regional and State Teams
- Rapid Assessment in California (Sutula et al. 2006)
- Mitigation Project Review (Ambrose et al. 2005, 2006)
- USACE ERDC Review (completed 2008)
- CRAM Validation (Stein et al. 2009)
- SWRCB Review (in progress)

www.cramwetlands.org

Prescribed Assessment Area

AA defined by multiple criteria

- Has hydrological and geomorphic homogeneity
- Subject to uniform management practices
- Meets specified size and shape requirements
- Can be assessed in one half day or less

Specified size and shape varies with wetland type



- CRAM recognizes four attributes of wetland condition
- Each attribute is represented by 2-3 metrics, some of which have sub-metrics













Metric Scoring Example

- Mutually exclusive alternative states
- Represent full range of possible condition

Buffer Width

Alphabetic Score	Numeric Score	Alternative State
А	12	Average buffer width 190-250m
В	9	Average buffer width is 130–189m
С	6	Average buffer width is 65–129m
D	3	Average buffer width 0-64m





Uses of the Stressor Checklist

- Identify possible causes for low CRAM scores
- Identify possible corrective actions
- Develop testable hypotheses relating scores to stressors



Monitoring Framework



http://dev.californiawetlands.net/tracker/

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California

Google

- North Coast
- Bay Area
- Central Coast
- South Coast
- Central Valley
- Lahontan
- Colorado River Basin

Questions Answered

- Background Info on Wetlands
- About Wetlands Portal
- Wetland Condition (CRAM)
- Feedback

My Water Quality

- Home
- Water Quality Monitoring Council
- California Wetlands Monitoring Workgroup

Dono

Welcome to the California Wetlands Portal

The purpose of the Wetlands Portal is to provide the public information on the quantity and quality of California wetlands.

Explore your wetlands

Select a region to view interactive maps monitoring information related to wetlands and wetland projects.

- North Coast
- San Francisco Bay Area
- <u>Central Coast</u>
- South Coast
- <u>Central Valley</u>
- Lahontan
- Colorado River Basin

Questions Answered

Click on a question below to view summary information based on available monitoring results.

- Where are California's wetlands? Is there a wetland near me?
- How much wetland habitat does California have?
- How much wetland habitat has California lost?
- How healthy are California's wetlands?
- What is being done to improve California's wetlands?
- What is the status of wetland mapping in California?

Wetland Condition

- .

Portal to Each Region Access to L1-L3 Data Auton Web Site maries

Search





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Project List Man	Basic Info 🔽 🗮 😂 🄇	<u>x LINKS</u>					
Summaries	Status Construction completed County Napa						
Questions	Project Type Compensatory mitigation Location 38.2793° N -122.2828° W MAP						
Questions Answered	Project Area 940.1 acres						
Background Info on Wetlands) on Preiest Identification - 2						
About Wetlands Portal		Type				A	
Wetland Condition (CRAM)	N25	SFBJV - 2001 code					
Feedback	1429,142911	3FB3V - 2000 COUR					
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Contact Us	No Data						
	Historical Habitats ?						



Sort by: Title | File Type | Submit Date | Submitted by

The Napa River Flood Management Effort

http://ceres.ca.gov/biodiv/newsletter/v5n4/chair.html

Submit date: 06/11/2004

Submitted by: Seth B. Shonkoff, San Francsico Estuary Institute, seth @ sfei.org

Napa River Flood Control and Water Conservation District Homepage

http://www.napaflooddistrict.org/

Submit date: 03/20/2003

Submitted by: Daniel Ficker, San Francisco Estuary Institute, danielf@sfei.org

	Estuarine Saline	0	zoom	Site Name ≜	Visit Date	CRAM Score	Latitude 🔨
	Estuarine Non-salin	ne 🔘	Q	Tiger Creek	03/10/2009	92.0	38.484149898702
A Start Barrie	Riverine Confined	$\overline{\mathbf{O}}$	Q	Topanga Canyon	10/17/2005	72.6	34.095509503253
	Riverine Non-conf	ined O	Q	Trabuco Creek	12/23/2008	89.0	33.682901240590
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2	 CRAM calibratio 	n		Truckee River	12/10/2009	72.0	39.177561990291
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Percent Maximum Possible Score (Riverine Confined)





Monitoring Framework



Assessing Policies, Programs, and Projects





Level 1	Unit	Unit Cost
Base Map plus Riparian	Quadrangle	\$6,000
Landscape Status & Trends	30 1-Km ² Plots	\$46,000
Project Mapping	Project	\$200
l evel 2	Unit	Unit Cost
CRAM Assessments	1 Assessment	\$800 - \$2,000
Probabilistic Ambient Survey	30 Assessments	\$24,000 - \$60,000
Project Assessment	2-6 Assessments	\$1.600 - \$12.000



Costs vary widely beginning at 2-3 x Level 2 per data point or site.

Thank you josh@sfei.org