

California Rapid Assessment Method for Wetlands and Riparian Areas

Meaning of CRAM Scores Example Applications and Interpretations



Scientific Meaning of CRAM Scores

- CRAM Index Score represents overall condition, functional capacity, or “health.”
 - It does not represent any particular function or set of functions (that’s Level 3)
- Analogous to:
 - Apgar Scores (new born infant health)
 - Dow Jones Industrial Average (DOW)
 - Gross National Product (GNP)
 - Grade Point Average (GPA)

Scientific Meaning of CRAM Scores

- Identical Index or Overall Scores can be derived from different Attribute Scores

- Must refer to Attribute Scores and sometimes Metric Scores to interpret Index Scores
- 10-point precision target

Landscape - Buffer	Hydrology	Physical Structure	Biotic Structure	Index Score
50	35	72	68	56
68	50	35	72	56

Index	Landscape/ Buffer	Hydrology	Physical Structure	Biotic Structure
70	58	58	66	89

Index	Landscape/ Buffer	Hydrology	Physical Structure	Biotic Structure
72	83	100	50	53

Scientific Meaning of CRAM Scores

- Each Attribute Score represents a suite of expected functions
 - e.g., Landscape and Buffer Attribute represents ecological connectivity at landscape scale, ability of buffer to mediate external stressors, etc.
 - e.g., Hydrology Attribute for riverine wetlands represents recharge, peak stage reduction, water quality maintenance, etc.

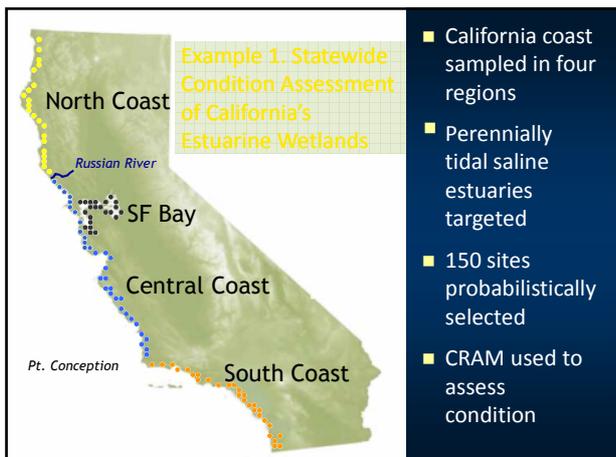
Scientific Meaning of CRAM Scores

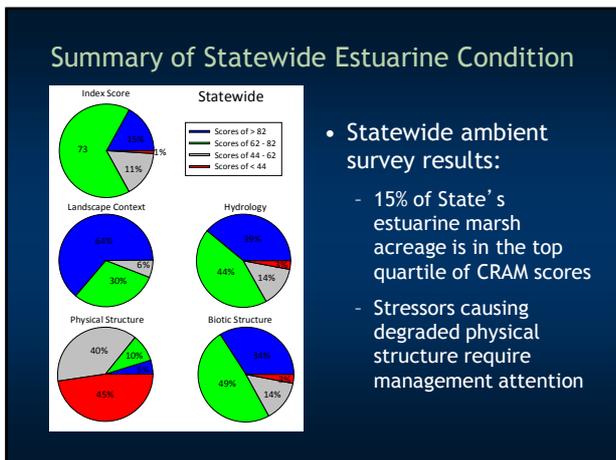
- As Attribute Scores decrease, associated functional capacity is expected to also decrease.
 - Stressor checklist plus Metric Scores helps identify possible causes for low Attribute Scores
 - Level 3 is required to validate relationship between Attribute scores and function or stress

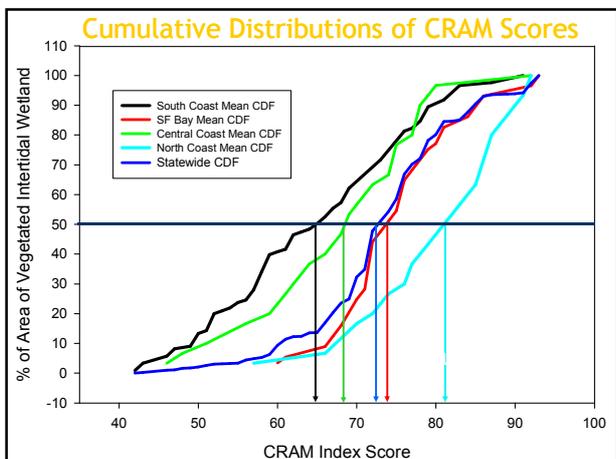
Examples: Applications and Interpretations

How is CRAM being Used?

- Statewide Assessments
 - Perennially tidal estuaries
 - Perennial Stream Ambient Assessment
- Watershed Assessments
 - Morro Bay Watershed Monitoring Program
- Program Assessments
 - Wetland Mitigation Program
- Project Assessments
 - Development Projects
 - Restoration Project Success







Example 2. CMAP/CRAM Statewide Assessment

Multiple Metrics:

CRAM

IBI

- Benthic macroinvertebrates

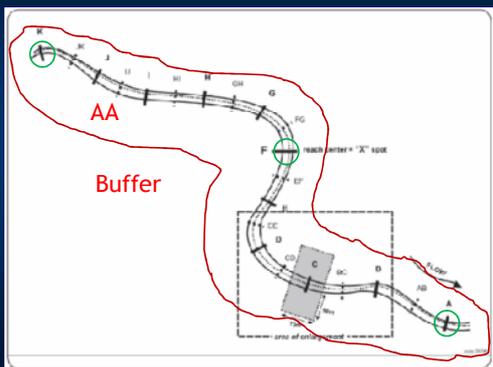
Physical Habitat

- Riparian Human Disturbance Index (RHDI)
- Embeddedness (% Sands & Fines)
- Canopy Cover

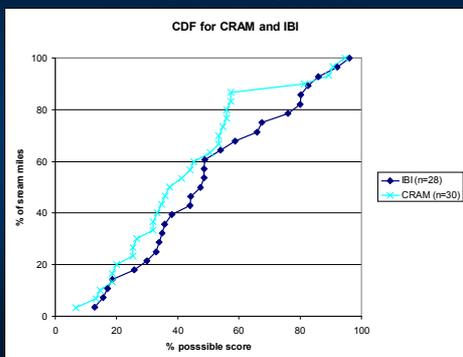


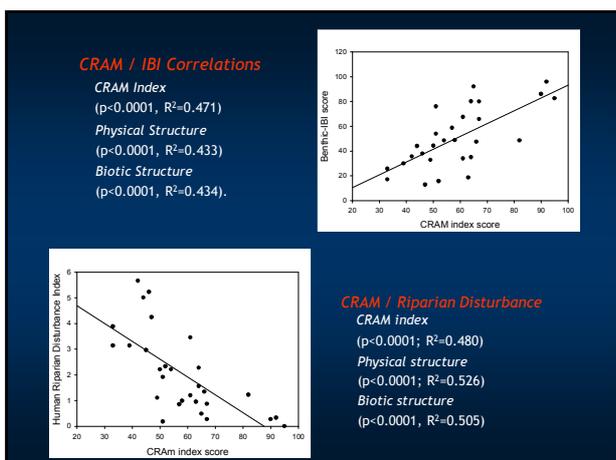
30 CMAP sites sampled between 2004-2007
CRAM assessment added in 2007

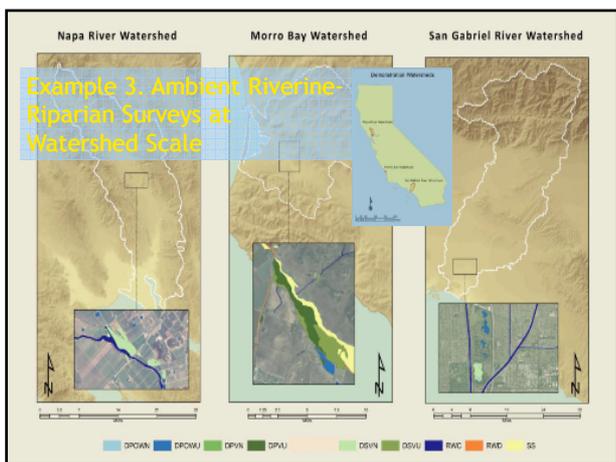
Joint CRAM and IBI Assessments

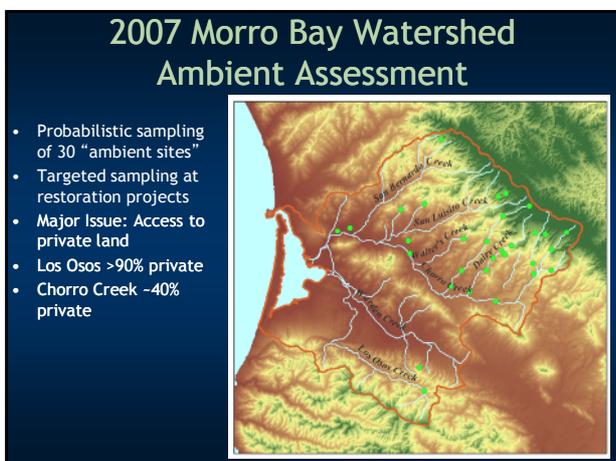


Cumulative Frequency Distribution of CRAM and CMAP



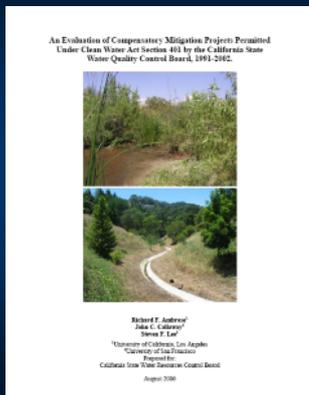




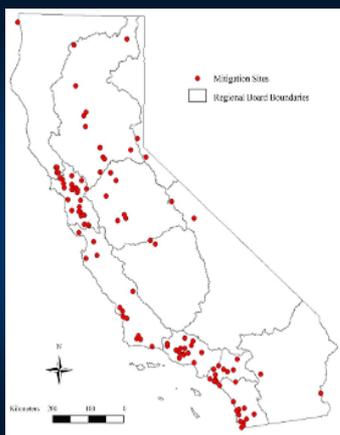


Example 4. Program Evaluation

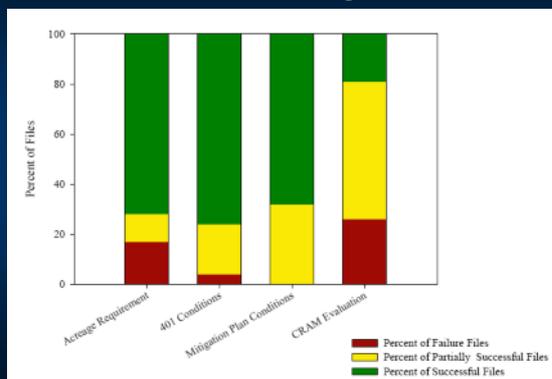
Focus: Evaluate the compliance and wetland condition of compensatory wetland mitigation projects associated with Section 401 Water Quality Certifications throughout California



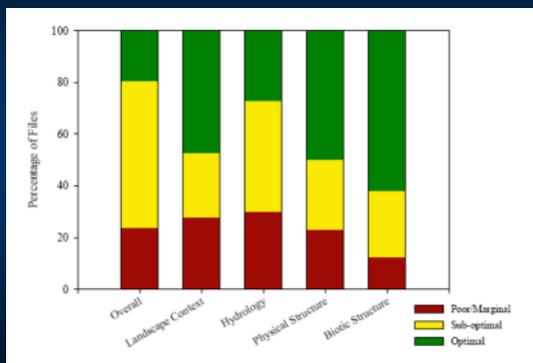
- 204 mitigation sites
- Review permit files for compliance
- Evaluate condition using CRAM



Successful Mitigation??



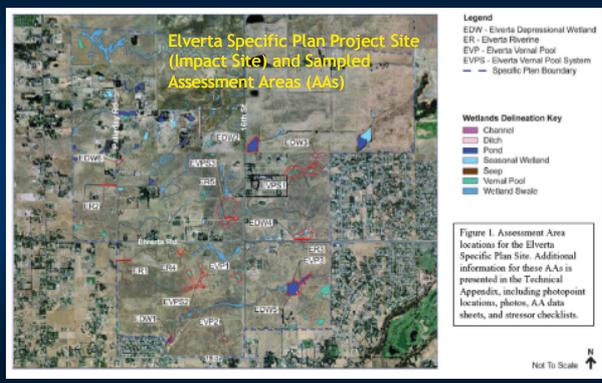
Condition of Mitigation Sites



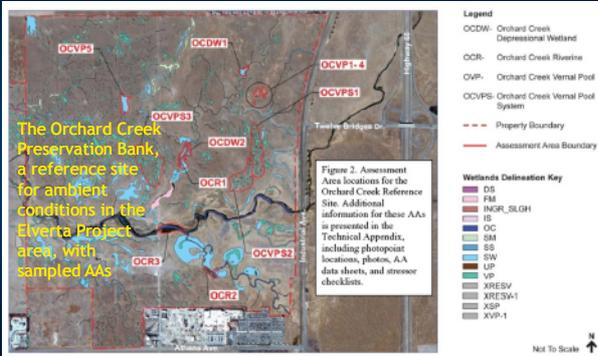
Example 5. Project Impact Assessment Using CRAM

- Approach depends on objective of project
- Approaches include:
 - Assess all impacts
 - Sequential comparison
 - Probabilistic survey
 - Targeted survey
 - Hybrid

Example 5A. Elverta SP Project Assessment



Elverta Project Assessment (2)



Elverta Project Assessment (3)



Elverta Project Assessment (4)

