Update on the California Rapid Assessment for Wetlands (CRAM)

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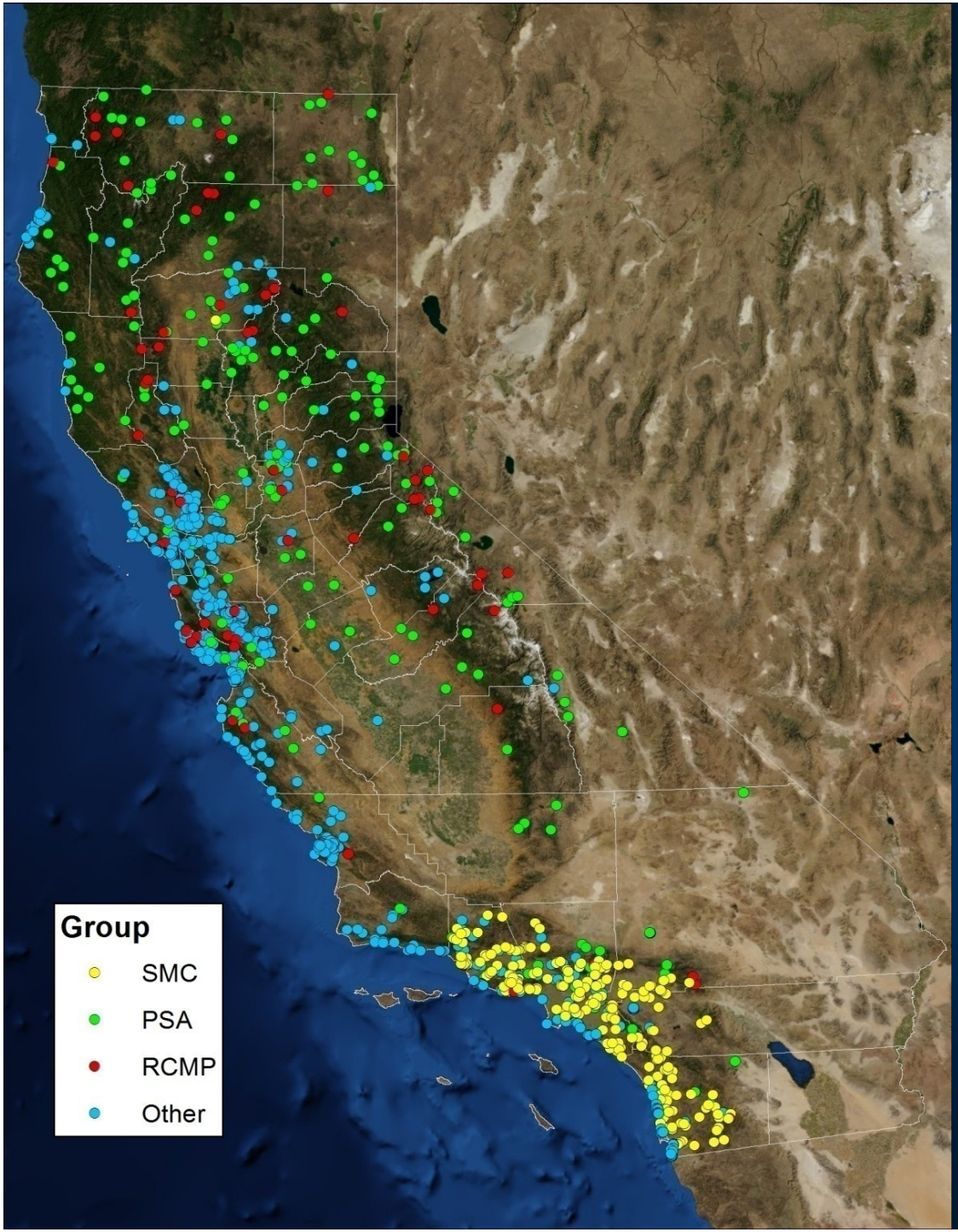
TOPICS FOR DISCUSSION

- Brief Overview of CRAM
  - comparison to other indicators
  - scoring
- Status of CRAM
  - Implementation
  - Infrastructure for support
- Future directions for CRAM



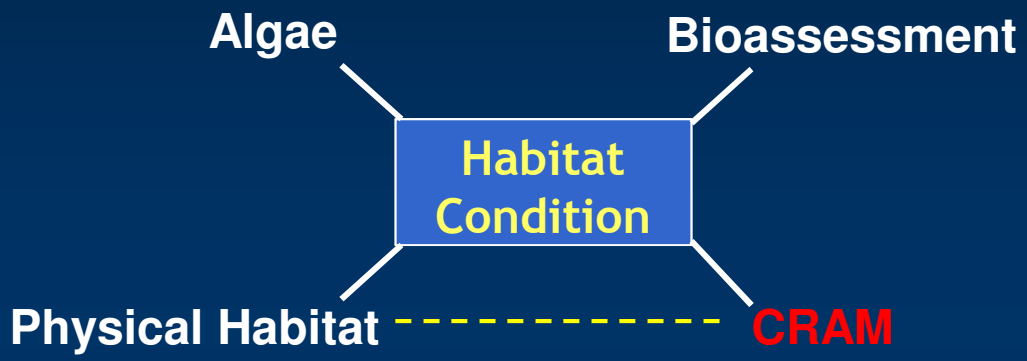
CRAM is being Implemented in California

- Ambient assessments
  - Statewide, regional, watershed-scale
- Program evaluation
  - Compensatory mitigation – 404/401 Clean Water Act
- Evaluate Restoration Effectiveness

CRAM Overview

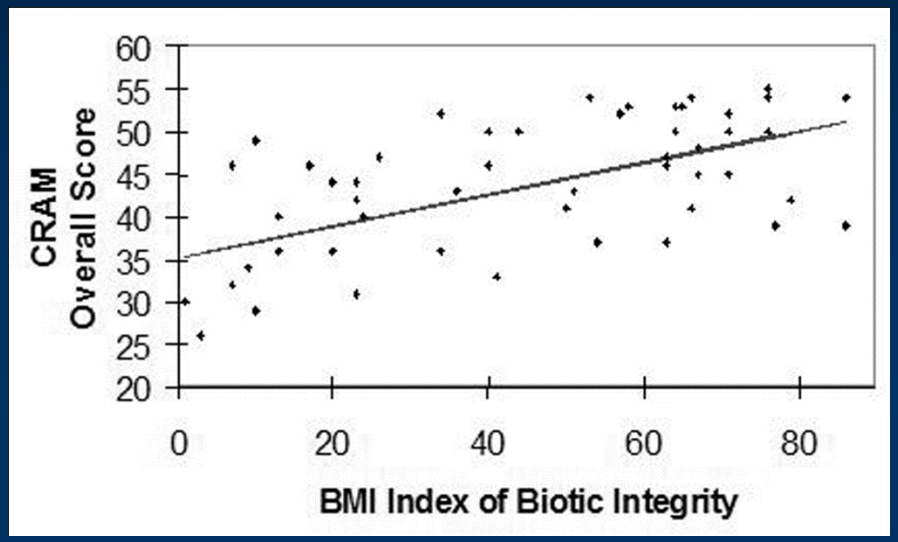
- Standardized diagnostic tool to assess wetland condition (health)
- Produces overall index score
  - scores range from 25-100
  - analogous to DOW Jones average, GNP, GPA, etc.
- 2 hrs field time + office component
- Team of 2-3 trained field practitioners

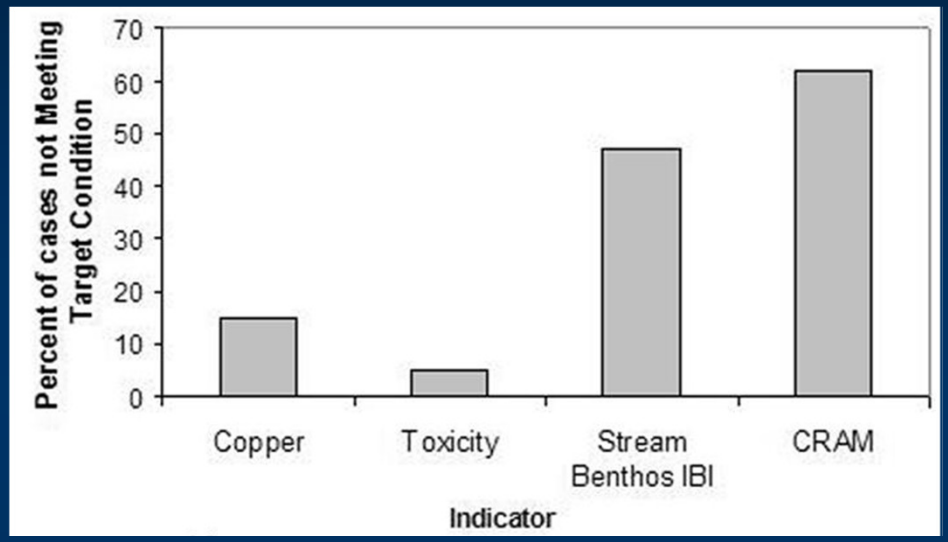
How Does CRAM Differ from Other Indicators Used in the PSA?



- Holistic, integrative approach to habitat assessment
- Inclusive for all "wetland" types in California (incl. streams)
- Landscape-level component
- Time required to process and obtain results is relatively minimal
- Requires no laboratory analysis
- Can be used to focus and prioritize need and location for more intensive assessments

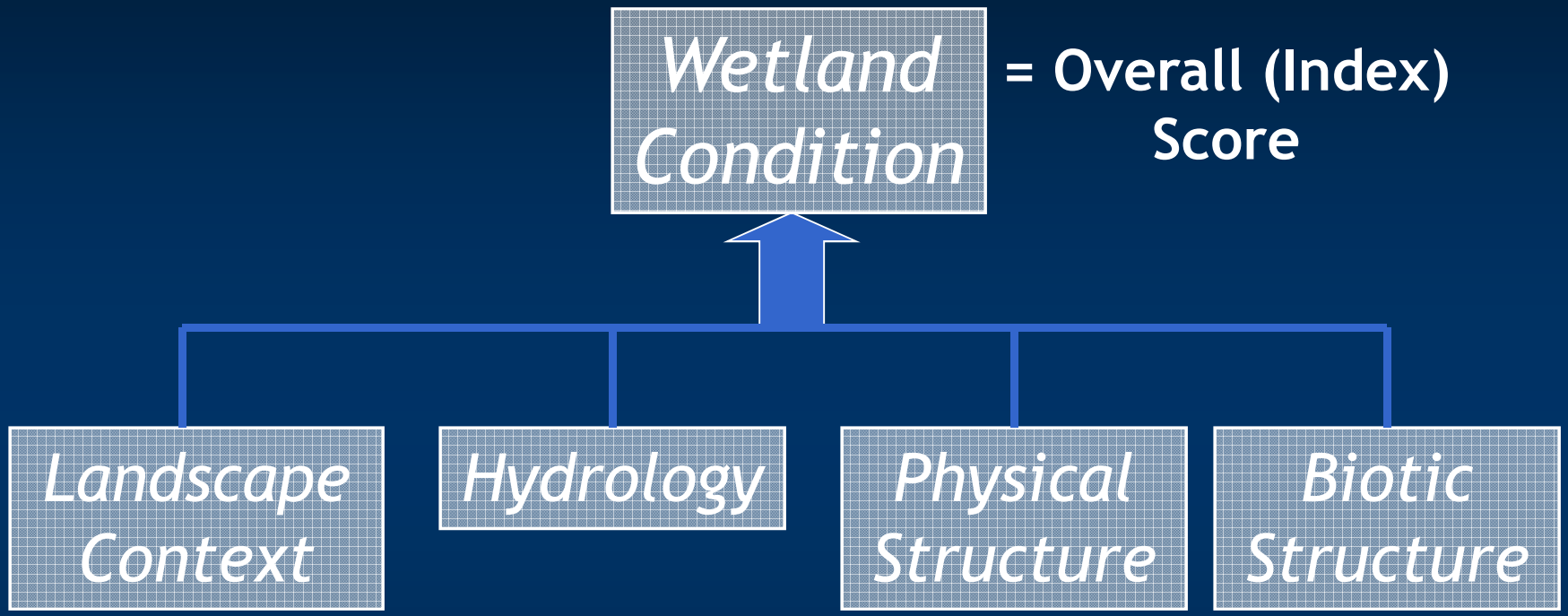
Relationship of CRAM to Other Indicators





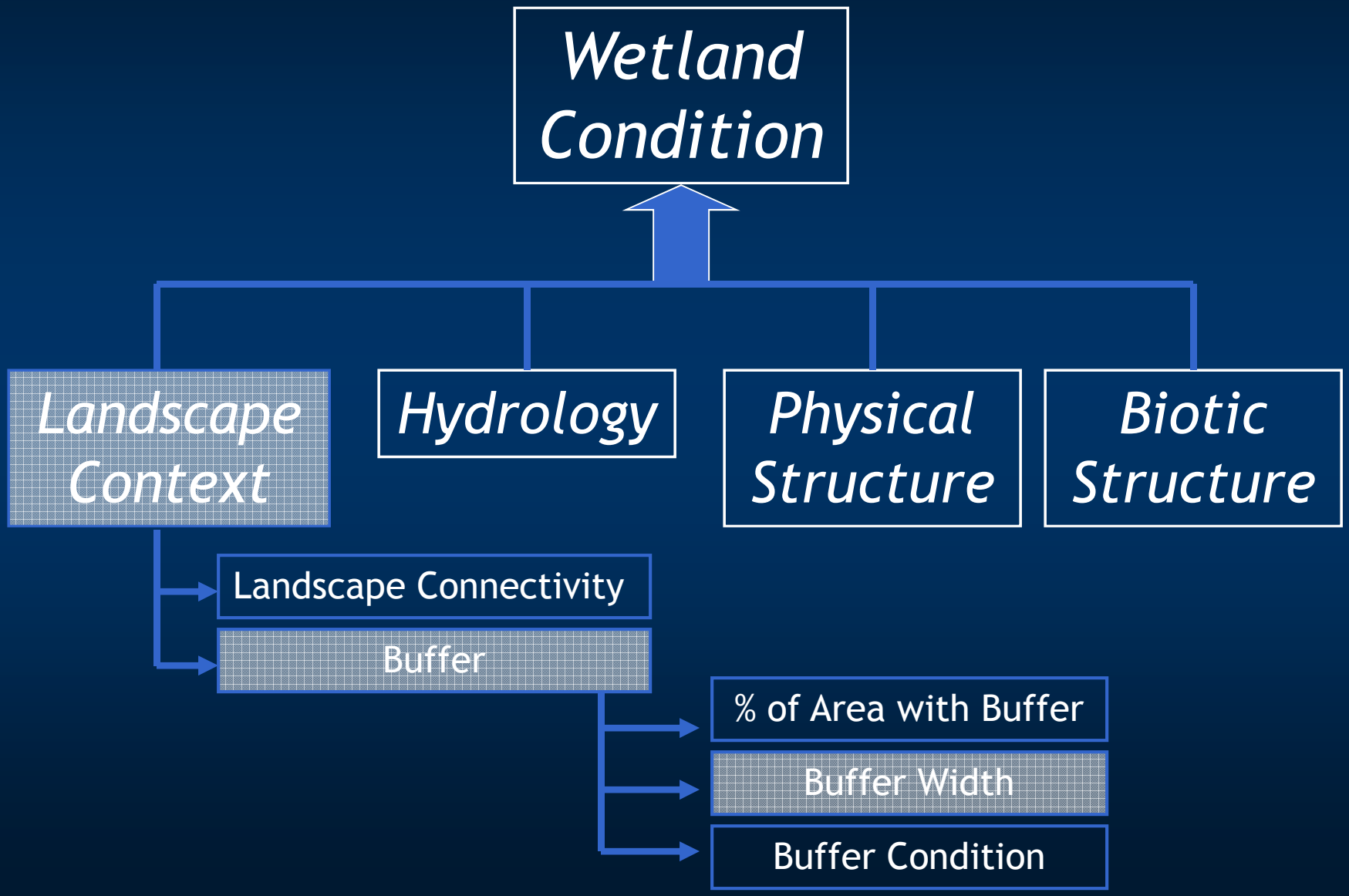
- CRAM scores correlate with traditional assessment data
- CRAM can provide a different insight on conditions at a site when compared to other types of indicators and the standard used

CRAM Framework

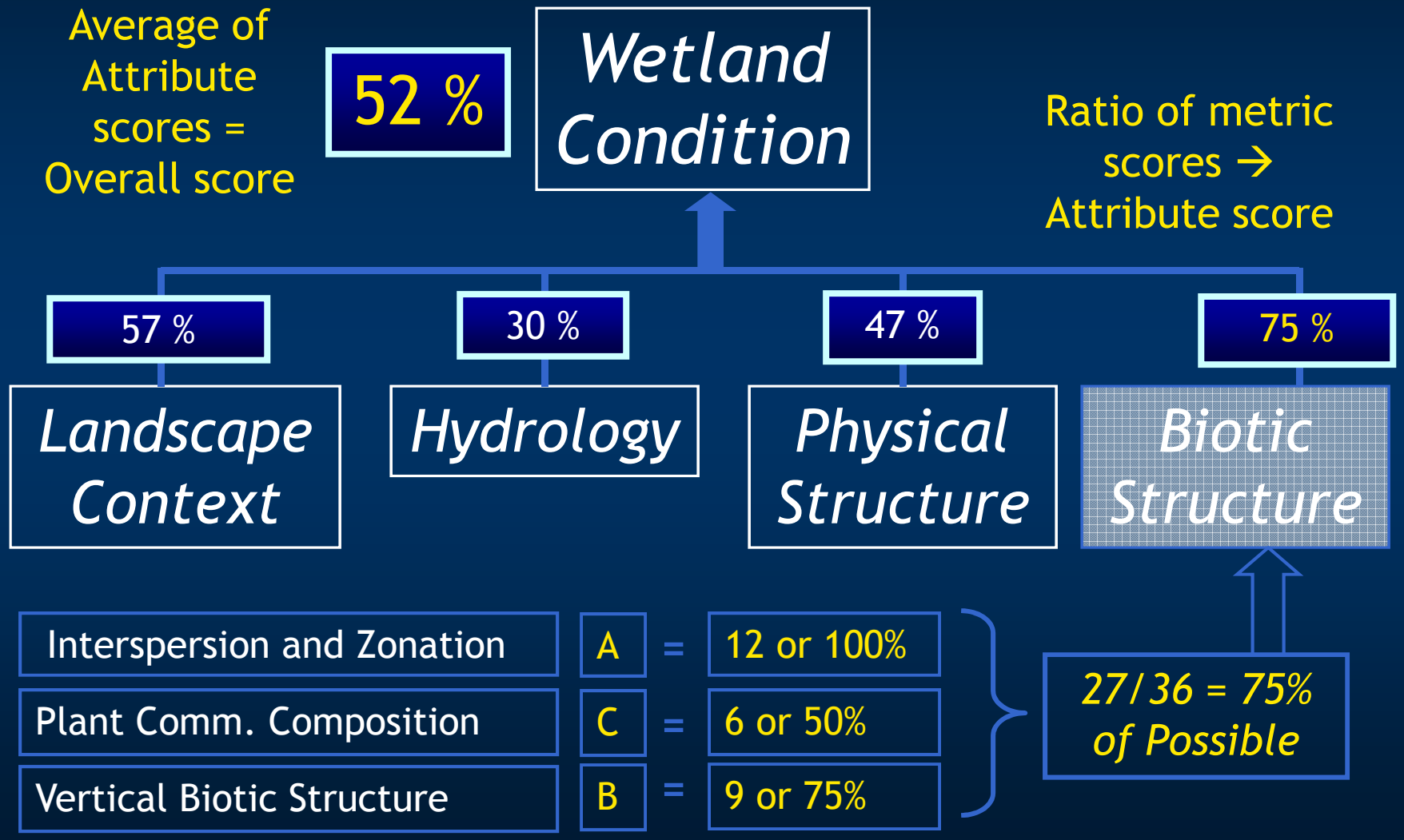


- CRAM is comprised of four attributes
- Each attribute is represented by 2-3 metrics, some of which have sub-metrics.

CRAM Metric and Sub-metrics

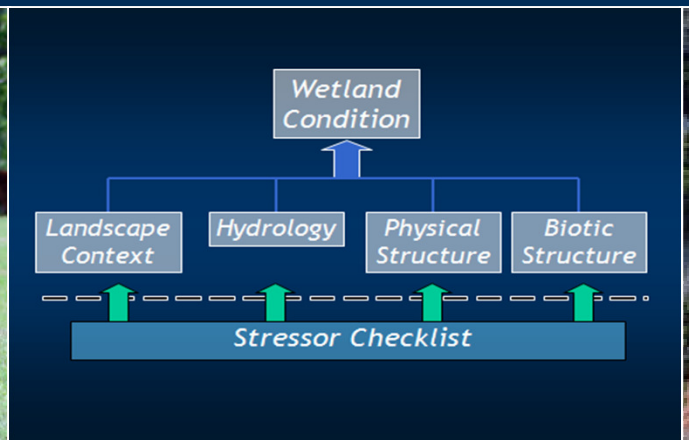


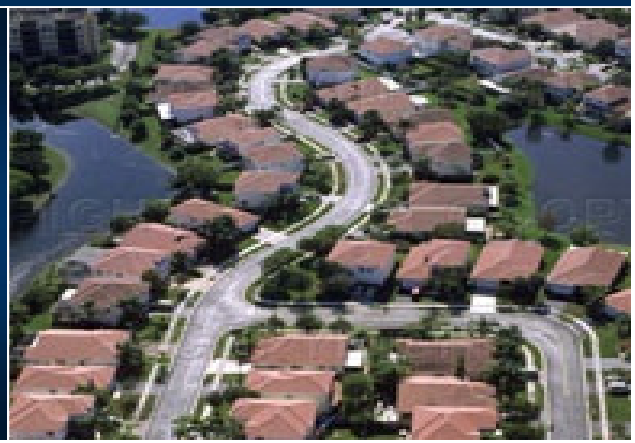
CRAM Scoring



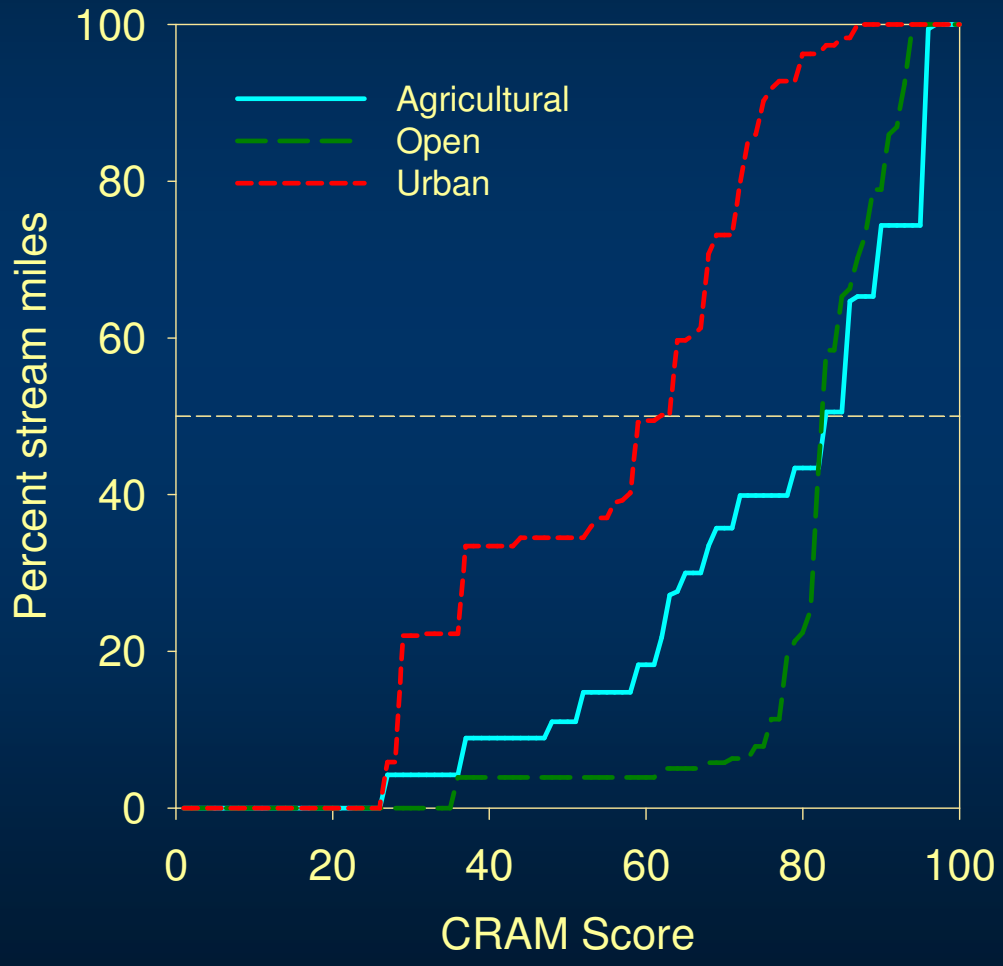
CRAM Stressor Checklist

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





Regional Cumulative Distributions of Ambient Condition Based on Land Use



Status of CRAM

- Validated modules for estuarine and riverine
- CRAM Manual + field books
- CRAM website (www.cramwetlands.org)
- *e*CRAM database
  - 1,986 assessment records
- Training Program
  - UC Davis Extension (practitioner-level)
  - State Water Board Training Academy (agency-level)
  - Since 2008, ~25 CRAM trainings for over 400 individuals have been conducted

Articles and Peer Review

WETLANDS, Vol. 29, No. 2, June 2009, pp. 648–665

VALIDATION OF A WETLAND RAPID ASSESSMENT METHOD: USE OF EPA'S LEVEL 1-2-3 FRAMEWORK FOR METHOD TESTING AND REFINEMENT

Eric D. Stein[1], A. Elizabeth Fetscher[1], Ross P. Clark[2], Adam Wiskind[3], J. Letitia Grenier[4], Martha Sutula[1], Joshua N. Collins[4], and Cristina Grosso[4]

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[2]*California Coastal Commission*
725 Front Street, Suite 300, Santa Cruz, California, USA 95060

[3]*Moss L... Marine Laboratories*
8272 Moss Landing R...

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7770 Pardee La...

Abstract: Wetland rapid assessment h... assessments rely on observable field indi... be validated against independent data. H... estuarine modules of the California Rapi... the method to "good" vs. "poor" wetlan... redundancy, alternative combination rule... no independent, concurrently collected... comprising CRAM was available for v... assessment data on avian diversity, ... composition. Results indicate that CRA... wetland condition based on its corresp... Reproducibility analysis revealed sever... construction led to high inter-team error... within 5%. This study demonstrates ... meaningful and reliable tool for assessin...

Key Words: calibration, CRAM, meth... condition, wetland monitoring

INTRODUCTION

In recent years, rapid wetland assessment m... have been gaining popularity for use in a r... wetland regulatory, ambient assessment, an... agement applications (Stapanian et al. 2004, ... et al. 2005, Fennessy et al. 2007). Increase... need for program accountability have resu... expansion of ambient monitoring program... rigorous performance monitoring for mitigat... restoration projects, and an increased fo... landscape scale and cumulative impact ass... (USEPA 2002). In recognition that an in... assessment is not always practical or desira... U.S. Environmental Protection Agency (U... has proposed a three-tiered approach to mo... and assessment, termed Level 1-2-3. Und... approach, Level 1 consists of habitat invento...

An Evaluation of Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the California State Water Quality Control Board, 1991-2002.

Richard F. Ambrose[1]
John C. Callaway[2]
Steven F. Lee[1]

[1]University of California, Los Angele...
[2]University of San Francisco

Prepared for:
California State Water Resources Control...

August 2006

Determining the health of California's coastal salt marshes using rapid assessment

Christopher W. Solek, Martha A. Sutula, Eric D. Stein, Chad Roberts[1], Ross Clark[2], Kevin O'Connor[2] and Kerry J. Ritter

ABSTRACT

The integration of rapid assessment methods with probability-based regional survey designs provides a cost-effective means for making unbiased assessments of wetland condition over a relatively large area within a short period time. We demonstrated this synergy through a statewide probability-based survey of the condition of perennially tidal saline estuarine wetlands (salt marshes) in California using the California Rapid Assessment Method (CRAM). An estimated 85% of the State's salt marshes scored within the top 50% of possible CRAM index scores. Among the four CRAM attributes for salt marshes, Buffer and Landscape Context had the highest scores. Physical Structure was the attribute for which California's salt marshes scored the lowest. CRAM index and attribute scores showed a general decrease from northern to southern California. The presence of dikes, levees, and other water control structures that restrict tidal exchange was a severe stressor that is responsible for low physical structure scores. Urbanization of surrounding land uses was significantly correlated to poor wetland health statewide. Information on landscape and local stressors gathered via the CRAM assessment suggest possible management actions that could be used to improve wetland health. This study demonstrates how RAM results from a regional probability-based survey can be used as contex... condition of restoration proje...

INTRODUCTION

Considerable resources h... wetland restoration and mana... States, mostly to offset histor... current threats. Since 1990, i... and private organizations hav... $15 billion on over 30,000 ri... restoration projects (Malakof... 2005). The National Coastal ... Grant Program awards betwe... dollars annually to acquire, re... enhance coastal wetlands (US... to account for the effectivene... and to track wetland status an... proliferation of wetland ambi... assessment programs across t... the United States Environmen... (USEPA) National Wetland C... (http://water.epa.gov/type/we... survey/index.cfm).

An important design elen... monitoring programs is the u... survey methods that allow sc... condition of large areas basec... a representative sample of loc... Olsen 2004). Because probal...

[1]*Roberts Environmental and Conservation Planning, LLC, Eureka, CA*
[2]*Moss Landing Marine Laboratories, Central Coast Wetlands Group, Moss Landing, CA*

Demonstration of an integrated watershed assessment using a three-tiered assessment framework

Christopher W. Solek, Eric D. Stein & Martha Sutula

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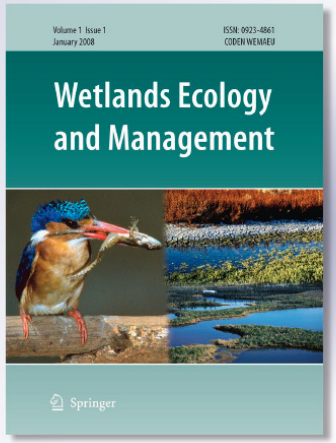
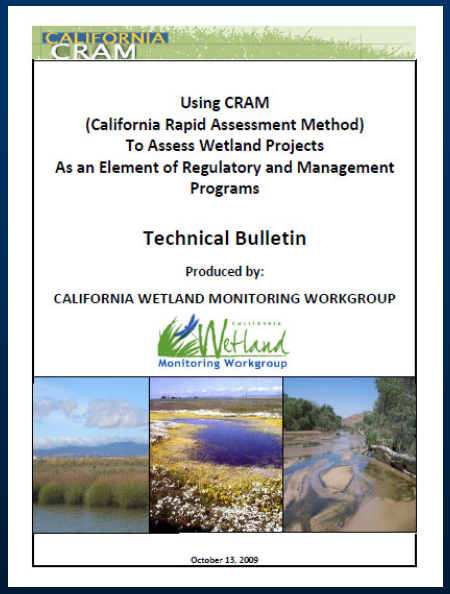
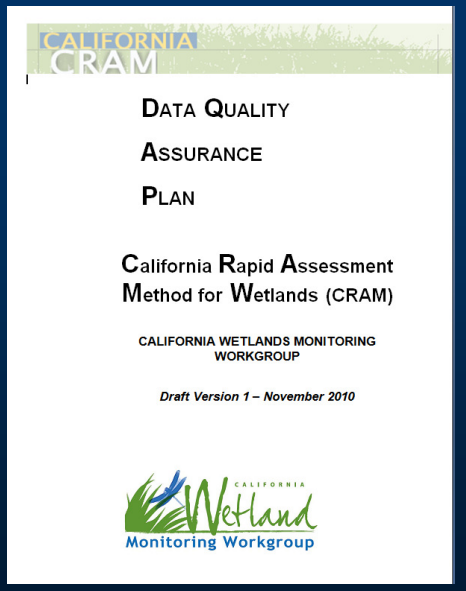


Papers available for download at: www.cramwetlands.org

CRAM Quality Assurance

- CRAM Technical Bulletins
  - Project Assessment
  - Role and funding of regional audit teams
- Draft data quality QA/QC Plan

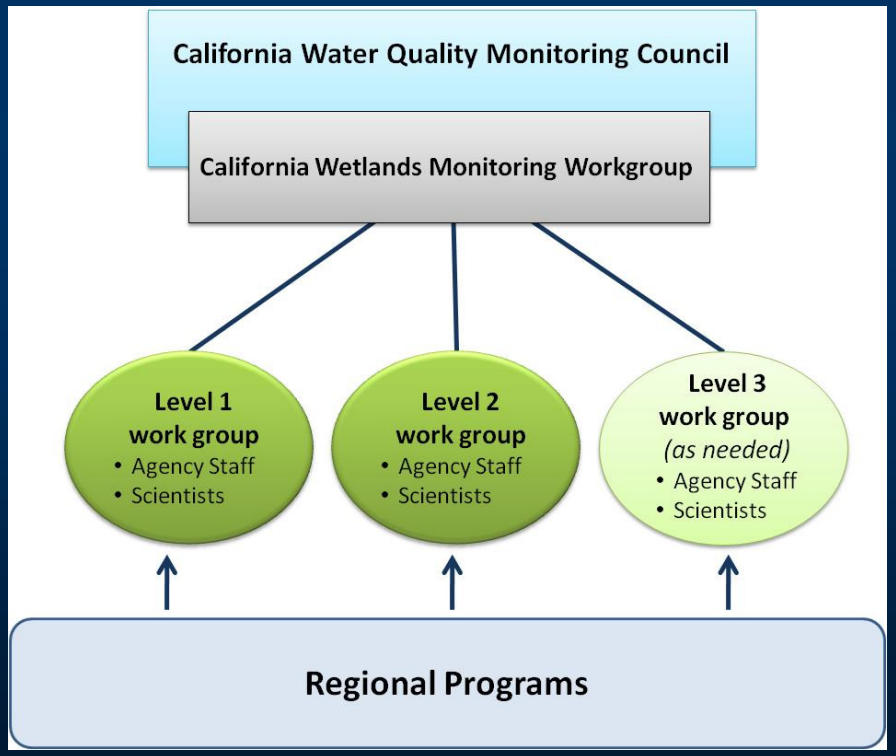




Available at: www.cramwetlands.org

Institutional Support for CRAM

- Evolving State wetland program and wetland policy
- State wetland web portal



www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup

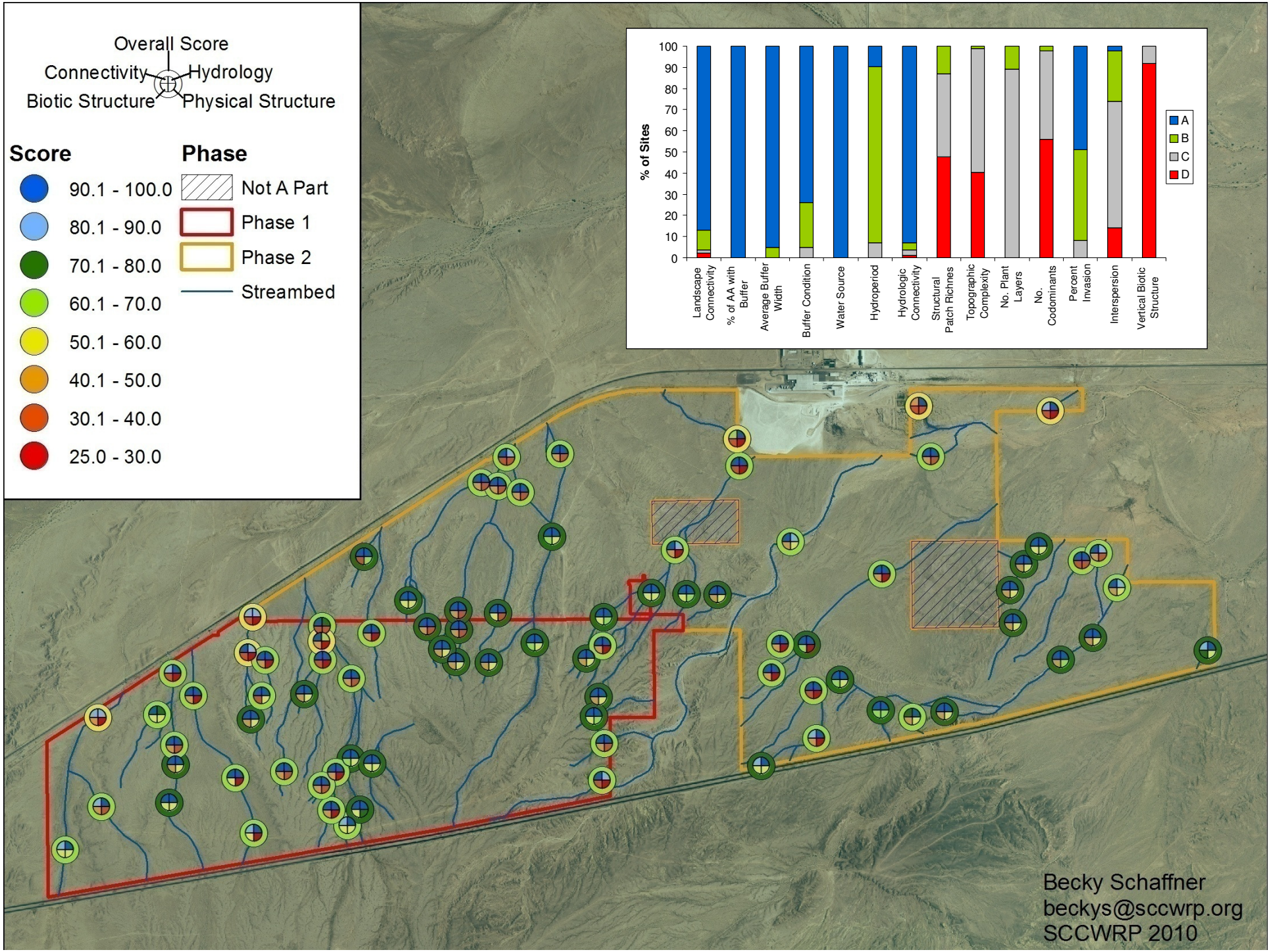
http://www.CaliforniaWetlands.net

State Reference Network Development

- Concept paper on reference site criteria
- Used CRAM to assess condition
- 95 sites distributed among 7 regions
  - estuarine, riverine, perennial depressional, vernal pools
- Sites to be used for multiple purposes, includes CRAM QA/QC
- Site information to be available on Wetland Portal by Jan. 2011

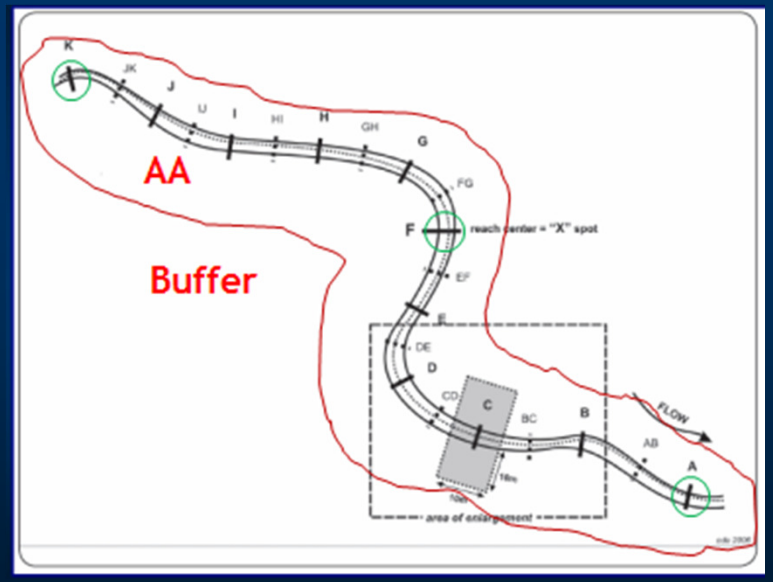
CRAM Module development and refinement

- Depressional wetland calibration/validation
  - Validate with bugs and algae (southern Calif.)
  - Calibration across range in hydroperiod (statewide)
- Arid ephemeral stream module
  - Funding in place; 3 year project
  - CRAM and intensive indicators
- Wet Meadow module
  - Tahoe Science Consortium spearheading effort


Overall Score
Connectivity
Hydrology
Biotic Structure
Physical Structure
Score
90.1 - 100.0
80.1 - 90.0
70.1 - 80.0
60.1 - 70.0
50.1 - 60.0
40.1 - 50.0
30.1 - 40.0
25.0 - 30.0
Phase
Not A Part
Phase 1
Phase 2
Streambed
% of Sites
100
90
80
70
60
50
40
30
20
10
0
A
B
C
D
Landscape Connectivity
% of AA with Buffer
Average Buffer Width
Buffer Condition
Water Source
Hydroperiod
Hydrologic Connectivity
Structural Patch Richnes
Topographic Complexity
No. Plant Layers
No. Codominants
Percent Invasion
Interspersion
Vertical Biotic Structure
Becky Schaffner
beckys@sccwrp.org
SCCWRP 2010

Next Steps for CRAM

- Improved integration of CRAM and physical habitat assessments
  - Eliminate redundancies and streamline methods

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