California Rapid Assessment Method for Wetlands and Riparian Habitats

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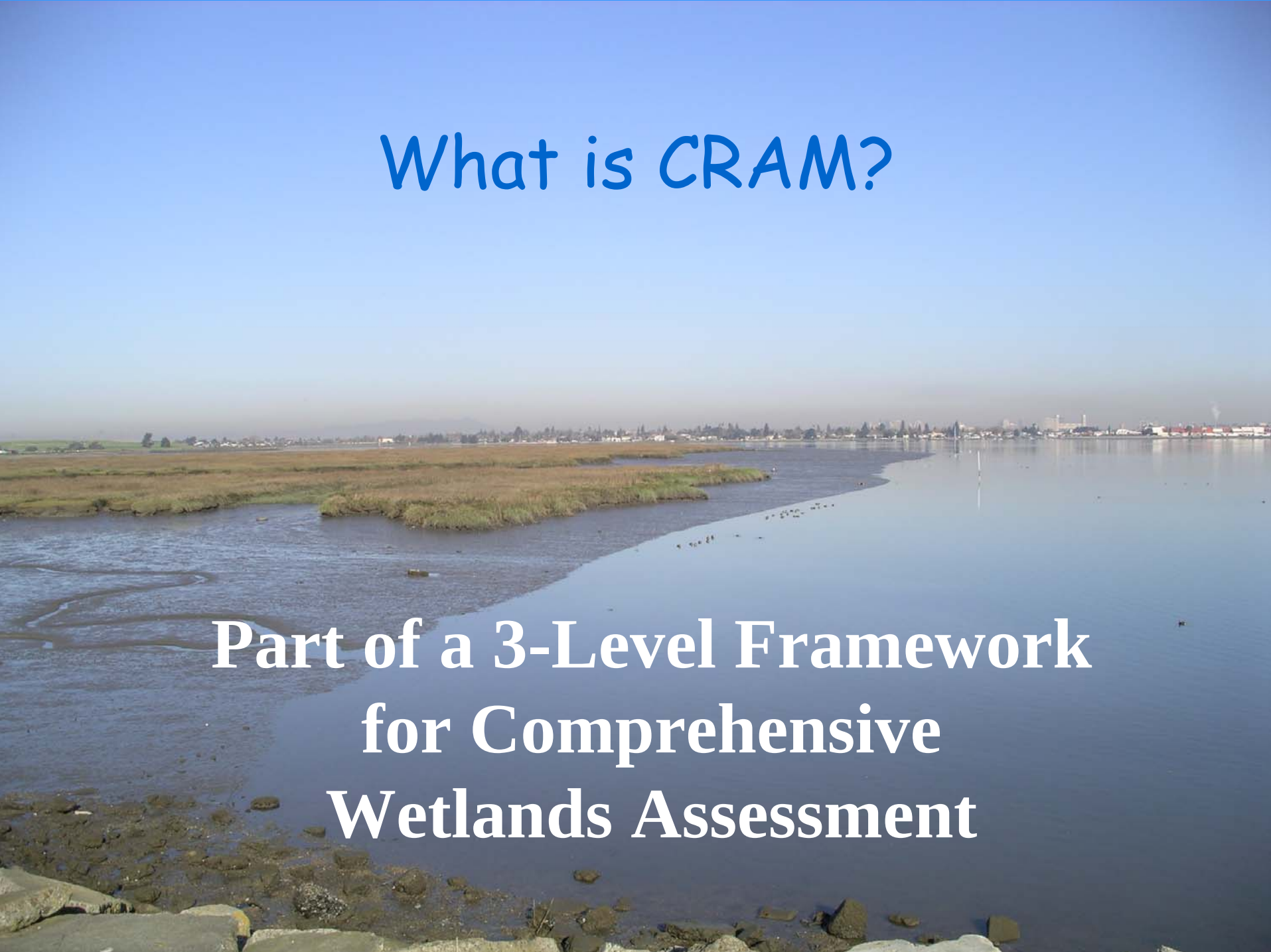
What is CRAM?



Part of a 3-Level Framework for Comprehensive Wetlands Assessment

Level 1: Inventories and Landscape Profiles

Answer the question!

Where *are* the wetlands and riparian habitats?

- Develop sample frame for monitoring ambient condition and trends by wetland type.
- Develop web-based tools for tracking habitats and projects.

Level 1: Inventories and Landscape Profiles

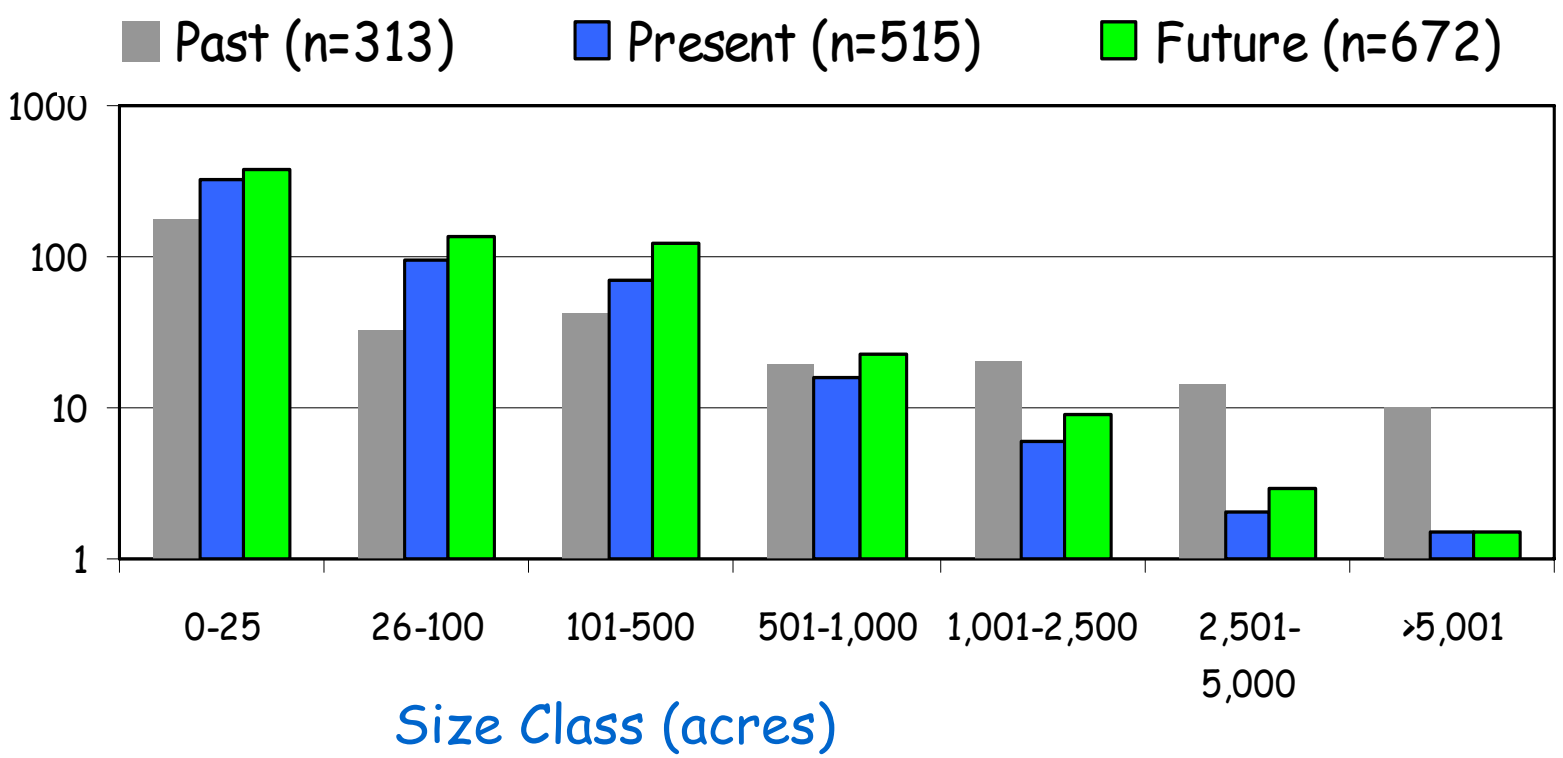
Geographic Scope: All wetlands of all types in California

lacustrine, estuarine, coastal lagoon, riverine, depresssions, vernal pools, seeps and springs, playas

At this time, "all" means every wetland that can be mapped using 1-3m^2 pixel resolution geo-rectified imagery plus ground-truthing.

Establish Level 1 Baselines
track progress over time

Tidal Marsh Patch Size



Level 2: Rapid Assessment (CRAM)

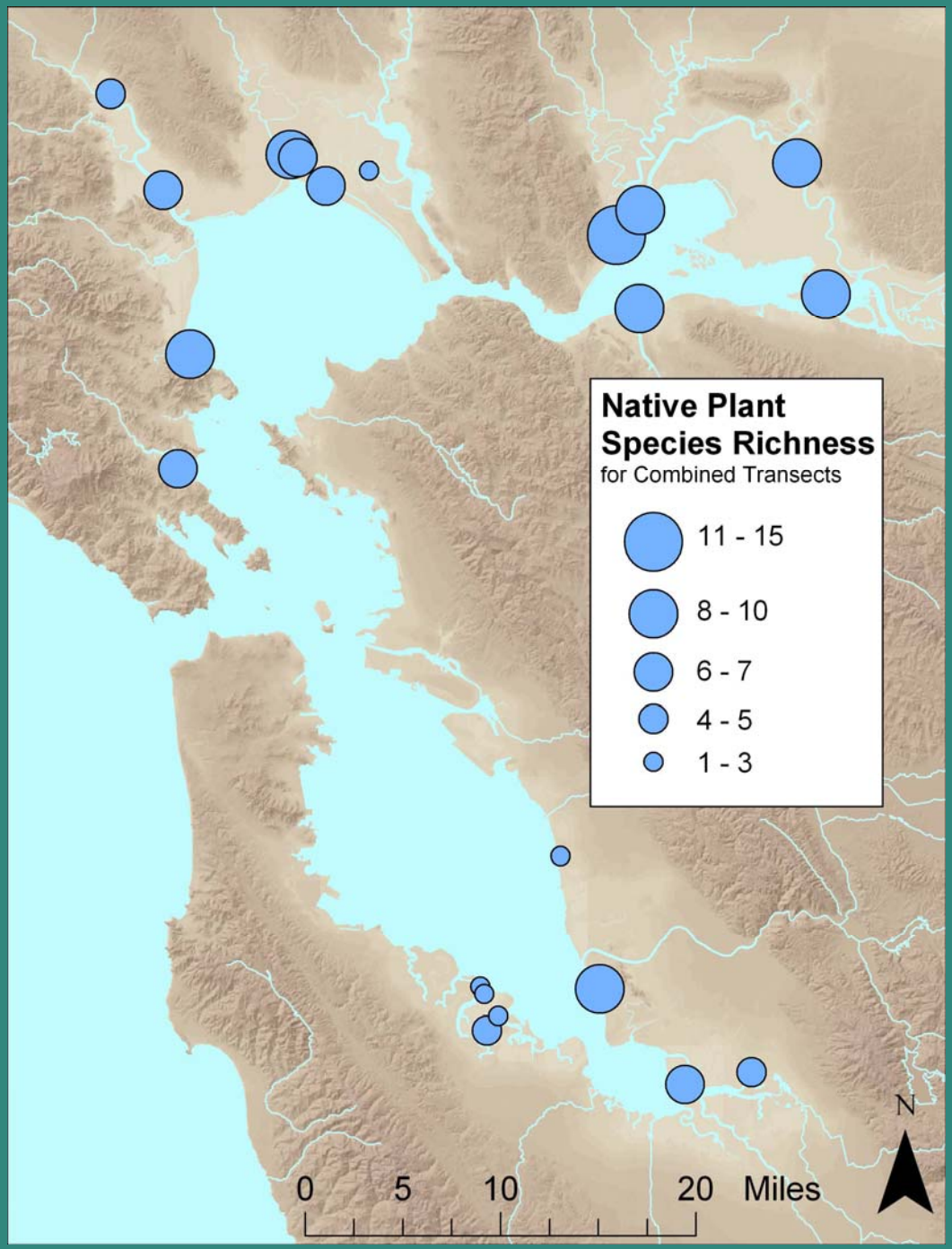
Answer the question!

How are the wetlands doing
(on a scale of 1-10)?

Develop a rapid method for assessing wetland condition that can be routinely used for evaluation and monitoring.

Level 3: Intensive Monitoring and Special Studies

- Develop predictive models of relations among states, functions, and stressors (e.g., IBIs).
- Calibrate and validate Level 1 and Level 2 methodologies.
- Develop standard protocols for intensive monitoring www.wrmp.org



Establishing Level 3 Baselines

Native plant species richness increases with marsh age and decreases with salinity.

Focus on Level 2:

California Rapid Assessment Method

CRAM

What is CRAM?

- Expert "walk and talk" diagnostic tool
- A set of questions with mutually exclusive multiple choice answers
- 30 -120 minutes of field time per Assessment for 2-3 person team
- Required expertise comparable to jurisdictional delineation

Purpose

Answer the questions: where are the wetlands and related projects and how are they doing?

Purpose

Support Project planning and tracking in watershed and regional context by envisioning *any project* in the context of *all projects*, and in context of historical and modern habitats.

Purpose

Track net change in wetland and riparian quantity and quality to ease the burden of reporting under CWA 401, 404, 305b, 304d, plus state directives including no-net-loss policies.

Purpose

Provide public access to basic wetland information to assist environmental education and science.

CRAM Applications

Answer the questions: where are the wetlands and related projects and how are they doing?

Support Project planning and tracking in watershed and regional context by envisioning any project in context of all others, and in context of historical and modern habitats.

Track net change in wetland and riparian quantity and quality to ease the burden of reporting under 401, 404, 305b, 304d, WDR, and no-net-loss policies.

Provide public access to basic wetland information to assist environmental education and science.

CRAM Scope

All wetlands of all types in California

lacustrine, estuarine, coastal lagoon, riverine, depresssions, wet meadow, vernal pools, seeps and springs, playas

At this time, "all" means the population of wetlands visible in 1-m^2 pixel resolution geo-rectified imagery plus ground-truthing.

CRAM Scope

Only compare wetlands of the same kind

Draft CRAM Tenets

Function follows from structure and form …

Basic wetland condition can be assessed using visible field indicators.

CRAM Tenets

Living resources matter most…

A monitoring program is not about the wetlands per se, but the life and physical services wetlands should support.

CRAM Tenets

More wetland is better …

Larger natural wetlands in better condition provide more service to society.

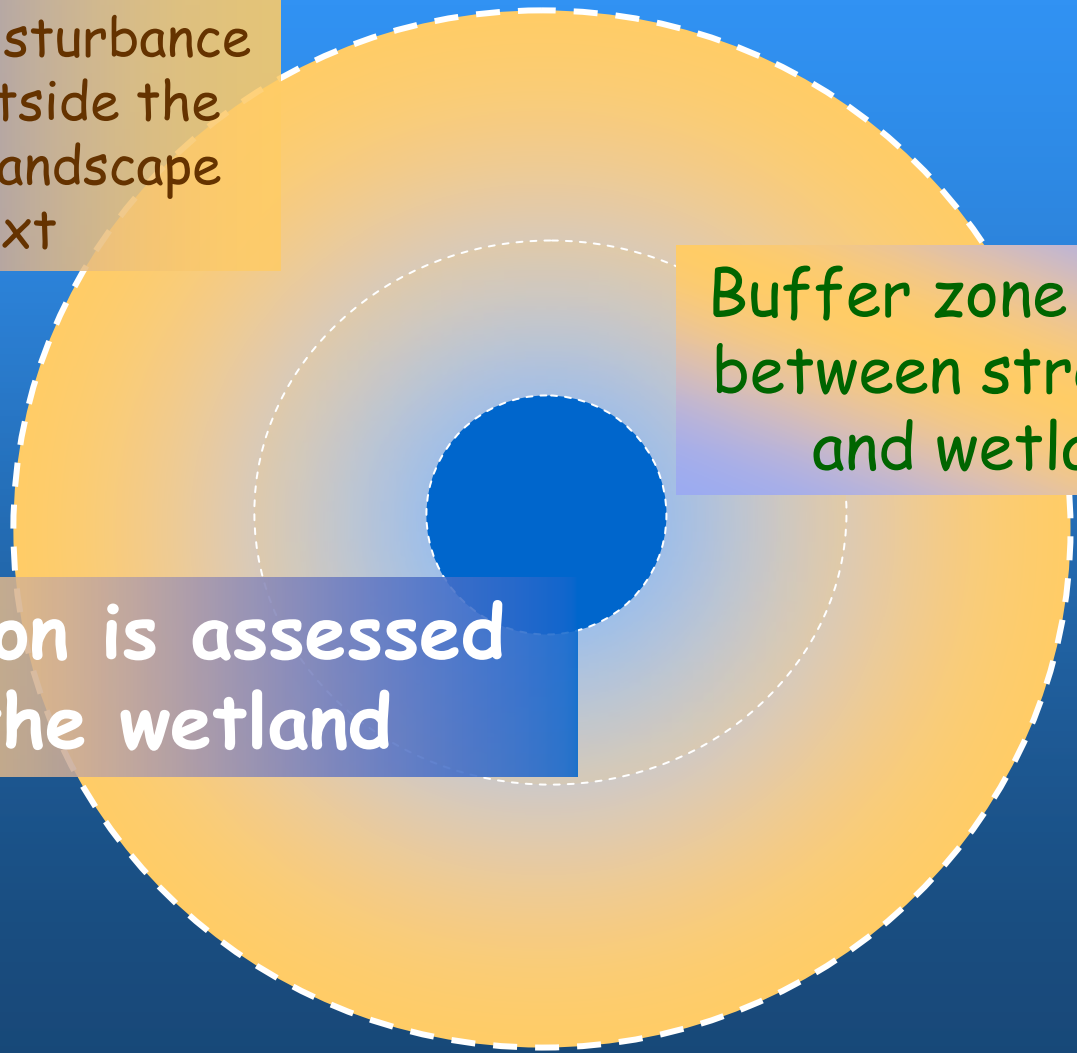
CRAM Tenets

More complexity is better …

Greater natural complexity means richer native communities.

Spatial Template of Driving Forces

Stress and disturbance originate outside the wetland, in landscape context



Buffer zone exists between stressors and wetland

Condition is assessed at the wetland

Hierarchy of Assessment Approach

Wetland Sites, *have one or more*

Assessment Areas, *for which there are*

Attributes of Condition

which have

Same for Regions and Classes

Vary for Regions and Classes

Metrics, *which have*

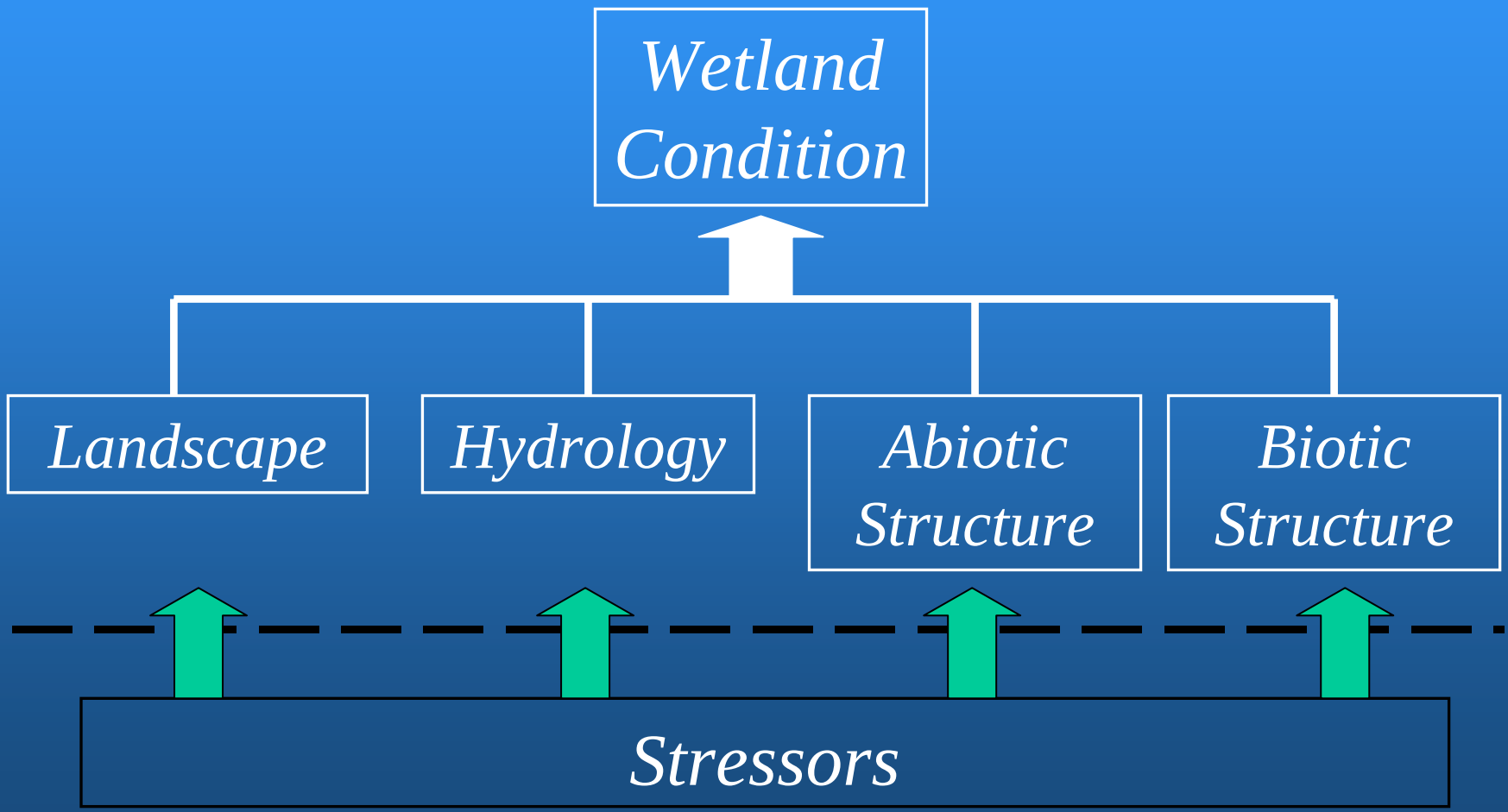
States, *which have*

Scores (*cf reference conditions)*

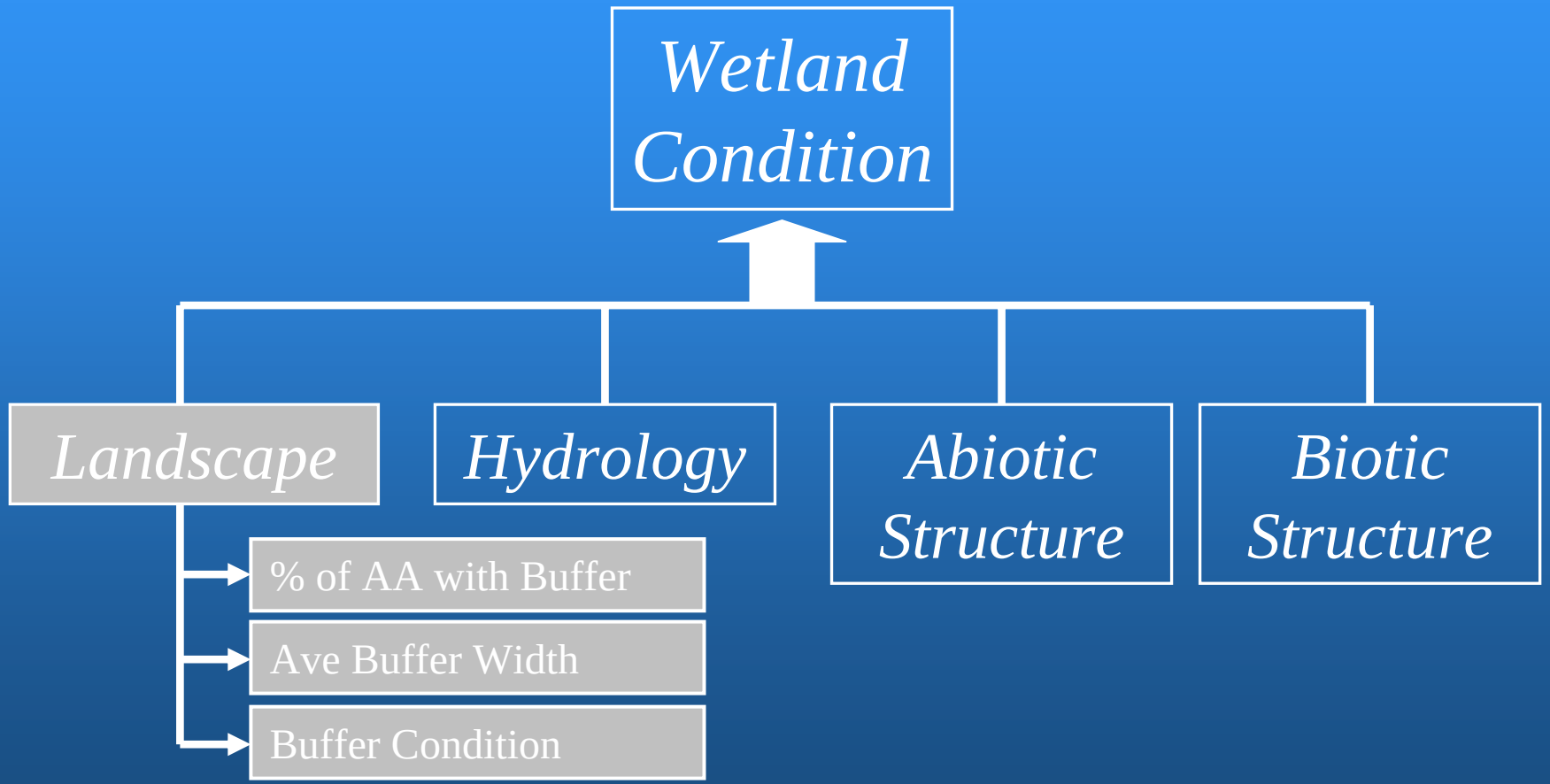
Reference Concepts

- Metrics are scored relative to statewide ideal (ideal varies between wetland classes).
- For each metric, a network of reference sites represents the full range of condition.

CRAM Conceptual Framework: Condition and Stressors



CRAM Conceptual Framework: Condition Attributes and Metrics



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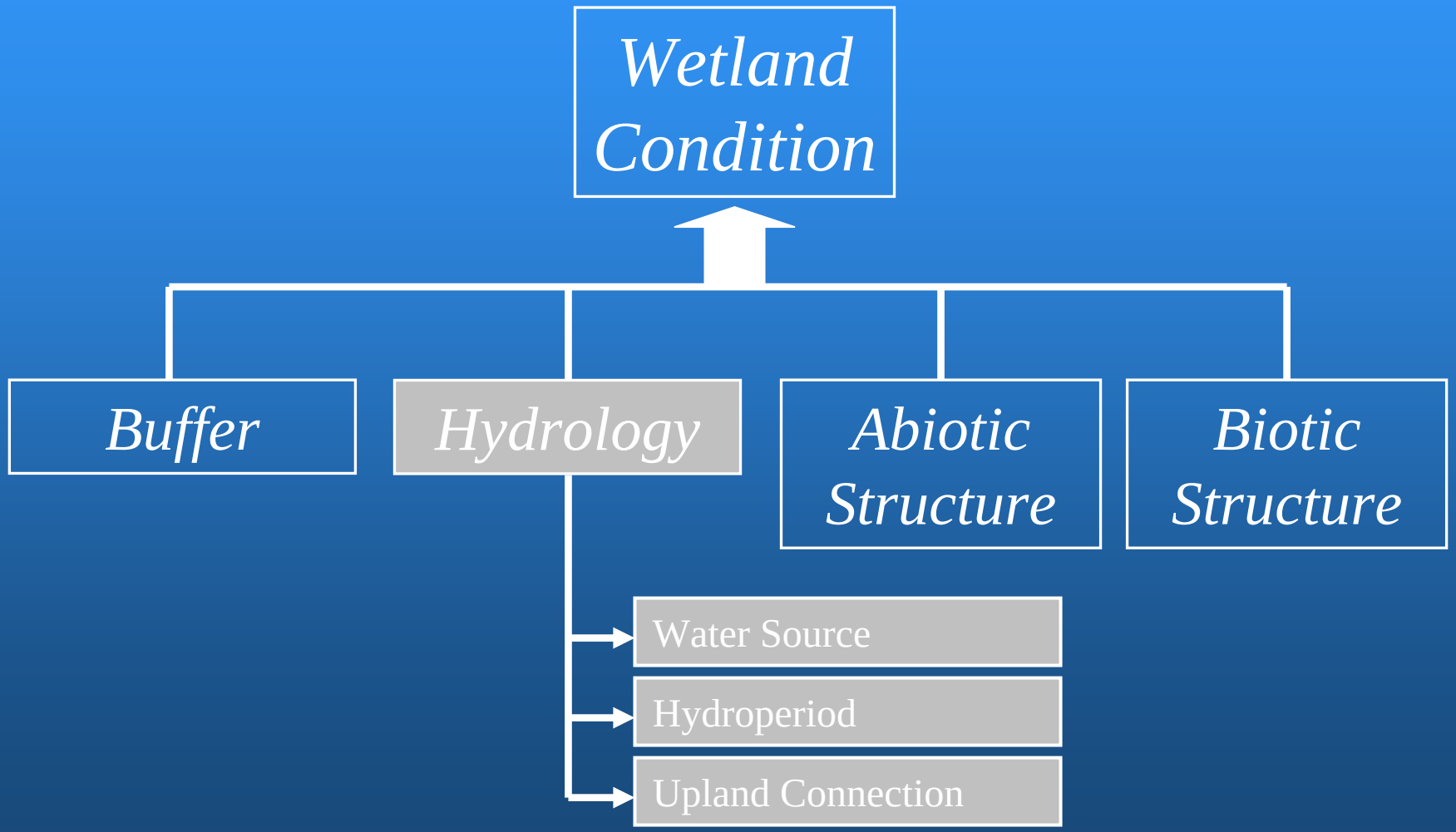

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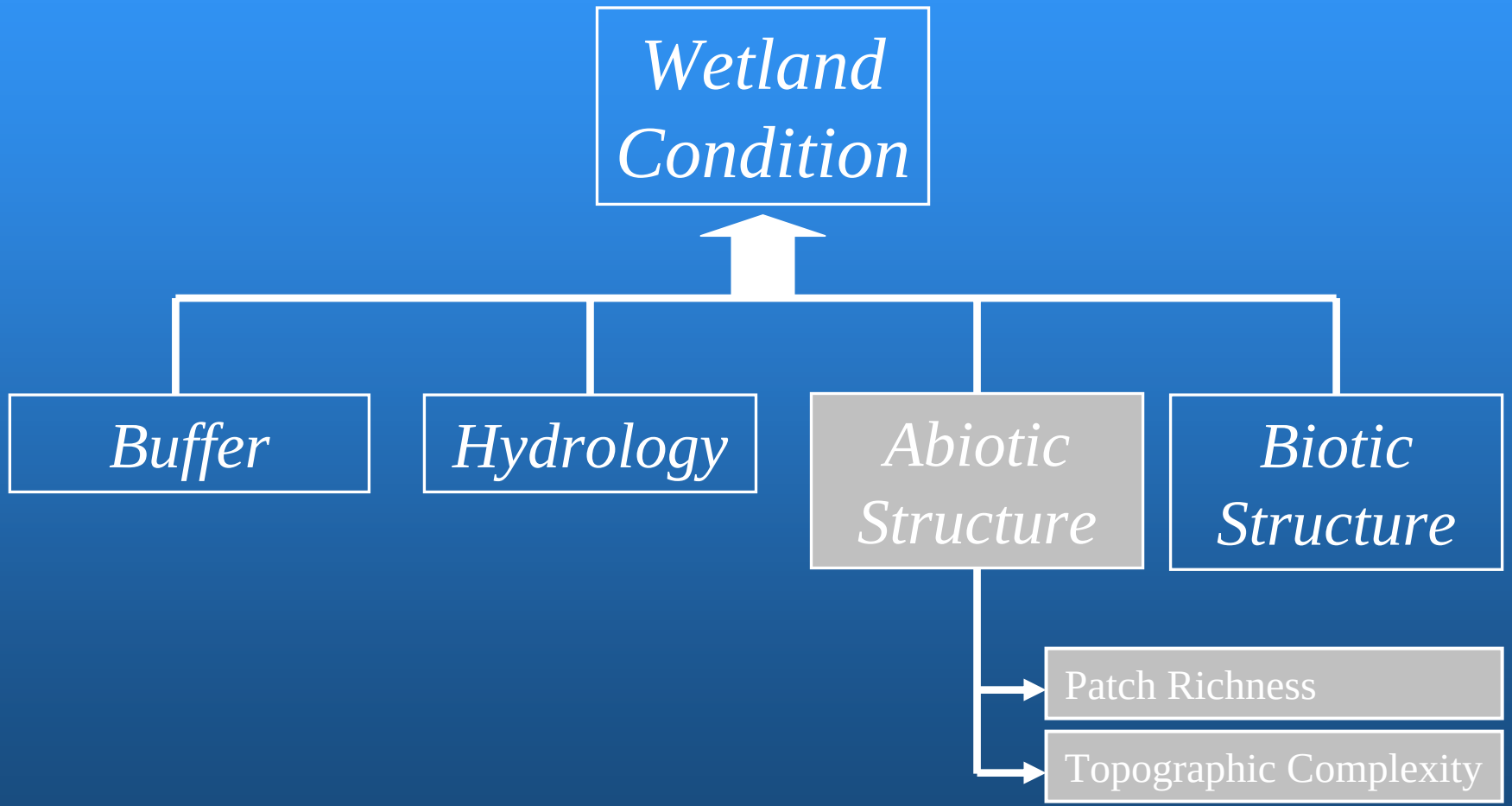

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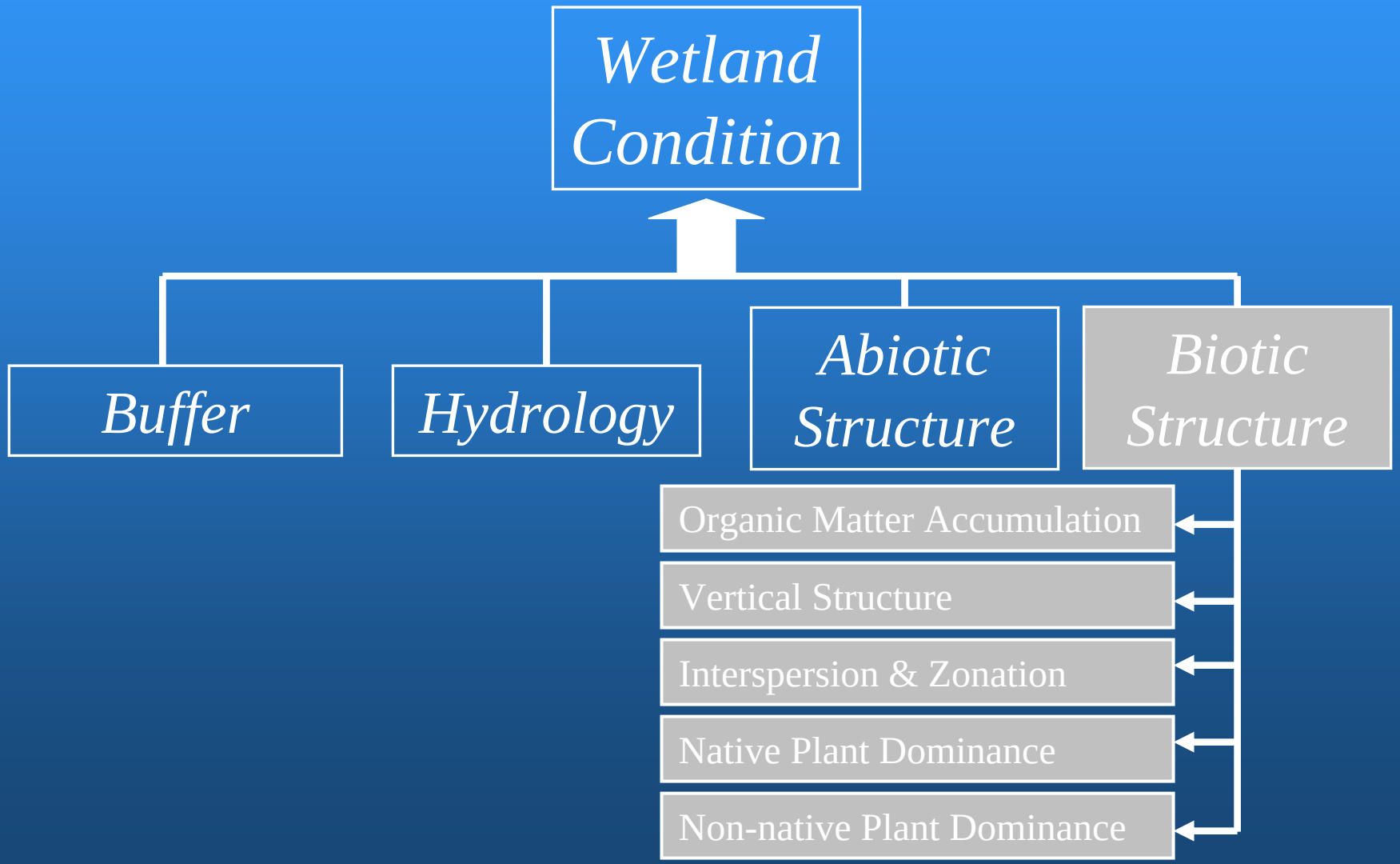


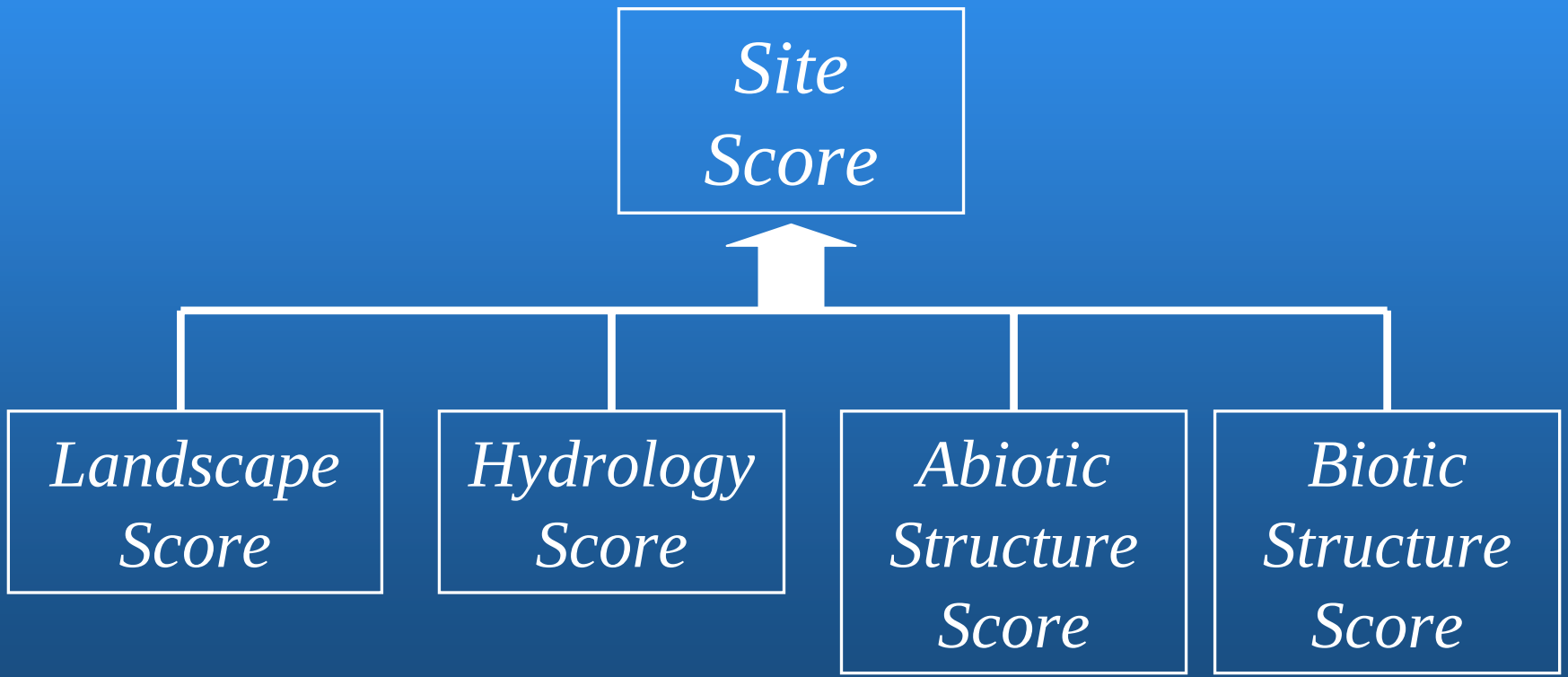
Example CRAM Metric

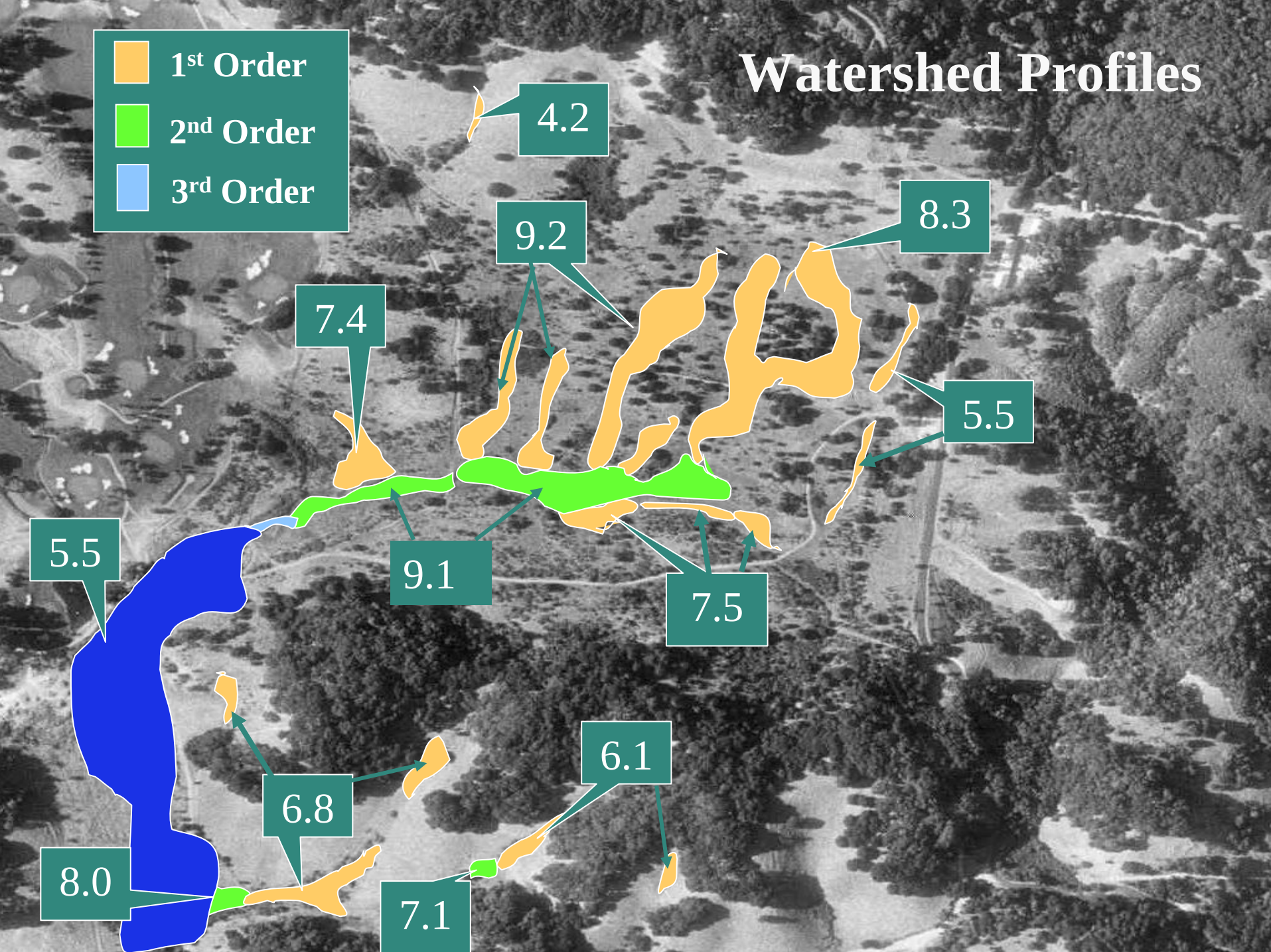
Attribute: Hydrology Metric: Water Source

Score	Alternative State
4	Dry-season freshwater source for AA is precipitation, groundwater, and/or natural runoff, or an adjacent freshwater body, with no indications of artificial water sources
3	Dry-season freshwater source is primarily natural; but AA receives occasional or small amounts of inflow from anthropogenic sources, such as urban runoff, agriculture, or POTWs
2	Dry-season freshwater source is primarily direct irrigation, pumped water, artificially impounded water, or other artificial hydrology
1	AA has no natural dry-season source of freshwater

CRAM Results: Attribute & Site Scores

Percent of Maximum Possible




1st Order
2nd Order
3rd Order
Watershed Profiles
4.2
9.2
8.3
7.4
5.5
5.5
9.1
7.5
6.1
6.8
8.0
7.1

What *Is* "Wetland Tracker" ?

Tracker is …

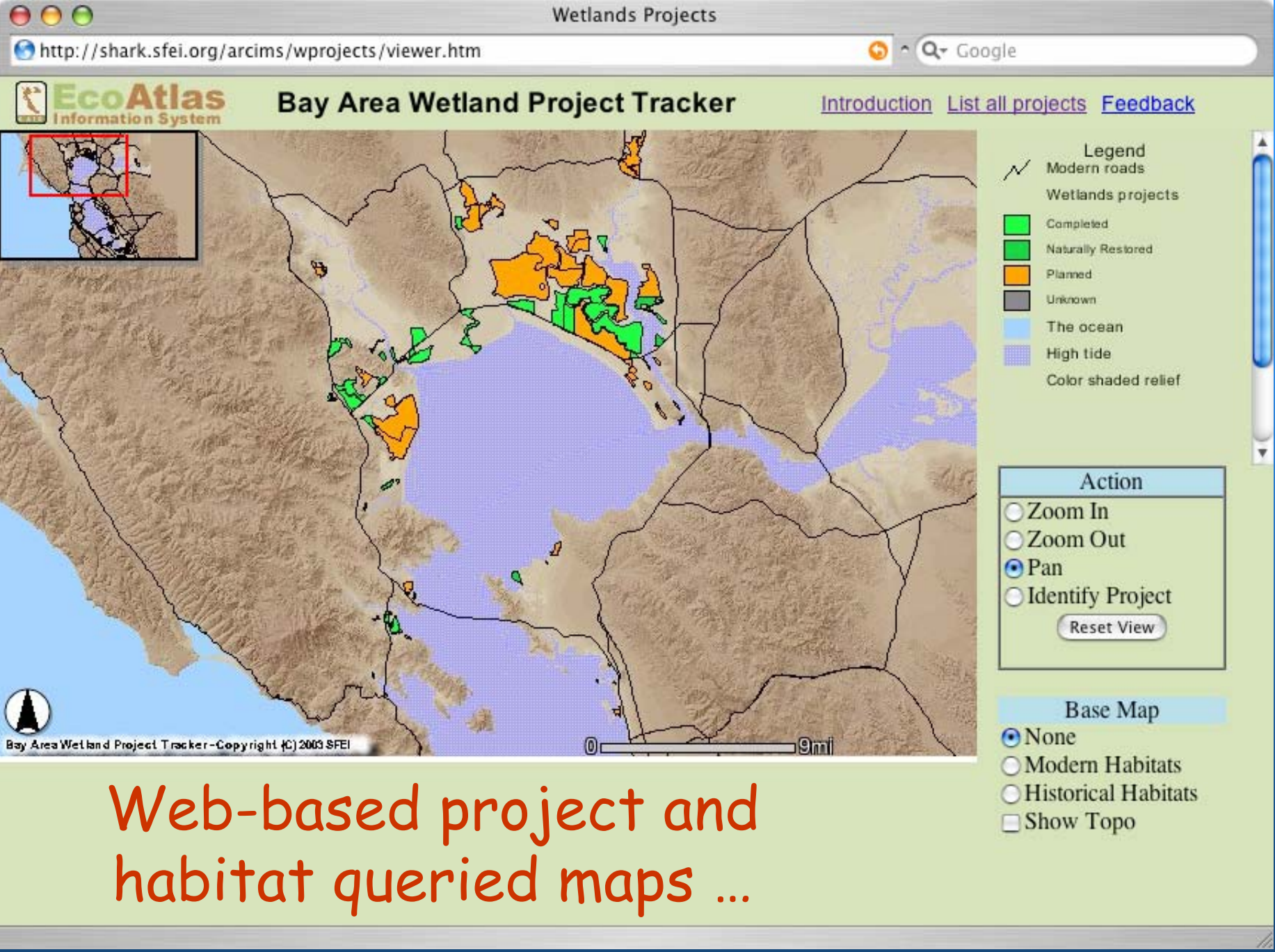
Standard Data Dictionaries and Transfer Forms for uploading and sharing data …

among regional habitat information systems (S. Coast, C. Coast, Bay Area, N. Coast) …

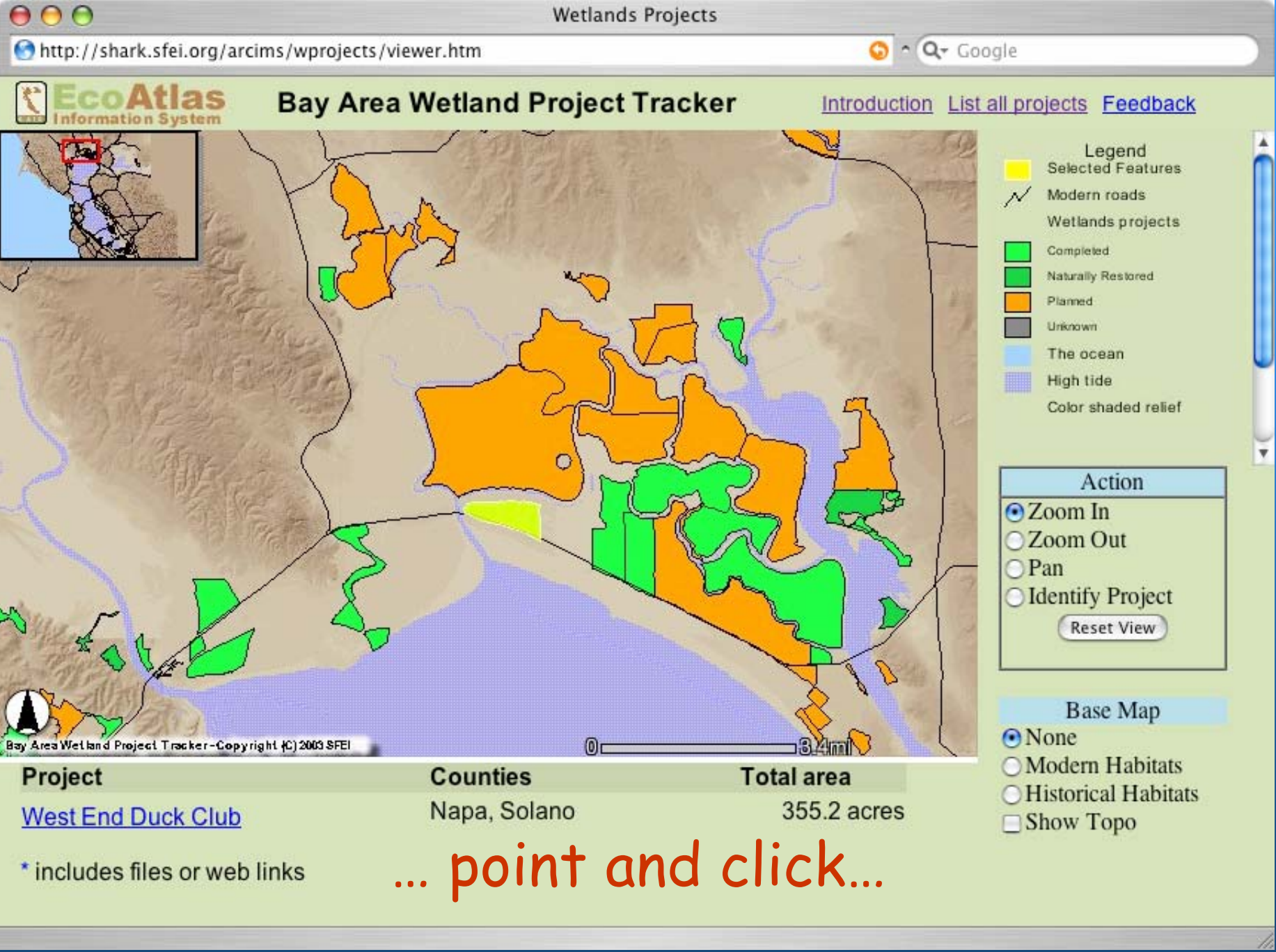
linking wetland and riparian habitat inventories (NWI, RHJV, Cal Veg) …

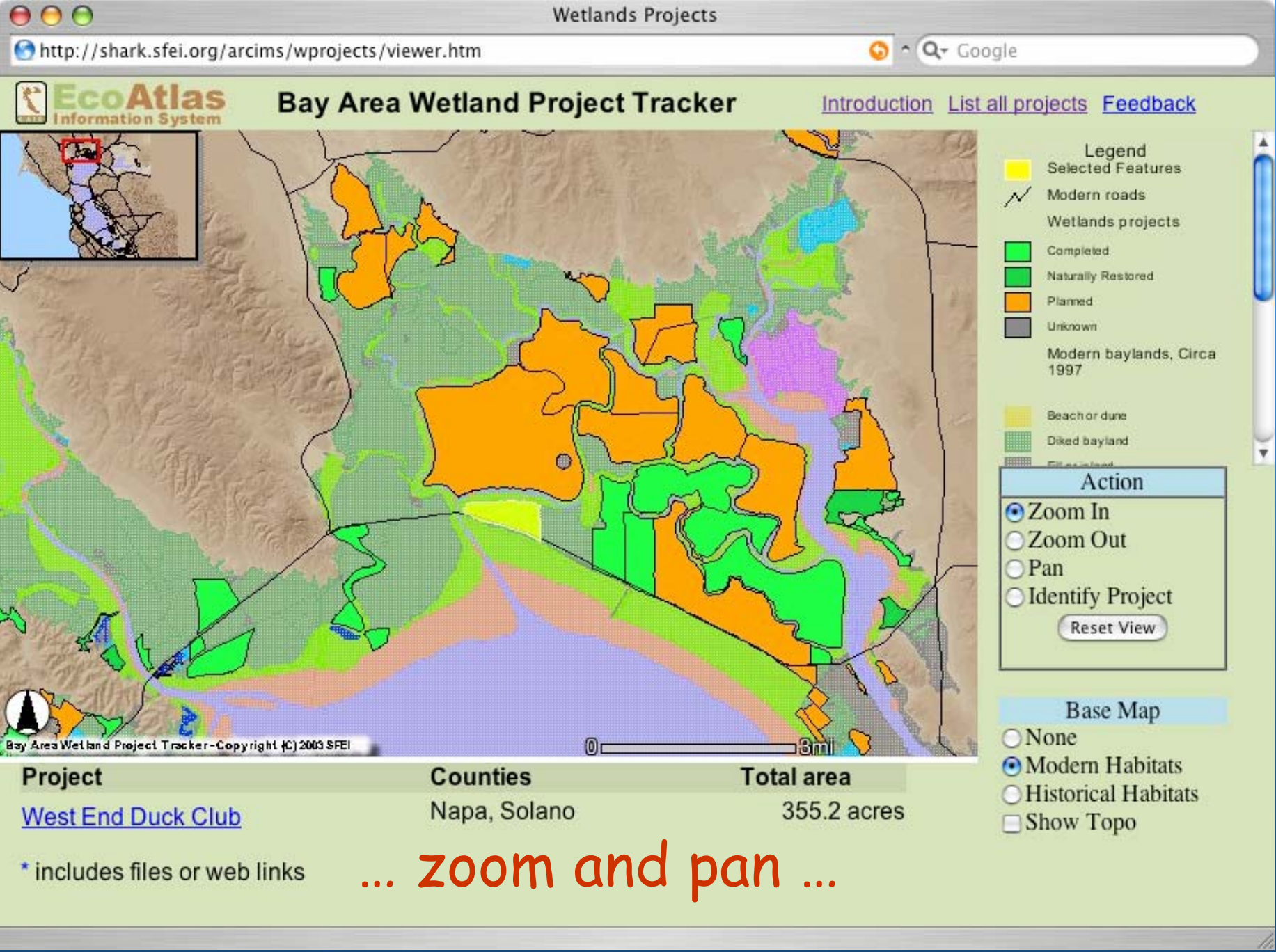
To rapid assessment (CRAM) …

for tracking ambient and project condition in watersheds, regions, and statewide.



Web-based project and habitat queried maps …


Wetlands Projects
http://shark.sfei.org/arcims/wprojects/viewer.htm
Google
EcoAtlas
Information System
Bay Area Wetland Project Tracker
Introduction
List all projects
Feedback
Legend
Selected Features
Modern roads
Wetlands projects
Completed
Naturally Restored
Planned
Unknown
The ocean
High tide
Color shaded relief
Action
Zoom In
Zoom Out
Pan
Identify Project
Reset View
Base Map
None
Modern Habitats
Historical Habitats
Show Topo
Bay Area Wetland Project Tracker - Copyright (C) 2003 SFEI
0
8.4mi
Project
Counties
Total area
West End Duck Club
Napa, Solano
355.2 acres
* includes files or web links
... point and click...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Selected Features
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Completed
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Planned
Unknown
Modern baylands, Circa 1997
Beach or dune
Diked bayland
Action
Zoom In
Zoom Out
Pan
Identify Project
Reset View
Base Map
None
Modern Habitats
Historical Habitats
Show Topo
Bay Area Wetland Project Tracker - Copyright (C) 2003 SFEI
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8mi
Project
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Total area
West End Duck Club
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355.2 acres
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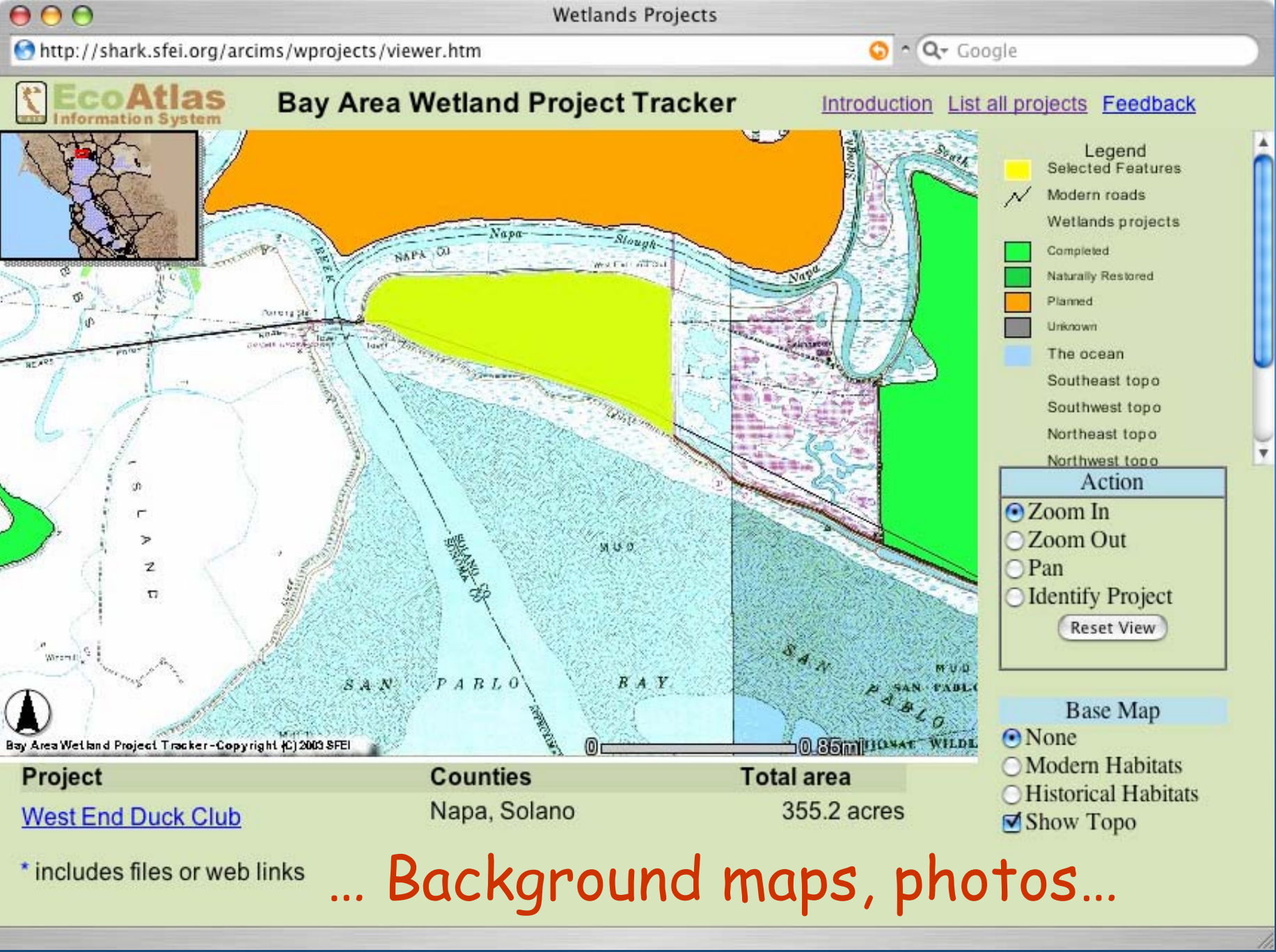
... zoom and pan ...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Slough
SAN PABLO BAY
MUD
Bay Area Wetland Project Tracker -Copyright (C) 2003 SFEI
0
0.85mi
Legend
Selected Features
Modern roads
Wetlands projects
Completed
Naturally Restored
Planned
Unknown
The ocean
Southeast topo
Southwest topo
Northeast topo
Northwest topo
Action
Zoom In
Zoom Out
Pan
Identify Project
Reset View
Base Map
None
Modern Habitats
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Show Topo
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Total area
West End Duck Club
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355.2 acres
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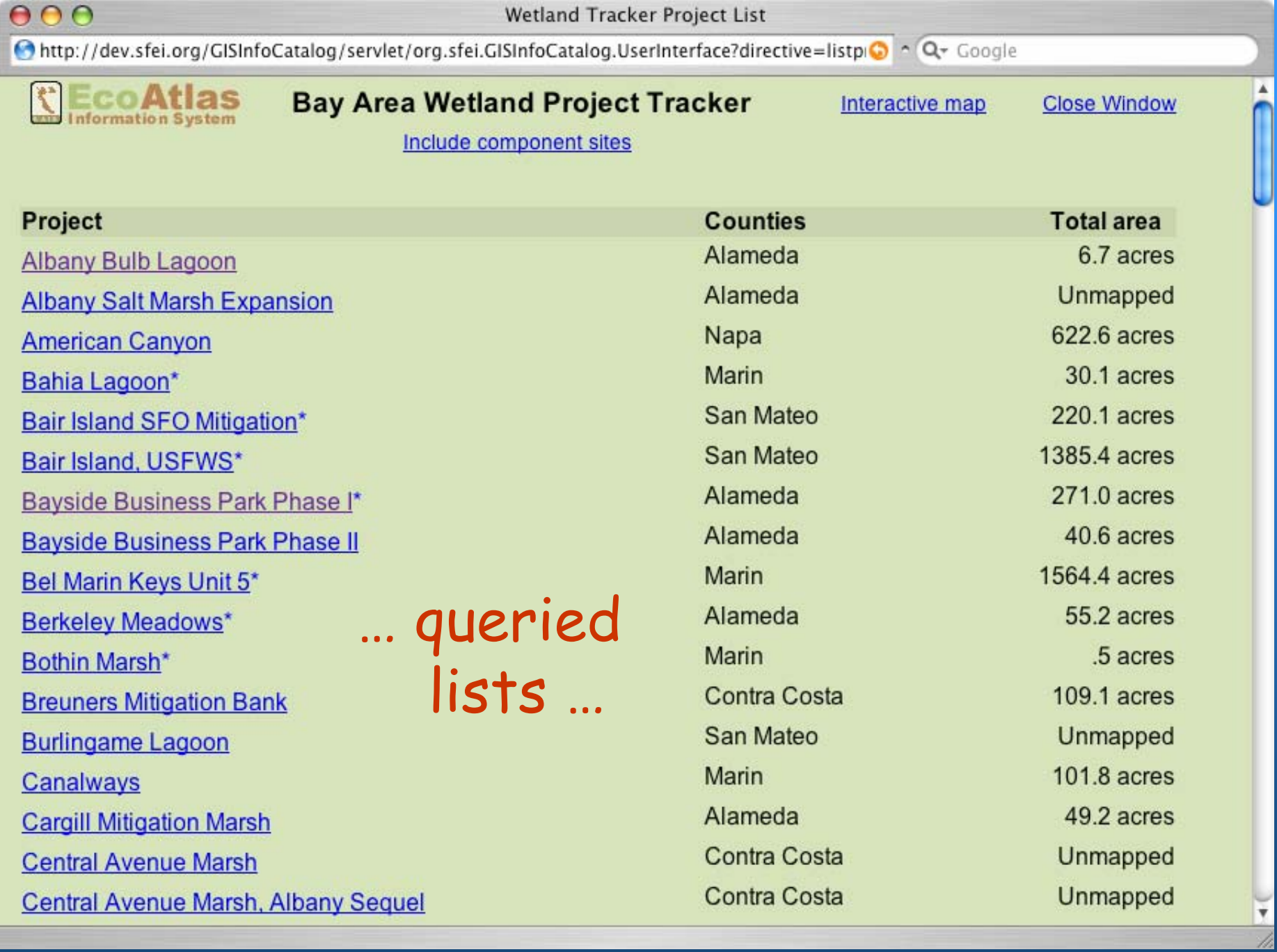
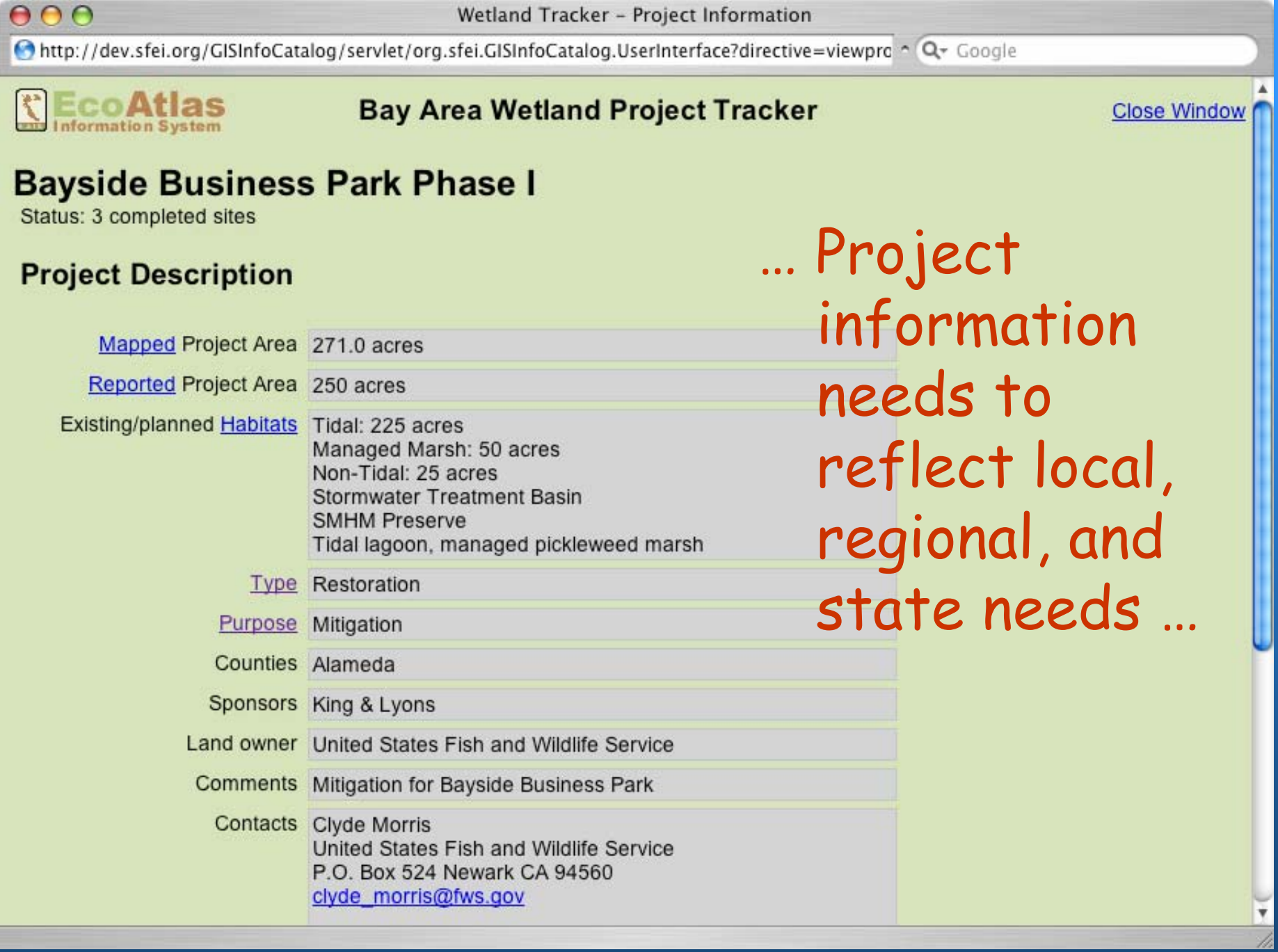
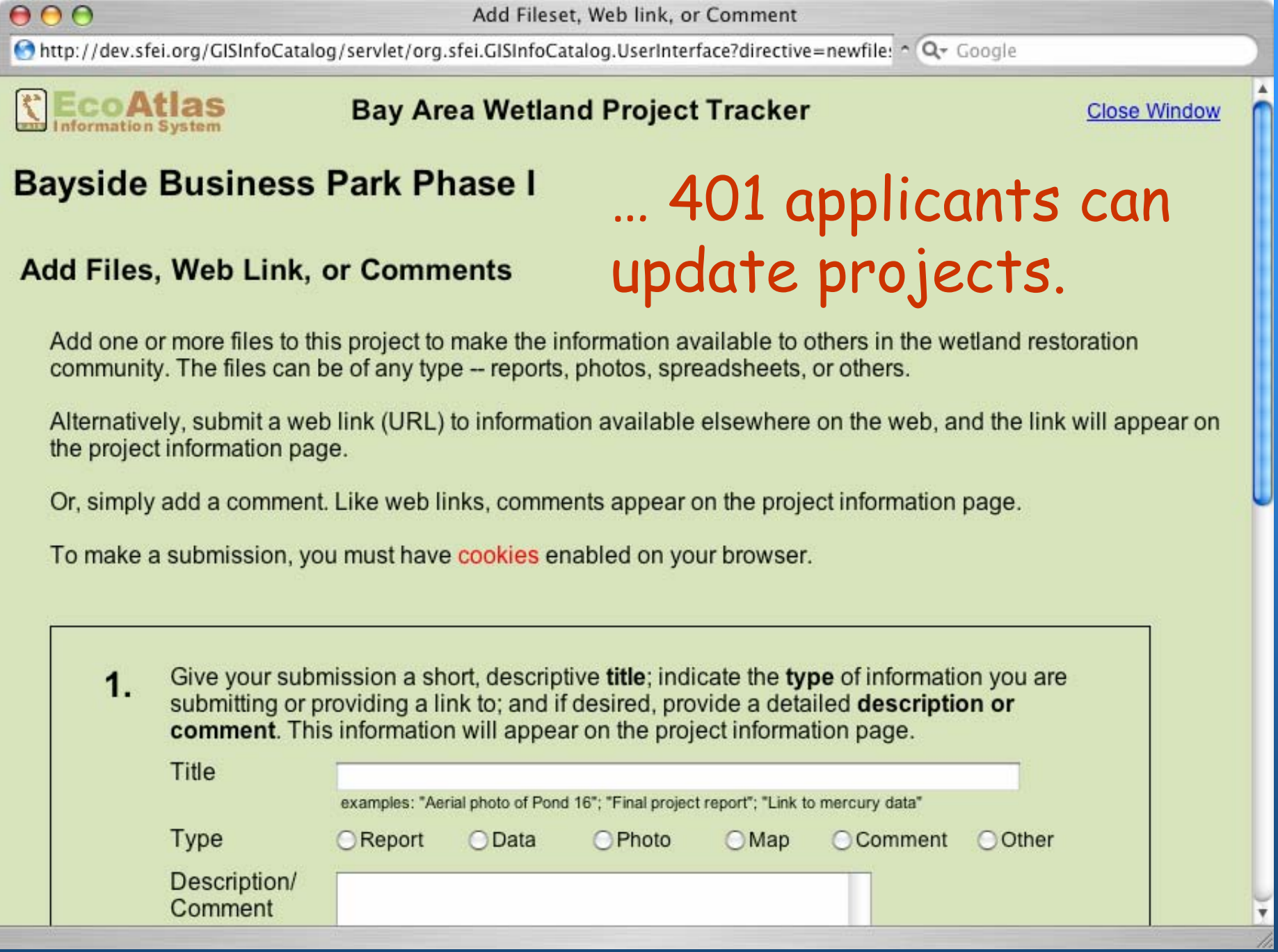
... Background maps, photos...


Wetland Tracker Project List
http://dev.sfei.org/GISInfoCatalog/servlet/org.sfei.GISInfoCatalog.UserInterface?directive=listp
Google
EcoAtlas
Information System
Bay Area Wetland Project Tracker
Interactive map
Close Window
Include component sites
Project
Counties
Total area
Albany Bulb Lagoon
Alameda
6.7 acres
Albany Salt Marsh Expansion
Alameda
Unmapped
American Canyon
Napa
622.6 acres
Bahia Lagoon*
Marin
30.1 acres
Bair Island SFO Mitigation*
San Mateo
220.1 acres
Bair Island, USFWS*
San Mateo
1385.4 acres
Bayside Business Park Phase I*
Alameda
271.0 acres
Bayside Business Park Phase II
Alameda
40.6 acres
Bel Marin Keys Unit 5*
Marin
1564.4 acres
Berkeley Meadows*
Alameda
55.2 acres
Bothin Marsh*
Marin
.5 acres
Breuners Mitigation Bank
Contra Costa
109.1 acres
Burlingame Lagoon
San Mateo
Unmapped
Canalways
Marin
101.8 acres
Cargill Mitigation Marsh
Alameda
49.2 acres
Central Avenue Marsh
Contra Costa
Unmapped
Central Avenue Marsh, Albany Sequel
Contra Costa
Unmapped
... queried lists ...



… Project information needs to reflect local, regional, and state needs …

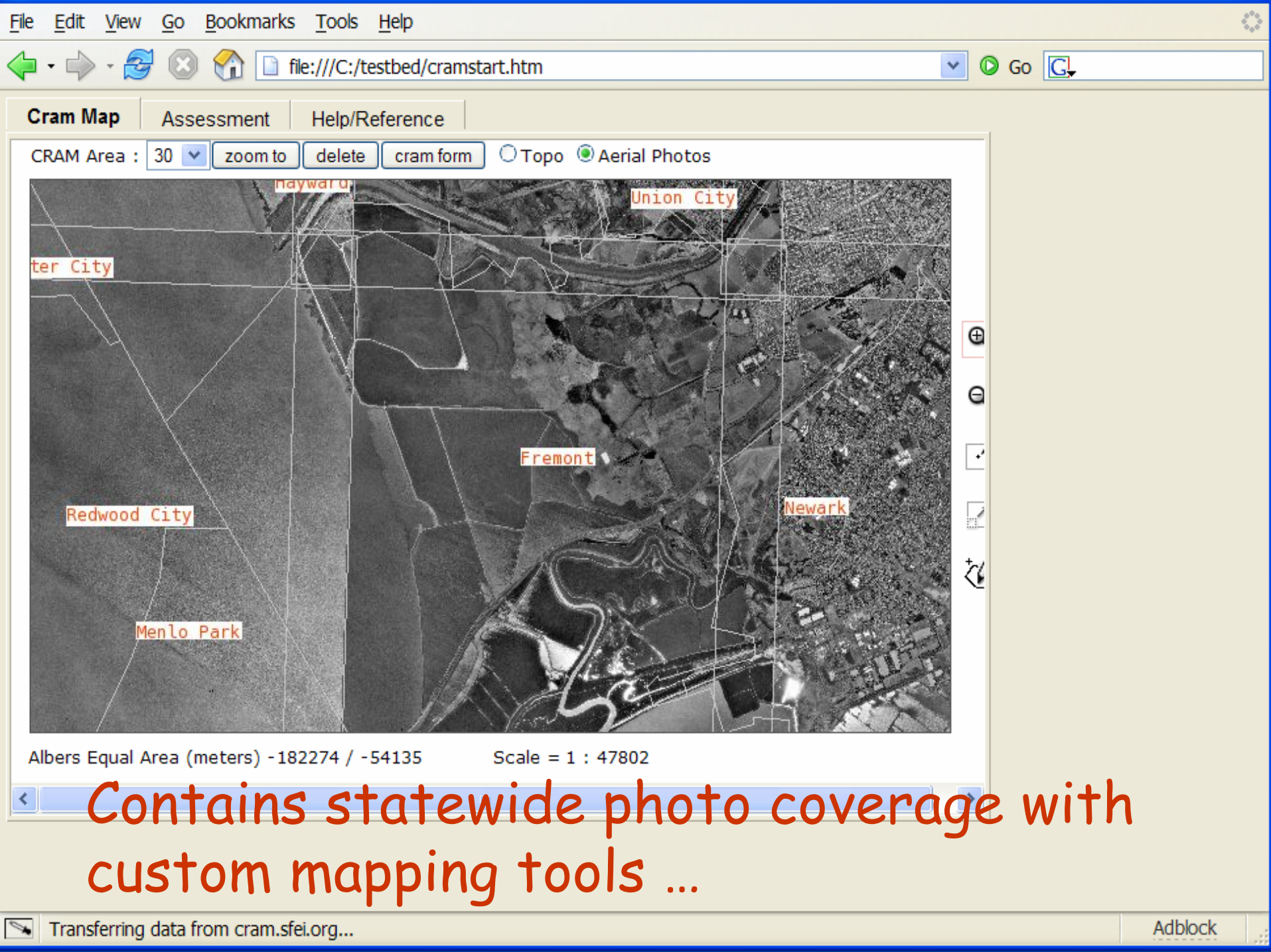

Add Fileset, Web link, or Comment
http://dev.sfei.org/GISInfoCatalog/servlet/org.sfei.GISInfoCatalog.UserInterface?directive=newfile
Google
EcoAtlas
Information System
Bay Area Wetland Project Tracker
Close Window
Bayside Business Park Phase I
... 401 applicants can update projects.
Add Files, Web Link, or Comments
Add one or more files to this project to make the information available to others in the wetland restoration community. The files can be of any type -- reports, photos, spreadsheets, or others.
Alternatively, submit a web link (URL) to information available elsewhere on the web, and the link will appear on the project information page.
Or, simply add a comment. Like web links, comments appear on the project information page.
To make a submission, you must have cookies enabled on your browser.
1.
Give your submission a short, descriptive title; indicate the type of information you are submitting or providing a link to; and if desired, provide a detailed description or comment. This information will appear on the project information page.
Title
examples: "Aerial photo of Pond 16"; "Final project report"; "Link to mercury data"
Type
Report
Data
Photo
Map
Comment
Other
Description/ Comment

What *Is* "CRAM IT"?

CRAM IT is …

Information Technology to increase ease and efficiency of CRAM

Tablet and web-based CRAM application with link to WDP wetland information system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file:///C:/testbed/cramstart.htm
Go
Cram Map
Assessment
Help/Reference
CRAM Area : 30
zoom to
delete
cram form
Topo
Aerial Photos
Union City
ter City
Fremont
Redwood City
Newark
Menlo Park
Albers Equal Area (meters) -182274 / -54135
Scale = 1 : 47802
Contains statewide photo coverage with custom mapping tools …
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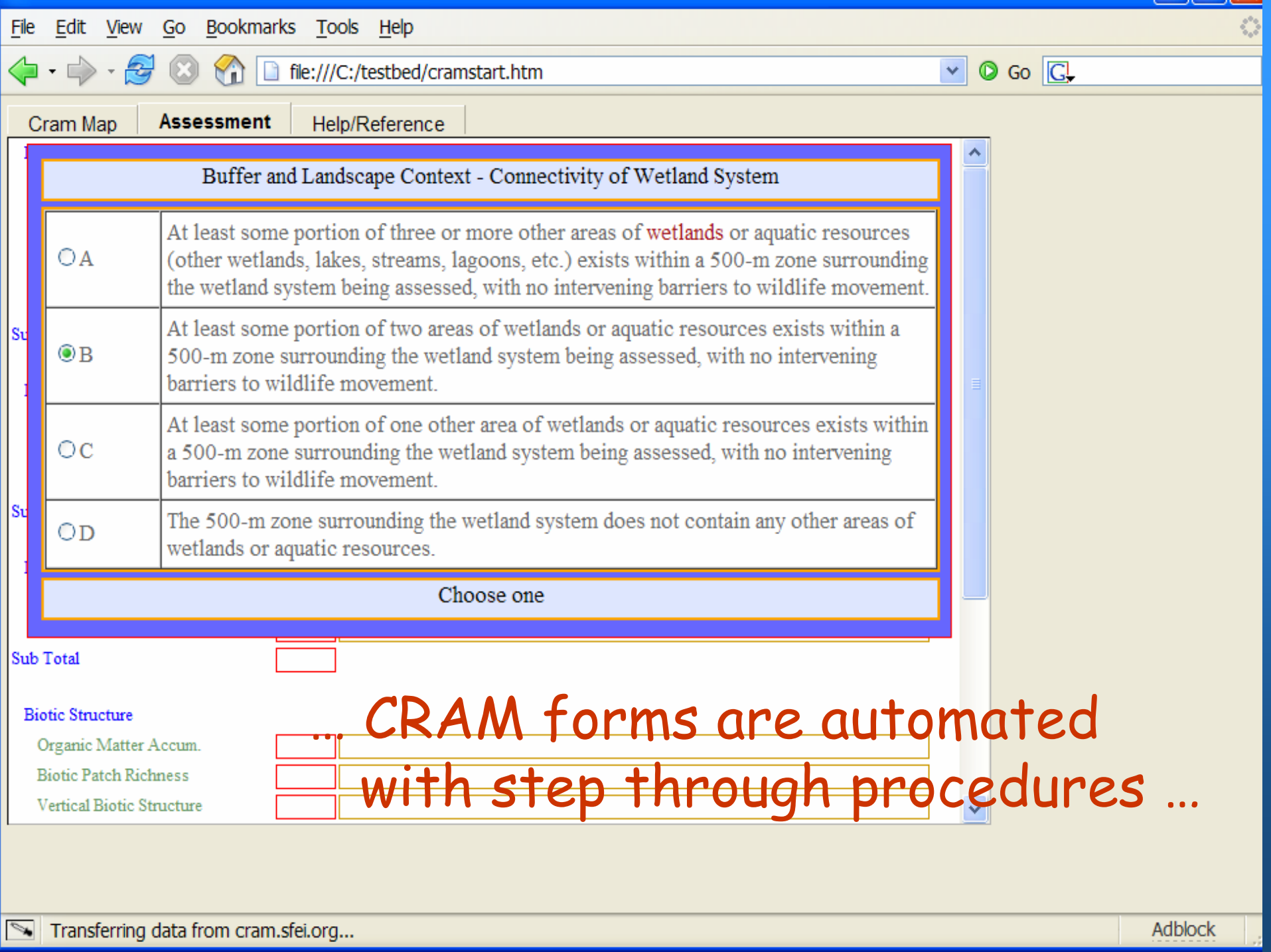
File Edit View Go Bookmarks Tools Help
file:///C:/testbed/cramstart.htm
Go
Cram Map
Assessment
Help/Reference
Buffer and Landscape Context - Connectivity of Wetland System
A
At least some portion of three or more other areas of wetlands or aquatic resources (other wetlands, lakes, streams, lagoons, etc.) exists within a 500-m zone surrounding the wetland system being assessed, with no intervening barriers to wildlife movement.
B
At least some portion of two areas of wetlands or aquatic resources exists within a 500-m zone surrounding the wetland system being assessed, with no intervening barriers to wildlife movement.
C
At least some portion of one other area of wetlands or aquatic resources exists within a 500-m zone surrounding the wetland system being assessed, with no intervening barriers to wildlife movement.
D
The 500-m zone surrounding the wetland system does not contain any other areas of wetlands or aquatic resources.
Choose one
Sub Total
Biotic Structure
Organic Matter Accum.
Biotic Patch Richness
Vertical Biotic Structure
... CRAM forms are automated with step through procedures ...
Transferring data from cram.sfei.org...
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File Edit View Go Bookmarks Tools Help

file:///C:/testbed/cramstart.htm

Go

Cram Map | Assessment | **Help/Reference**

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Wetlands: Wetlands Home | Program Information | Projects | Reports, Posters & Presentations

WETLANDS SCIENCE PROGRAM

Through the Wetlands Science program, SFEI helps the regional client community of wetland interests reach consensus about the highest priority needs for scientific information about wetlands and define SFEI's roles in meeting those information needs.

Program Information
Overview, objectives and history of the Wetlands Science Program

Projects
Current Wetlands Science Program Projects

Reports, Posters & Presentations
Current list of Wetlands Science Program Reports, Transcripts and PowerPoint Presentations

Related information
Wetlands Regional Monitoring Program

WETLANDS SCIENCE PROGRAM INFORMATION

Program Manager:

Joshua N. Collins, Ph.D.

… with pull down menus to supporting manuals, photos, etc.

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Thank You
This wetland was constructed as a stock pond before WWII and is now regarded as a high-quality reference site.