BAY AREA BASE MAP OF AQUATIC HABITATS

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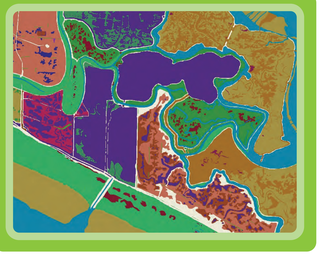
PHOTOGRAPH BY MICHA SALOMON

Introduction

The San Francisco Estuary Institute is creating a new base map of aquatic habitat for the nine counties of the Bay Area as part of the Wetlands Regional Monitoring Program (WRMP). The information is captured through a combination of methodologies including: aerial photo interpretation, field work and landscape modeling. The mapping resolution exceeds existing standards and has undergone extensive internal quality control to meet regional and local needs. The Bay Area Base Map of aquatic habitats has two immediate purposes: to foster the development of protocols for statewide mapping of the extent of deepwater, wetland, and riparian habitats and may also serve as the Bay Area regional base map for displaying spatial data. This Base Map must meet the needs of local agencies for detail and accuracy while complying with federal and state mapping standards.



Project Extent

The Base Map extent covers the boundary of the SF Bay Regional Water Quality Control Board which includes portions of the 9 Bay Area counties and 106 USGS 7.5 minute Topographic Quadrangles which is roughly 2.9 million acres.

Project Partners

CALPIA
Geographical Information Center
California State University, Chico

WETLANDS SCIENCE PROGRAM
WETLAND REGIONAL MONITORING PROGRAM AND GEOGRAPHIC INFORMATION SYSTEM (GIS)

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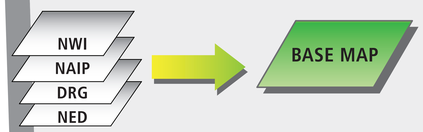
Mapping Methodology

MAPPING STANDARDS

SFEI has developed rigorous mapping standards that can be applied statewide and have been vetted by the Project Science Advisory Group, NWI, and project partners. The Standards address data requirements, scale, minimum mapping unit (MMU), classification, and quality assurance and quality control (QAQC). The standards also outline an objective procedure for wetland delineation. For more detailed information on the mapping standards please see: http://wrmp.org/protocols.html#protocols

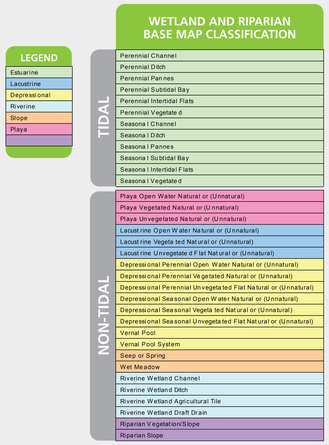


DATA

National Agricultural Imagery Program (NAIP) aerial photograph mosaics are used as the base imagery to demonstrate the viability of the possibility for statewide mapping methodology. California 2008 NAIP imagery has a 1 meter pixel resolution, and is available to the public free of charge.

Other Ancillary data include:

- National Wetland Inventory (NWI) – USFWS
- National Hydrographic Dataset (NHD) – USGS
- National Elevation Dataset (NED) – USGS
- Vegetation – CADFG and USFS
- Existing Bay Area Wetland Inventory – SFEI



CLASSIFICATION

The classification system used in the Base Map has been adopted from the California Rapid Assessment Method for Wetlands (CRAM) protocols. Using this State-wide typology provides a consistent dataset for California and a sample frame for CRAM.

SCALE AND MINIMUM MAPPING UNIT (MMU)

- Tidal Habitat
  - 1:2,500 scale
  - Polygons 50 m² (0.05 ha) MMU
  - Linework 50 m MMU
- Non-tidal Habitat
  - 1:5,000 scale
  - Polygons 100 m² (0.1 ha) MMU
  - Linework 50 m MMU*

**50 m for channels. 25 m for all ditches, agricultural tiles and channels connecting to a lake, reservoir, pond, well-head, or spring*

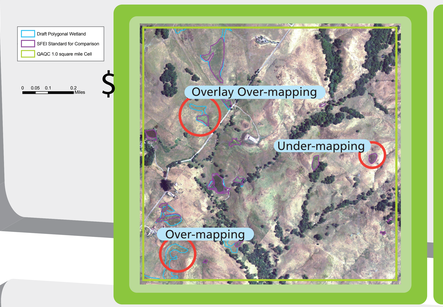
Quality Assurance and Quality Control (QAQC)

SFEI receives draft mapping data for linear and polygonal features from Prison Industries Authority (PIA) and California State University, Chico Geographic Information Center (GIC), respectively. A quantitative assessment of mapping quality is performed in randomly selected 1.0 square miles sample plots within the USGS quadrangle. These cells represent approximately 10% of the area of a 7.5 minute USGS Topographic Quadrangle. A measure of difference between the draft maps and SFEI mapping (SFEI mapping is considered the standard for comparison) is calculated and recorded. Draft maps with an error rate of < 15% for each of the QAQC error measurements are accepted and become final.

Feature Articles	Associated QAQC Error Measurements
Linear (Stream Network)	Alignment Over-mapping Under-mapping
Polygonal	Overlay a. Overlay Alignment b. Overlay Over-mapping c. Overlay Under-mapping Over-mapping Under-mapping Coding

QAQC ERROR MEASUREMENTS

1. Alignment errors occur when linework is more than 7.5 meters outside of SFEI's linework.
2. Over-mapping errors occur when the draft maps delineate features that should not have been mapped according to the SFEI delineation.
3. Under-mapping errors occur when the draft maps do not delineate a feature that should have been mapped according to the SFEI's delineation.
4. Coding errors occur when draft map classification does not match SFEI's classification.
5. Overlay error calculates the degree to which the draft map polygonal features align with SFEI's mapping. This QAQC measurement has three subgroups;
   - a. Overlay Alignment
   - b. Overlay Over-mapping
   - c. Overlay Under-mapping



PHOTOGRAPH BY KRISTEN CAYCE

QAQC Fieldwork

In situ field work is used to both calibrate and verify wetland identification and map delineations. Prior to mapping a region, project staff identify unique image signatures in the NAIP and locate them in the field. Plant samples, photos and notes are taken at the site to determine the absence/presence of an aquatic feature, its aquatic characteristics and its associated classification. Similar methodology is conducted after in-house QAQC is complete to validate mapping.

Base Map Progress

As of September of 2009 84% of linework and 79% polygonal wetlands are in draft or completed phases.

For more information on WRMP and the Base Map please visit: http://www.wrmp.org/prop50.html