Tracking Extent and Distribution of Wetlands and Streams in CA

ERIC STEIN

S. CA COASTAL WATER RESEARCH PROJECT

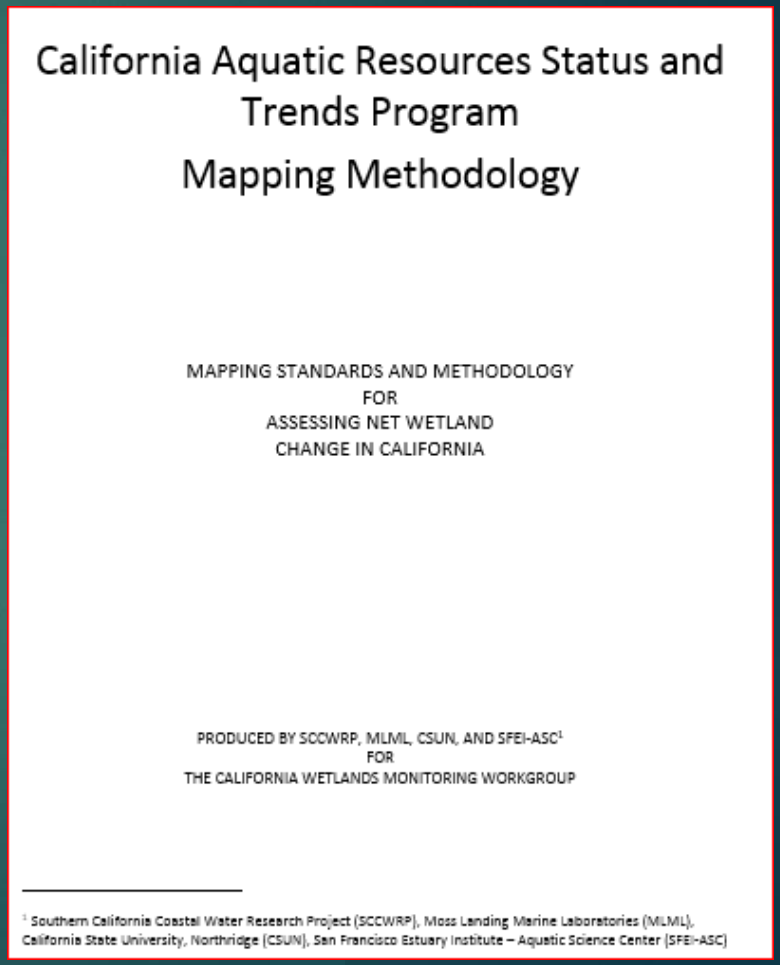
Funded by USEPA

Long Term Goals

- Provide scientifically defensible estimate of statewide extent and distribution of wetlands
- Track changes in wetland extent and distribution over time
  - Relate changes to various management programs/efforts
- Develop highest possible quality map for as much of the state as possible
- *Provide sample frame for future condition assessment*
- Make data/information readily available via web-based services

Phase 2 Effort

- Standard Operating Procedures
  - Classification
  - Mapping protocols
  - Change assessment rules
- Data quality objectives
- Statewide sample draw
- First phase implementation
  - Demonstration using ≈ 200 plots



California Aquatic Resources Status and Trends Program

Mapping Methodology

MAPPING STANDARDS AND METHODOLOGY
FOR
ASSESSING NET WETLAND
CHANGE IN CALIFORNIA

PRODUCED BY SCCWRP, MLML, CSUN, AND SFEI-ASC[1]
FOR
THE CALIFORNIA WETLANDS MONITORING WORKGROUP

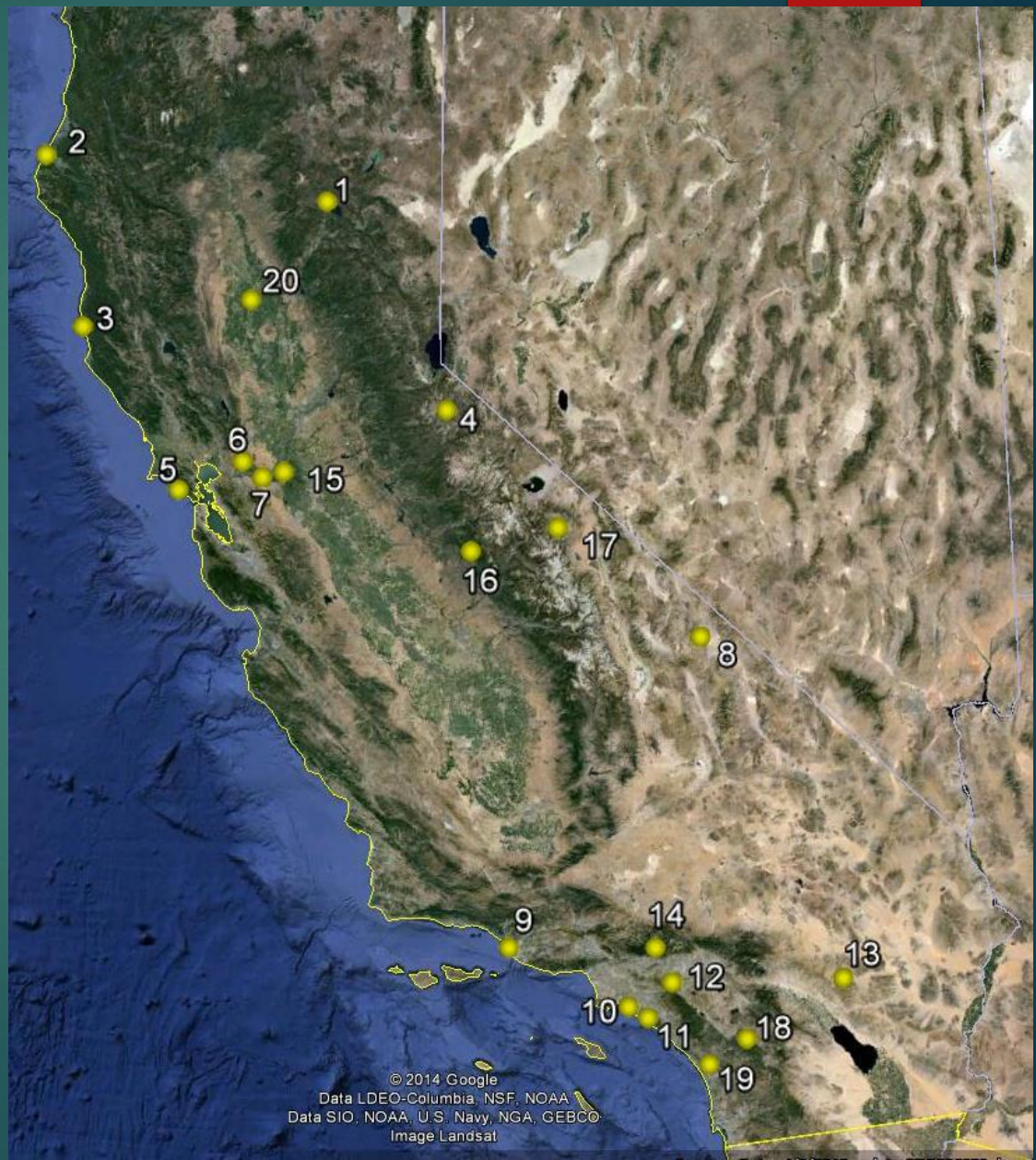
[1] Southern California Coastal Water Research Project (SCCWRP), Moss Landing Marine Laboratories (MLML), California State University, Northridge (CSUN), San Francisco Estuary Institute – Aquatic Science Center (SFEI-ASC)

Recent Progress

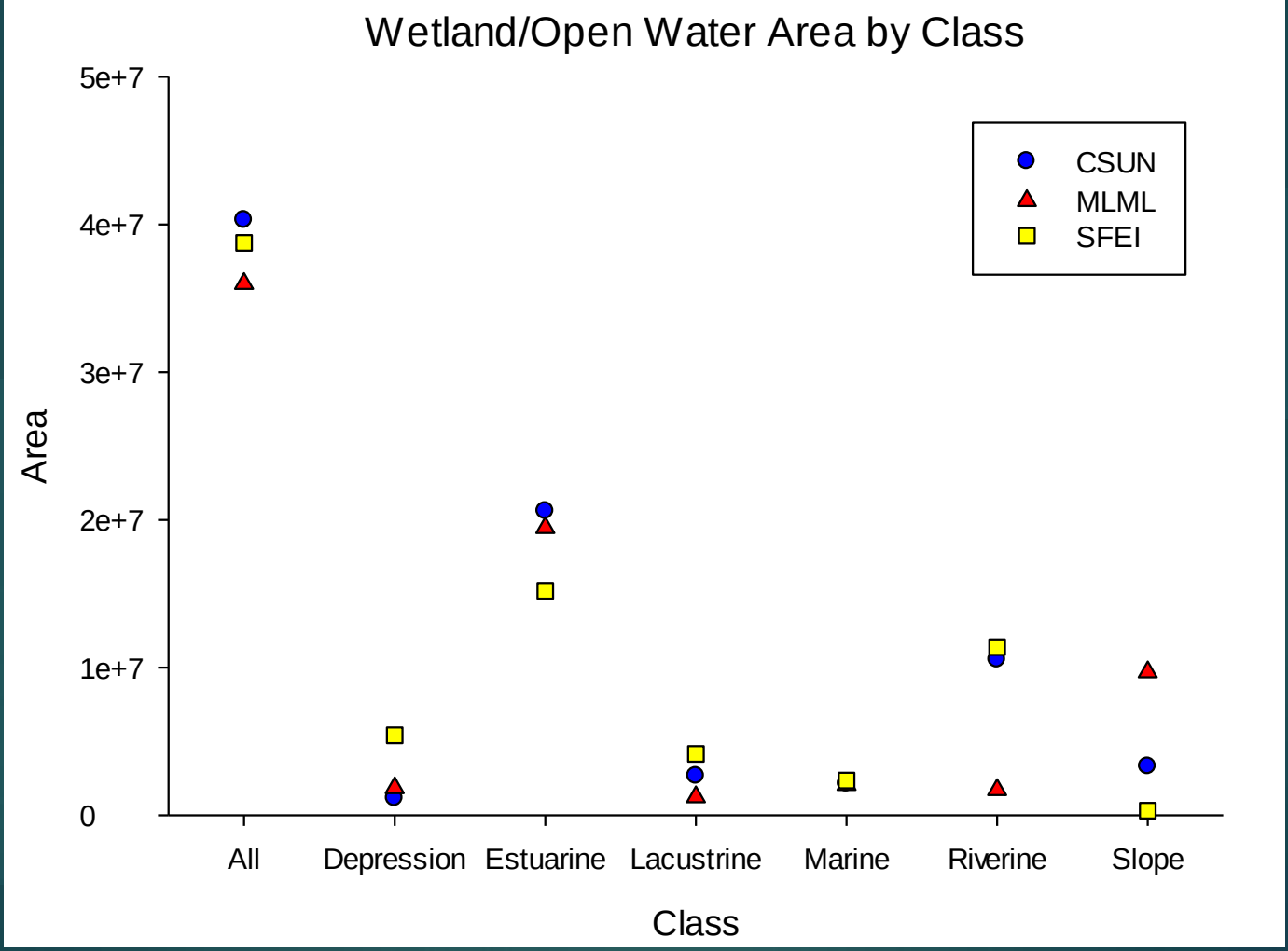
- Completed intermapper variability exercise
- Updated SOP
  - Reduce ambiguity
  - Added examples and additional guidance
  - Revisit “required” level of classification
- Developed data quality objectives

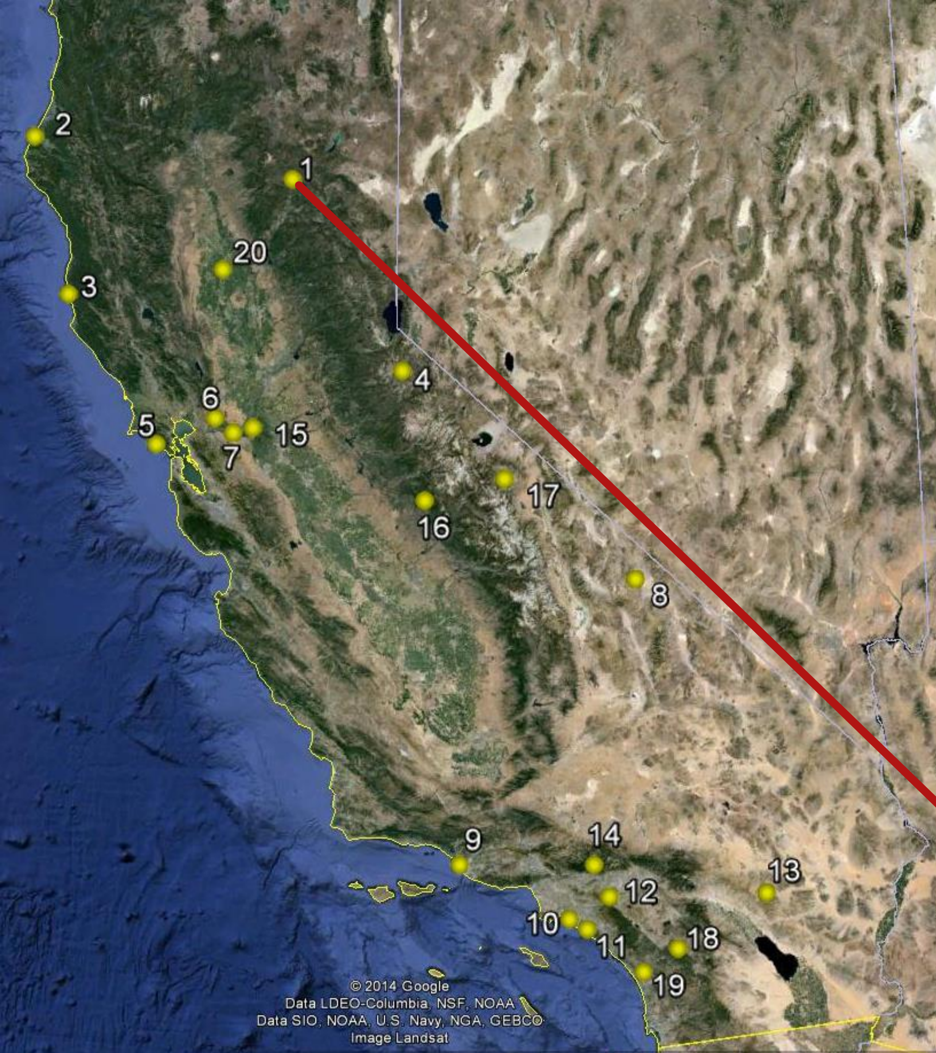
Intermapper Variability

- 20 plots
  - Mapped by 3 teams
- Broad geographic coverage
- All wetland types represented
- Representative of different settings
- Focus on more challenging situations
  - Transitional zones
  - Ambiguous areas
  - Managed areas



Overall Results

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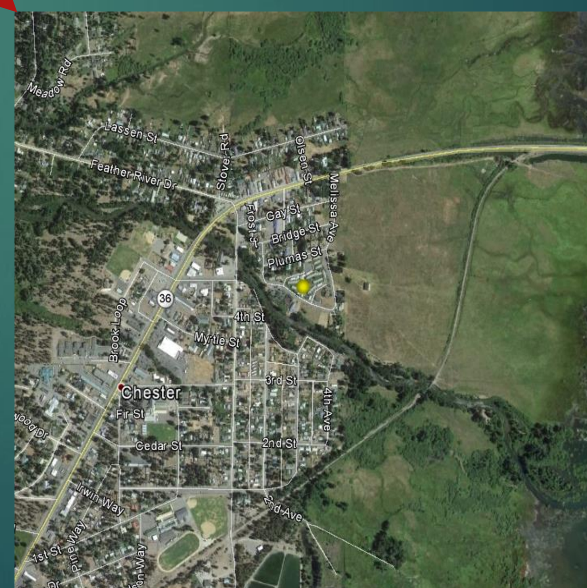
Data LDEO-Columbia, NSF, NOAA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat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Feather River Dr
Stover Rd
Olsen St
Melissa Ave
Gay St
Bridge St
Plumas St
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Brook Loop
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Chester
Fir St
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Cedar St
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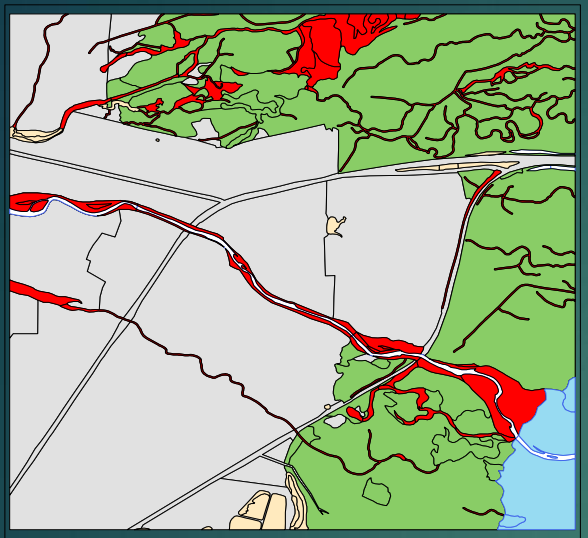
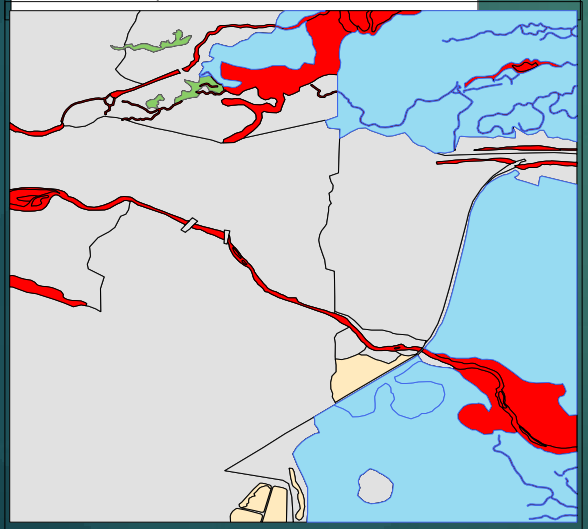
Twin Way
2nd Ave
1st St



CSUN

- Wetland Depression
- Wetland Estuarine
- Wetland Lacustrine
- Wetland Riverine
- Wetland Slope
- Open Water Marine
- Open Water Estuarine
- Open Water Lacustrine
- Open Water Riverine
- Upland



SFEI

- Wetland Depression
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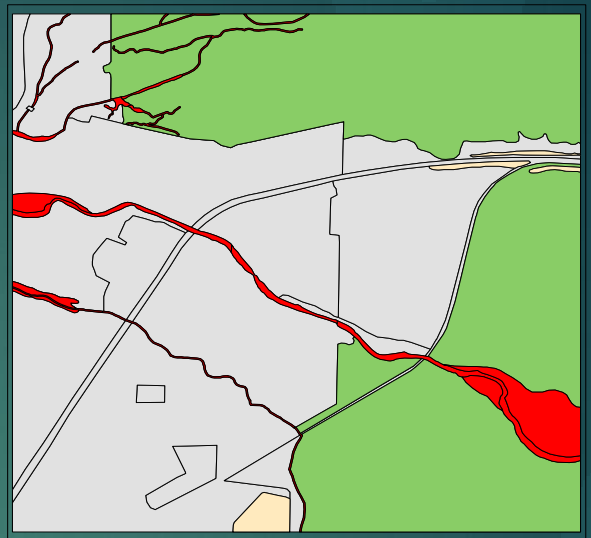

MLML

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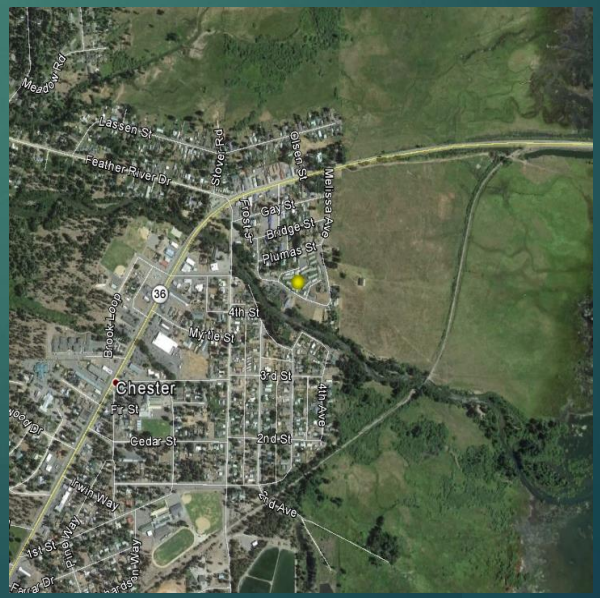

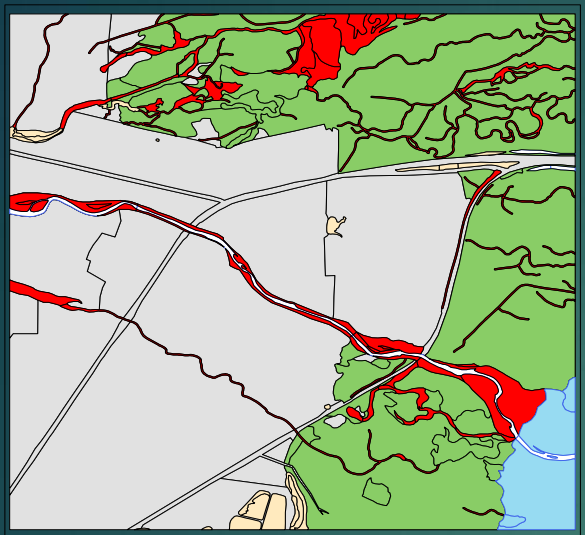
CSUN
Wetland Depression
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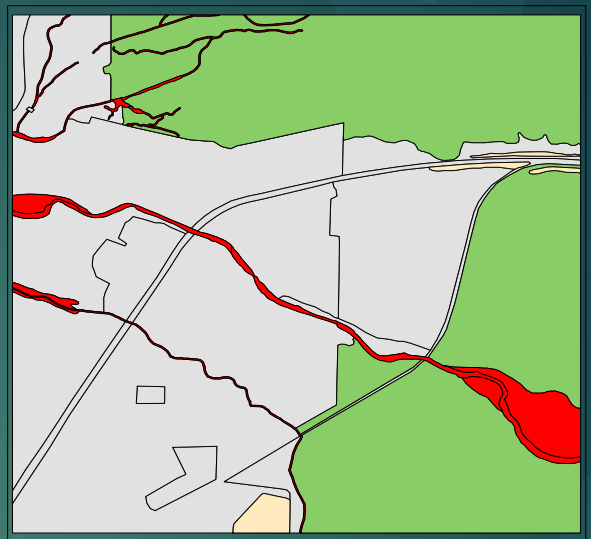
MLML
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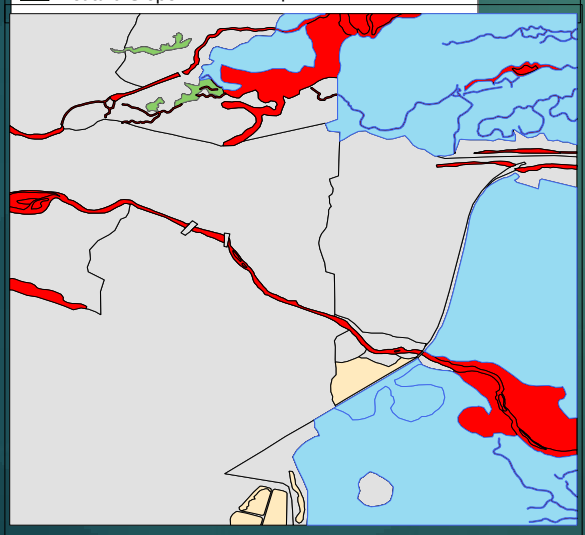
SFEI
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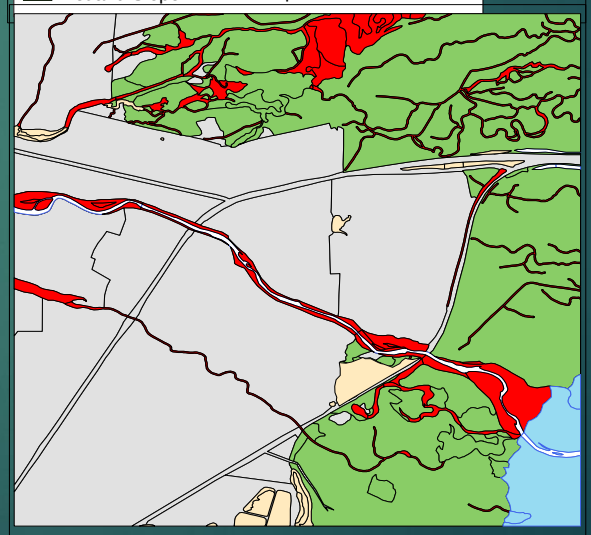

Consensus
Wetland Depression
Wetland Estuarine
Wetland Lacustrine
Wetland Riverine
Wetland Slope
Open Water Marine
Open Water Estuarine
Open Water Lacustrine
Open Water Riverine
Upland

Overall Accuracy

	Accuracy	
	Producers	Users
Overall	95.2	99.0
Depressional	91.4	90.4
Estuarine	77.0	100.0
Lacustrine	98.4	100.0
Slope	100.0	89.9
Riverine	82.2	88.8

Producer's Accuracy (error of omission) measures the percent of wetland features that are correctly mapped as wetlands

Users Accuracy (error of commission) measures the percent of polygons mapped as wetlands, that are actually wetlands

FGDC Standards:

- Overall Producers Accuracy: 98%
- Classification Producers Accuracy – 85%
- Users Accuracy: No standard

Proposed Data Quality Objectives

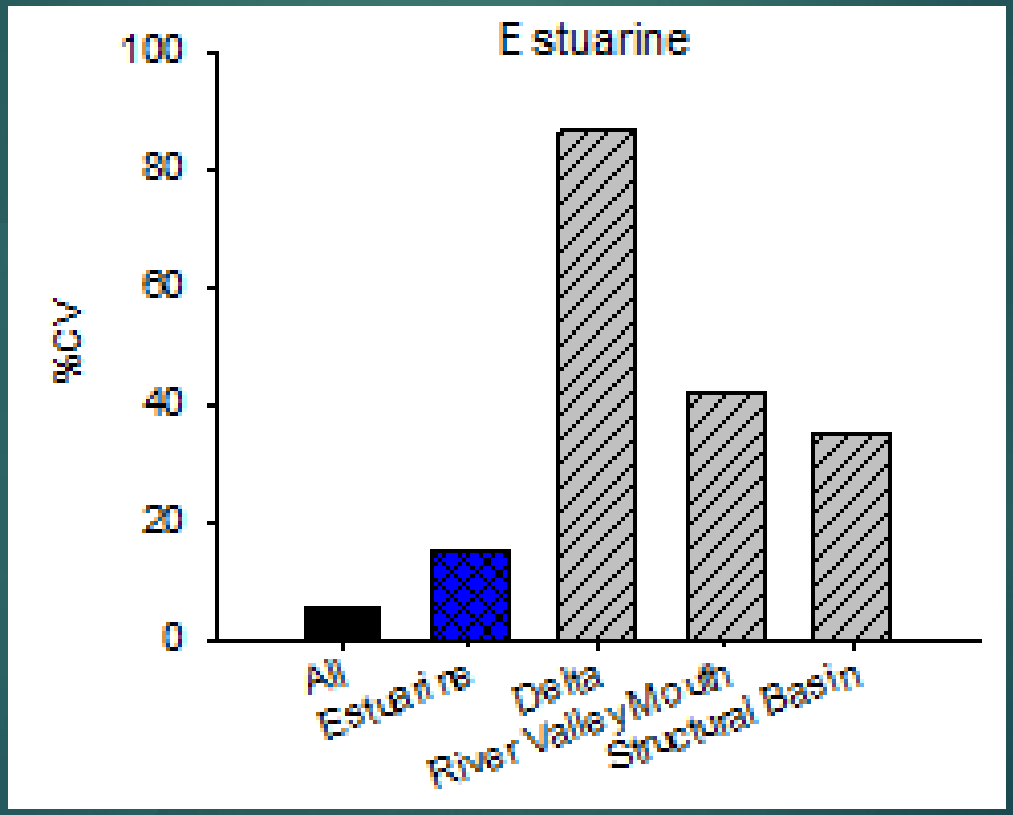
- **Overall wetland area: ±6%**
- **Overall stream length: ±15%**
- **Wetland class: ±20%**

Criterion	Quality Control Requirement	Objective
Representativeness	use GRTS draw without substitutions	±10%
Comparability	use of standard imagery, data sources and protocols	100%
Completeness	all area within all plots selected should be mapped	100%
Precision/Bias		
area	10% of plots verified by an independent mapper	±6%
classification		80%
Accuracy		
area	groundtruthing 5% of mapped plots	±6%
classification		80%

Classification

Class	*Type*	*Subtype*
Depression (D)	Floodplain (f)	Defined outlet (d) Undefined outlet (u)
	Non-floodplain (n)	Defined outlet (d) Undefined outlet (u)
Lacustrine (L)	Structural Basin (b) Topographic Plain (p)	
Slope (S)	Hillslopes (o) Fan (a) Break in slope (k) Topographic Plain (p)	
Riverine (R)	High-gradient (h)	Confined (f) Unconfined (i)
	Low-gradient (l)	Confined (f) Unconfined (i)
Estuarine (E)	Canyon Mouth (c) River Valley Mouth (r) Delta (d)	
	Structural Basin (b)	Embayment-Rocky Headland (r) Embayment-Bar Built (b) Dune Strand/Lagoon (l)

Error Increases Below Class



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What Should We Require?

A. Require classification to class level, all other levels are optional

B. Require classification to subtype level, but data quality objectives only apply to class level
   - Confidence levels not reported below class level

C. Invest additional time and resources to improve precision for deeper levels of classification
   - Would require additional funds

Anthropogenic influence and vegetation modifiers are required

Progress and Next Steps

- Completed intermapper variability exercise
- Updated SOP
  - Reduce ambiguity
  - Added examples and additional guidance
  - Determine “required” level of classification
- Developed data quality objectives
- *Preparing to initiate pilot application*