

Benthic Index of Biotic Integrity (B-IBI) for San Francisco Bay Area Creeks

Project Update

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Background

- Goal: Develop of a tool to assess status of aquatic life uses in Bay Area creeks
- Use:
 - To identify and prioritize creek reaches and associated watershed areas where protection or restoration is needed
- Users:
 - Stormwater Programs
 - Flood Control Agencies
 - Water Districts
 - Regional Water Boards
 - Local Watershed Groups
- Southern and Northern California IBIs have been developed
 - may be applicable to the Bay Area creeks
- BAMBI – IBI Work Plan developed in 2004

Initial IBI Work Plan

Tasks	Participants	Status
1. Acquire and Compile Existing Data	Stormwater Programs, SWAMP, Friends of Napa River, Sonoma Ecology Center, Contra Costa Volunteer Monitoring Program	Complete
2. Standardize and Import into Centralized Database	Stormwater Programs and SWAMP	All data except Napa and Sonoma
3. Develop Reference Conditions	Stormwater Programs, SWAMP, UC Berkeley?, USGS?	Work Plan in Development
4. Screen Metrics used in Northern and Southern California IBIs	Stormwater Programs, SWAMP, USGS?	To be completed

Decision Point After Comparison to No. and So. Cal IBIs

Task #1 – Acquire and Compile Existing Data

➤ Data from:

- Stormwater Programs
- SWAMP
- Friends of Napa River
- Sonoma Ecology Center

➤ Spring 2000-2005

➤ Total of 589 Data Points from 394 Sites

➤ Data Quality Criteria- must have used CSBP



Task #2 – Standardize Data and Enter into Database

- Most data in Excel spreadsheets
- Cal EDAS – Access-based database
- Standardization
 - CSBP pre-2003
 - 3 riffles @ 300 each (no composite)
 - 18 ft²
 - CSBP post-2003
 - 3 riffles @ 500 composite
 - 9 ft²
 - Monte Carlo Function in Cal EDAS
 - All data standardized to post-2003 (500 composite)
- To-do
 - Sonoma and Napa data
 - ~ 36 sites with missing site information



ECOLOGICAL DATA APPLICATION SYSTEM

CaIEDAS



Version 3.2.4

last Modified 11/10/04

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CaIEDAS v3 is a custom database application for use with Microsoft Access XP®. Microsoft, Windows, and Access are trademarks of the Microsoft Corporation.
This application is regularly being updated and is subject to change.

Select the metrics you would like to include

Available

Selected

- Cumulative EPT Taxa
- Cumulative Taxa
- EPT Index (%)
- EPT Taxa
- Number Amphipoda Individuals
- Number Baetidae Individuals
- Number CF + CG Individuals
- Number CF + CG Taxa
- Number Chironomidae Individuals
- Number Chironomidae Taxa
- Number Chironominae Taxa
- Number Coleoptera Taxa
- Number Collector Filterer Individuals
- Number Collector Filterer Taxa
- Number Collector Gatherer Individuals
- Number Collector Gatherer Taxa
- Number Corbicula Individuals
- Number Crustacea + Mollusca Individuals
- Number Crustacea Individuals
- Number Diptera Individuals
- Number Diptera Taxa
- Number Elmidae Individuals
- Number Elmidae Taxa
- Number Ephemere... Taxa

Navigation buttons: Right arrow, Double right arrow, Left arrow, Double left arrow

Selected metrics area (currently empty)

Navigation buttons: Up arrow, Down arrow


Description of Selected Metric:

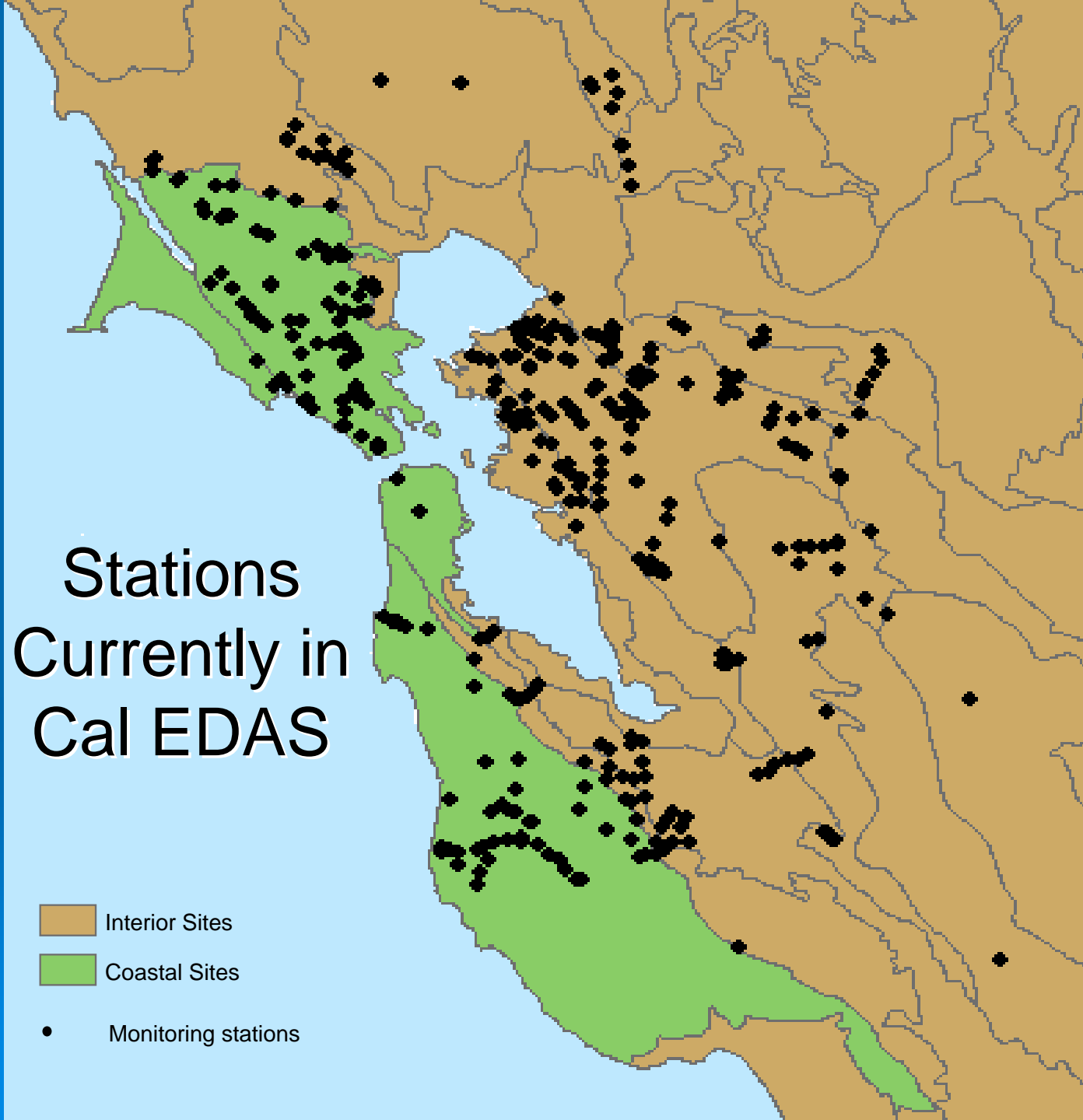
Cancel/Done < Back Next > Create Report

Stations Currently in Cal EDAS

 Interior Sites

 Coastal Sites

 Monitoring stations



Step #3 – Reference Condition Development

Northern & Southern California IBI's

- All sites screened using GIS (ATtILA)
 - Four spatial scales:
 1. Entire watershed upstream (watershed scale)
 2. 1 km upstream area (local scale)
 3. 100 m riparian zone on each side of all streams in watershed upstream
 4. 100 km riparian zone in 1 km upstream area

Northern/Southern Cal IBIs

- Sites then eliminated based on subjective land use thresholds at local and watershed scales
- Sites further screened based on local in-stream/riparian condition assessments:
 - Bank stability
 - Fines
 - Channel alteration
 - Total dissolved solids
 - Tot N
 - Tot P
- Pool of remaining sites divided into development and validation sets
- Work Plan in Development
 - Use PHAB Scores as first cut?
- Need Assistance !!!!
 - UC Berkeley Students?

Reference Conditions

GIS Layers Acquired

Data type	Specific Data Set	Retrieval Info
Land Cover	CDF Multi-source Land Cover Data (V.2)	SWRCB GIS website
	ABAG land use data	ABAG
Hydrography	NHD	SWRCB GIS website
Watersheds	Cal Water (v. 2.2.1)	SWRCB GIS website
	Creek and Watershed Data	Oakland Museum, Stormwater Programs
Bioregions	Bioregion Subsections	USDA
Elevation	USGS Elevation Data	SWRCB GIS website
Transportation	Roads	SWRCB GIS website
Population	Census(2000 Block Migrated)	UC Berkeley

Step #4 – Screen Metrics Used in N & S California IBIs

- Possible 77 metrics (Cal EDAS)
 - Test each metric for:
 1. Range needed for scoring
 2. Responsiveness to watershed and local scale disturbance variables
 3. Discrimination between reference and test sites
 4. Redundancy

- Proposal: Use Northern and Southern California IBIs as starting point
 - May be able to apply IBIs to Bay Area
 - Save lots of time and resources?
 - But will it work????

Step #4 – Screen Metrics Used in N & S California IBIs (cont.)

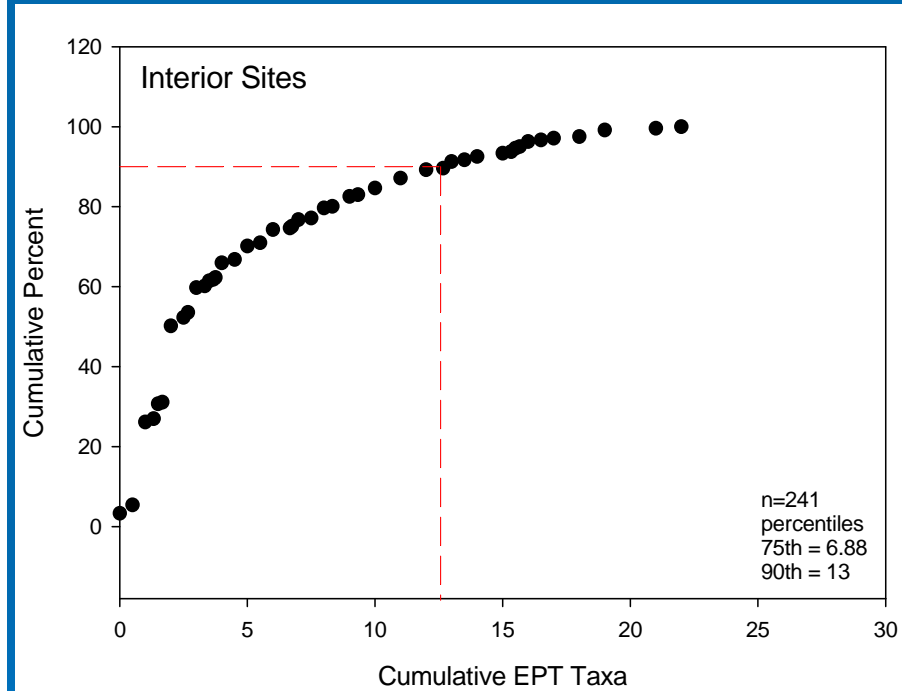
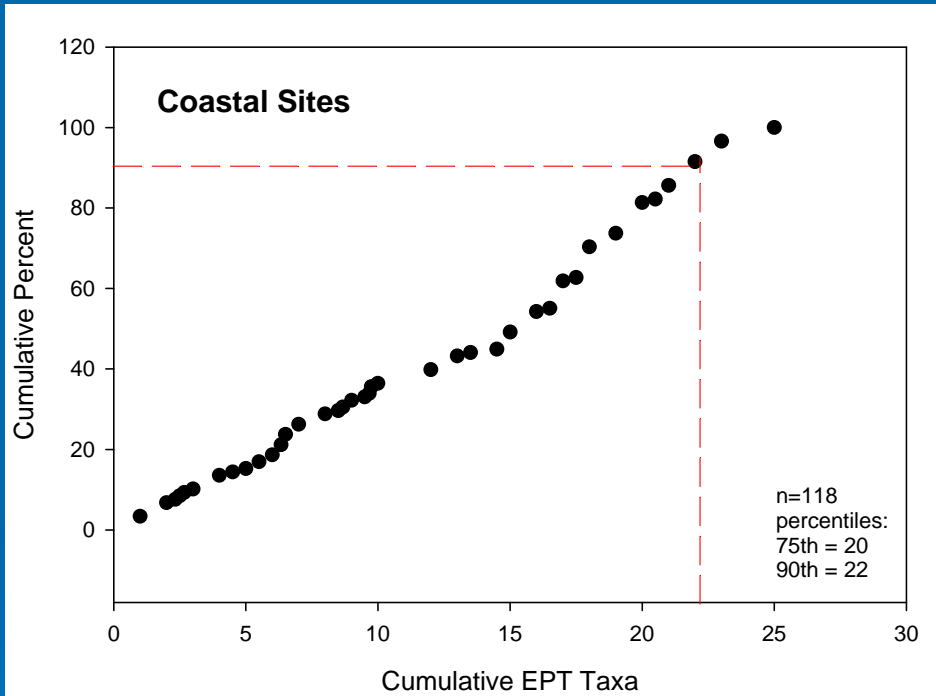
Northern (8)	Southern (7)
% Intolerant Individuals	% Intolerant Individuals
% Non-Gastropoda Individuals	% Collector Individuals
% Non-Insect Taxa	% Non-Insect Taxa
% Predator Individuals	Predator Richness
% Shredder Taxa	% Tolerant Taxa
EPT Richness	EPT Richness
Coleoptera Richness	Coleoptera Richness
Diptera Richness	

Step #4 – Screen Metrics Used in N & S California IBIs (cont.)

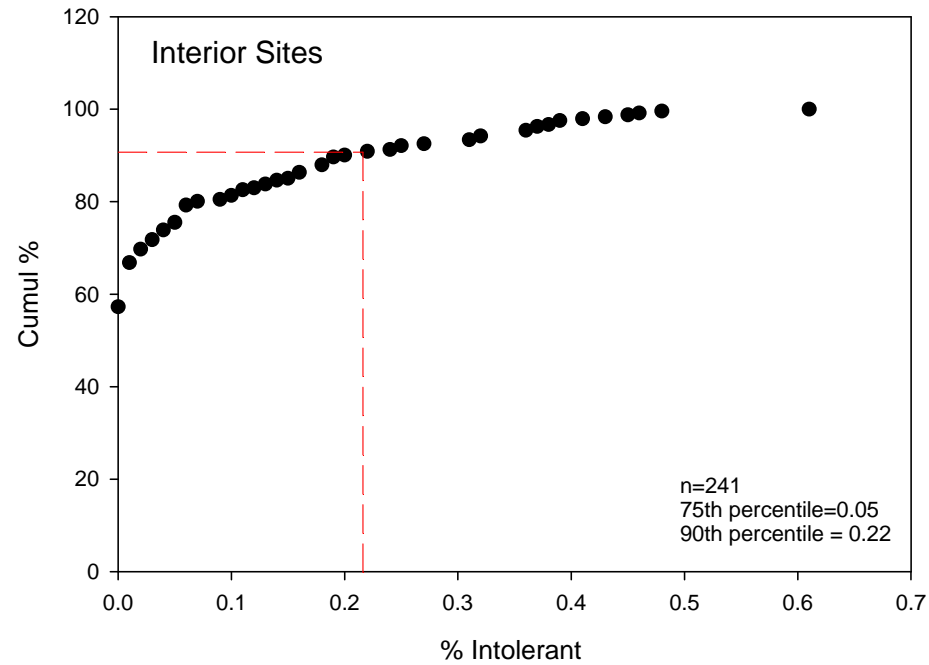
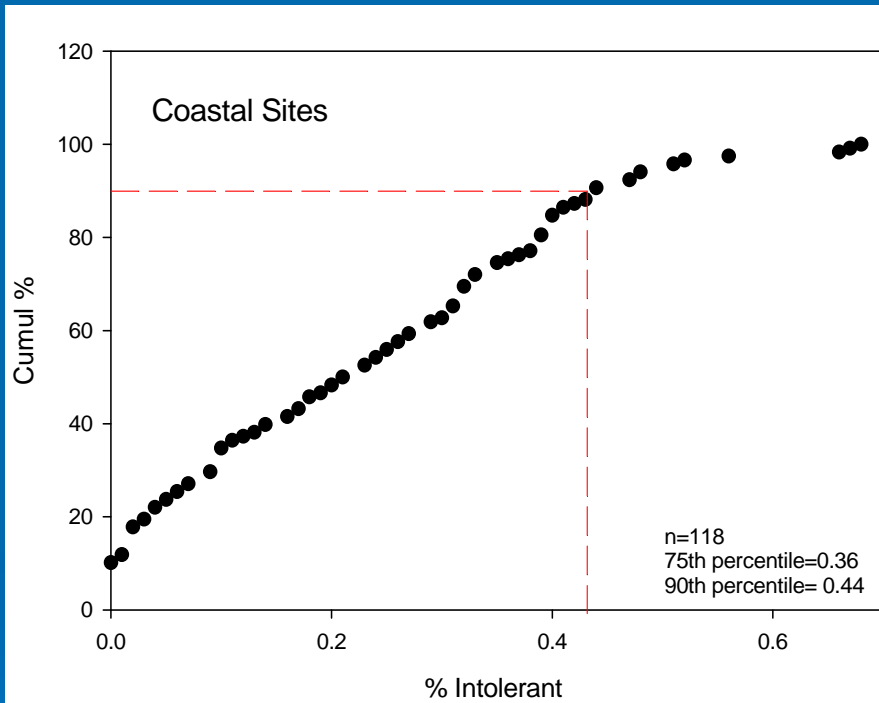
➤ Suggested Process:

- Use Bay Area data to test 11 (N & S) metrics for:
 - Discrimination between reference and test sites
 - Visual evaluation of box-whisker plots
 - Statistical evaluation of differences in populations
 - Range – Sufficient for scoring?
- May need to compare different ecoregions in the Bay Area to metrics
 - Preliminary observations appear to tell us that metric scores for Marin/Coastal SM appear to be different than other areas in the Bay Area

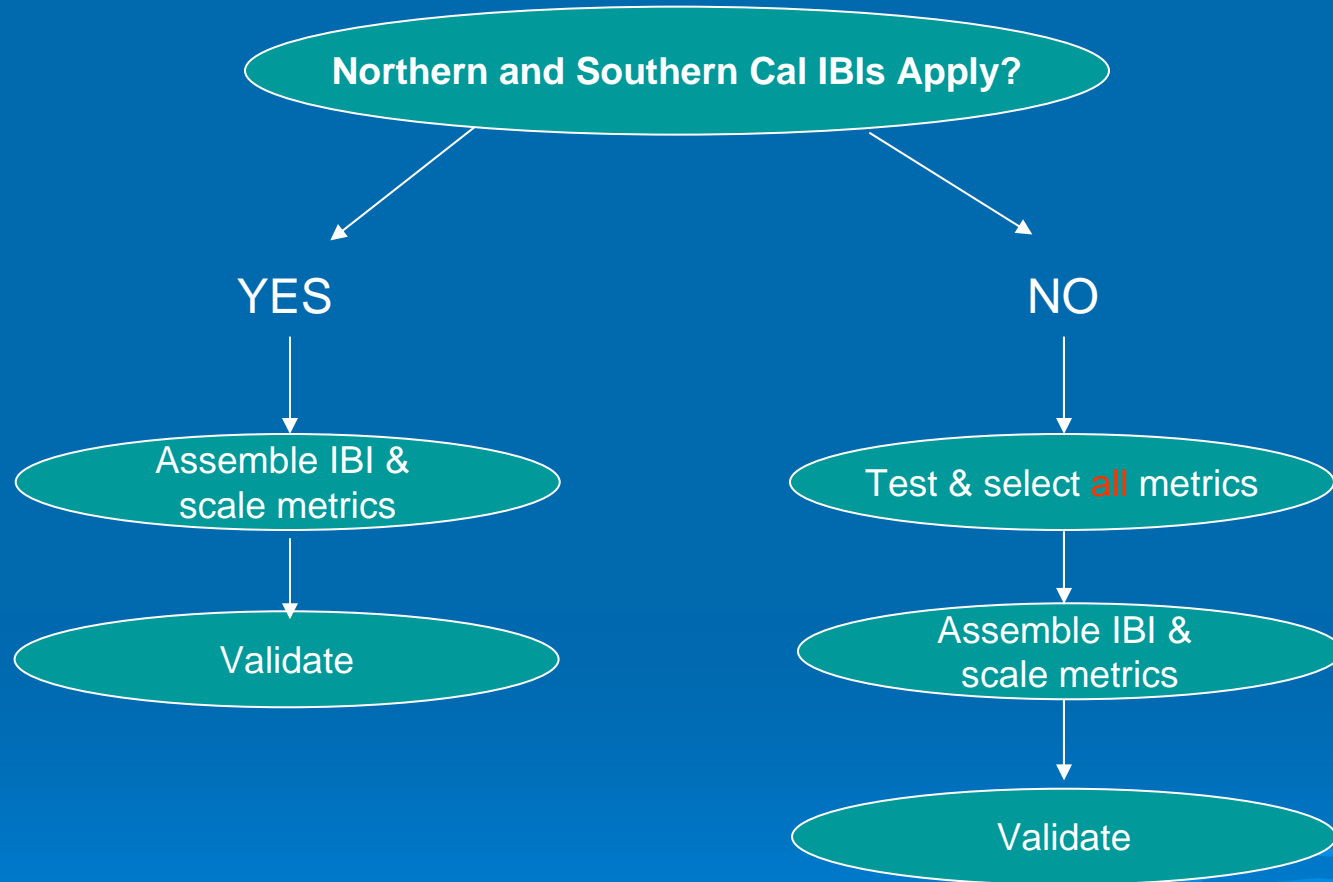
EPT Taxa Richness



% Intolerant Taxa



Next Steps Dependant on Results of Step #4



Schedule

- Step # 2 – Standardize and Enter Data
 - Scheduled for completion in February
- Step #3 – Reference Conditions
 - Develop short work plan in February
 - Task completion in March
 - Could use assistance on GIS tasks
- Step #4 – Testing N & S Cal Metrics
 - Begin in March/April
- Step #5
 - Assemble IBI using N & S Cal Metrics **OR**
 - Test all 77 metrics

