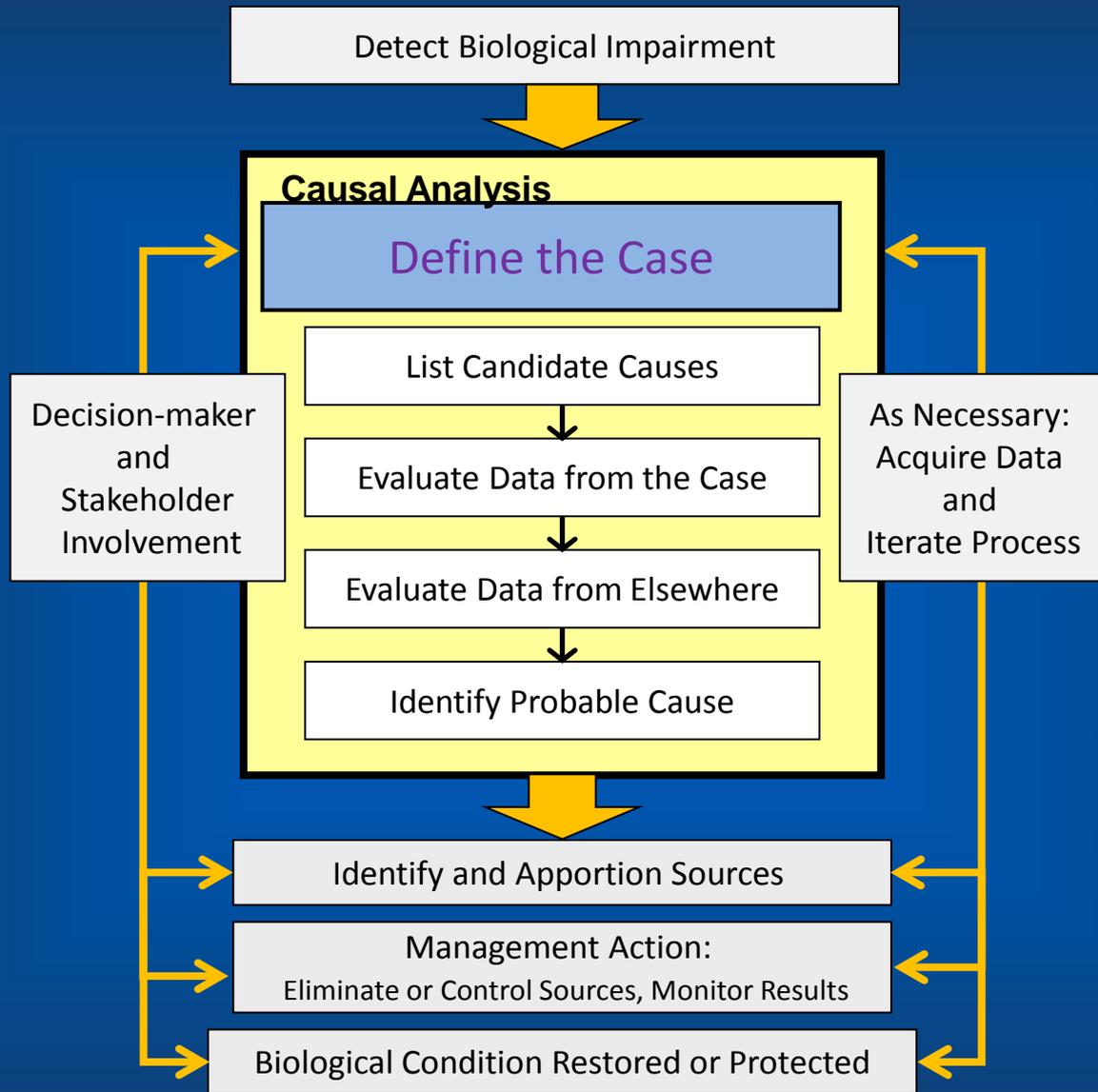


Defining The Case

Step 1

San Diego Creek Causal Assessment Workshop 1
December 17, 2014





What is the Case?

- The case defines scope of the assessment
 - Why are we doing the assessment?
 - Where is the assessment?
 - When did the impact occur?
 - Who are the biotic endpoints?
 - What comparator sites are to be used?
- Defines the objectives of the assessment



Legal Parallel:

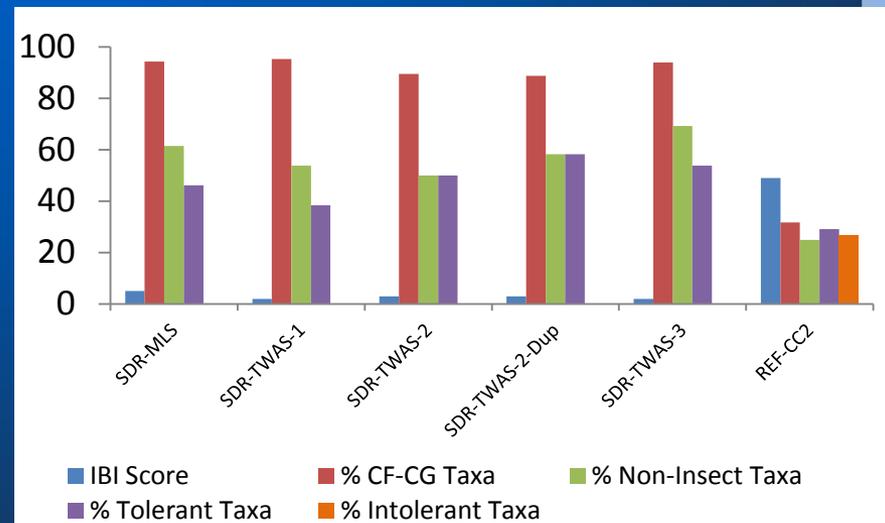
The reading of the complaint

What is the Case?

- The case definition serves as the blueprint from which the assessment will be conducted
 - Serves to keep all parties working from the same page
- All information summarized in a 1-2 page narrative statement
 - Five parts (typically)

Nature of the Impairment

- What is the problem that spurred the assessment?
 - Fish kill, low bioassessment scores, noxious algae, etc
- San Diego River Case
 - Consistently low SoCal IBI scores



Site Characterization

- What stream are we going to assess?
- General biological composition
- Predominant land uses
- Atypical features
 - Discontinuities, golf courses, weirs, boat ramps, etc.
- Distinct potential stressor sources
 - Nearby dams, channel armoring, POTW inputs, etc.

-  Sampled Sites
-  Streams, rivers
-  Primary roads
-  Secondary roads
-  Ramps
-  Subbasins, catchments
-  Open water
-  Developed, open space
-  Developed, low intensity
-  Developed, medium intensity
-  Developed, high intensity
-  Barren land
-  Deciduous forest
-  Evergreen forest
-  Mixed forest
-  Shrub/scrub
-  Grassland/herbaceous
-  Pasture/hay
-  Cultivated crops
-  Woody wetlands
-  Emergent herbaceous wetlands



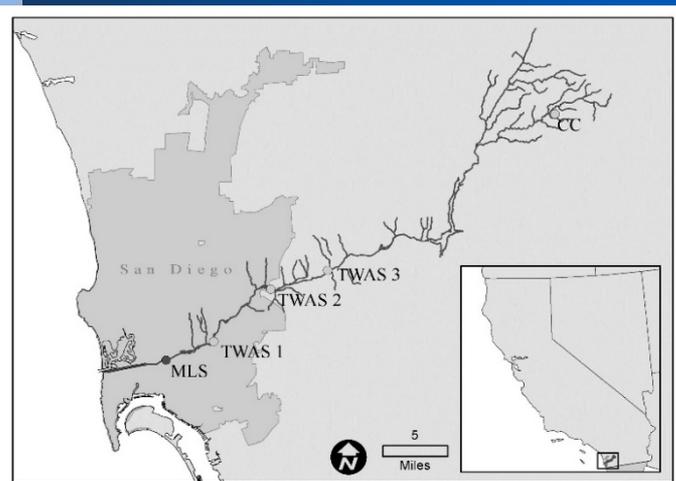
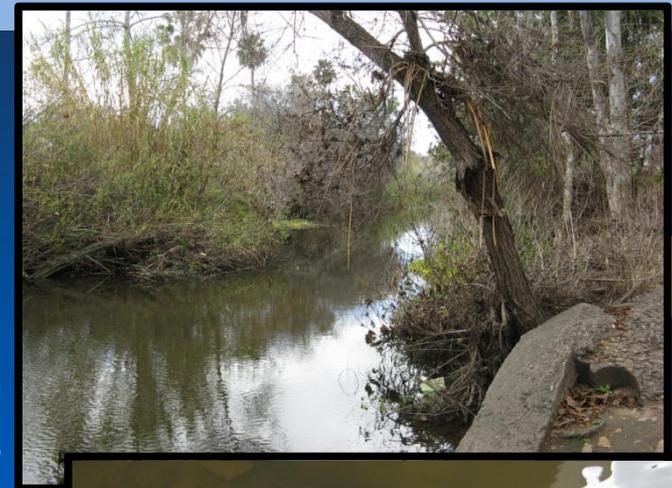
Salinas River

Spatial-Temporal Extent

- What are the boundaries of the assessment?
- Single site or multiple sites?
 - One sample or multiple samples through time?
- Appropriate time scales for data
 - Most assessment tools use an index period
 - Are synoptic data best? Data from the preceding quarter?
 - Point versus diel/time-series measurements

San Diego River

- **MLS site near Fashion Valley Mall in Sp 2010**
 - Industrial gw PAH cleanup, golf course, constrained channel, mostly urban/suburban landcover
 - BMI community dominated by amphipods and snails; more insects upstream

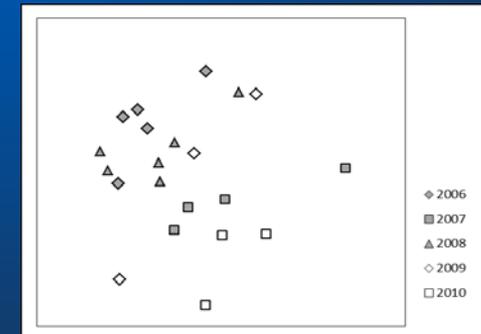
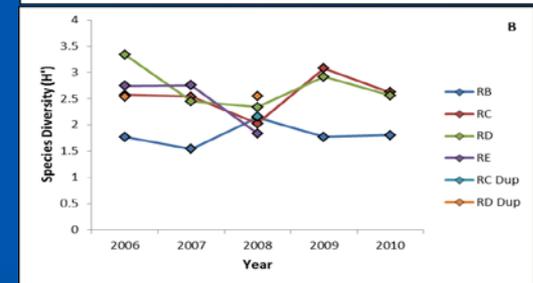
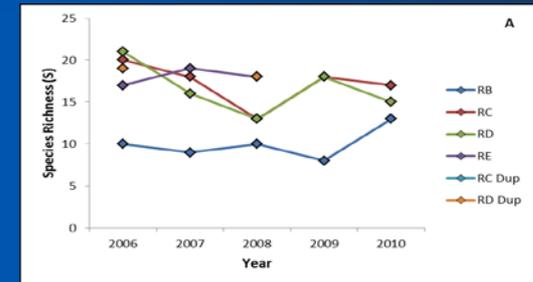
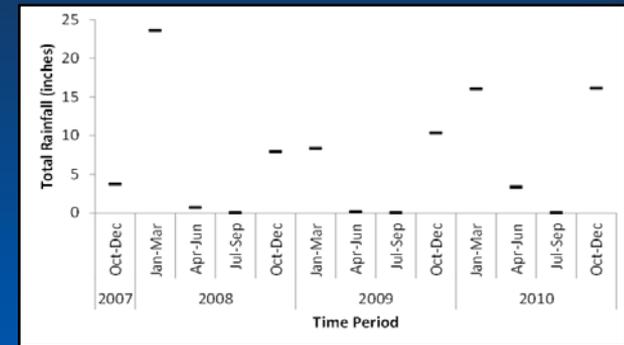


Multi-Site & Multi-Year Assessments

- Assessments integrating across multiple sites and samples/year are *probably* more appropriate for CA
 - NPS stressors plus robust monitoring programs
- Ensure comparability between sites/samples to be aggregated
 - Look for outliers in biology or natural stressors
 - Appearance of mudsnails
 - Fire/mudslide, historically abnormal rainfall/flow events, etc

Santa Clara River

- Interest in doing multi-year assessment
- Looked at variability in rainfall and the biology at test and comparator sites
- Could use the same approach for multiple sites



...probably more appropriate for
CA

- We will be doing single-site and multi-site assessments as part of this project
 - I will be working on the multi-site assessments in parallel to the single-site work
- Should allow us to better evaluate the chronic, watershed scale problems we face here
 - Allow us to test the usefulness of one approach versus the other in SoCal

Biological Endpoints

- What aspects of the biotic community are we going to use?
 - Doesn't *have to* be what triggered the assessment
- Need to be able to compare sites with a “biological ruler”
 - Site D > Site G > Site A w/ regard to Coleoptera taxa
- A number of the lines of evidence have a biotic component to them
 - Response variable in regression, condition indicator for relative risks, indicator taxa for specific stressors

Biological Endpoints

- Options lie upon a spectrum

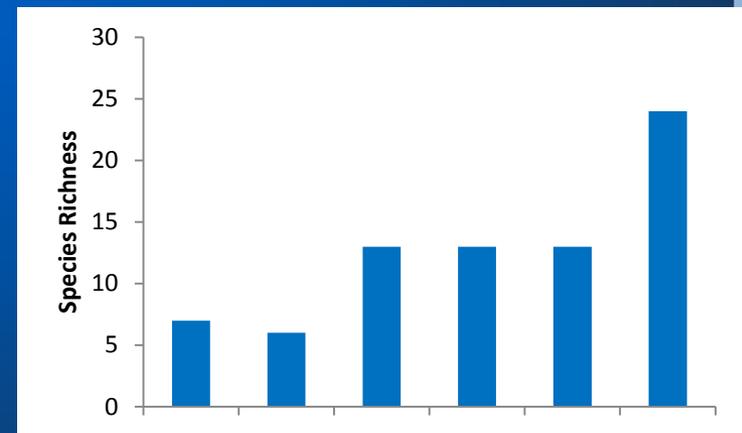
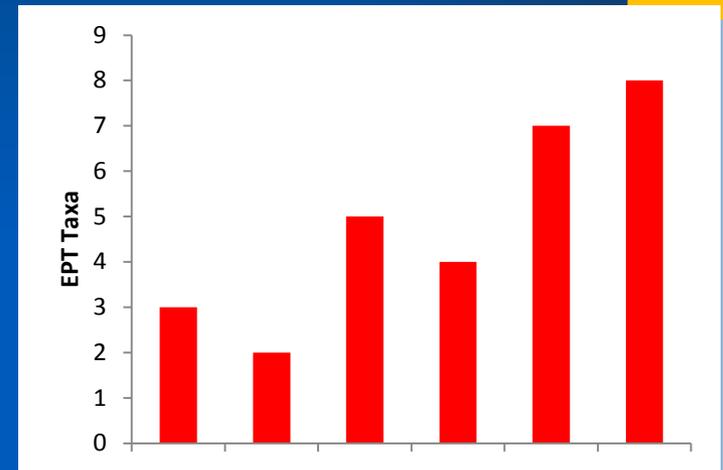


- Selection of endpoint will depend, in part, upon assessment goals



- In all four case studies, we used sub-metrics of the SoCal or NorCal IBIs
 - Plus Amphipods in San Diego River
- Chosen because they related back to overall IBI score
 - And showed variation among sites*

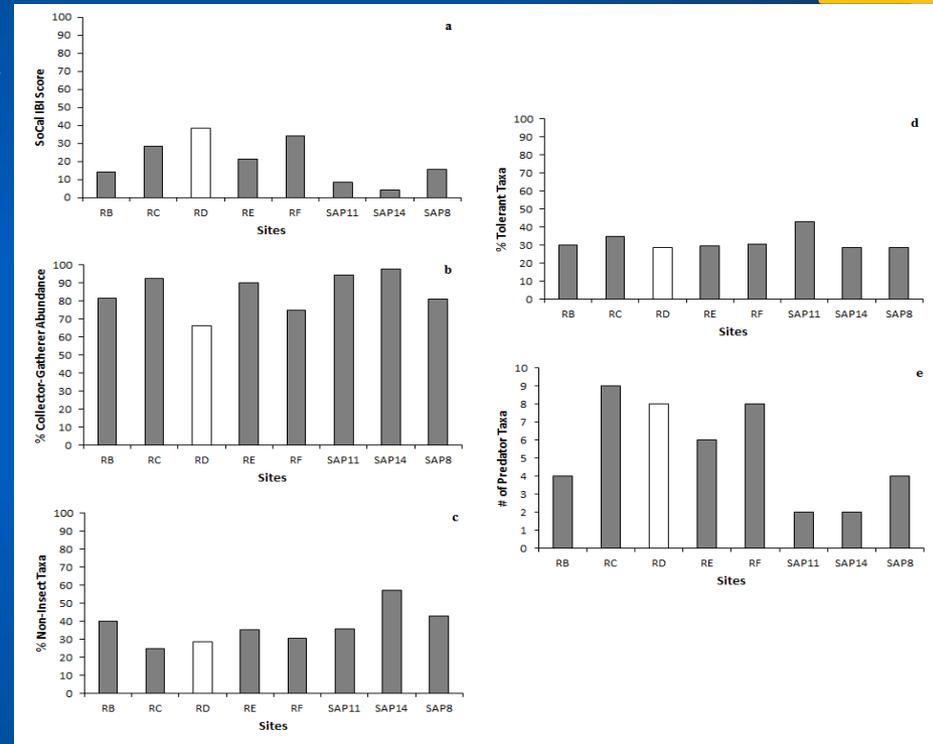
Salinas River



DAV SSP SAC SAC GRN SYL

* Santa Clara River

- We made a poor choice of selecting endpoints
 - Not strong variation among test and comparator sites
 - Didn't understand the importance of the biological gradient
- Resulted in a weakened overall assessment



Biological Endpoints

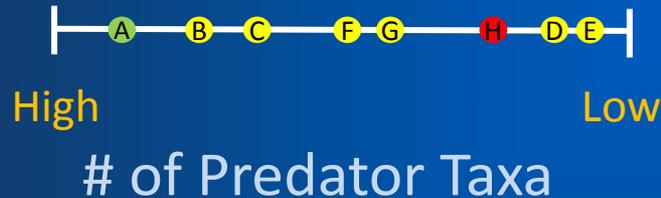
- Does not have to be limited to benthic macroinvertebrates
 - Though there are a number of practical and ecological reasons to use them
- Fish, amphibians, algae, birds are all valid options
 - We do have an algal index in SoCal

Comparator Sites

- Used to contrast biotic and abiotic conditions at the test site
 - Provide insight to the causes of condition at the test site
- Not reference sites
 - Though 1 or 2 reference sites may be useful
- Sites with similar ecological settings and biology in the absence of human modifications
 - Ideally comprising a gradient of condition

Comparator Sites

- Sites spanning gradient of condition reflected in the biological endpoint(s)
 - Note that it's not about good versus bad sites, but better (and possibly worse) sites



Comparator Sites

- Variety of ways to select comparator sites
 - Upstream/downstream or before/after
 - BPJ within the same watershed or biogeographic province
 - Empirically based upon measured natural gradients
- All are acceptable, but pluses and minuses will influence assessment outcome

Upstream/Downstream

- Best if there is a discrete impairment

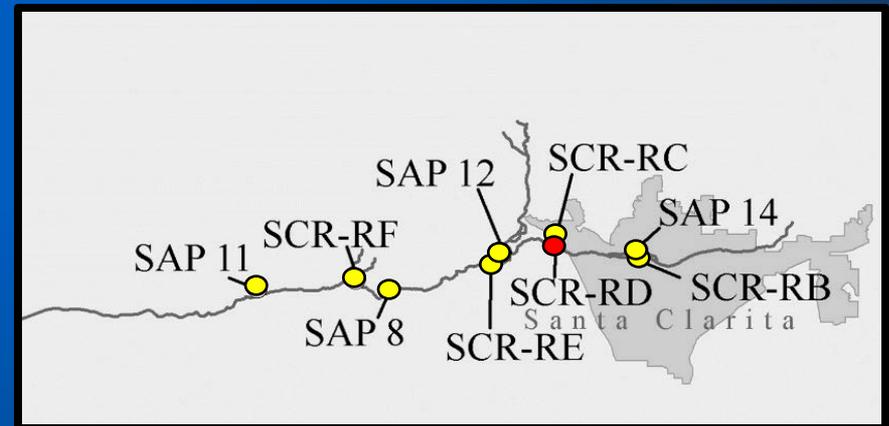
- Spills, point sources, etc.

- Pros

- Conceptually easy to understand
 - Analytically simpler

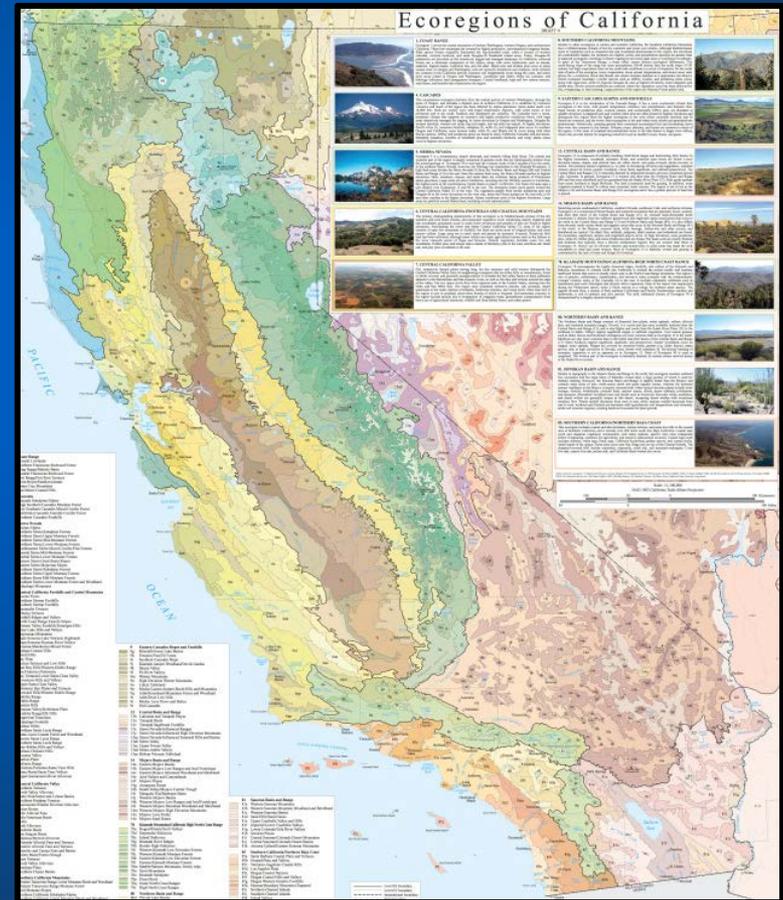
- Cons

- Challenging with NPS, chronic impairments



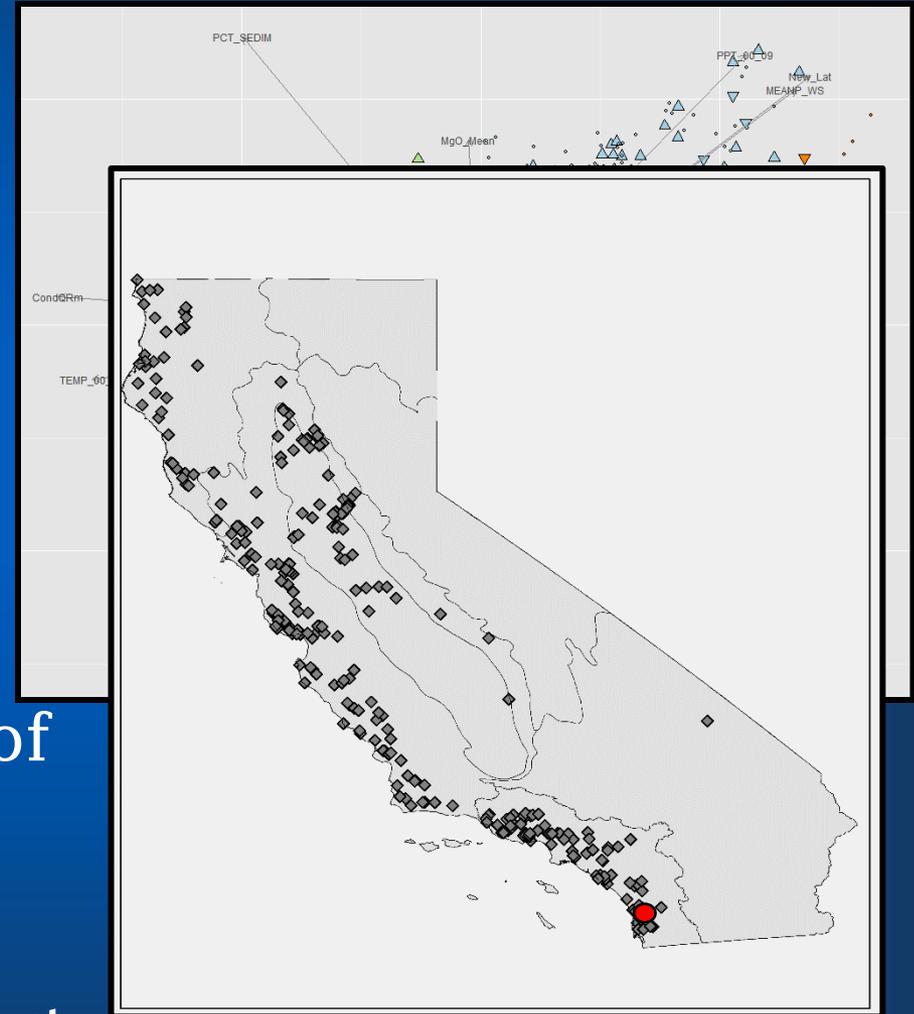
Same Watershed or Biogeography

- Better than local site approach for NPS and chronic stressors
- Pros
 - Stakeholder comfort
 - Good chance of creating gradient of condition
- Cons
 - No guarantee of similarity



Empirical Selection

- Select sites based upon measurable natural gradients that influence biology
- Pros
 - Direct measurement of similarity
- Cons
 - Stakeholder discomfort





Once you have all of those
components

You can write up the narrative
case description