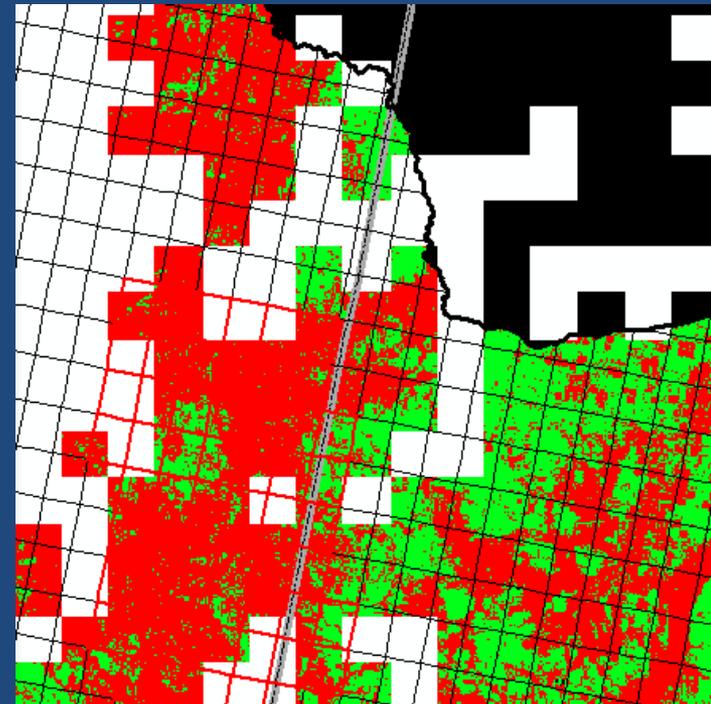


Approaches to Vulnerability Assessment Scale



Multiple Issues of Scale

- Species habitat and life history aspects
- Data scale/precision differences
- Land planning/management scales
- Time relative to effects, decisions, implementation

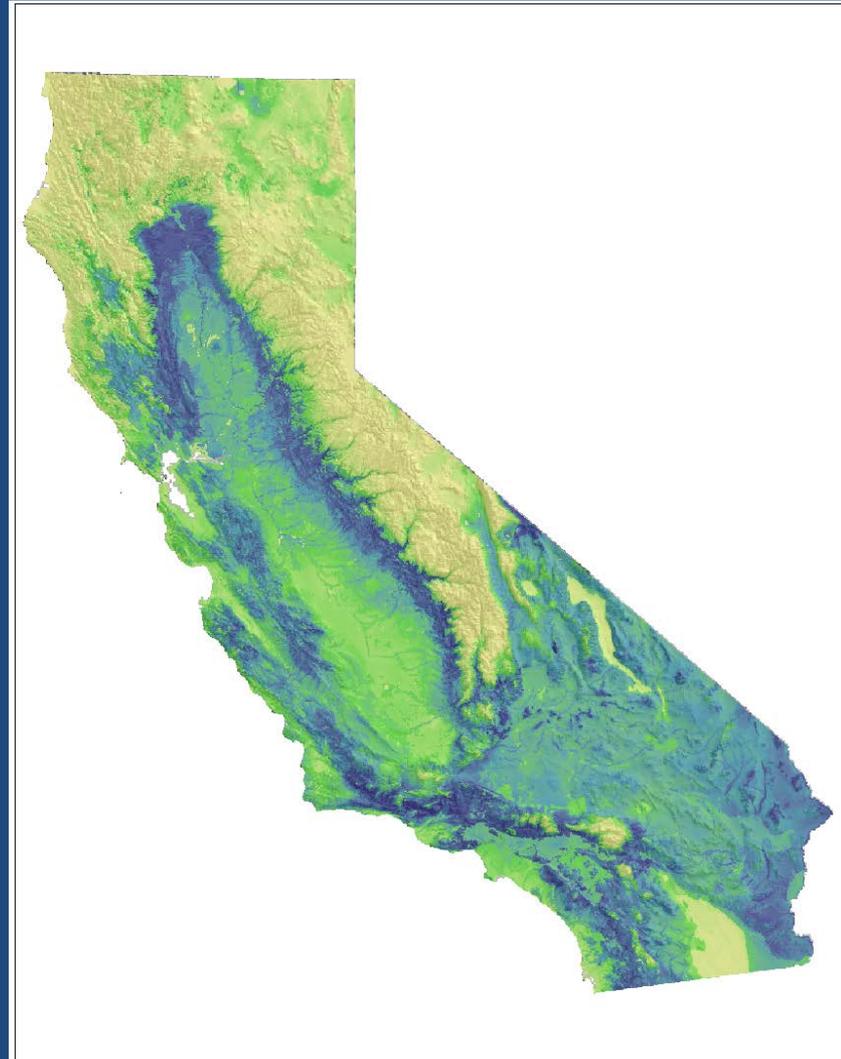


Species Issues

- **Broadly distributed species/habitats may have different exposures across their range**
 - Naturally wide ranging
 - Highly migratory
- **Species/habitats associated with narrow niches may have microclimates not assessable through normal CCVA**
- **Species climate tolerances/habitat associations may not be completely represented within CCVA study area**

Breeding bird distributions in California

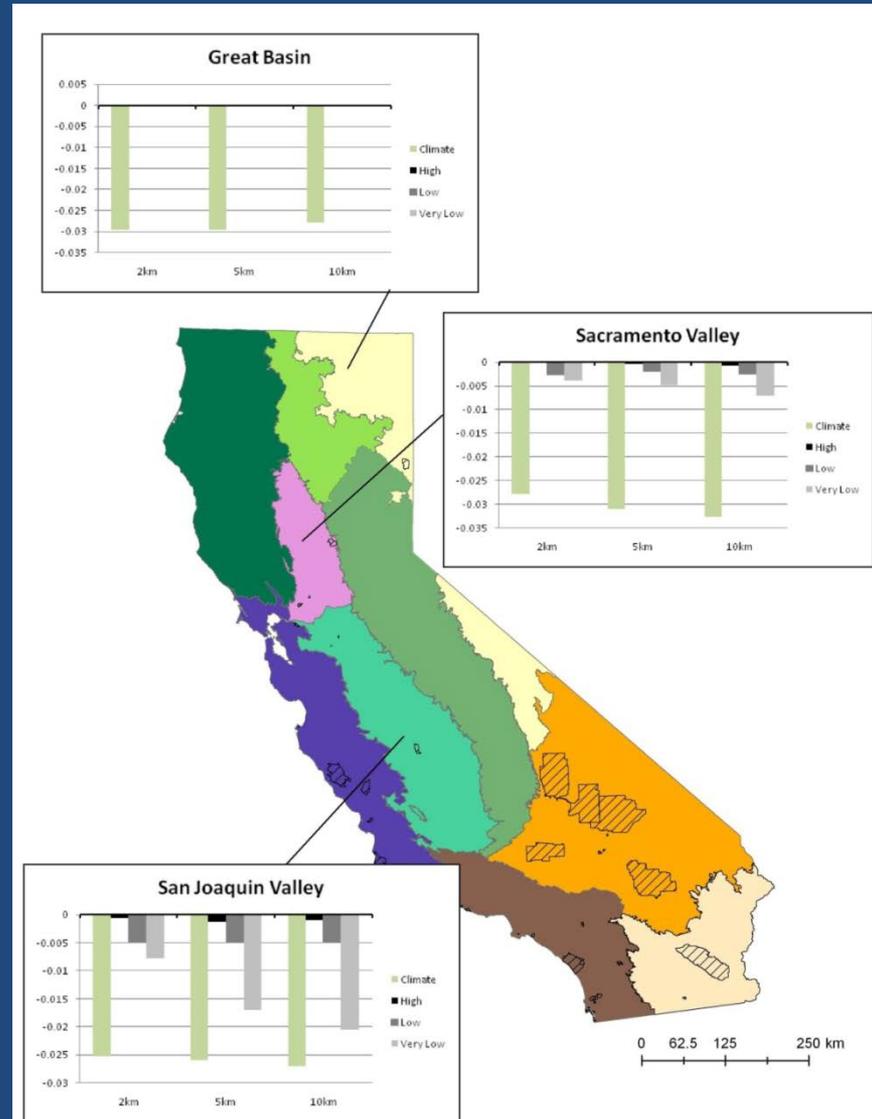
Vulnerability may vary
across range



Ecoregions

A “zoning” approach based on ecoregions

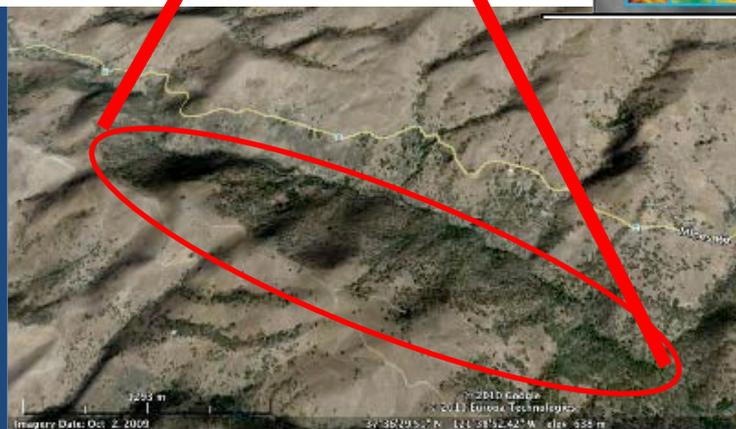
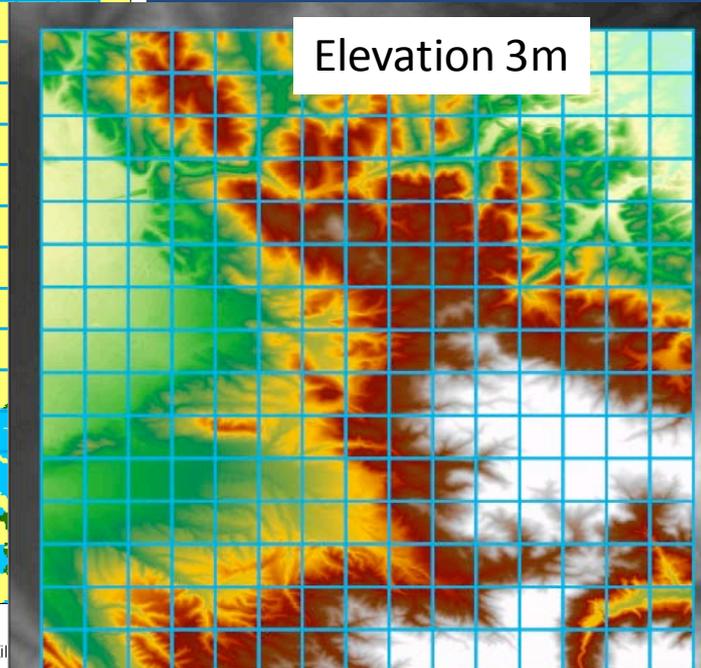
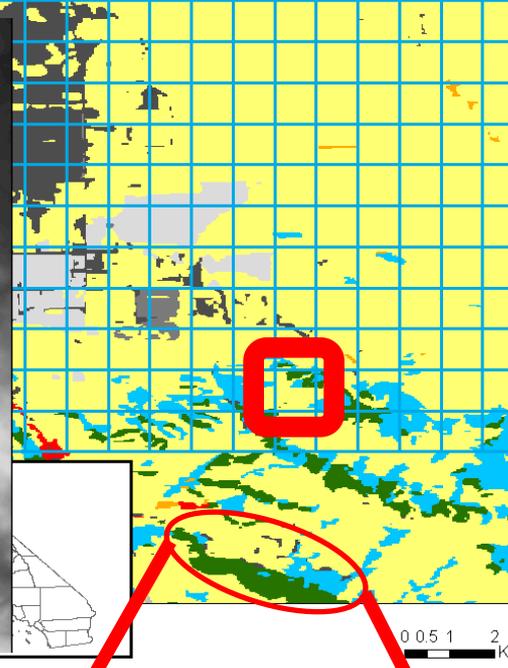
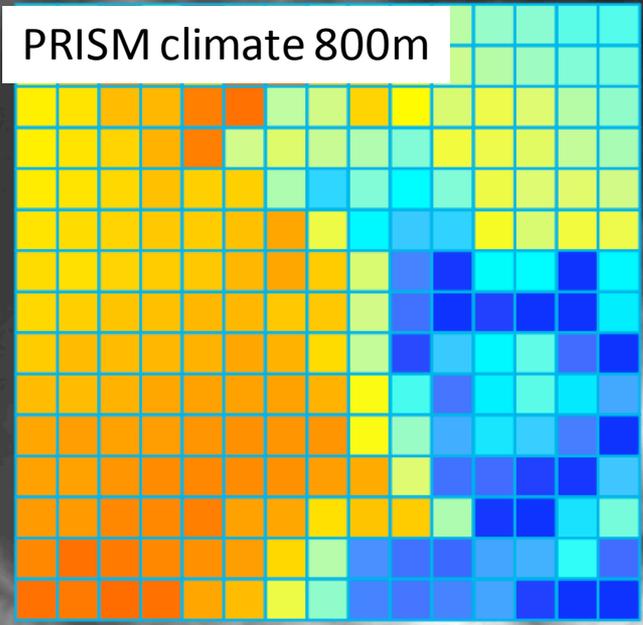
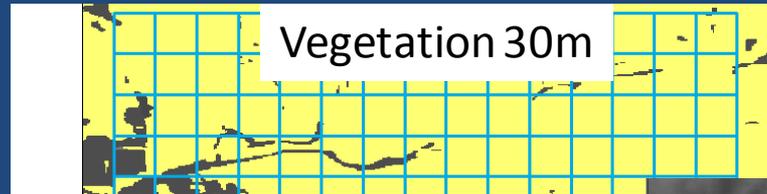
Climate and urbanization stressors



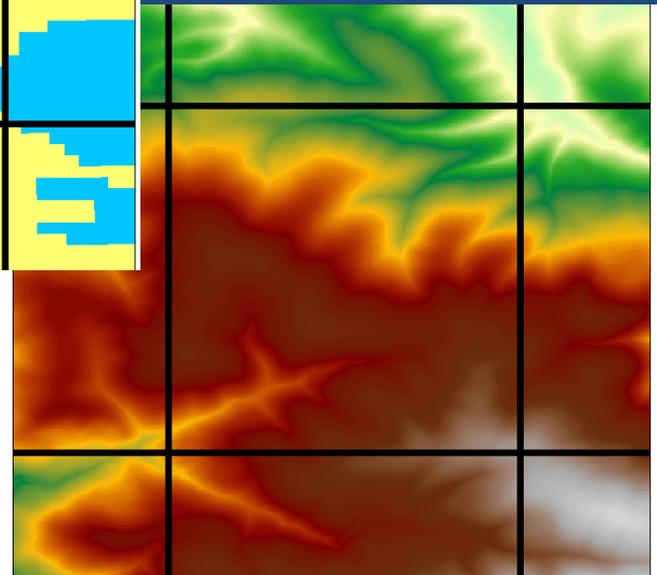
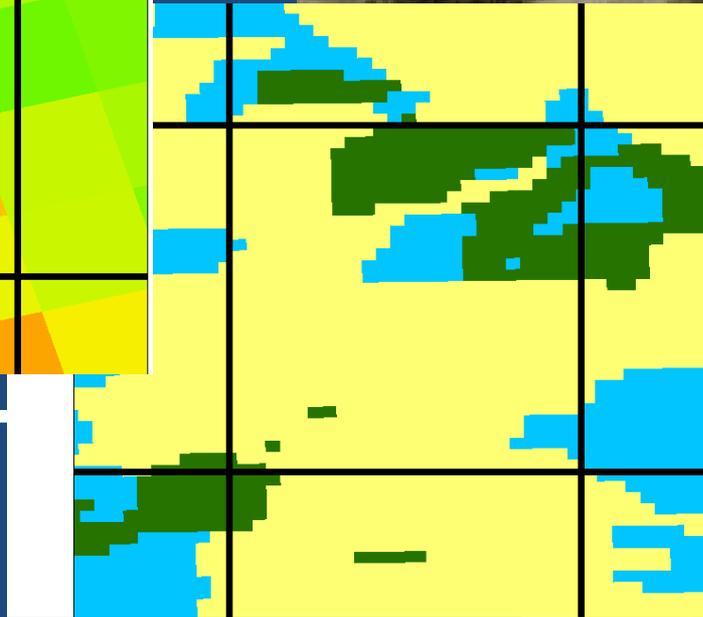
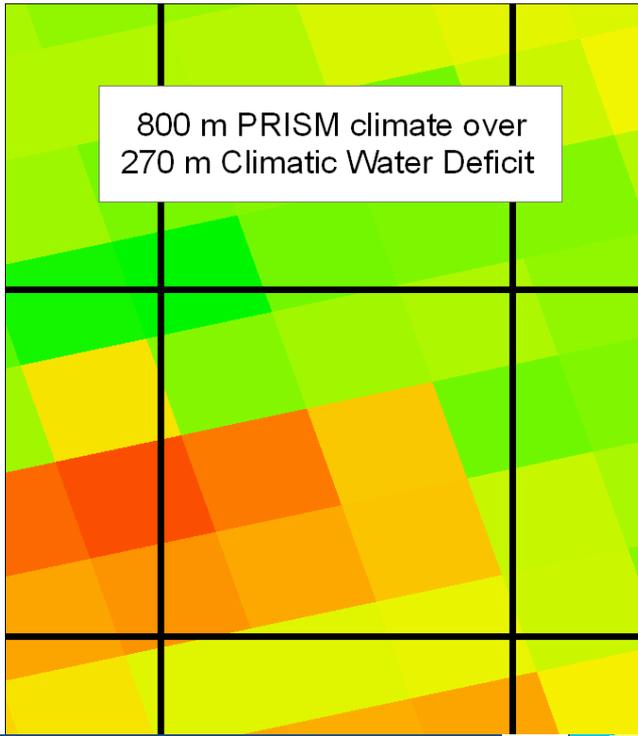
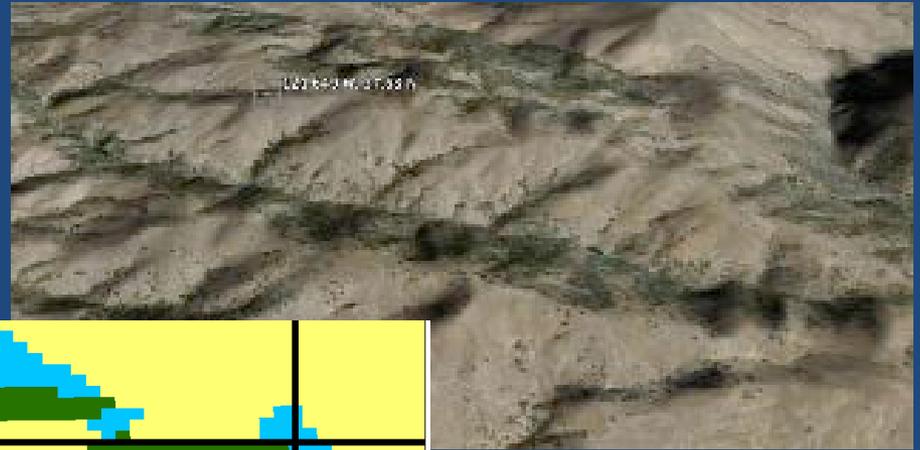
Data Issues

- Consider how well CC effects data match your resource data in resolution
 - If species is associated with fine grain features (e.g., rare soil type, north facing slopes, etc.) can you determine vulnerability from downscaled climate data? (one option: use geophysical features to further “filter” results)
 - What about migrants with key part of range outside the U.S.? (outside existing downscaled data, one option—live with uncertainty of GCM scale)

Grain of Resource Distribution



800 m PRISM climate over
270 m Climatic Water Deficit



Topoclimate influence on vegetation

Ackerly, TBC3, 2010

Considerations for Implementation Scale

Informs what are the useful types and scale of products to inform decision making

- Geographic position can matter:
 - On the coast vs upland
 - Implementers with small or narrowly defined jurisdictions (e.g., only river management)
- Type of implementation
 - Broad brush policy
 - Comprehensive use/management planning
 - Narrow site scale project design or regulation

Scale of Implementation

- Scales often mixed within the same landscape:
 - Federal region
 - State government
 - Local governments
 - Agency jurisdiction
 - Watershed management
 - Individual land owner
 - Project site



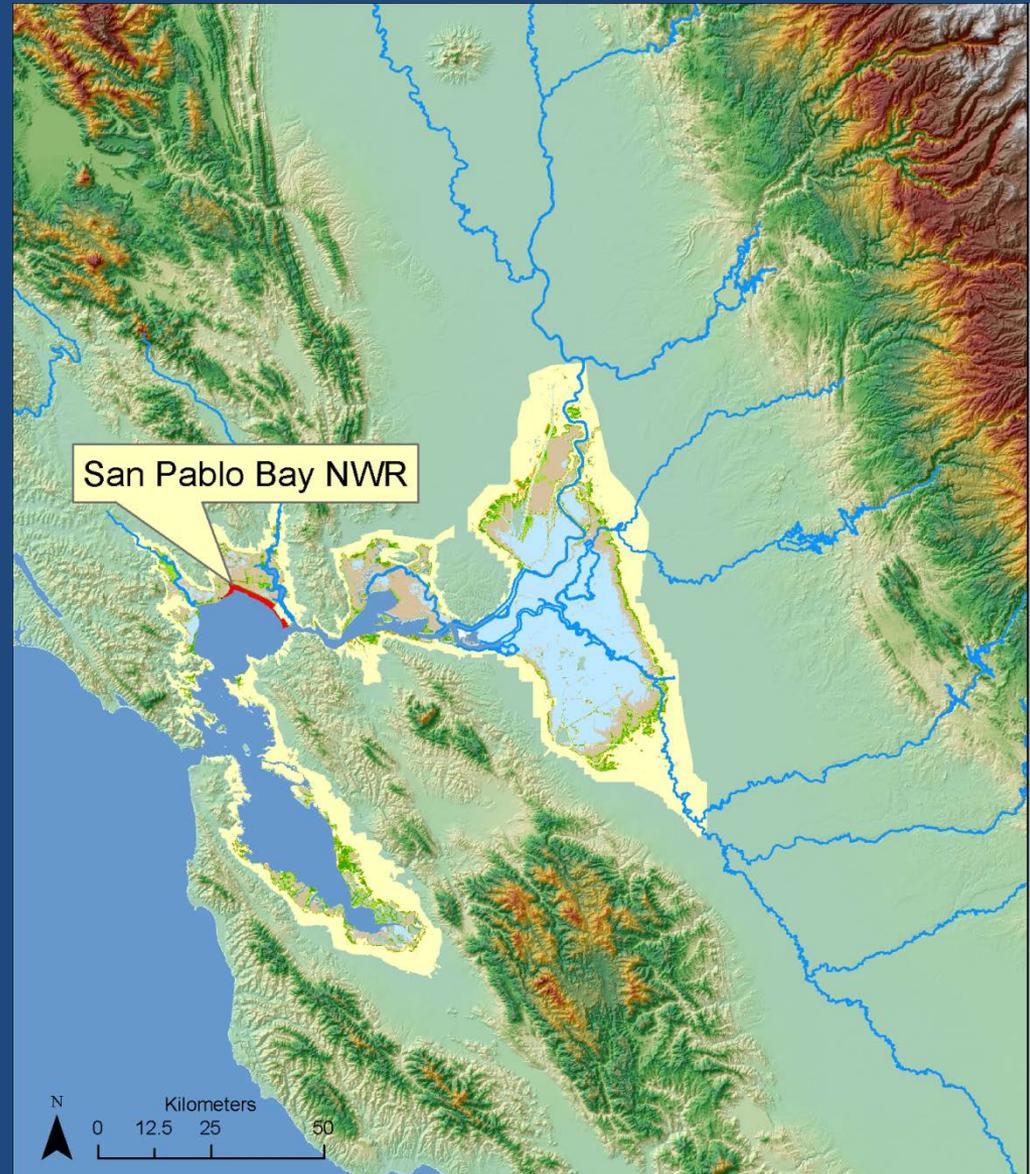
All in same planning area

Context vs Scale of Implementation

San Pablo Bay National Wildlife Refuge

Region influences policies and broader ecosystem function

- Implementation: highly influenced by surrounding land planners, owners, other NGOs activities



Conclusion

- Scale has large implications
 - Types of possible assessments
 - Data needed
 - Uncertainty
 - Applicability to different scales and purposes
- Scale can only be somewhat controlled
 - Downscaling and modeling
 - New data collection and mapping
 - But projects will inherently contain resources and processes functioning at a variety of scales
 - One size fits all will not serve the assessment well
 - But can't have the ideal scale for all features
 - Compromise is necessary