Assessing Sensitivity

Vulnerability Assessment

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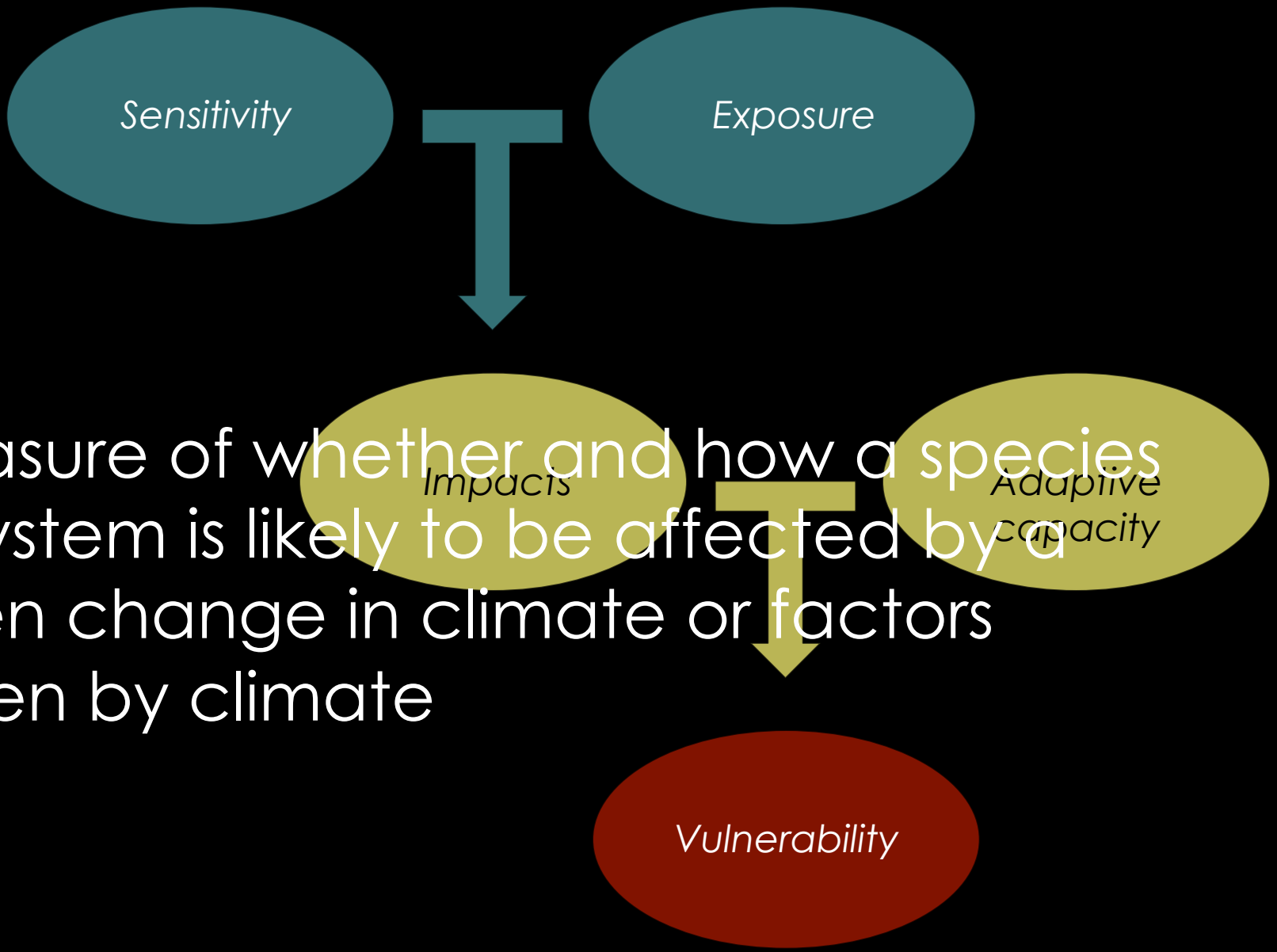
EcoAdapt

(Adapted from a presentation by Sam Veloz)

EcoAdapt™
Meeting the challenges of climate change

CA LCC



Measure of whether and how a species or system is likely to be affected by a given change in climate or factors driven by climate

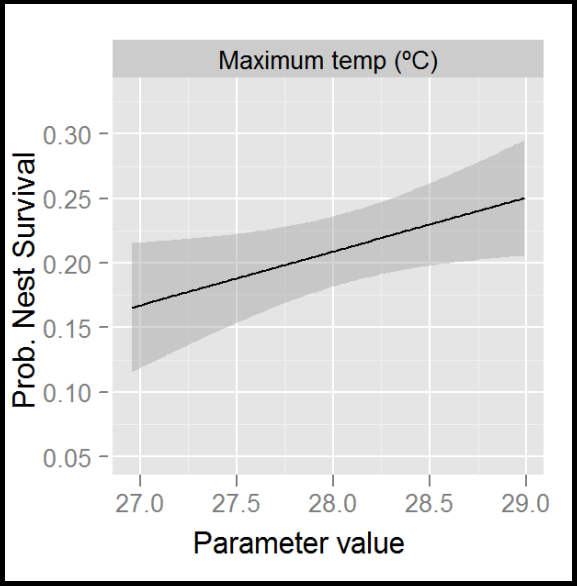
- Sunburn example:
  - Amount of melanin in skin is key physiological factor
  - Melanin absorbs UV rays, which cause sunburn
  - Skin with lower melanin levels is more sensitive to sunburn

Sensitivity of species




Species' Sensitivities to Climate Change

Physiological sensitivity



Nur et al. 2012

Species' Sensitivities to Climate Change

Physiological sensitivity

Sensitive habitats and

disturbance regimes

Species' Sensitivities to Climate Change

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Interspecific interactions

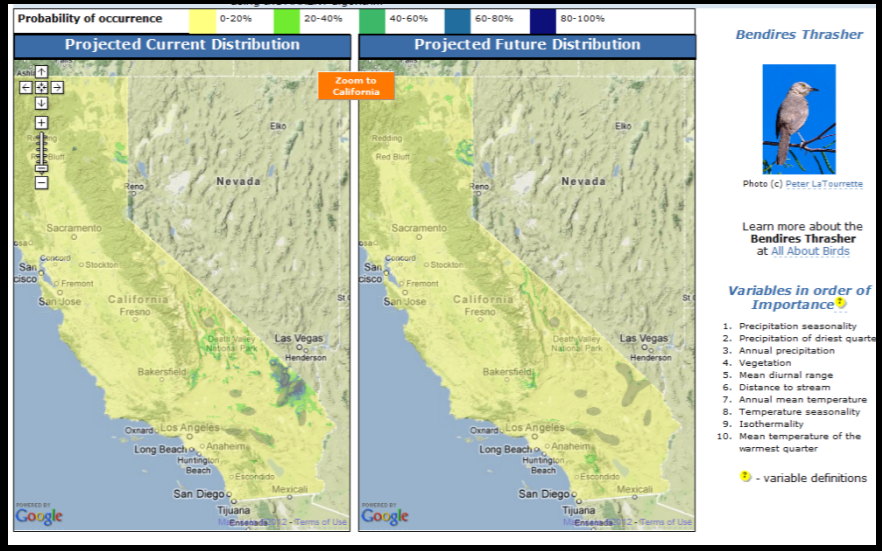
Species' Sensitivities to Climate Change

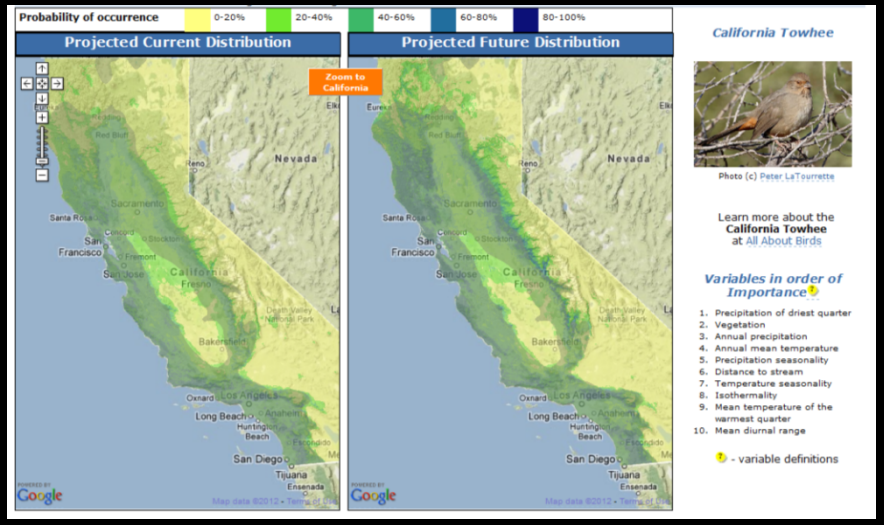
Physiological sensitivity

Sensitive habitats and disturbance regimes

Interspecific interactions

Location and range





Species' Sensitivities to Climate Change

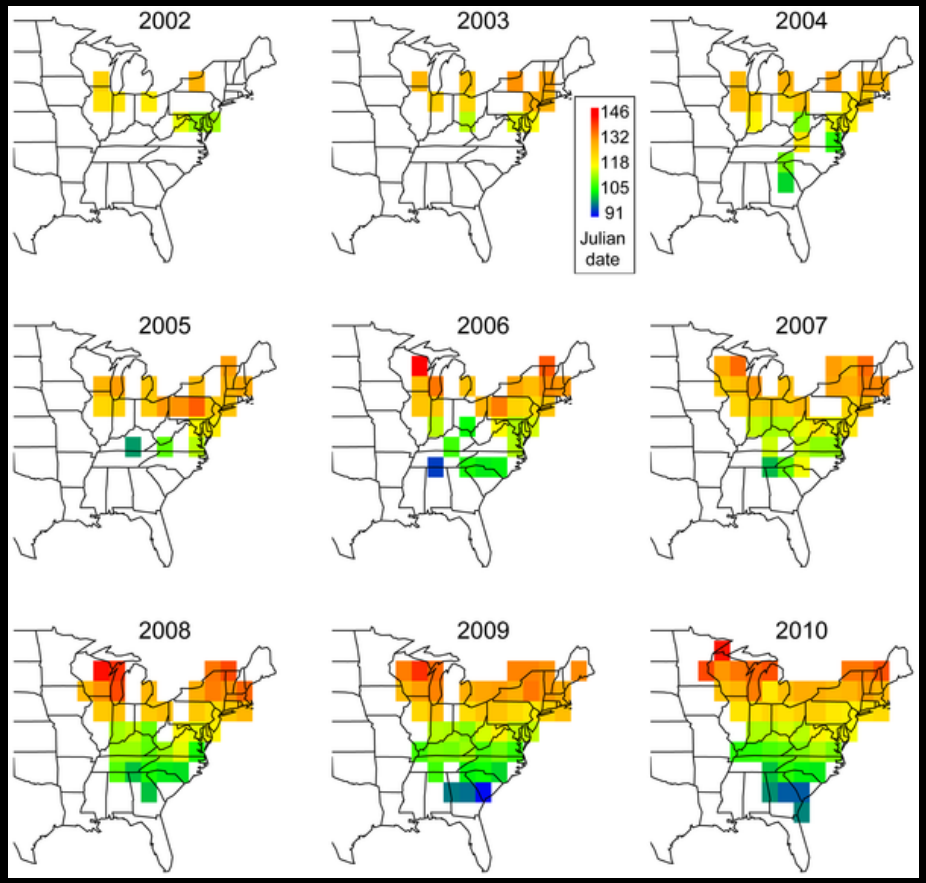
Physiological sensitivity

Sensitive habitats and disturbance regimes

Interspecific interactions

Location and range

Phenology



Hurlbert AH, Liang Z (2012) Spatiotemporal Variation in Avian Migration Phenology: Citizen Science Reveals Effects of Climate Change. PLoS ONE 7(2): e31662. doi:10.1371/journal.pone.0031662
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0031662

Species' Sensitivities to Climate Change

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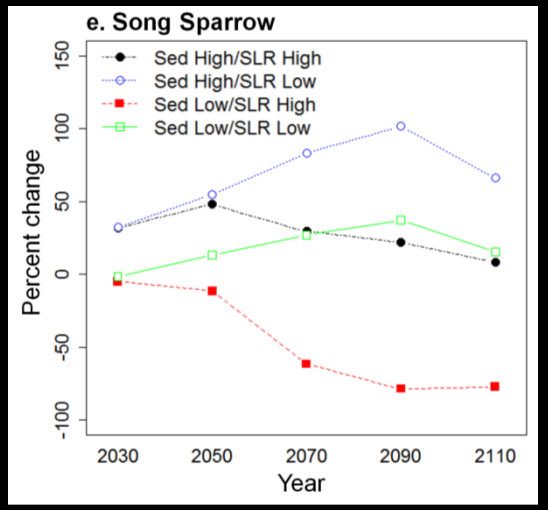
Additional interacting stressors

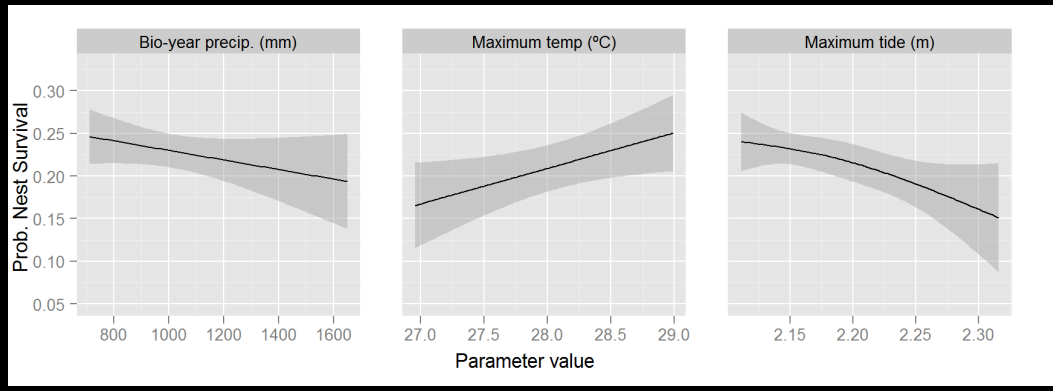
Species sensitivity: Song Sparrow

3 tidal marsh subspecies: California species of special concern

Availability of tidal marsh habitat; suitable conditions

Nest survival: influenced by precipitation, temperature and extreme high tides



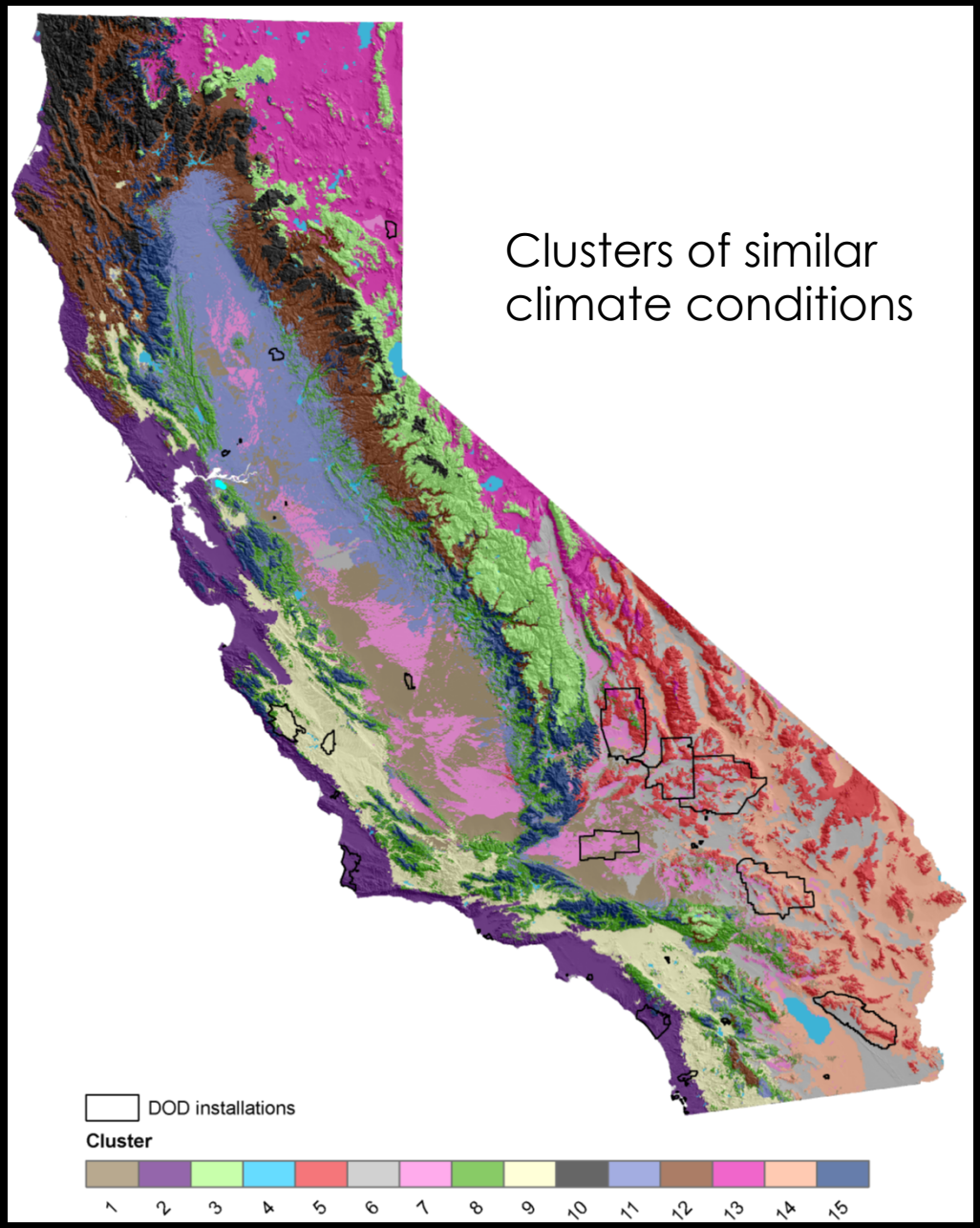


Nur et al. 2012

Sensitivity of Ecosystems

System sensitivities to climate change

Climate breadth



System sensitivities to climate change

- Climate breadth
- Component species sensitivities

System sensitivities to climate change

- Climate breadth
- Component species sensitivities
- Disturbance regimes

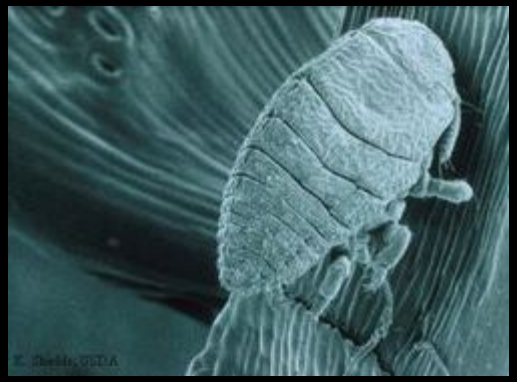
System sensitivities to climate change

Climate breadth

Component species sensitivities

Disturbance regimes

Other stressors



System sensitivity: Tidal Marsh example

Will tidal marsh ecosystems in the San Francisco Estuary sink or swim?

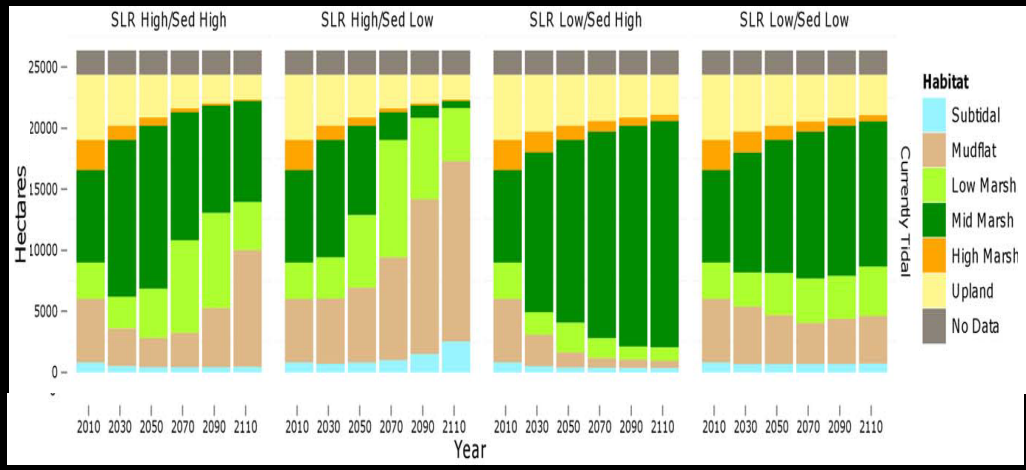
Tidal marsh elevation sensitive to:

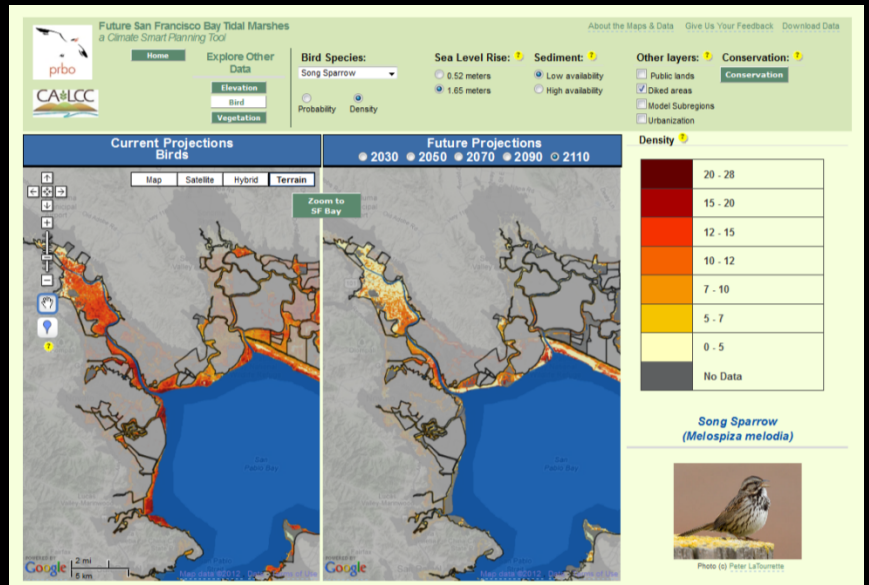
1. The rate of sea level rise
2. The amount of suspended sediment

Not sensitive to organic accumulation

Tidal marsh vegetation and birds also sensitive to changes in marsh habitat

Stralberg et al., 2011





Activity

Ecosystem Sensitivity Assessment

Please pay close attention to the gray boxes in each section. If time is limiting the project team can populate the non-gray fields although we may ask for participants to review answers later.

Ecosystem: _____

1. Direct sensitivities to changes in temperature and precipitation

Two ways to consider ecosystem sensitivity to changes in temperature and precipitation:

(1) Does the system inhabit a relatively narrow climatic zone(s) (= more sensitive); and

(2) Does the system experience large changes (composition or structure) to small climatic changes (temperature or precipitation) (= more sensitive), or does system experience small changes even with larger climatic changes (= less sensitive)?

How sensitive is the system to temperature (means and extremes)? *Please circle.* **Low** **Moderate** **High**	**Confidence in the direct sensitivity to changes in temperature:** *Please circle.* **Low** **Moderate** **High**
How sensitive is the system to precipitation (means and extremes)? *Please circle.*	**Confidence in the direct sensitivity to changes in precipitation:** *Please circle.*

Ecosystem sensitivity…

1. To changes in temperature and precipitation
2. Of component species
3. To changes in disturbance regimes
4. To other types of climate and climate-driven changes
5. To impacts of other non-climate stressors
6. Other sensitivities

Confidence

Low Medium High

Support from theory

Support from model results

Support from data or trends in the existing environment

Degree of consensus in expert opinion

Working groups

Alpine/Sub	Tricia, Gavin, Bruce G.
Yellow Pine/Mixed Conifer	Terri, Andrea G., Greg A.
Meadows/Riparian	Ryan, Laura, Shana, Alex R.
Aquatic	Belin, Emily B., Lonie F., Laura P.
Sagebrush	Chris D., MicheleS, , Jo Ann
Chaparral	John, Ryan, Tiffany
Red Fir	Steve B, Joe (day 2 only), Stefan L, Bruce H
Pinyon-Juniper	Aimee, Angela, Leroy W.
Oak	Chrissy, Chris K., , Anna O