

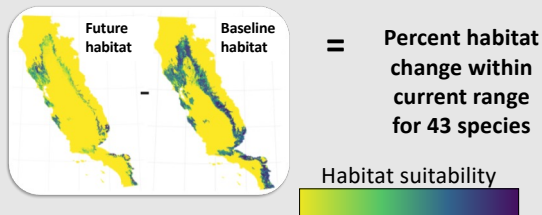
Global change threats to southern California's shrubland plant diversity

Janet Franklin (jfranklin2@sdsu.edu), Brooke Rose (mbrose@sdsu.edu)

Center for Open Geographical Science, Department of Geography, San Diego State University

Background

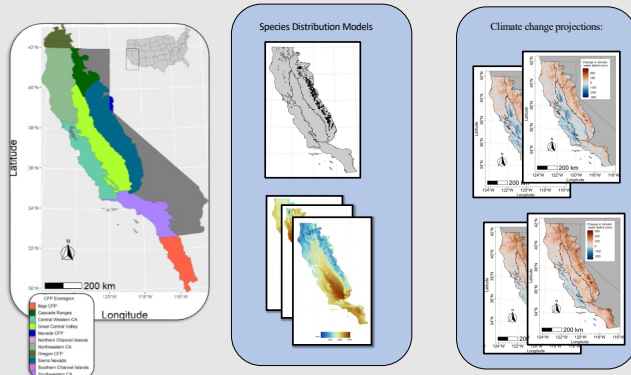
- Shrubland plant species face multiple global change threats: climate change, habitat conversion
- Identifying the species most at-risk supports and areas that might harbor persistent populations for conservation planning



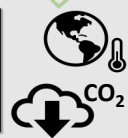
Approach

- Species distribution models based on hydroclimate (Basin Characterization Model), terrain and soil
- Projected habitat change under future climate change scenarios (CMIP5)
- Calculate change in suitability within current habitat

Methods



43 chaparral and coastal sage plant species



Climate change projections

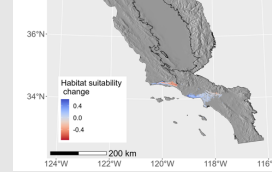
Global climate models (X2)

Representative Concentration Pathways (X2)

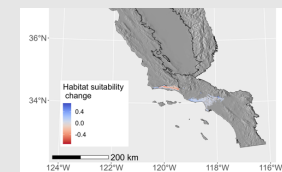
Results

Chaparral: *Ceanothus megacarpus*

Warm / Wet climate model (CNRM-CM5)

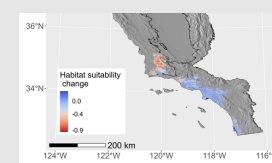


Hot / Dry climate model (HadGEM2-ES)

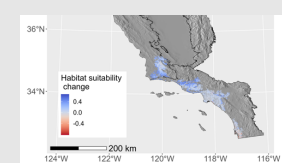


Coastal Sage Scrub: *Salvia leucophylla*

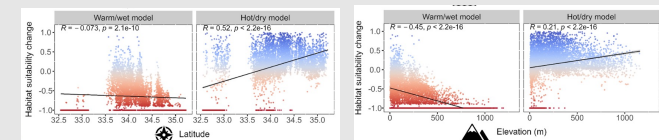
Warm / Wet climate model (CNRM-CM5)



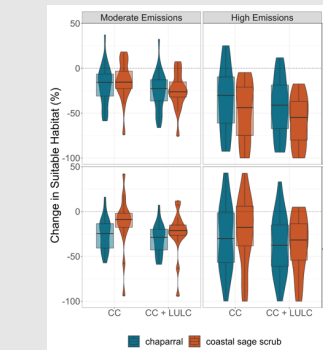
Hot / Dry climate model (HadGEM2-ES)



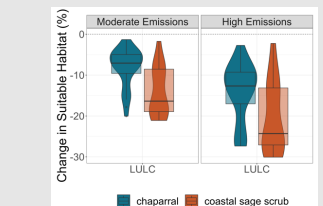
Projected habitat change, end of century, two climate models (warm/wet and hot/dry); high emissions scenario



For *Salvia leucophylla* scatterplots and trend lines show relationship between habitat change and geographic features at the pixel level, contrasting two climate models



Habitat change across species for two climate models and two emissions scenarios



Habitat change across species for land use change scenarios

Discussion

1

CSS species greater predicted declines in habitat relative to current than chaparral species under a warm/wet climate model, *opposite* under hot/dry

2

Greater predicted habitat decline due to land use change for CSS than chaparral species

3

Locations of refugia under global change, and their relationship to geographic features were species-specific and dependent on the direction and magnitude of climate change



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