CSS Distribution in Cheseboro Canyon

Megan Honey, Brian Maka, &
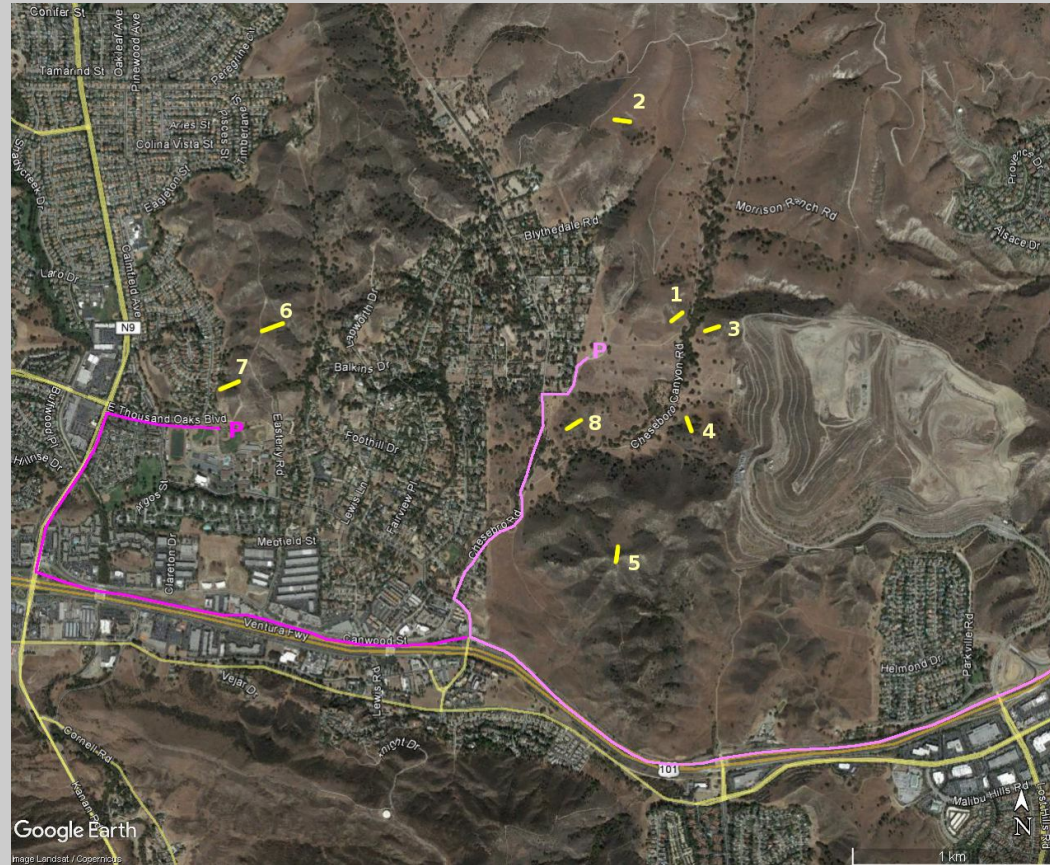
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GEOG 442

Spring 2019

Introduction

➤ Study of California sage scrub community in Cheseboro Canyon
- ○ Northern portion of Santa Monica Mountains
- ○ East of Agoura Hills

➤ Monitor vegetation cover
- ○ Recommendations for restoration efforts

➤ Using a chi squared analysis
- ○ Alpha=0.10

http://web.csulb.edu/~rodrigue/geog330/maps/CheseboroCanyon2016.png

History

- Cheseboro Canyon
- Chumash occupied for 1000's of years
- Ranchers came into area in 1800's
- Managed as Open Space by the National Park Service
- Loss of CSS from:
  - Cattle grazing
  - Fires
  - Fragmentation
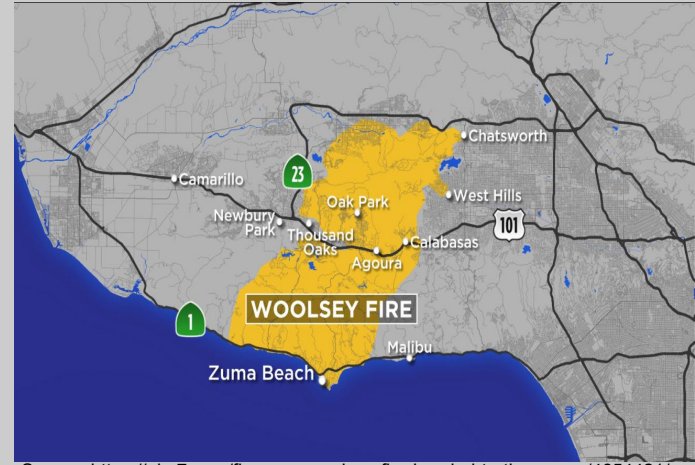 - Invasive/ Non-Native Species

Morrison Ranch House

Source: https://www.nps.gov/samo/planyourvisit/cheeseboropalocomado.htm

Background

- 2005 - Scott Eckhardt's thesis
  - Wanted to identify loss of CSS in the Canyon
  - Collected data by looking at aerial photos
  - Found CSS expanding in areas although no restoration efforts had been done
  - Species mix of 95% native species in 8 areas observed
- 2017-2018: Student-collected data
  - Collected transects at Eckhardt's sites
  - Compared data to Scott Eckhardt's data
  - Decrease in species mix - 70% native
  - Further research needed

Our Goal

- Compare plant succession communities between pre and post-fire periods
  - Woolsey Fire in 2018
  - Using Scott Eckhardt's data from 2005
  - Compare to our data
- Compare the species found during the drought to species found after the drought
  - Using data from 2017-2018 collected by previous students
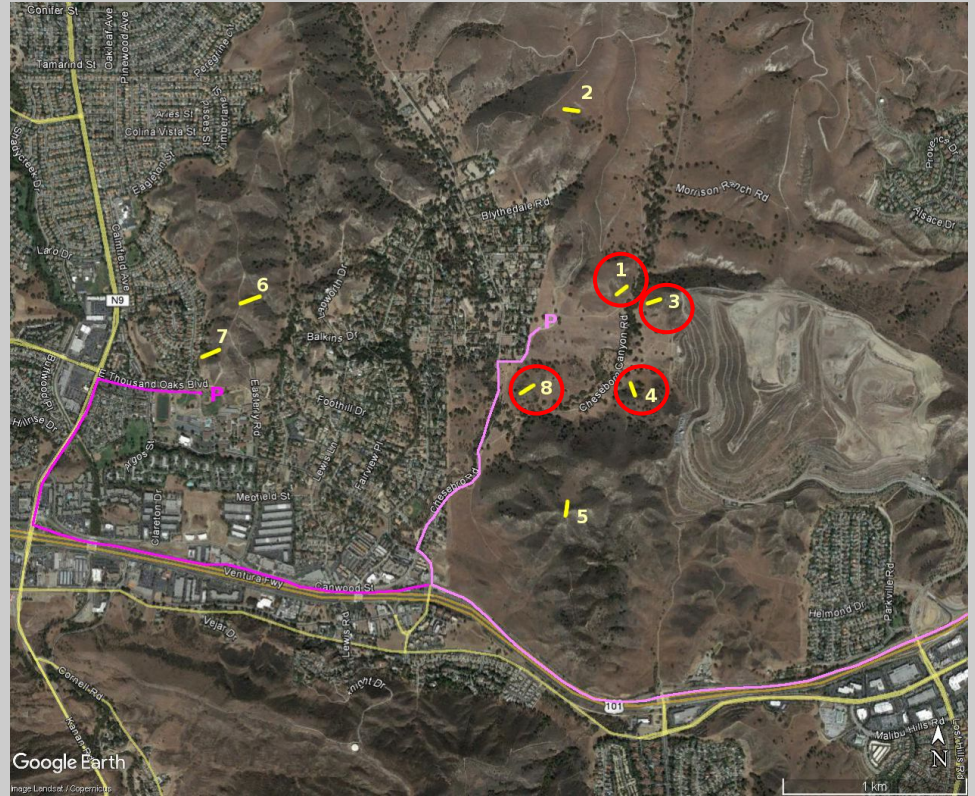 - Compare to our data

Source: https://abc7.com/fire-map-woolsey-fire-headed-to-the-ocean/4654421/

Source: https://www.nps.gov/samo/planyourvisit/cheeseboropalocomado.htm

Methods

- Visited 4 of Eckardt's 8 locations
  - T1,T3,T4, and T8
- 8 continuous 1x1 meter quadrats per transect
- Documented species richness and percent coverage
- Identified native vs. Non-native

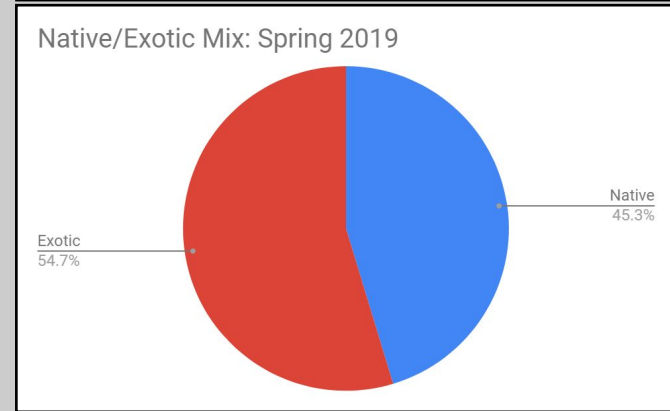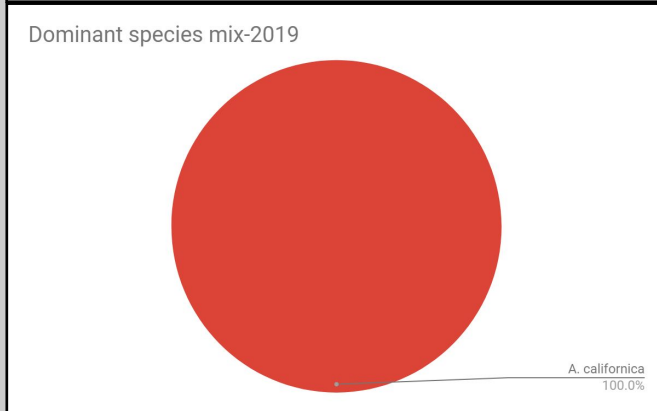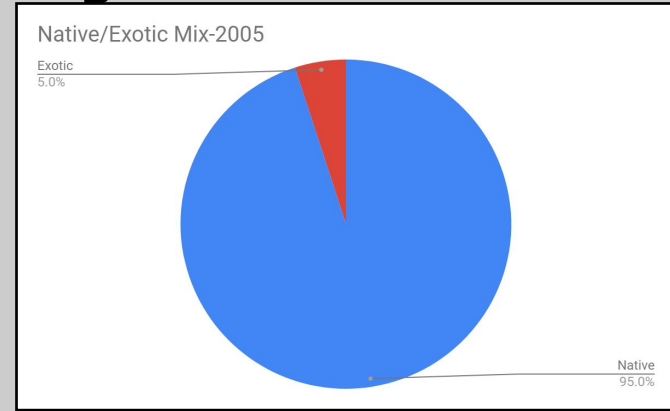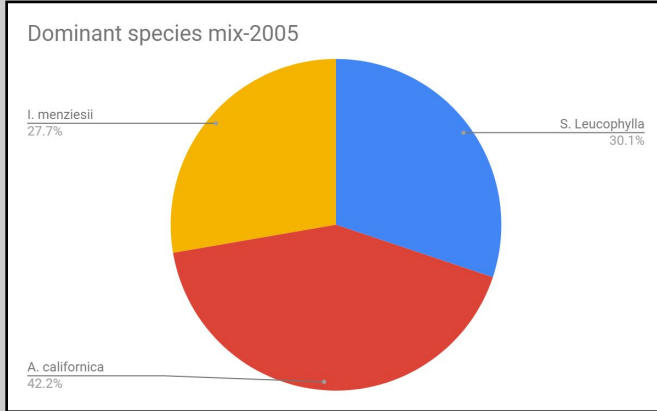Source:web.csulb.edu/~rodrigue/geog330/maps/CheseboroCanyon2016.png

Hypothesis

- Working: There is a significant difference in plant communities prior to and following the fire in Fall of 2018.
- Null: There is no significant difference in the make up of plant communities between the pre-fire and post-fire succession.

- Working: There is a significant difference in plant communities during and after the drought.
- Null: There is no significant difference in plant communities during and and after the drought.

Results - Post Fire: Comparing 2019 and 2005

Alpha	0.10
X2 Calc	11.952
X2 Critical	4.605
Probability Value	0.003
Effect size	0.358
Corrected Power	0.935

Results – Post Fire: Comparing 2019 and 2005

Dominant species mix-2005
- S. Leucophylla 30.1%
- A. californica 42.2%
- I. menziesii 27.7%

Native/Exotic Mix-2005
- Native 95.0%
- Exotic 5.0%

Dominant species mix-2019
- A. californica 100.0%

Native/Exotic Mix: Spring 2019
- Native 45.3%
- Exotic 54.7%

Results – Post Drought: 2017/18 – Present

X2 Calc	95.058
X2 Critical	9.236
Alpha	0.1
Probability Value	0.000
Effect Size (Cramer's V)	0.469
Corrected Power	0.999

Results - Post Drought: 2017/18 - Present

Native/Exotic Mix: Spring 2017-Spring 2018
- Exotic 29.6%
- Native 70.4%

Dominant Species Mix-2017-2018
- S. leucophylla 23.7%
- A. fatua 18.2%
- A. californica 7.6%
- E. glaucus 20.4%
- E. cinereum 14.0%
- M. imperfecta 16.1%

Native/Exotic Mix: Spring 2019
- Exotic 54.7%
- Native 45.3%

Dominant Species Mix-2019
- A. californica 100.0%
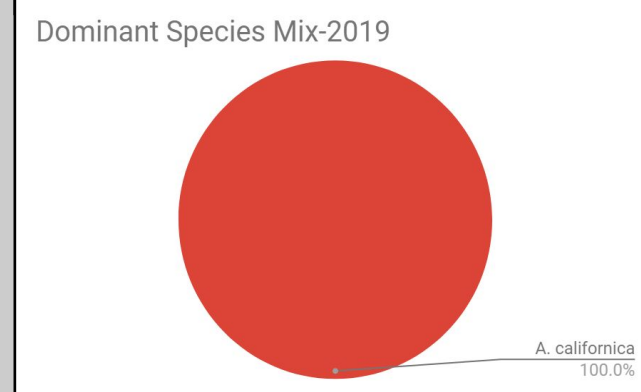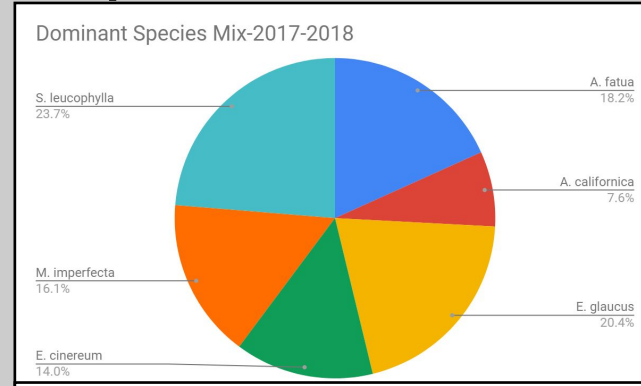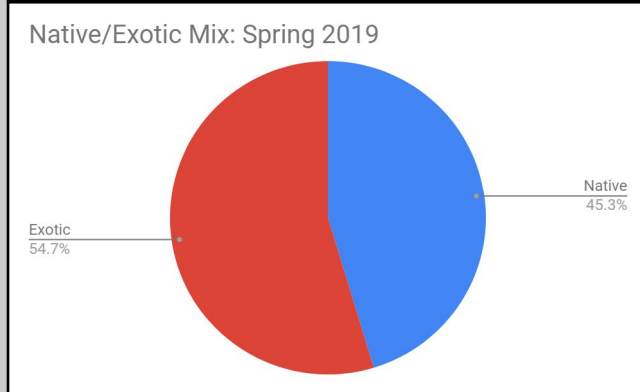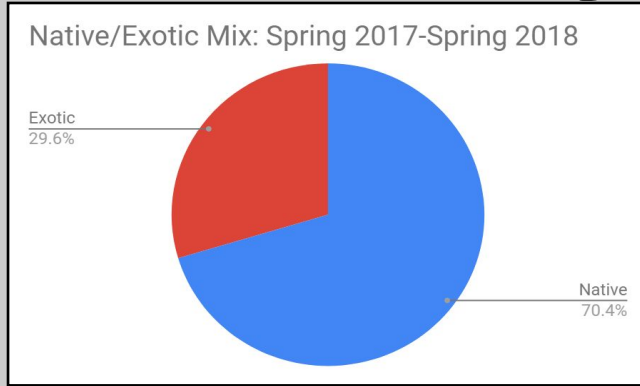
Discussion

➤ Hypothesis 1: Reject the null at 90% confidence level
  ○ Post-fire survey: lower coverage of native shrubs, dominated by grasses
  ○ Natives seen were largely small seedlings
➤ Hypothesis 2: Reject the null at 90% confidence level
  ○ Post-drought survey: larger proportion of exotic species
  ○ Likely due to wet season that ended the drought
➤ Combination of fire followed by heavy rains:
  ○ Made room for exotic annual growth
➤ Different methods of data collection pose as potential source of bias
  ○ Quadratting versus transecting

Conclusion

➢ Interaction of influences on CSS coverage is unclear
  ○ Which factor had greater effect on increased proportion of exotics?
➢ Natives species largely observed as seedlings
  ○ May establish successful stands after exotic annuals finish life cycle
➢ Limitations exist due to exploratory nature of this survey
  ○ Valuable contribution of data to the body of research.
➢ Recommendation for further surveys
  ○ Monitor during both times of year
  ○ Complete transects at all 8 sites
  ○ Consistency in data collection methods

Thank You