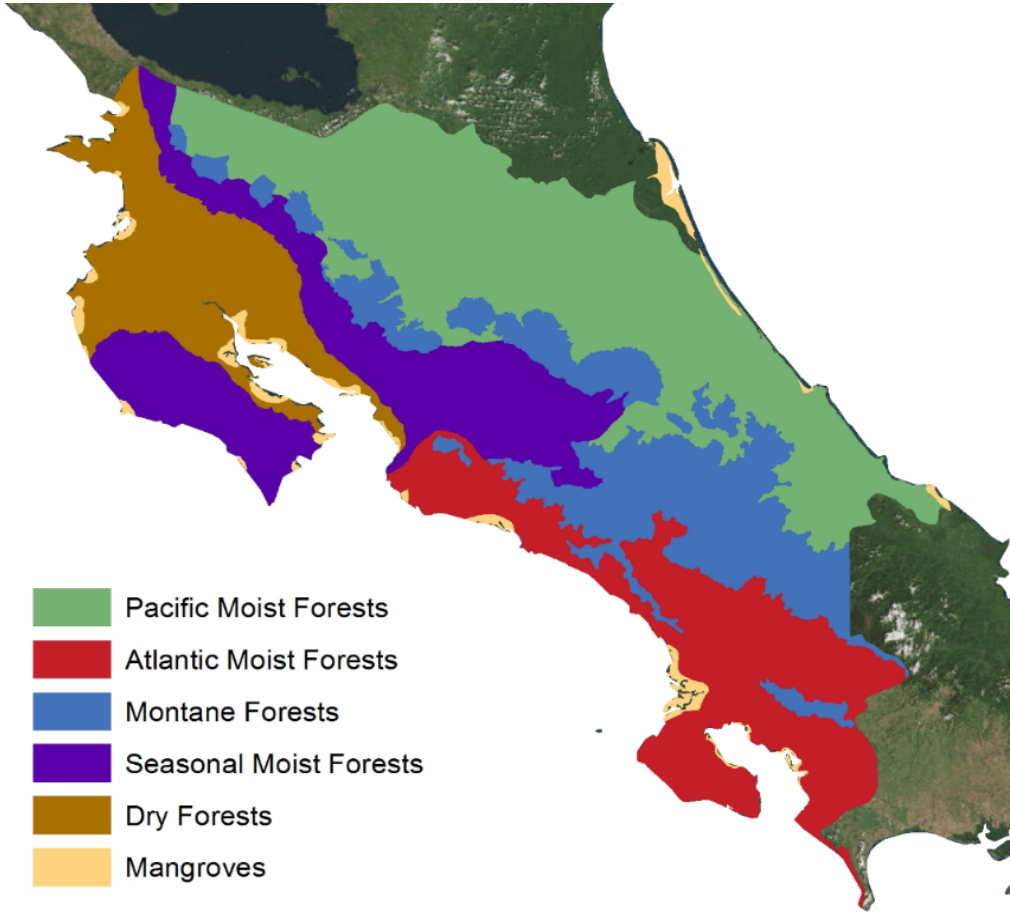
Analyzing Advantages of ECOSTRESS as a Tool for Drought Detection and Water Management Practices

NASA DEVELOP National Program

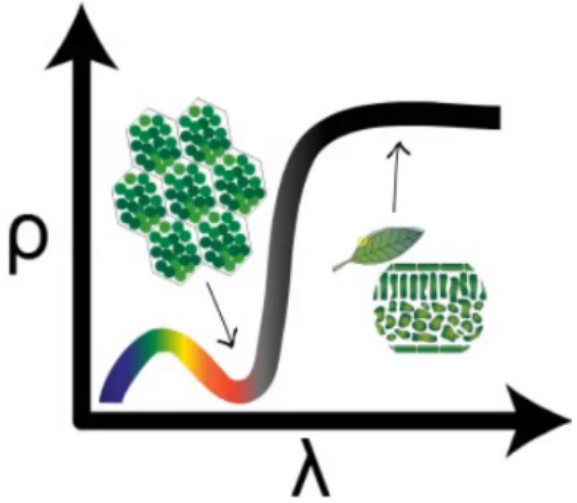
Background

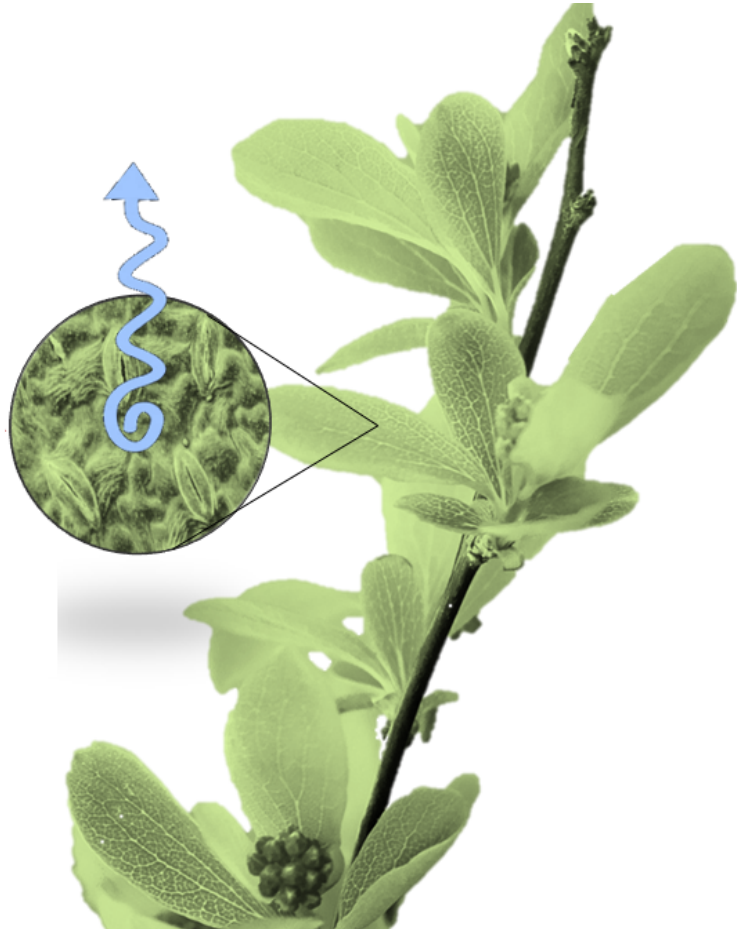
- Project Partner: EARTH University
- 2013 Drought in Costa Rica
- 2015 El Niño



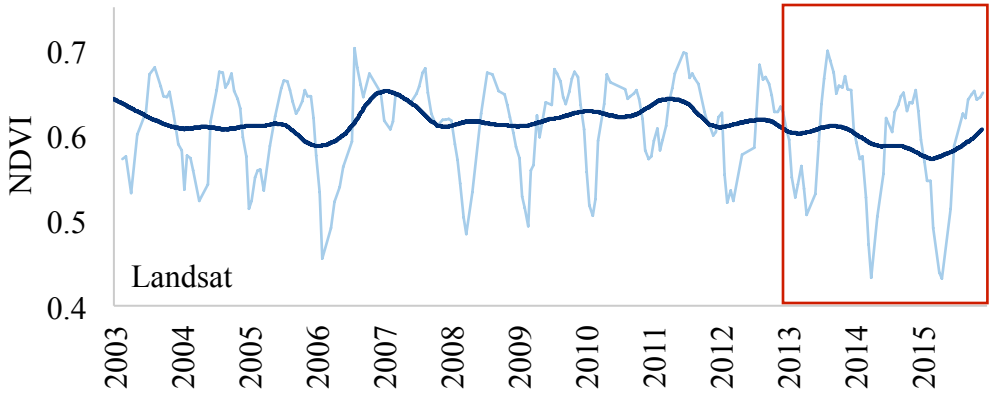
Overview of methods

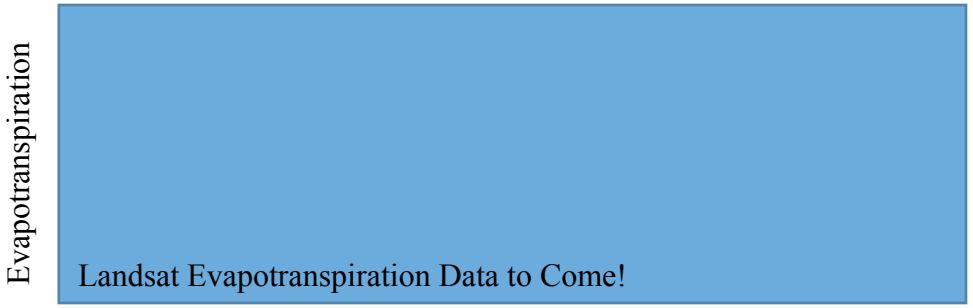
- How will ECOSTRESS improve the current methods used for the analysis of vegetative stress?
  - TWO sources of imagery: **Landsat** and **MODIS**
  - TWO methods of detection:
    NDVI and **Evapotranspiration**

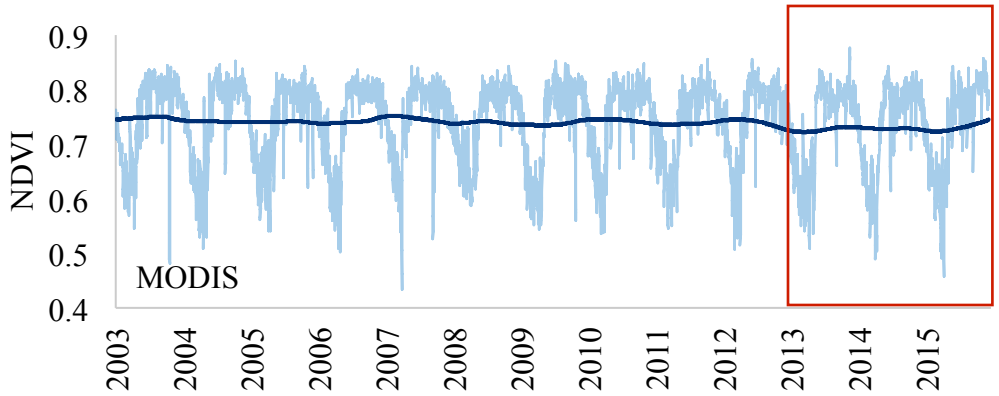


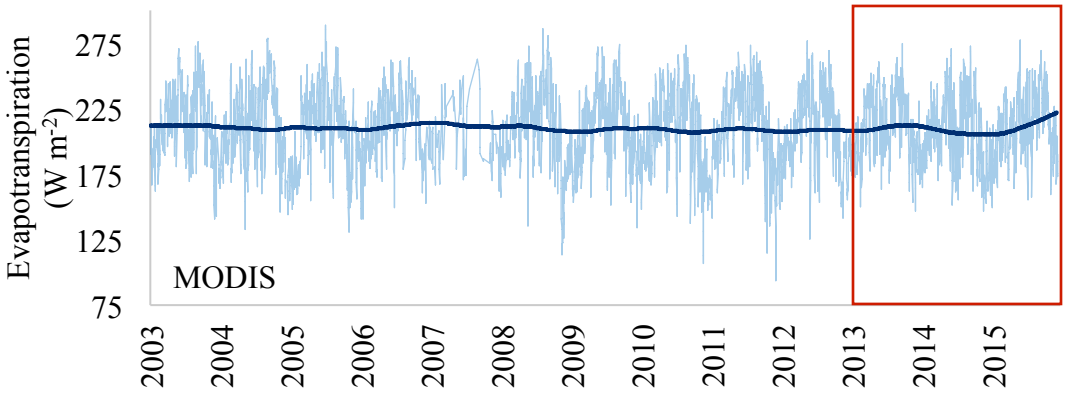


Temporal Results







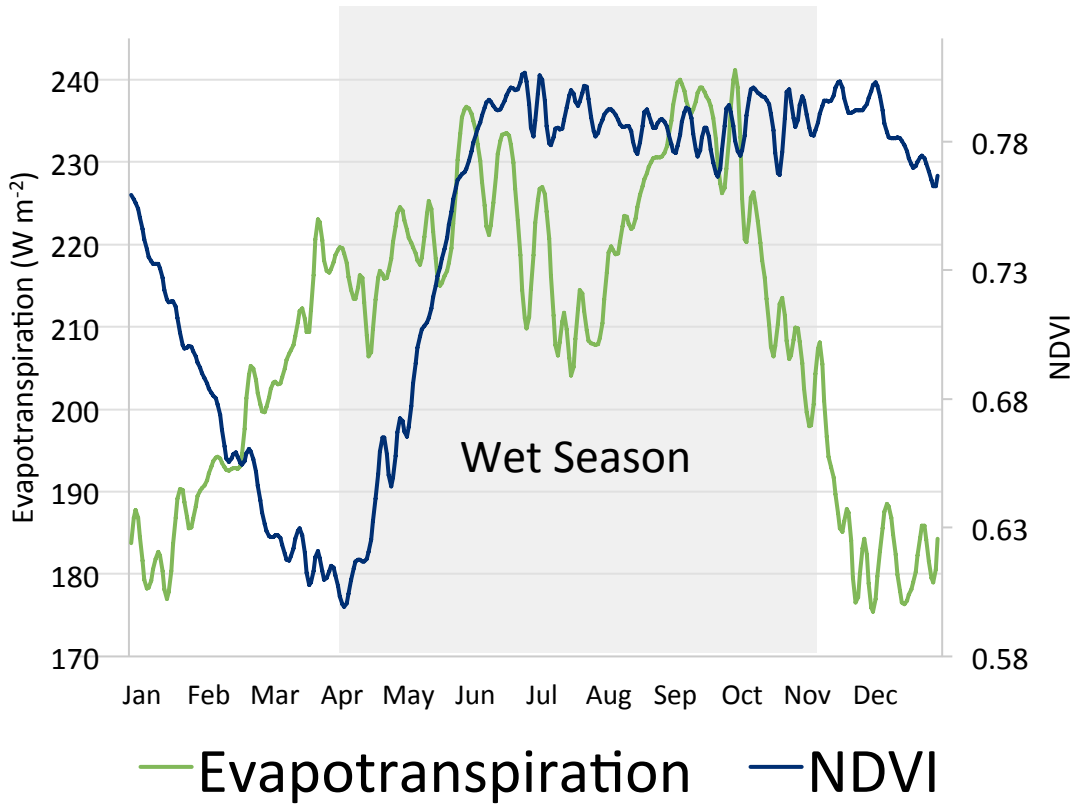


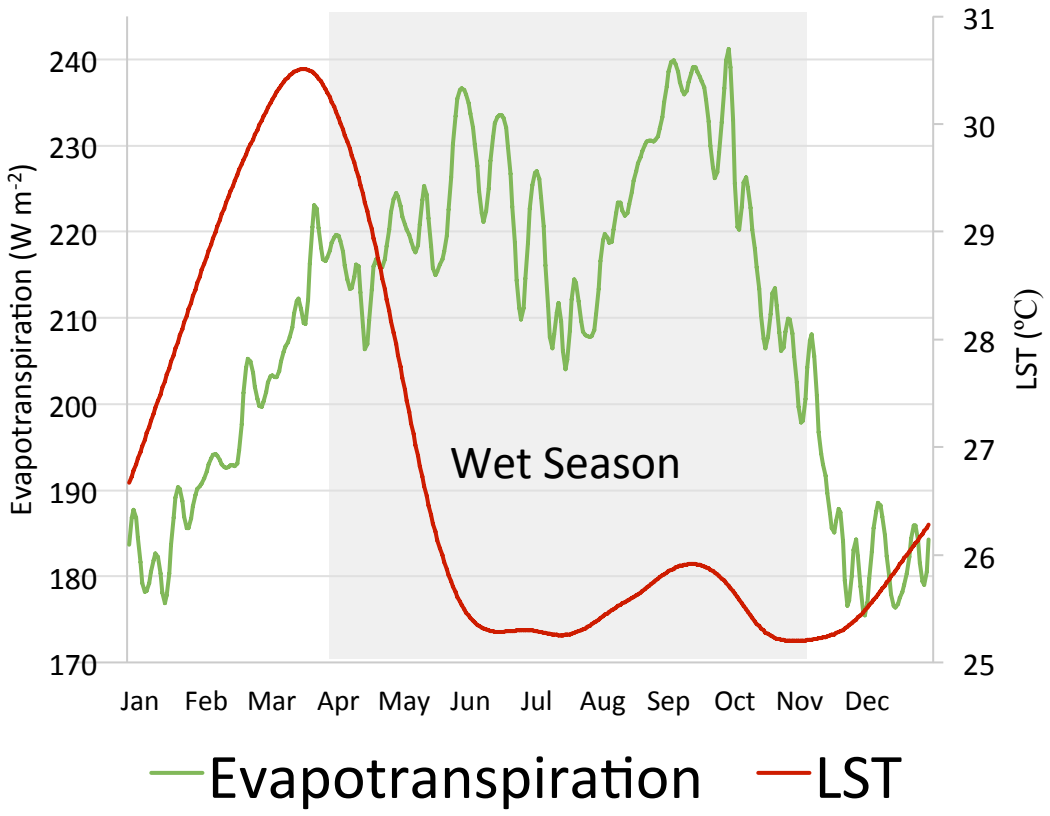
Trend (3-day average)

Trend (seasonally corrected)

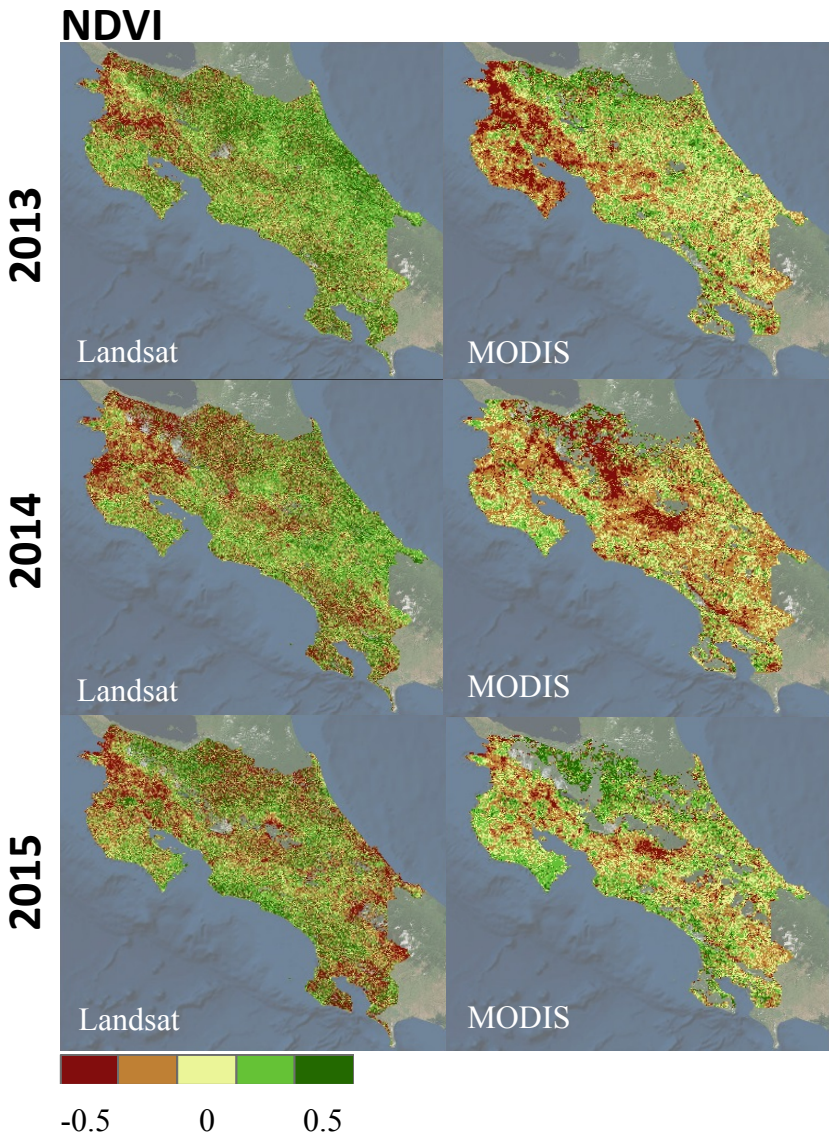
Drought years: 2013-2015

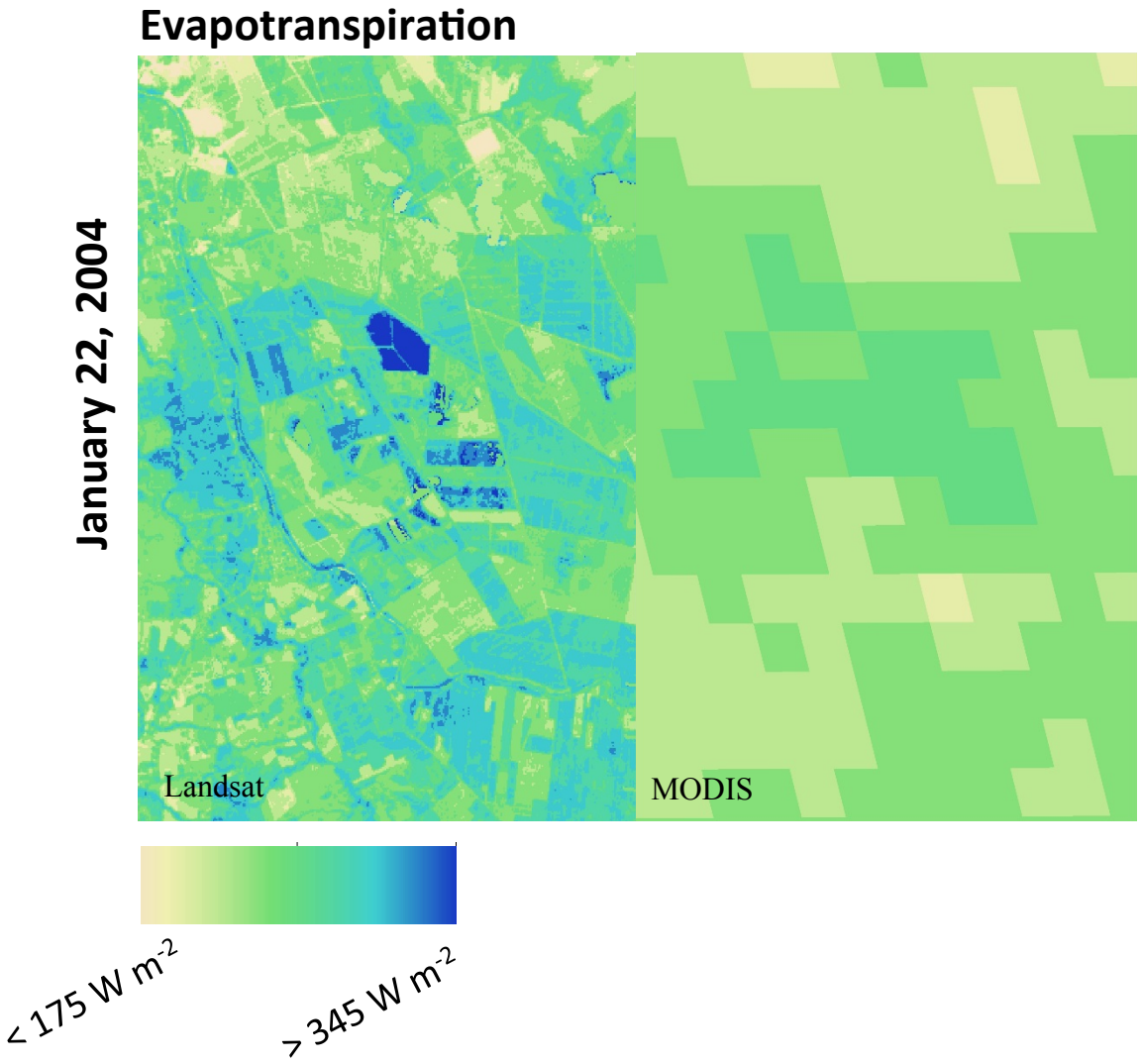
Daily Aggregation of ET, NDVI, LST: 2003-2015 for MODIS





Spatial Results: Landsat vs. MODIS





Conclusions so far…

- ET derived from the PT-JPL model directly mirrors the seasonal patterns of Costa Rica
- NDVI exhibits a 2 month lag, and misses the dry period from July-August entirely
- MODIS allows us to track vegetation stress in near-real time, but using Landsat allows us to track exactly where vegetation stress is occurring at the farm scale
- MORE results to come!

Acknowledgements

- Thanks to the whole ECOSTRESS Science Team for creating a product we desperately need!

- Thanks to Greg Halverson for PT-JPL MODIS & Landsat pipeline.

- Special thanks to Dr. Josh Fisher and Dr. Christine Lee for their guidance and support throughout the project.