Evaluation criteria - don’t forget to

A. Scientific Question (1 - 10 points)
- Does the scientific question advance our understanding of critical environmental or biological phenomena?
- Is it clearly formulated?

B. Creativity and Innovation (1 - 10 points)
- Does the proposal recycle existing approaches, or is it groundbreaking?

C. Transdisciplinary, Interdisciplinary, and/or Cross-sector Collaboration (1 - 5 points)
- Does the proposal integrate disciplines and/or sectors?
- Is the integration meaningful and effective?

D. Use of the Data Cube and Cyberinfrastructure (1 - 5 points)
- Does the proposal rely on a single data layer, or does it integrate multiple data sets?
- Does it lever high-level computational resources?

E. Implementation of artificial intelligence (AI) (1 - 10 points)
- Does the proposal incorporate AI?
- Does the proposal explain the advantages, limitations, and biases of the model of choice?

F. Technical execution of Preliminary Analyses (1 - 10 points)
- Did the team conduct informative and creative preliminary analyses?
- Did they produce compelling figures in support of their proposal?

G. Potential Impact and Engagement (1 - 5 points)
- Does the proposal demonstrate potential for broad-reaching impact/provide actionable solutions to a current problem?
- Does the proposal include a comprehensive dissemination plan?

H. Bonus Points (0 - 5 points)

Bonus points for any exceptional, unexpected, or outstanding aspects of the project that do no fit into the above categories

Team B

Eligio Maure (Navagis, UTC +9)

1. Intro: Elígio Maúre originally from Maputo (Mozambique) currently in Japan.
2. Team Contribution: Proficient with Python, particularly in processing/analysis of remote sensing data. Have applied remote sensing data to coastal eutrophication monitoring in Google Earth Engine (GEE) App

Choose 2

1. Background: Ph.D environmental studies (Oceanography), Nagoya University
2. Project Experience: Coastal eutrophication monitoring with satellite imagery
3. Skill Proficiency Self-Assessment: Remote Sensing, Python, GEE
4. Learning Interests: Use of AI/ML in environmental data science

Rieke Schäfer (time: UTC+1)

1. PhD candidate at PTB and GEOMAR in Germany, mostly around seawater pH and metrology in oceanography
2. I've been working a little bit with data in R and Python but mostly smaller datasets; I'm volunteering for Climatematch but not in the curriculum; I have some knowledge about oceanography and I have worked with ornithologists in the past, so I know some things about birds

4. Interest in environmental issues: Due to my work, I'm mostly familiar with ocean acidification

6. Team role preference: Probably researcher (literature search, do we something similar in our data, …) + making nice figures

Lise St. Denis (CIRES, Earth Lab)

1. Intro: I am a research scientist in Earth Lab. My background is in art, CS and crisis informatics. I work on tools and techniques for mining observations from the ground during disasters (e.g. social media and incident reporting). I've worked extensively with incident management teams in the us, primarily wildfire, currently work with industry partner and USFS.

2. I am proficient in python, data wrangling/plotting, and some deep learning skills as well.
3. I'd like to improve my proficiency with geospatial data.
4. I'm happy to play whatever role makes sense on the team.

Chandra Earl (NEON Biorepository)

1. Hi all, I'm Chandra and currently based in Honolulu, HI. I'm primarily a biodiversity data scientist and work with biological data in a big way, from analyses to data management. BS in Biotechnology/Bioinformatics, PhD in Genetics and Genomics from the University of Florida.
2. I'm familiar with biological big data (which uses environmental data tangentially) and with the ways it is used in AI/machine learning. I'm also fluent in Python/R and I know the biodiversity/genetic repos (ie GBIF, BOLD, GenBank, OBIS) like the back of my hand. I'm also familiar with general modelling (regression, CNNs, etc)

Choose 2

1. **Project Experience** - I've got various research projects right now across the biological realm: 1. Modelling chirality across mollusc species 2. Comparative evolution of moth eye spots and owl eyes 3. Matrix population models of captively reared snails 4. Gene expression analyses of diurnality in moths 5. Environmental niche characterization of a native Hawaiian snail species.
2. **Learning Interests** - While I use env data in some ways (mostly as predictors for species ranges), I don't really have a background in env science or ecology and don't know what kinds of questions are being asked or what data is available or how that data is used. I've recently started a job with the NEON biorepository as their data manager/developer so I'm interested in how people are using both NEON ecological and biodiversity data. Hope to be able to think of ways to use both here!

Jamal Sheriff

1. Personal Introduction
    a. Hi! I'm Jamal Sheriff. I am a PhD student at the Univ. of Illinois - Chicago. I'm a microbial ecologist studying the microbial dynamics of biological soil crusts within temperate biomes, particularly coastal dunes. As my graduation date has slowly started approaching, I find myself interested in pursuing a career in data science following my time at UIC. I have little experience with handling env. Data, machine learning, and AI, and I thought this hackathon would be a great way to get an introduction.
2. Team Contribution
    a. Most of what I've learned here over the course of the past few weeks have been new to me, but I would like to consider myself very much above-average with my R coding skills. I think that would be my best contribution to the project.
3. Specific Skills
    a. Statistics, Command Line, and R
4. Interest in Environmental Issues
    a. Effects of climate change on low-income communities; predictive modeling of fire risk for low-income communities

Nate Quarderer (Earth Lab; ESIIL - Team B Mentor; https://nquarder.github.io/)

1. Intro - Nate Quarderer. I'm currently living in Arvada, CO (USA). I spent most of my time prior to coming to CO in Iowa where I grew up and went to college. I studied physics (BS), civil/env engineering (MS), teaching/learning (PhD) at the University of Iowa. I spent 10 yrs teaching math/science at Northeast Iowa Community College before coming to CU Boulder for my postdoc. I'm currently Director of Education at Earth Lab and ESIIL
2. Contribution - Team mentor; I'm here to help make sure that the team dynamic is healthy and that everyone is able to contribute in a meaningful way; I won't be a ton of help when it comes to the data science piece but we have lots of others who will be able to contribute

Choose 2

1. Background - See above, Intro.
2. Skills - Python (4/10); R (5/10); GitHub (4/10)

Problem statement - why does your research matter?

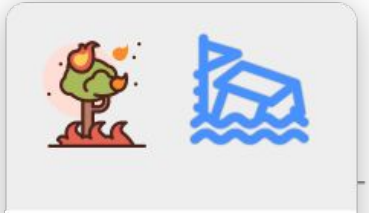
Image source: https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts (Nov 17th 2023)

Image source: https://www.noaa.gov/education/resource-collections/climate/climate-change-impacts (Nov 17th 2023)

What’s your research question?

Why is your research question important? How is it innovative? How does it advance our understanding of environmental processes? In other words, what’s the intellectual merit of your proposal?

Research Question



Natural Hazards

How do natural hazards (e.g., wildfire/flood) affect measures of community, cultural and biological diversity?

Predictors	Disaster characteristics, before disaster measures of community, cultural, biological, environmental measures
Response	After disaster measurements of community, cultural, biological, environmental diversity

Methods

Are you proposing a new approach?

What data sets are you planning to use? What are their characteristics and structure (tabular, gridded products, observations, modeled data)?

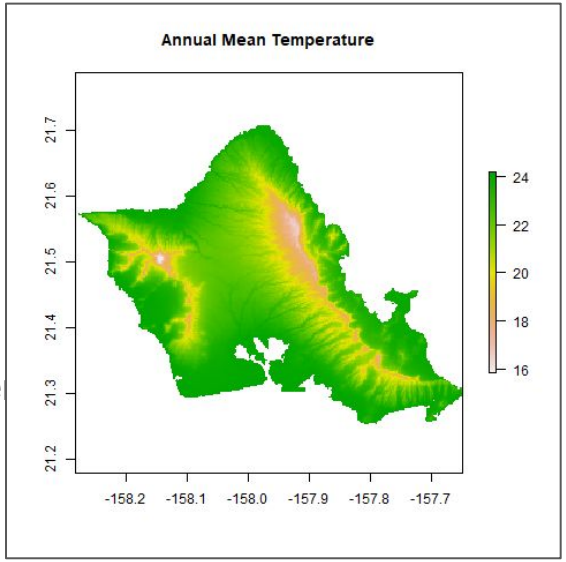
What are the strengths and weaknesses of the data sets? Any biases?

Any figures you'd like to include?

What AI algorithm do you propose to use? What's the AI problem that you want to solve (cluster, classify, predict)? What's the AI task (supervised, unsupervised learning)? What advantages does it have over other approaches? Biases or limitations?

Would you like to share a workflow?

Data Sets/Metrics



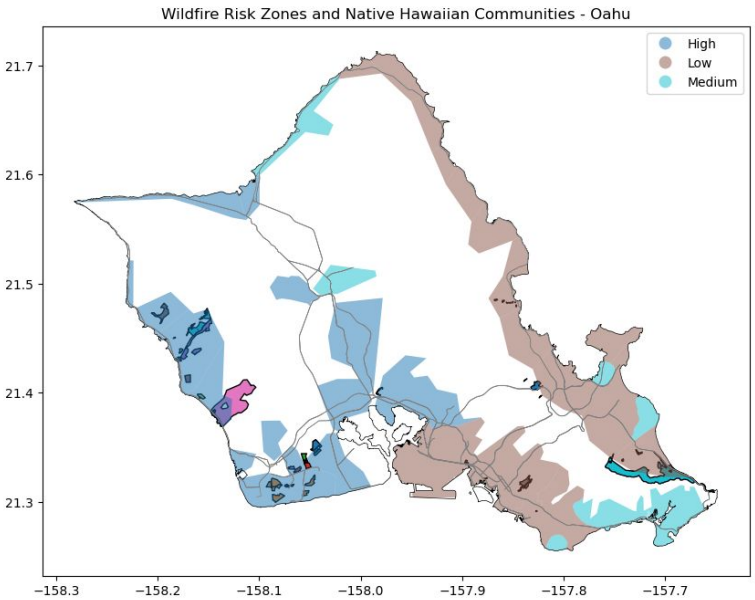
- Biodiversity Metrics (before/after) [GEOBON]
  - Alpha biodiversity
  - Habitat type
  - Indicator species ranges
- Community Metrics (before/after) [CDC social vulnerability index, Ope (OSM)]
  - Social vulnerabilities metrics
  - Infrastructure and resources
- Cultural Metrics (before/after) [CDC SVI (global equivalents), OSM]
  - % rebuilt
  - Changes in elements of SVI
- Environmental Metrics (before/after) [MODIS, HydroSHEDS, CHIRPS, NDVI]
  - Ecological attributes (temp, wind, elevation, precipitation, etc.)
  - Location, Distance to sea, river size, etc.
  - Land cover, urbanisation
- Disaster Metrics [FIRED, incident reporting (e.g. ics209+)
  - Spread rate
  - Acres damaged
  - Structures threatened/damaged/destroyed
  - Injuries & fatalities
  - duration

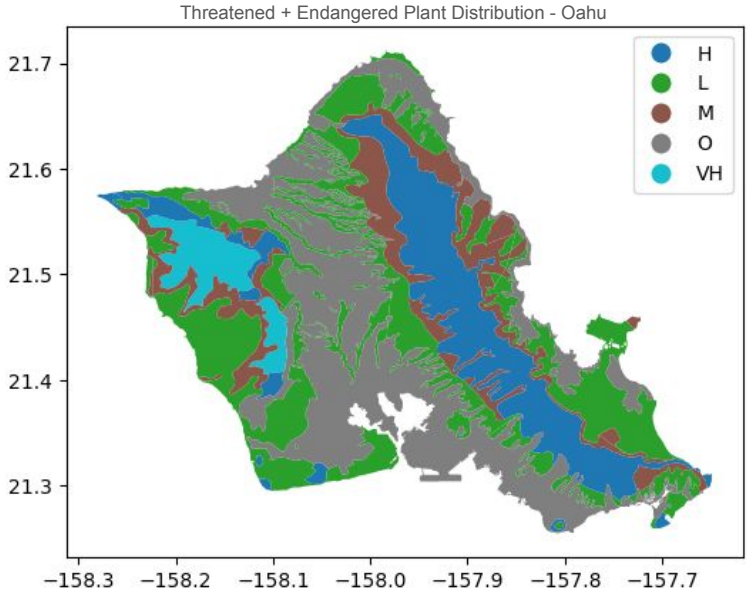
Methods

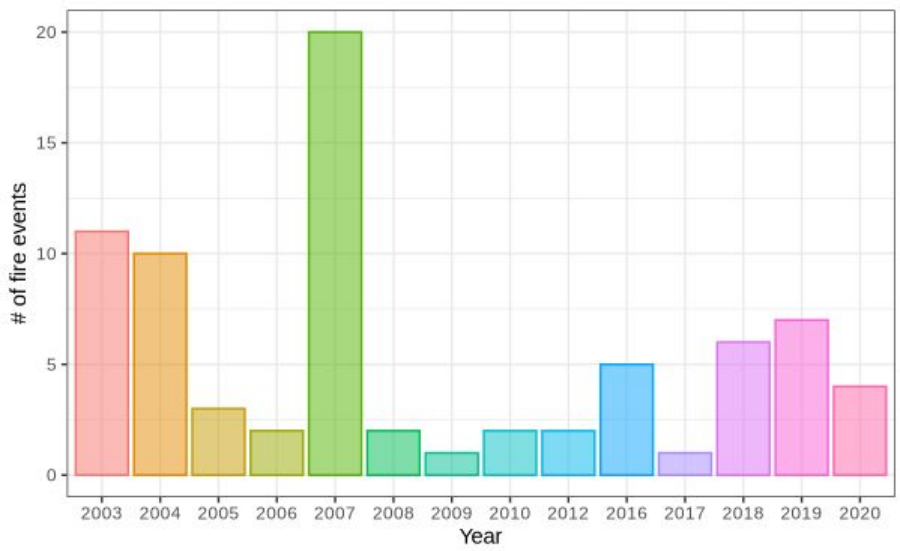
- Dataset reduction on a sample sites (e.g. feature reduction, correlation, PCA)
- Modelling
  1. Regression
     - Ensemble methods: bagging, boosting & stacking
     - Can get predictor coefficients/importance
  2. CNNs
     - Good for prediction, hard to get feature importance
- Look at different communities/spatial areas across high/low predictors
  - Oahu, HI (fire from ics209+ where homes threatened)
  - Superior, CO - Marshall Fire
  - Flood sites from Europe, Mozambique
  - Wildfire greece

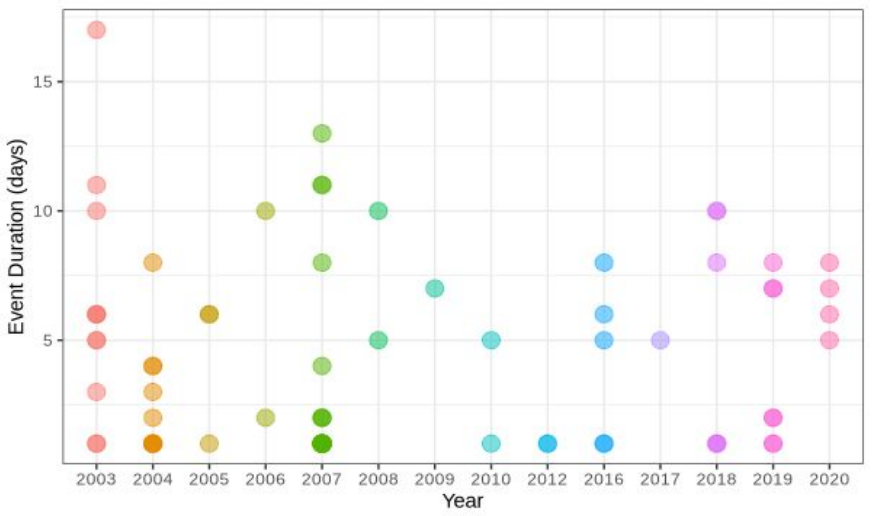
What are you hoping to achieve? Can your project provide actionable solutions to a problem? What are the broader impacts of your project? Does the project involve community engagement? If so, how?

Looking at Wildfire Risk Zones and proximity to local Indigenous communities; distribution of threatened & endangered plants (Oahu, HI)

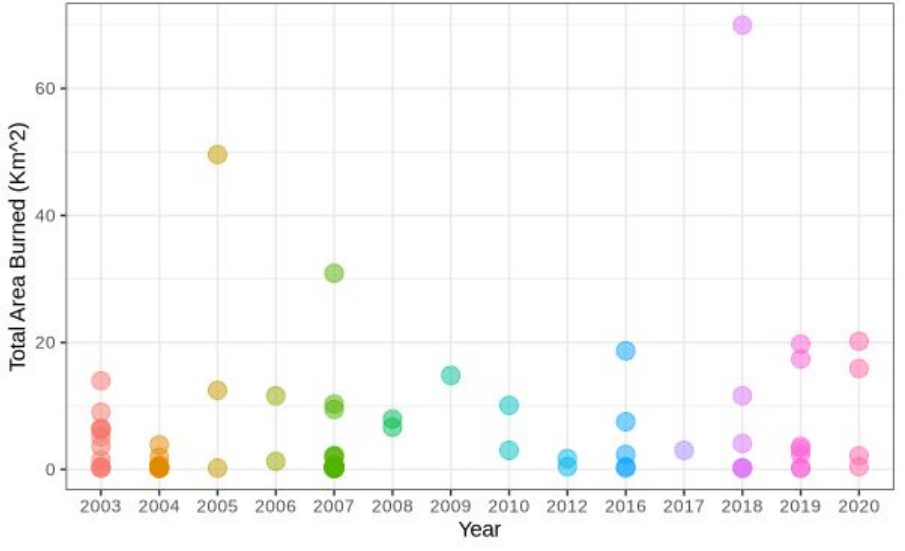


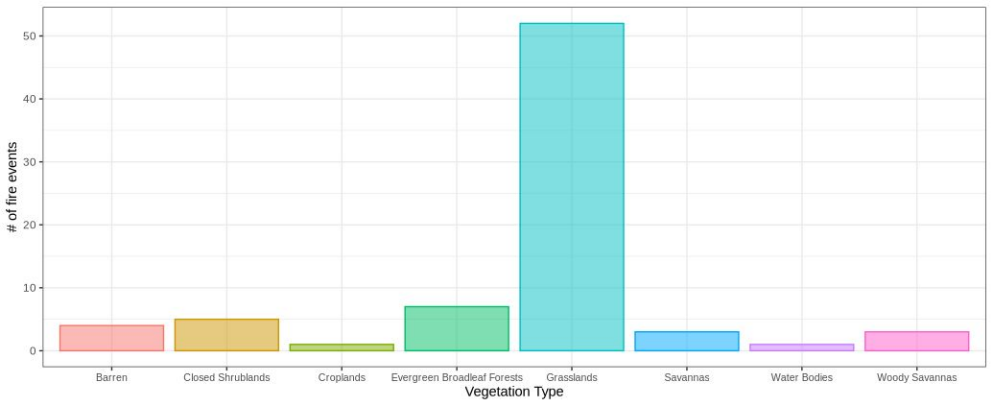


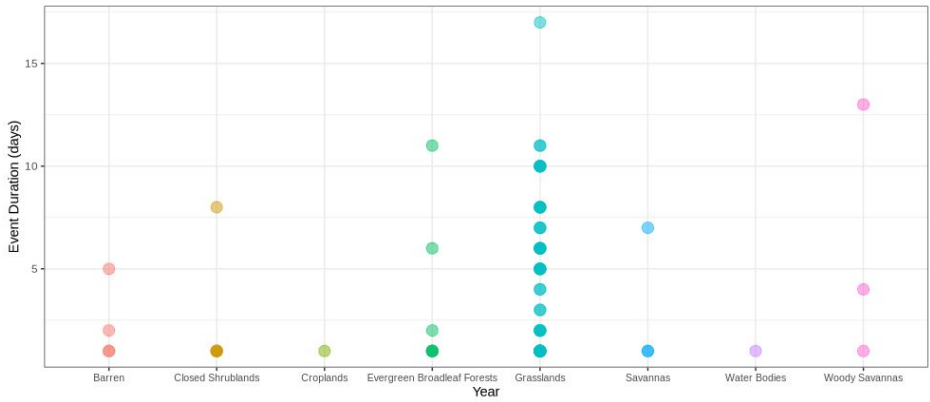




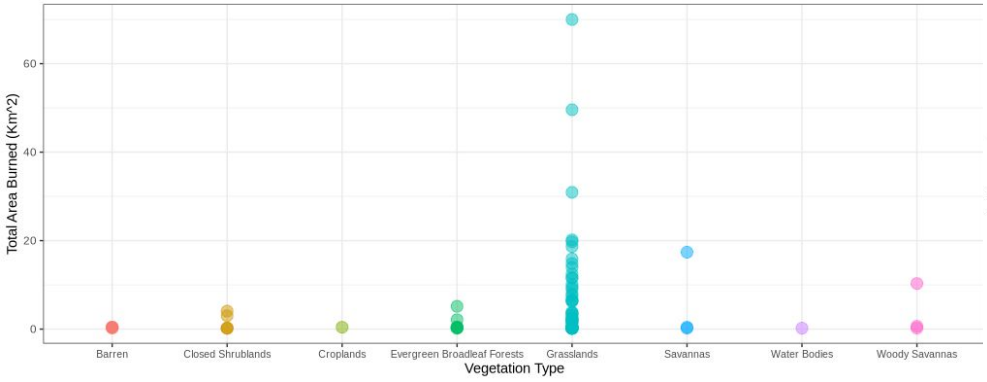
FIRED Data Exploration

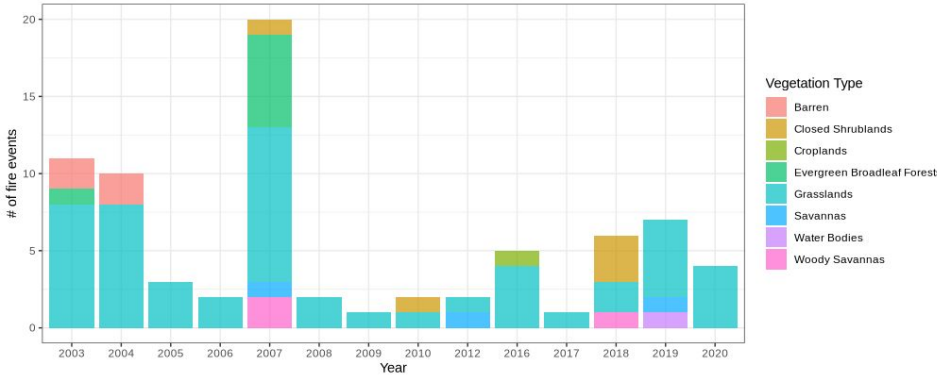






FIRED Data Exploration





Preliminary analyses/proof of concept

Is there something outstanding about your project that you’d like to share?