Thermalwatch

Capstone Presentation

SFP

Team Satellite Fire Patrol

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Our Clients

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Problem Statement

- Climate change's effects are felt throughout the world
  - Wildfires
  - Coral Bleaching
  - Tropical Forest Canopies

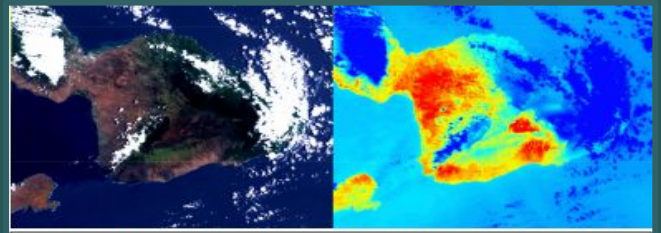
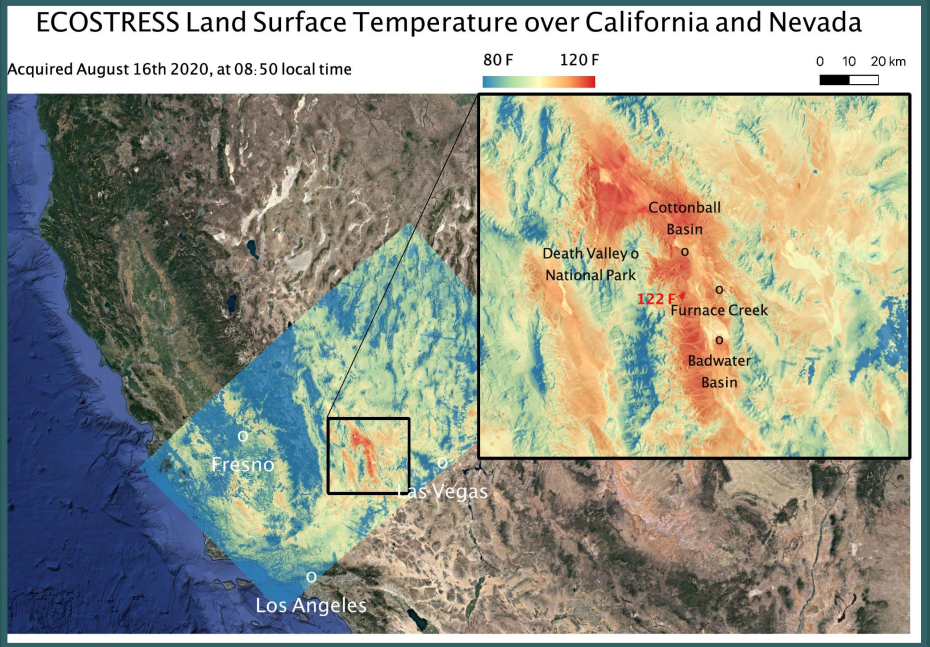


Figure 2: Landsat 8 satellite images of Maui, Hawaii from August 7, 2023, the day before devastating wildfires broke out across the island. *Left:* RGB image. *Right:* Corresponding thermal infrared image shows hot conditions in the grasslands on the western side of the island, where fires broke out the following day.

Problem Statement

- Satellites
  - Ecostress
  - Sentinel-3 SLSTR
  - ASTER
  - MODIS

- Lack of easy access to temperature data



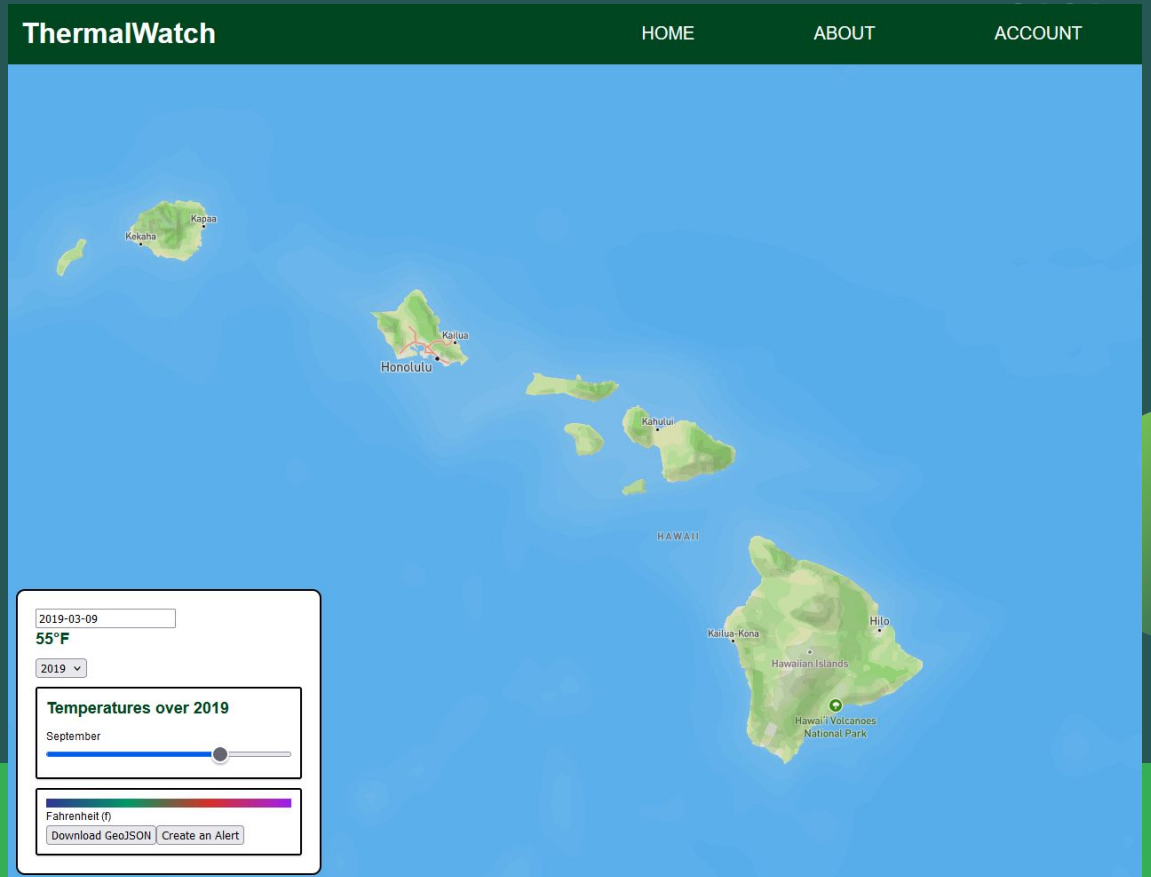
Solution Overview

NAU's Monsoon and Data Portal

- Nasa Ecostress
- Alert System

Technologies

- Nasa Ecostress
- NAU Monsoon
- Vue and Mapbox

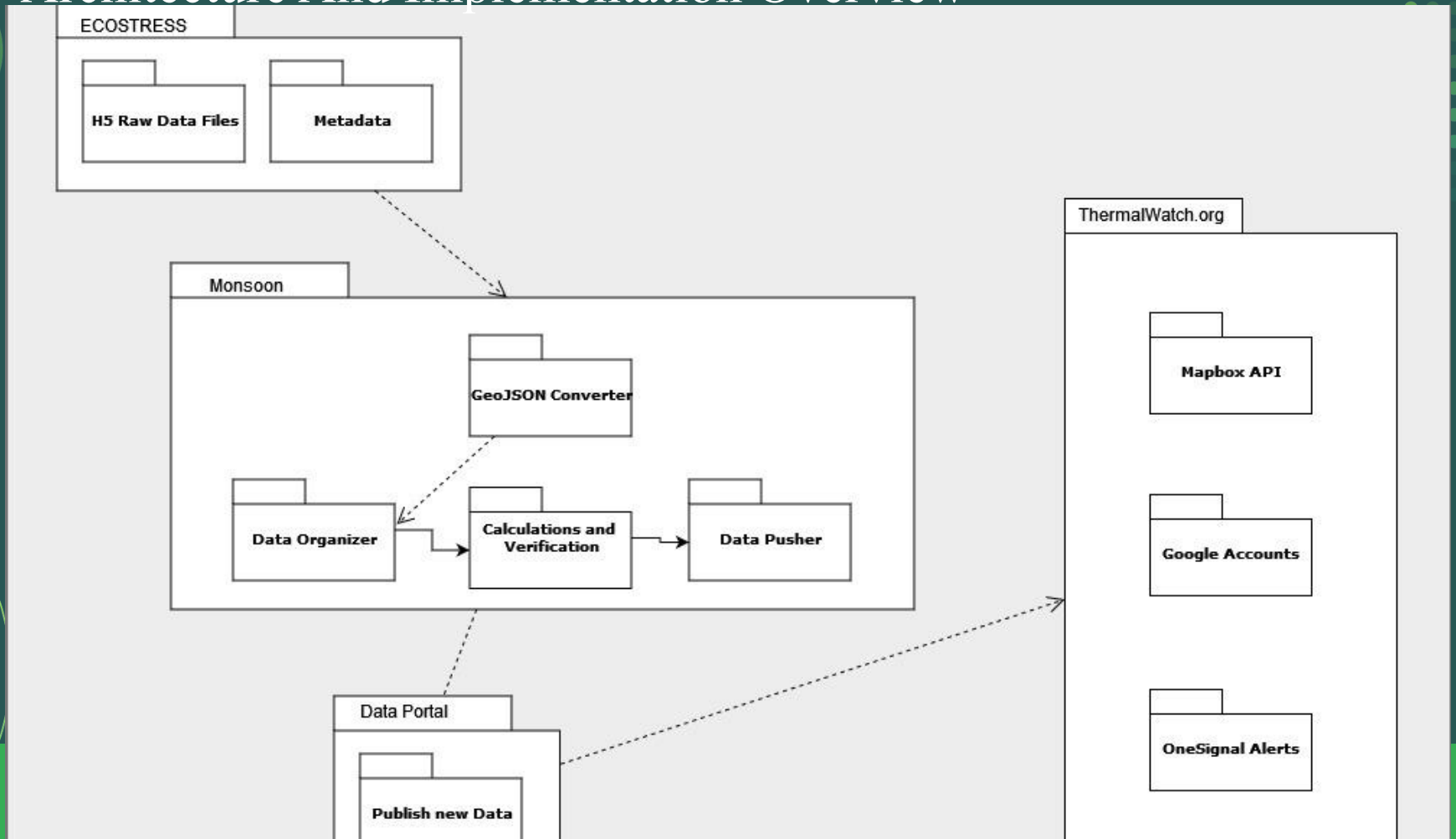


Demo Review

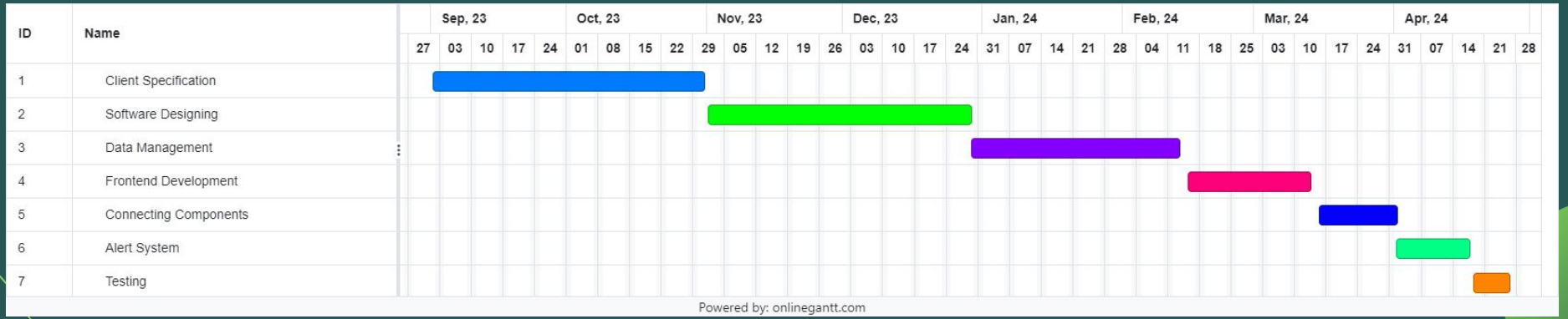
Requirements

- Overlay and store most recent temperature data on Hawaii
- Overlay and store historical temperature data on Hawaii
- Allow users to set custom areas to monitor with custom thresholds
- Allow users to download temperature data files

Architecture And Implementation Overview



Schedule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27 03 10 17 24 01 08 15 22 29 05 12 19 26 03 10 17 24 31 07 14 21 28 04 11 18 25 03 10 17 24 31 07 14 21 28
1 Client Specification
2 Software Designing
3 Data Management
4 Frontend Development
5 Connecting Components
6 Alert System
7 Testing
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Challenges and Resolutions

Challenges

- Mapbox Storage Limitations
- Monsoon Not allowing Communication
- Cloud Masking
- Averages of Data
- General Quality Control

Resolutions

- Land Masking
- Publishing data and creating a backend on AWS
- NASA Ecostress Quality Control

Testing

Unit

- Monsoon Scripts
  - PyTest
- AWS Scraper
  - JEST

Integration

AWS Backend

- Retrieves Data Correctly
- Error Avoidance
- Vue is building correctly

Monsoon

- Proper Publishing and calculations

Usability

Website

- Feedback from clients
- Random User testing

Future Work

- Make the system worldwide
- Data Validation & Control
- Expand historical data beyond 2019

Conclusion

Summary

- Increased temperatures worldwide
- Easier access to data for research

Outcomes

- Improved the speed and access to NASA's Ecostress

Value

- Easier access to thermal data for researchers

Thank you to our clients and others!

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Thank You

Questions?