



# BioSphere

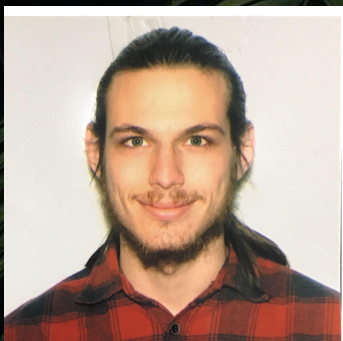
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Project Biomapper  
Sponsored by Christopher Doughty & Jenna Keany



# Team BioSphere

Team Lead



Matthew  
Nemmer

Recorder



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Warman

Release Manager



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Architect



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# Our Sponsors and Mentor



Dr. Christopher Doughty

Sponsor



Jenna Keany

Sponsor

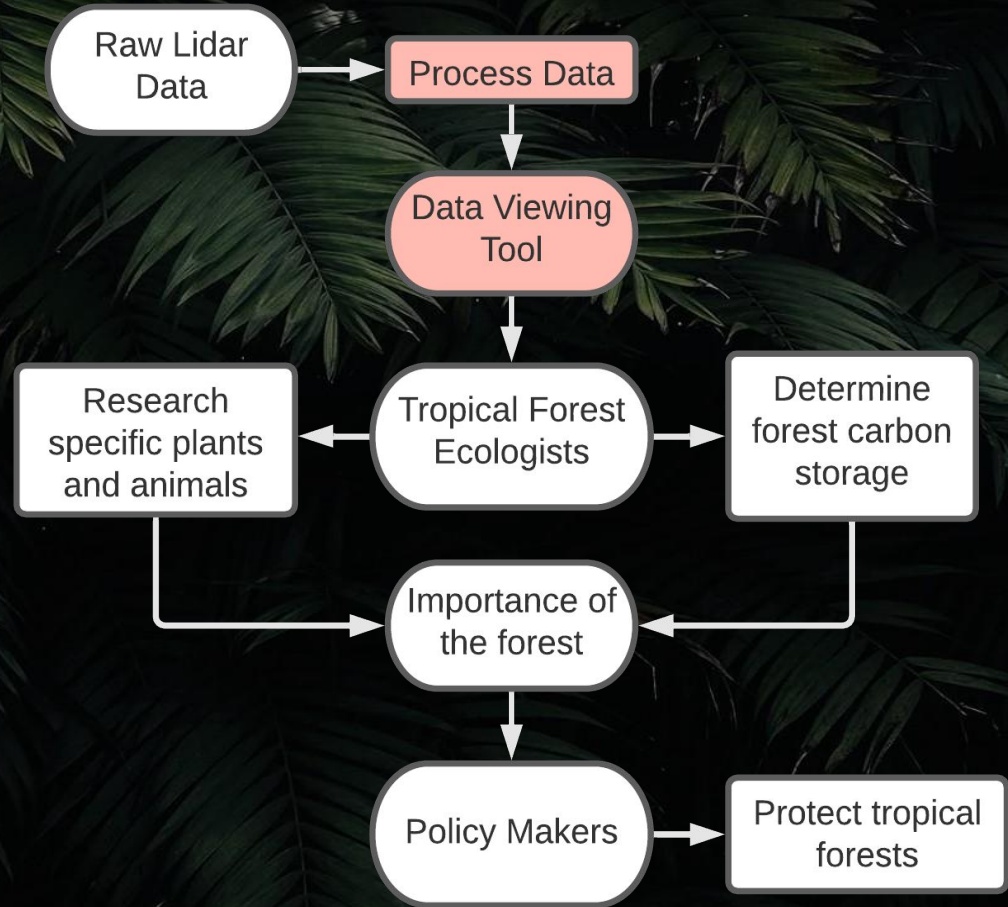


Melissa Rose

Mentor

# Background

- Tropical forests are vital to the global ecosystem
  - Carbon storage
  - Species-rich
- Ecologists use lidar data to make conclusions about forests
- Policy makers use these conclusions to protect forests



# Problem Statement

- GEDI: Satellite Lidar Sensor
  - New (2018) advanced Lidar system
  - Near-global coverage
  - Describes forest structure
    - Elevation
    - Canopy height
    - Above-ground biomass
- GEDI data is complex, difficult to process, and hard to obtain



# Problem Statement

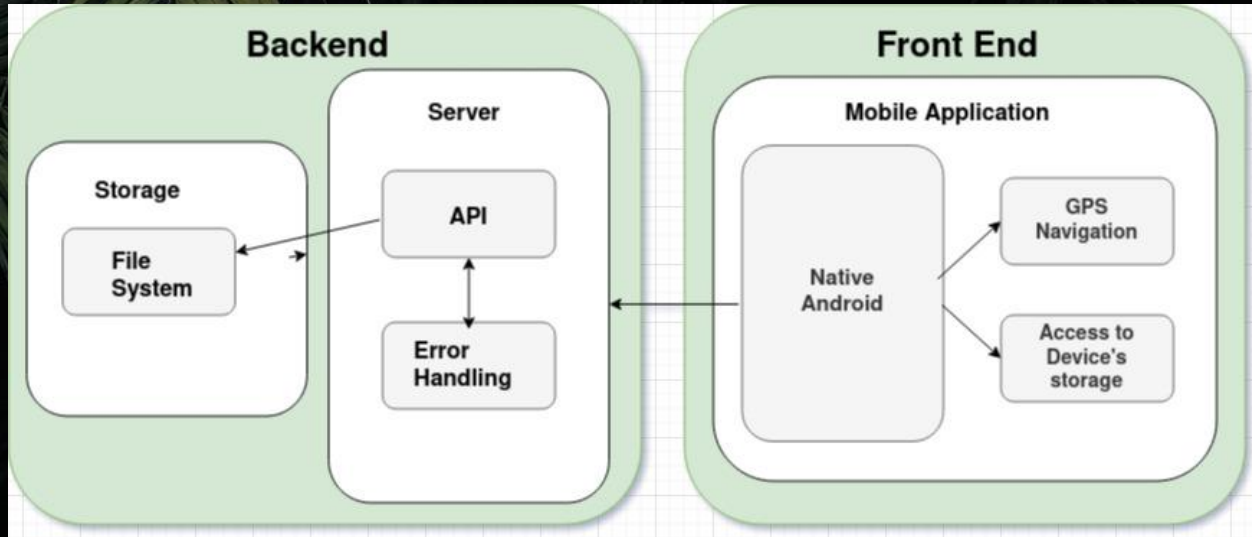
- Ecologists and researchers struggle to obtain and view the GEDI data they need
- Our clients can process GEDI data for us
- Need for a tool to visualize the processed data
  - Google Earth Engine exists, but is inadequate

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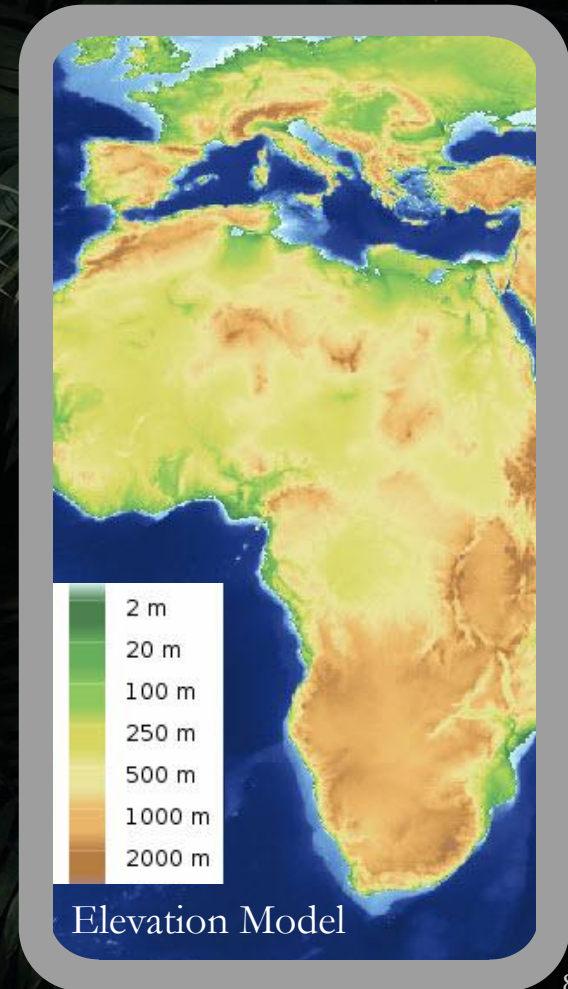
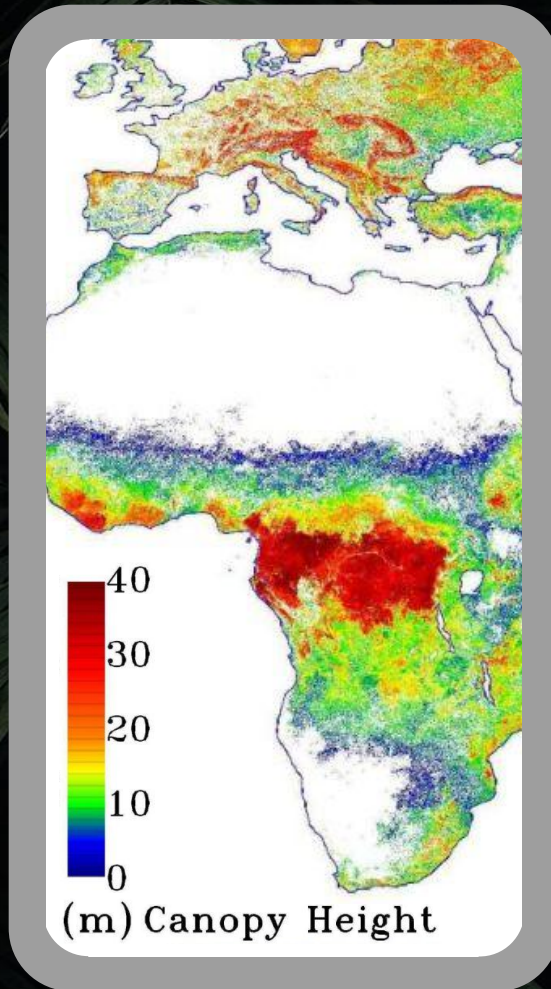
# Solution Overview

- We will create a mobile application
- The app will display a map for a region of the user's choosing
- Ability to download data for offline use



# Solution Overview

How we envision the app might look:





# Project Requirements

## Requirements Acquisition:

- Client meetings
- Researching the field
  - Geospatial Information Systems
  - Tropical Forest Ecologists

## Key Requirements:

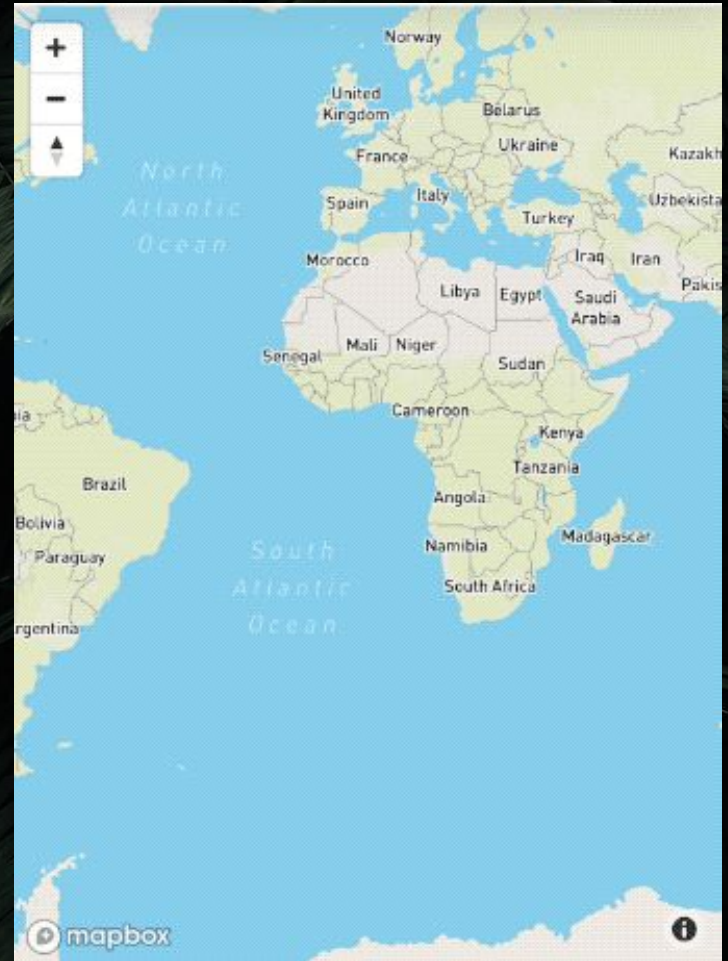
- App will feature tools for its use
- Capable of offline functionality
- Create a backend server
- Initial map-data retrieval
- App will display a navigable map



# Project Requirements

## Displaying a dynamic map:

- Display a color-based heat map
- User can select the desired type of data
- User can scroll and zoom the map
- \*New map tiles loaded within 500 milliseconds
- \*The map will be available within 5 seconds of app start
- \*\*The app will be built for Android



# Project Requirements

## Displaying a navigable map:

- User can select the desired type of data
  - canopy height
  - above-ground biomass
  - elevation
- User can scroll and zoom the map
  - Scrolling → new map tiles
  - Zooming in → more detailed map tiles, less area each
  - Zooming out → less detailed map tiles, more area each

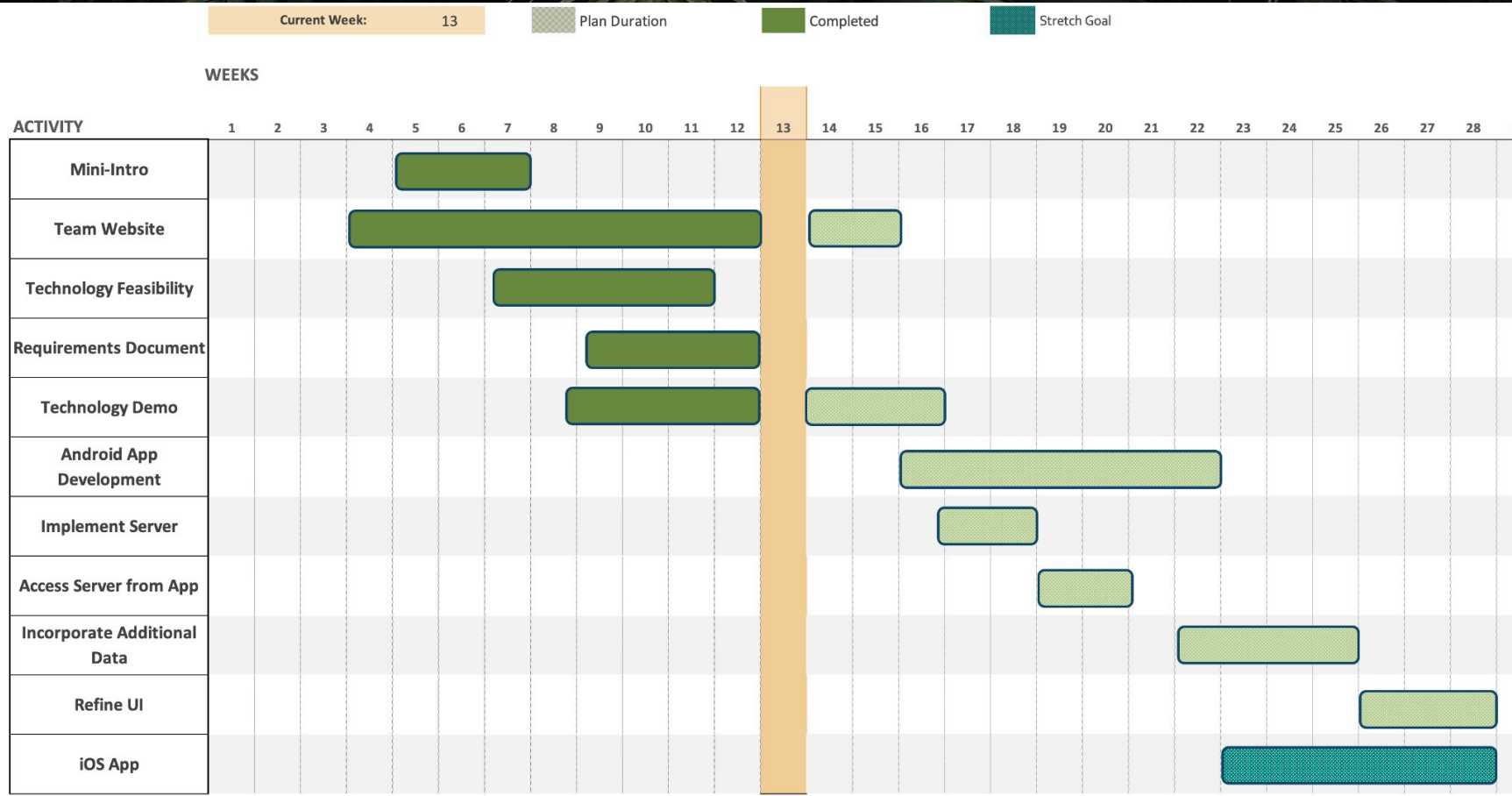


# Risks and Feasibility

- Androud OS Update
- Unpredictable Web Hosting Service
- Incorrect Data Provided
- Legacy Node.js packages



# Schedule



# Conclusion

- Problem: Ecologists and researchers struggle viewing lidar data from GEDI
- Solution: Mobile application with offline functionality
- Plan: Continue progress on Android application





**Thank you for your time**

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We are open to answering questions