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# Pyrophytic Tree Classification in Berea Forest using Unmanned Aerial Systems

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## Introduction

## Research Question

**Which sensor (Anafi, Sequoia, or combined) will classify pyrophytic trees best in Berea College Forest?**

## Methods

### Imagery Specifications

- Field UAS Data Collected on June 1st, 2021
- Drones: DJI Mavic and Parrot Anafi (Table 1)
- Additional Sensor: Sequoia
- Accuracy assessments of classifications on Maps 3-5

	Anafi	Sequoia
Ground Sampling Distance	3.1 cm	9.2 cm
Blue Band (450-495 nm)	X	
Green Band (495-570 nm)	X	X
Red Band (620-750 nm)	X	X
Red Edge Band (680-730 nm)		X
NIR Band (780-2,500 nm)		X
TIR Band (10,600-12,500 nm)	X	

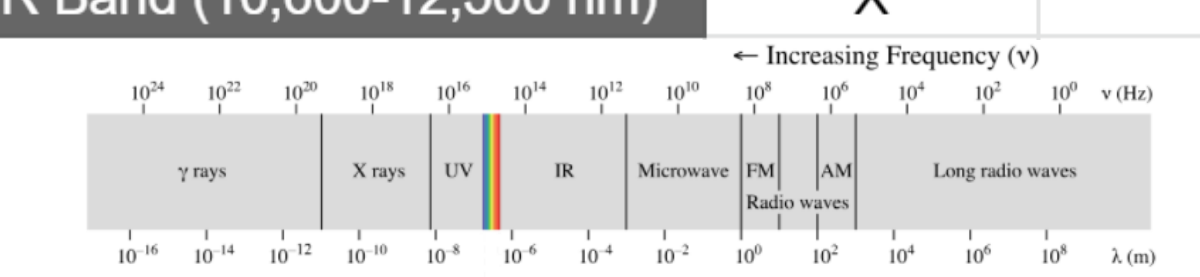
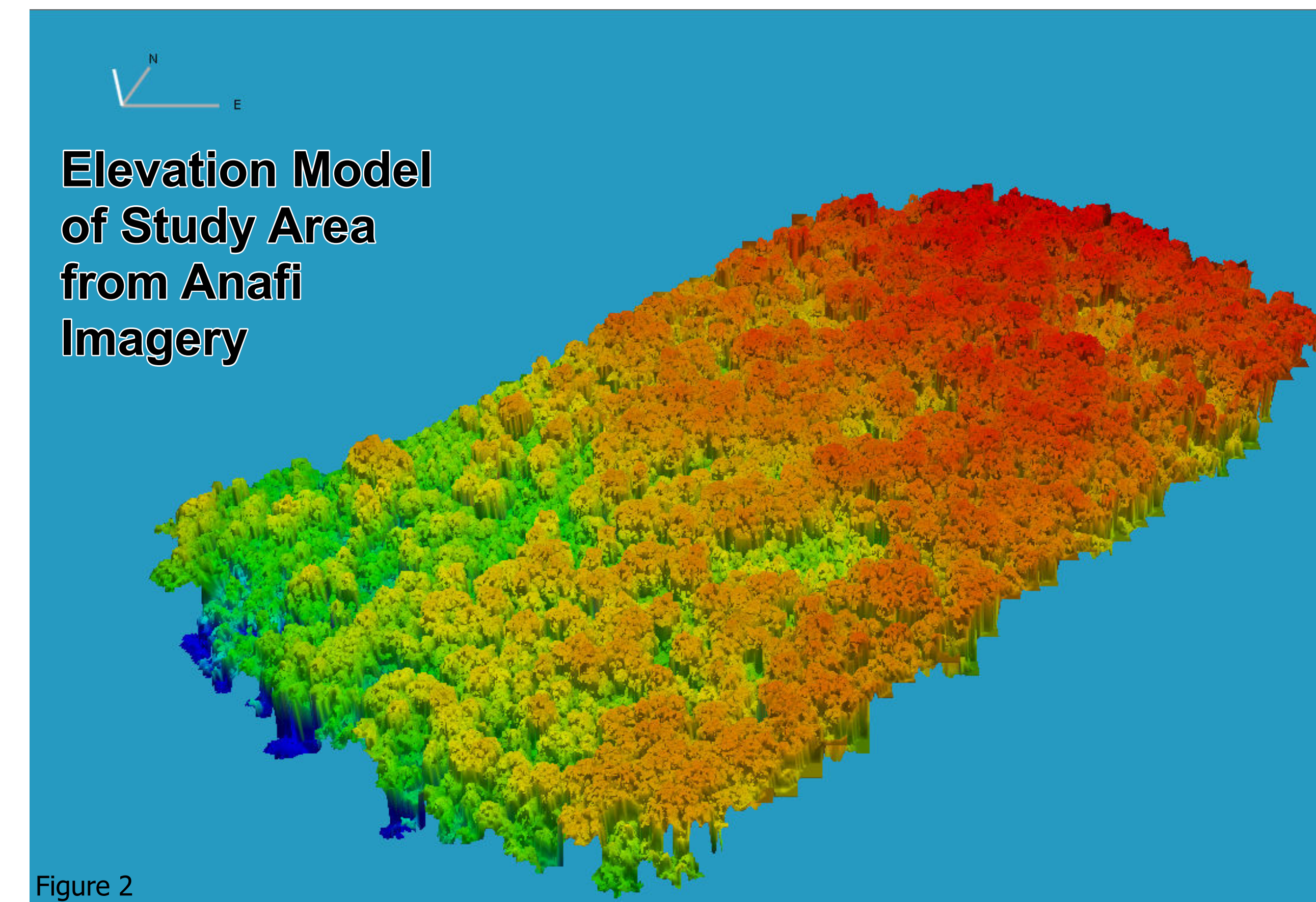
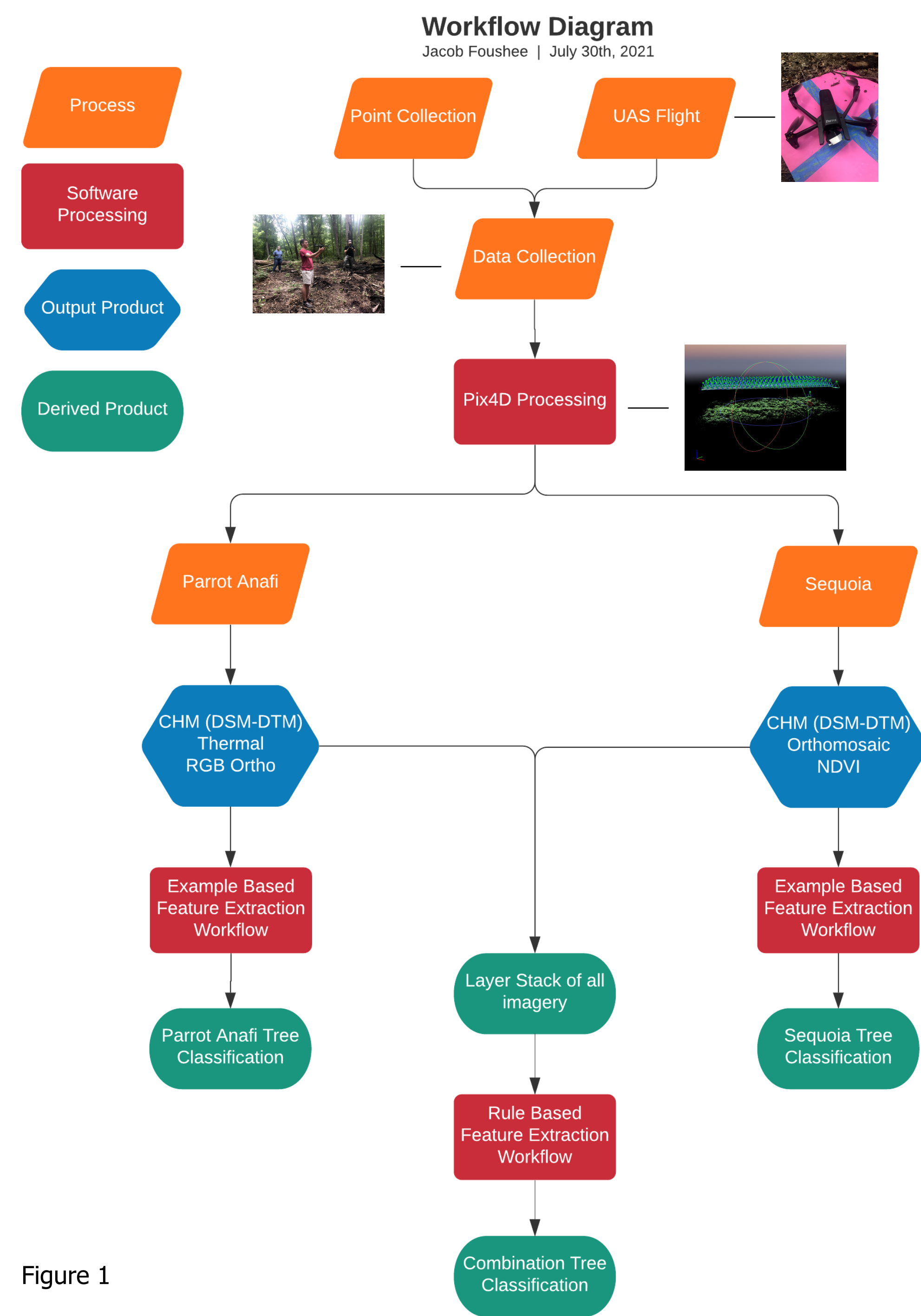



Figure 1

Figure 2

Pyrophyte - Tree species adapted to endure fire.

- Passive Pyrophyte - Resist the effects of fire.
- Active Pyrophyte - Requires fire to spread, germinate, and regrow

Despite its defenses, a pyrophyte can be overwhelmed and destroyed by fire. After decades of total fire suppression policies along with rising average temperatures as a result of climate change, forest fires have grown in intensity, frequency, and coverage.

With the assistance of Unmanned Aerial Systems (UAS), foresters can survey the distribution of pyrophytic trees and develop sustainable approaches to forest management that restore the natural ecosystem and reduce the threat of forest fires.

## Study Area

The Department of Forestry at Berea College is researching the effectiveness of prescribed burns in forest management. The Department is burning eight units on the southwestern slope of the West Pinnacle. Our research is focused on Burn Unit 1 (Map 1). The Burn Unit is located on the southwestern slope of West Pinnacle mountain (Figure 2). The study area is located in a temperate deciduous forest (Map 2).

## Results

