

Project 1

Alternative Jet Fuel Supply Chain

Tropical Region Analysis

Motivation and Objectives

Motivation

- Aircraft operate globally, requiring global supplies of alternative jet fuel
- The tropics account for ~36% of the world's land and receives ~60% of the global solar insolation
- Tropics are home to unique biomass materials, production practices/systems, and temporal availabilities

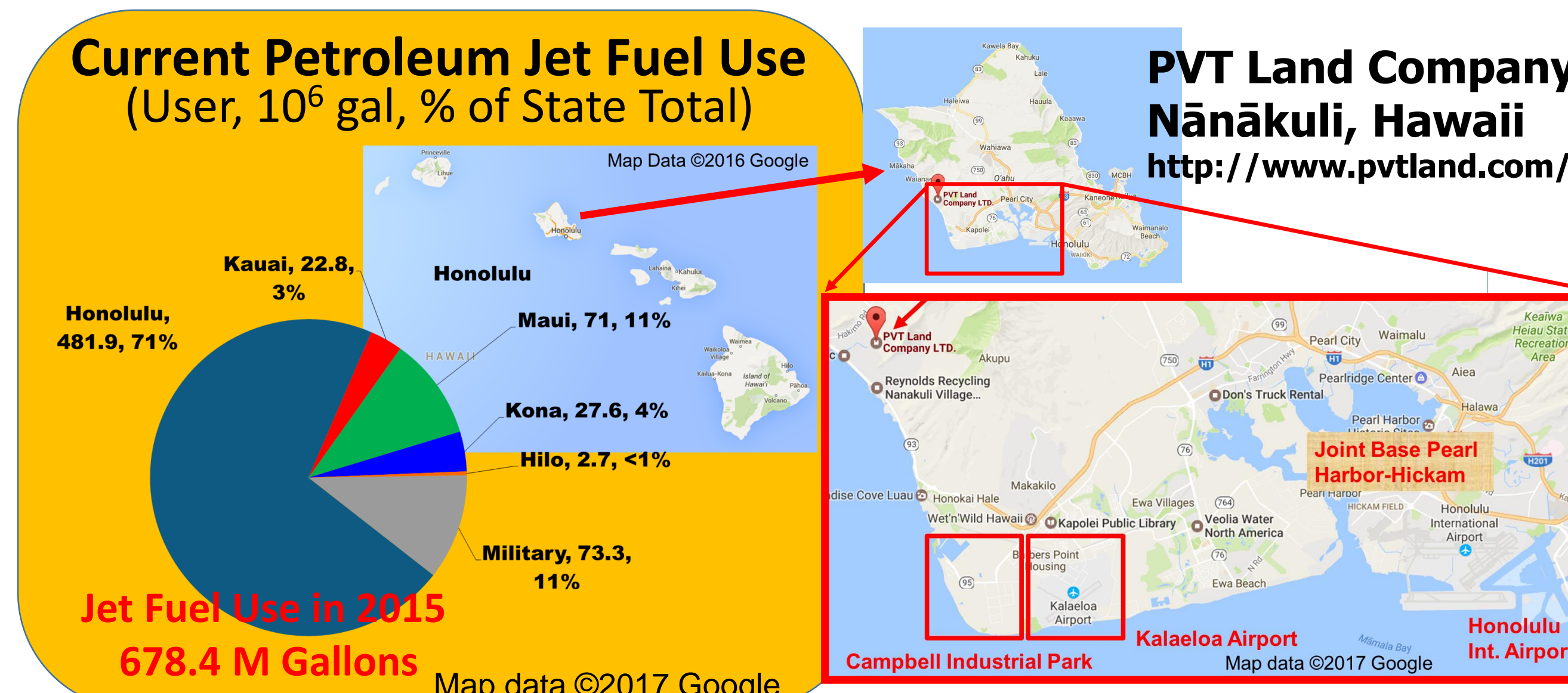
Objectives

- Long-term:** Develop information on regional supply chains for use in creating scenarios of future alternative jet fuel production in tropical regions
- Near term:**
 - Develop preliminary technical production estimates of jet fuel in Hawaii
 - Develop fundamental property data for tropical biomass resources
 - Support MOU between FAA and Indonesian Directorate General of Civil Aviation
 - Support Volpe Center and CAAFI Farm to Fly and inform POLYSIS and existing tools

Alternative Jet Fuel Value Chain



Regional Supply Chain Analysis



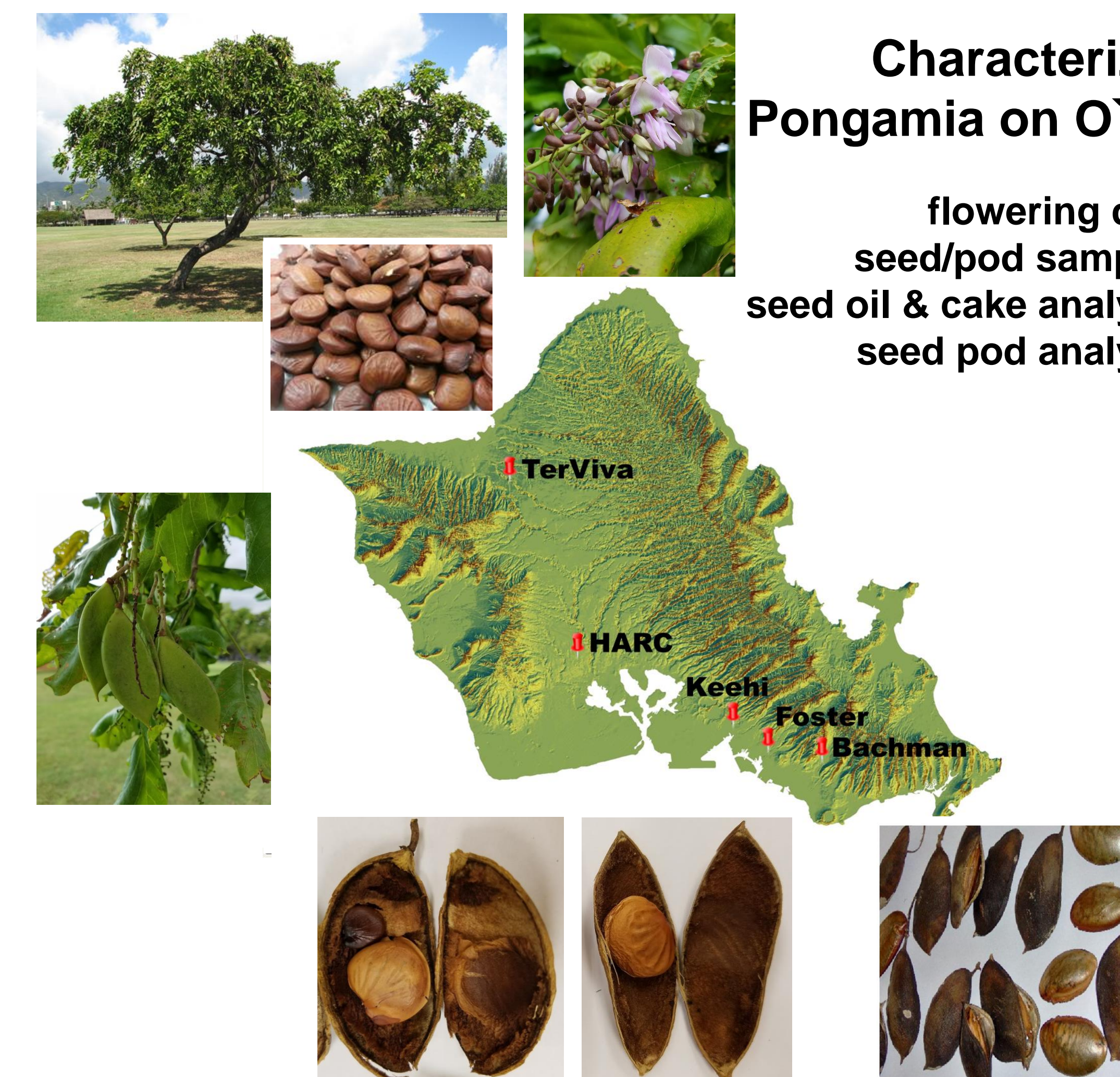
Background

- PVT is the only construction & demolition (C&D) landfill on O'ahu
- 135 acre site, zoning allows landfilling, recycling, and fuel processing
- Current intake 1,775 tpd C&D waste
- Tipping fee \$50 per ton, or \$54 per ton for LEED certified
- 50% of intake converted to feedstock, up to 900 tpd
- Waste-in-place also "mined" for additional "feedstock"
- Recycling system currently processing and stockpiling material
- Other sources of fiber also available in HI

Approach – PVT C&D Landfill as primary feedstock source for AJF production

- Analysis of feedstock-conversion pathway efficiency, product slate (including co-products), maturation
- Scoping of TEA issues
- Screening level GHG LCA
- Identification of supply chain partners
- Plan and initiate stakeholder outreach
- Develop transportation and regional data needed for FTOT
- Evaluate feedstock availability
- Evaluate infrastructure availability
- Develop regional project proposal

Fundamental Data for Pongamia

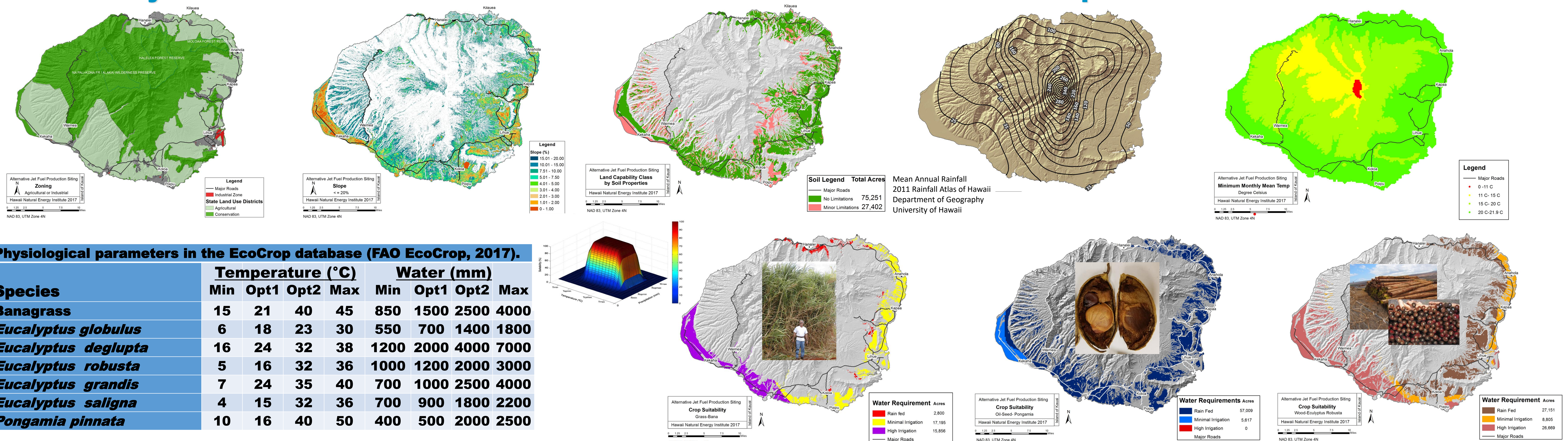


Characterizing Pongamia on O'ahu

- flowering data
- seed/pod samples
- seed oil & cake analysis
- seed pod analysis

	Bachman	Ke'ehi
Pod, % H ₂ O wet basis	9.7	14.8
Seed, % H ₂ O wet basis	24.9	16.9
Pod/Seed dry mass ratio	59/41	47/53

Preliminary Technical Production Estimates of Jet Fuel in Hawaii – Kauai Example



Physiological parameters in the EcoCrop database (FAO EcoCrop, 2017).

Species	Temperature (°C)				Water (mm)			
	Min	Opt1	Opt2	Max	Min	Opt1	Opt2	Max
Banagrass	15	21	40	45	850	1500	2500	4000
<i>Eucalyptus globulus</i>	6	18	23	30	550	700	1400	1800
<i>Eucalyptus deglupta</i>	16	24	32	38	1200	2000	4000	7000
<i>Eucalyptus robusta</i>	5	16	32	36	1000	1200	2000	3000
<i>Eucalyptus grandis</i>	7	24	35	40	700	1000	2500	4000
<i>Eucalyptus saligna</i>	4	15	32	36	700	900	1800	2200
<i>Pongamia pinnata</i>	10	16	40	50	400	500	2000	2500

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