



# THE POTENTIAL OF BREADFRUIT UNDER CLIMATE CHANGE

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University of Hawai'i, Manoa

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Hā o ke Kai



Source: Polynesian Voyaging Society



Source: Facebook



Source: Hawaii Ulu Cooperative

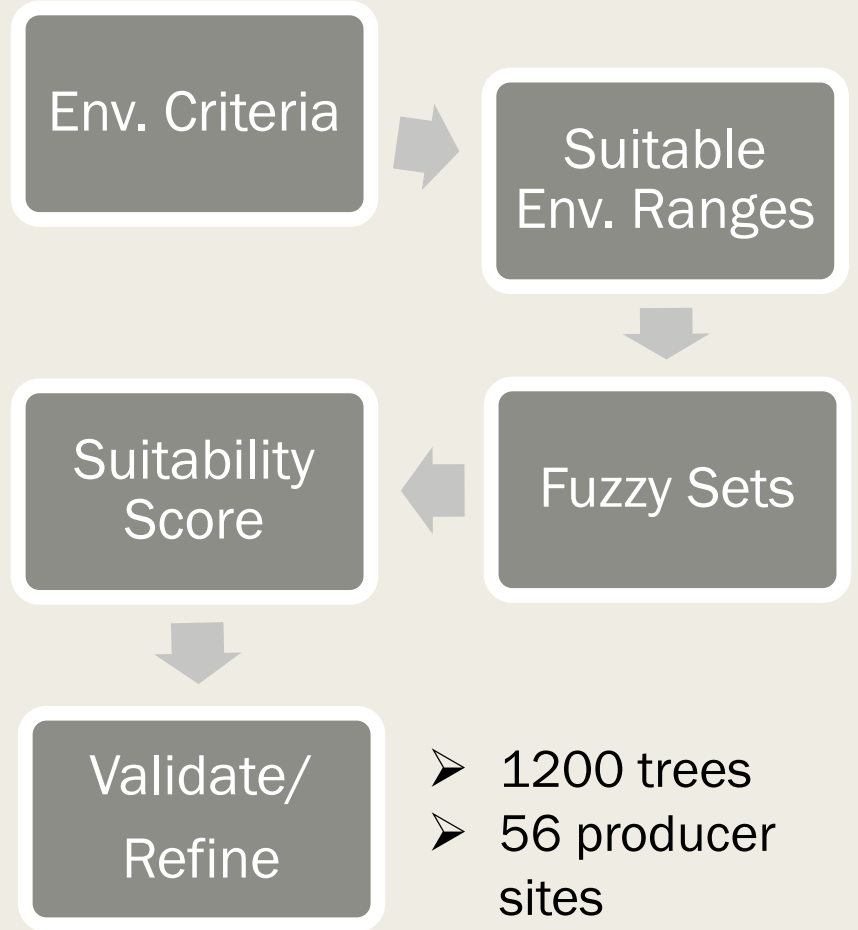
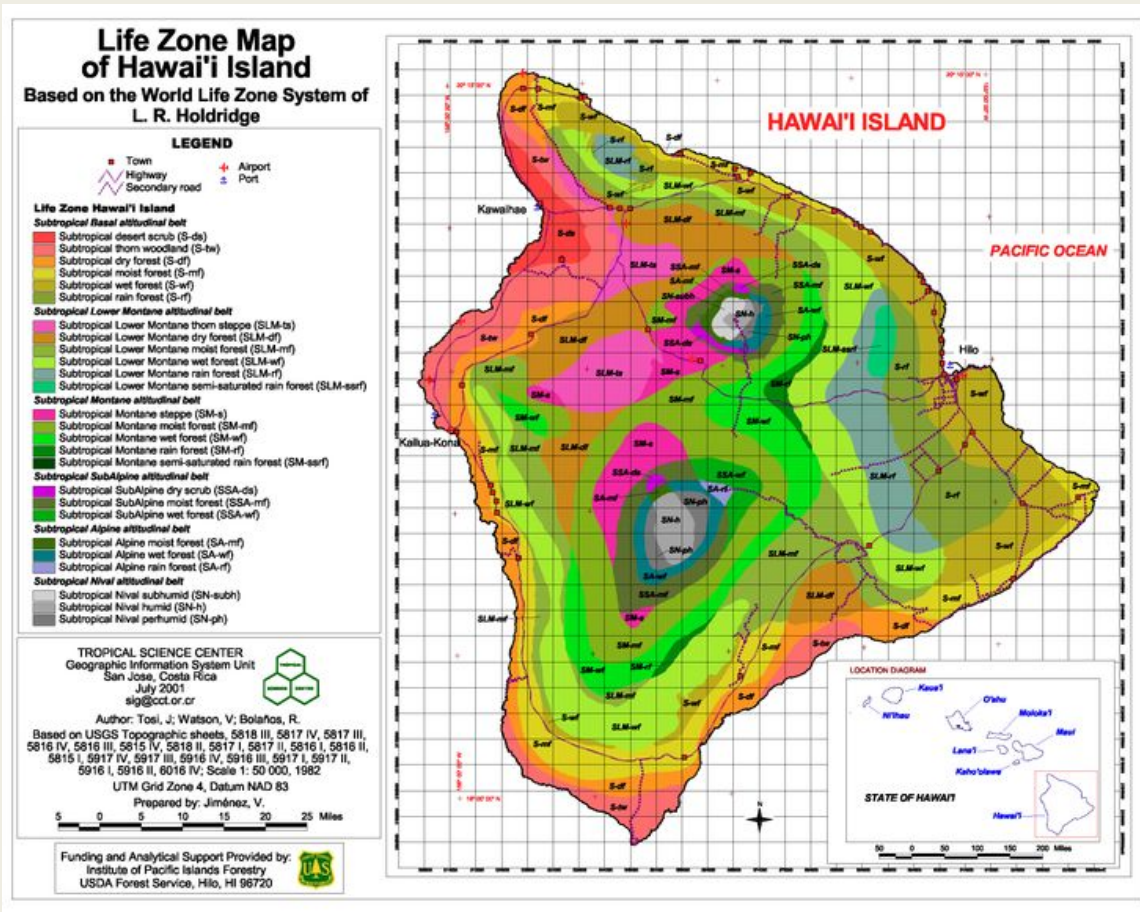


# Purpose

- Let's include Agriculture in climate vulnerability & adaptation planning
- Apply climate modelling to Agriculture
- Study neglected, Under-utilized Traditional Crops
- Support Future Food Systems

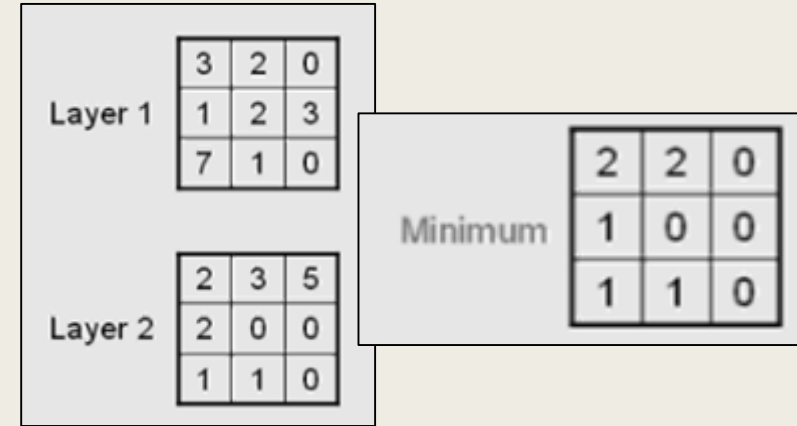
# MODELLING APPROACH – Habitat Suitability

## Hawaii a Model System



# DATA

- Temperature
- Rainfall
- Solar Radiation
- pH
- Drainage Class



$$SUIT_{overall} = \min(C_{SUIT\ 1}, C_{SUIT\ 2}, \dots, C_{SUIT\ n})$$

**Table 1. Final model parameters derived and the initial model parameters obtained from the EcoCrop database.**

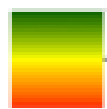
		Abs Min	Abs Max	Opt Min	Opt Max
<b>Final Model Parameters</b>	<b>Temp (°C)</b>	17	40	21	33
	<b>Rain (mm/yr)</b>	750	8000	1500	4000
	<b>Solar Rad. (W/m<sup>2</sup>)</b>	20	295	50	197
	<b>pH</b>	4	8.7	5	6.5
	<b>Drainage Class</b>	2	7	4	6
<b>EcoCrop Parameters</b>	<b>Temp (°C)</b>	16	40	21	33
	<b>Rain (mm/yr)</b>	1000	3500	1500	3000
	<b>Solar Rad. (W/m<sup>2</sup>)</b>	20	295	50	197
	<b>pH</b>	4.3	8.7	5.5	6.5
	<b>Drainage Class</b>	4	6	4	6

# CURRENT HAWAI'I SUITABILITY

- 50m resolution
- $r^2$  0.91,  $p < 0.001$

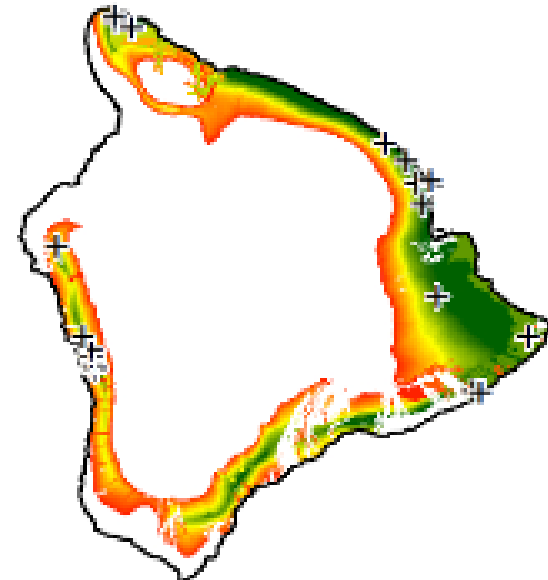
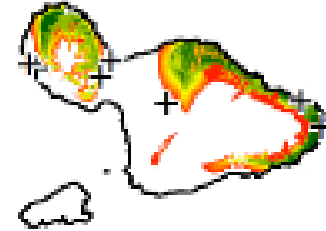
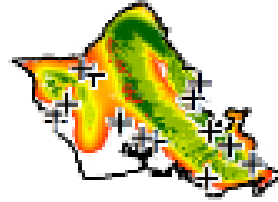
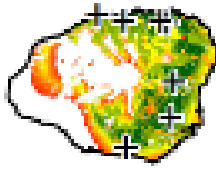
## Suitability Score

+ Validation Sites



High : 100

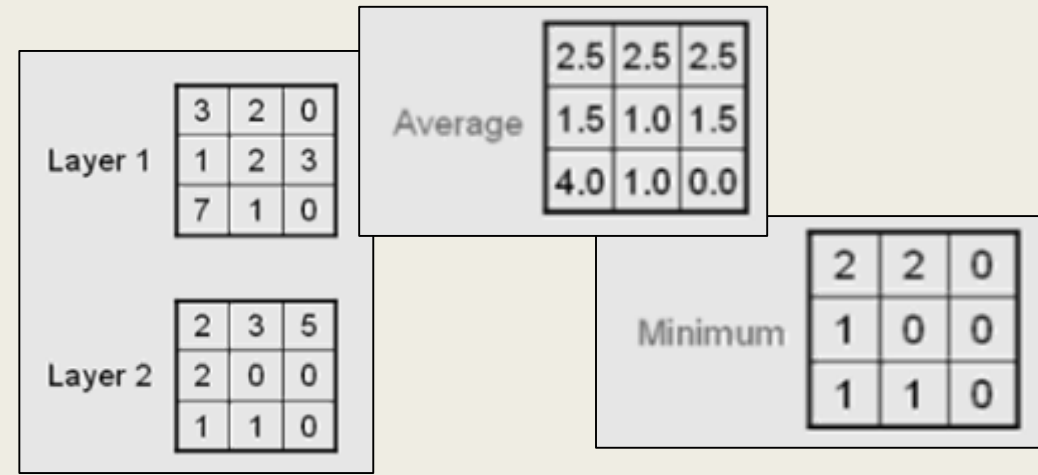
Low : 0





# DATA

- Temperature ←
- Rainfall ←
- Solar Radiation
- pH
- Drainage Class
  
- 17 Global Climate Models
  - RCP4.5, 8.5
  - 2070
  - 833m resolution

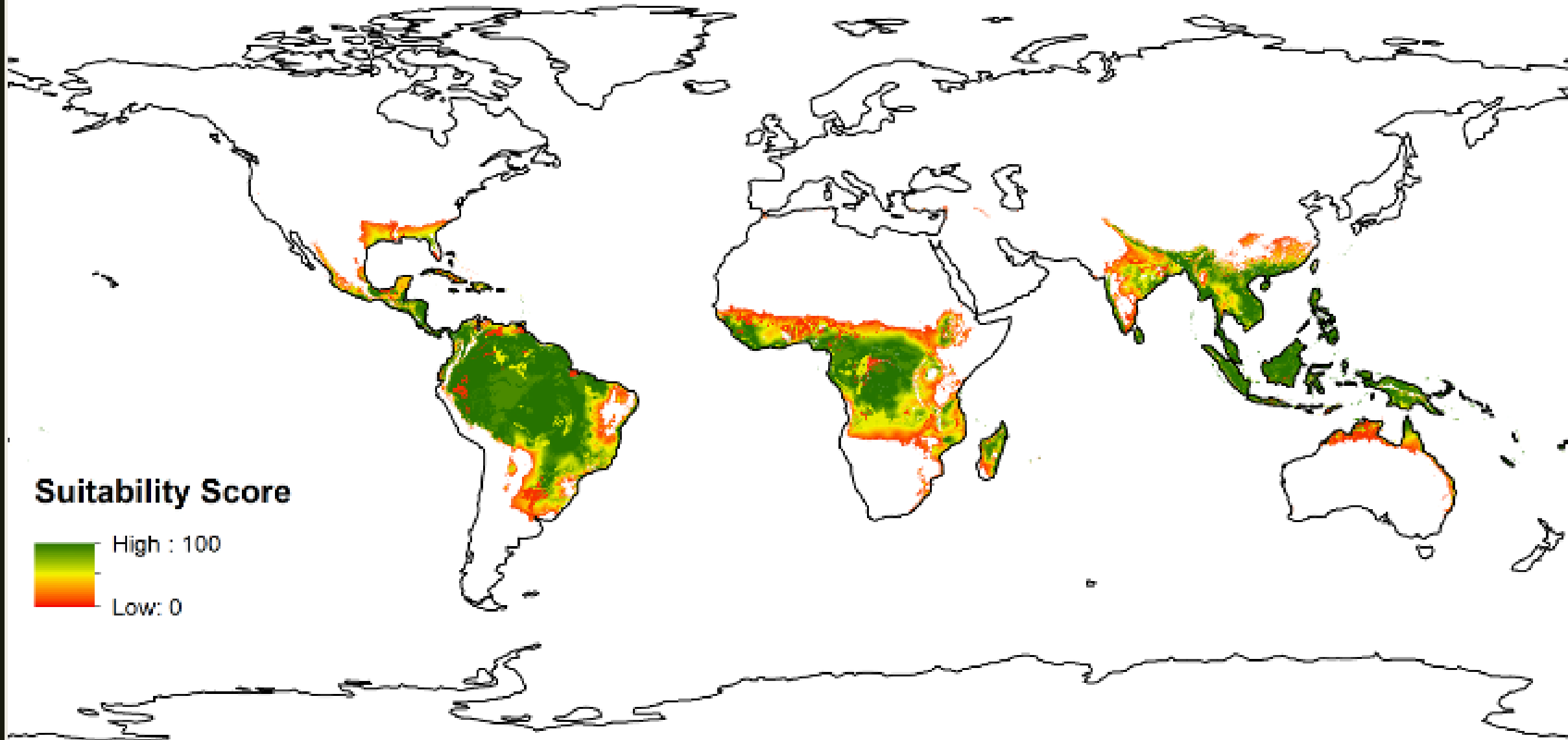


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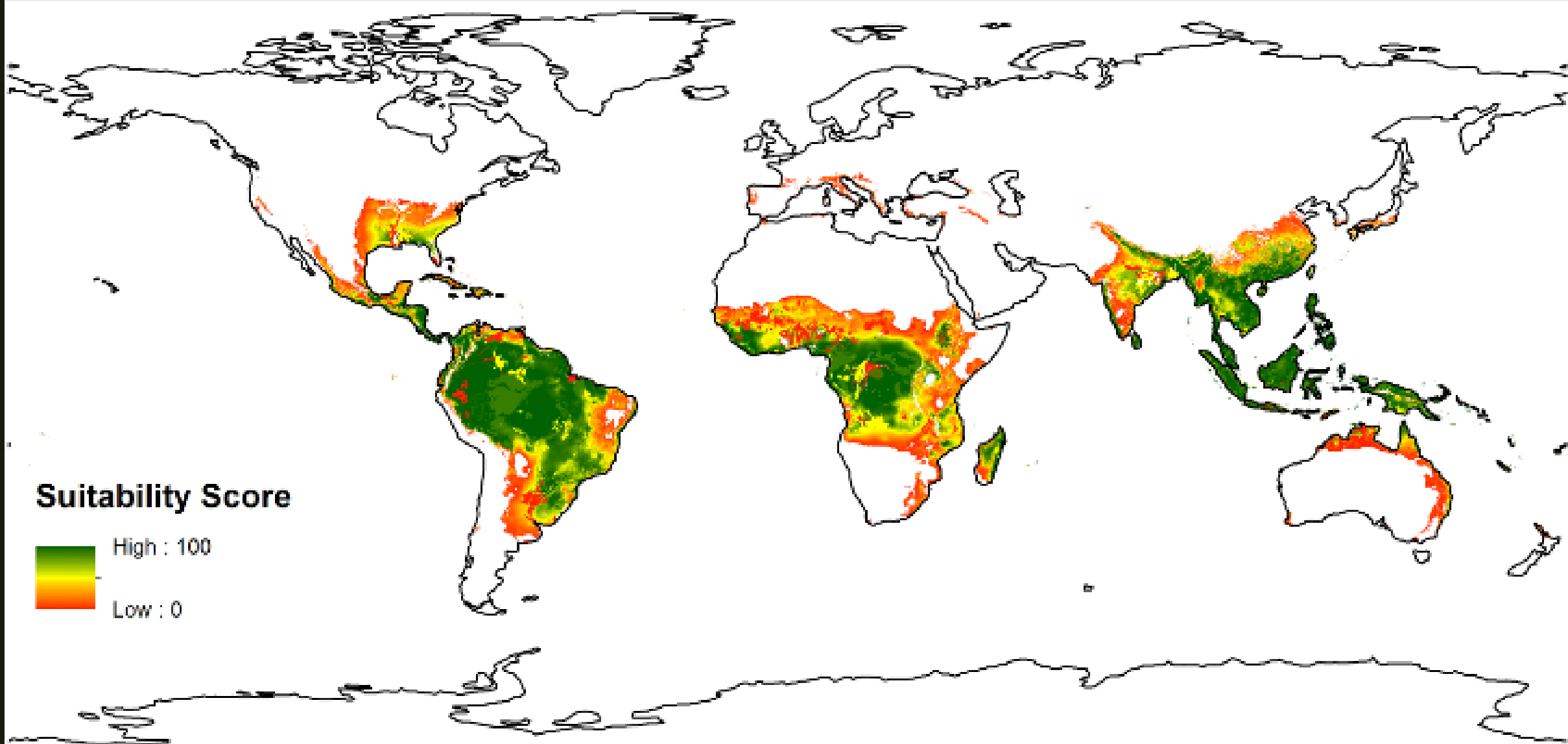
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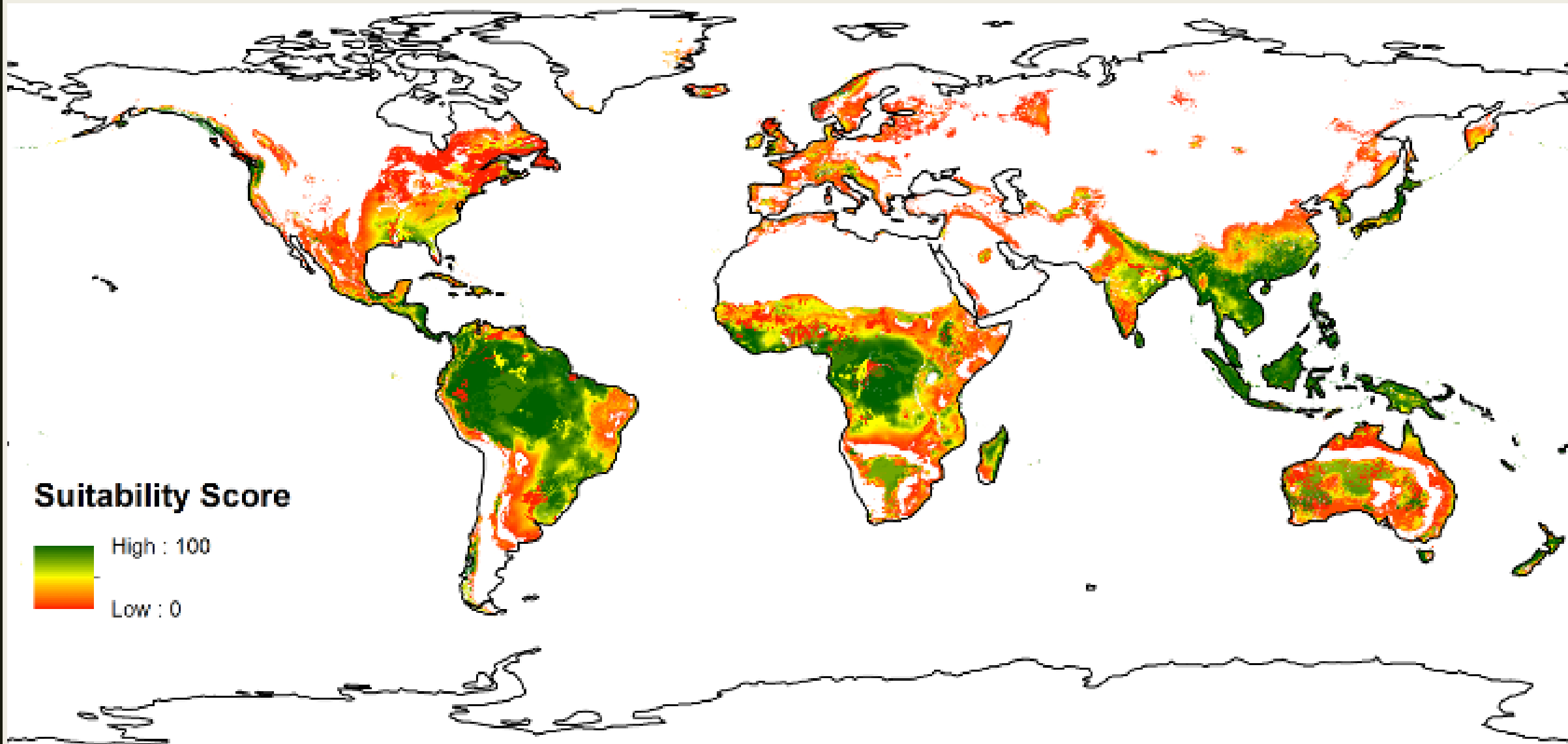
# CURRENT GLOBAL SUITABILITY



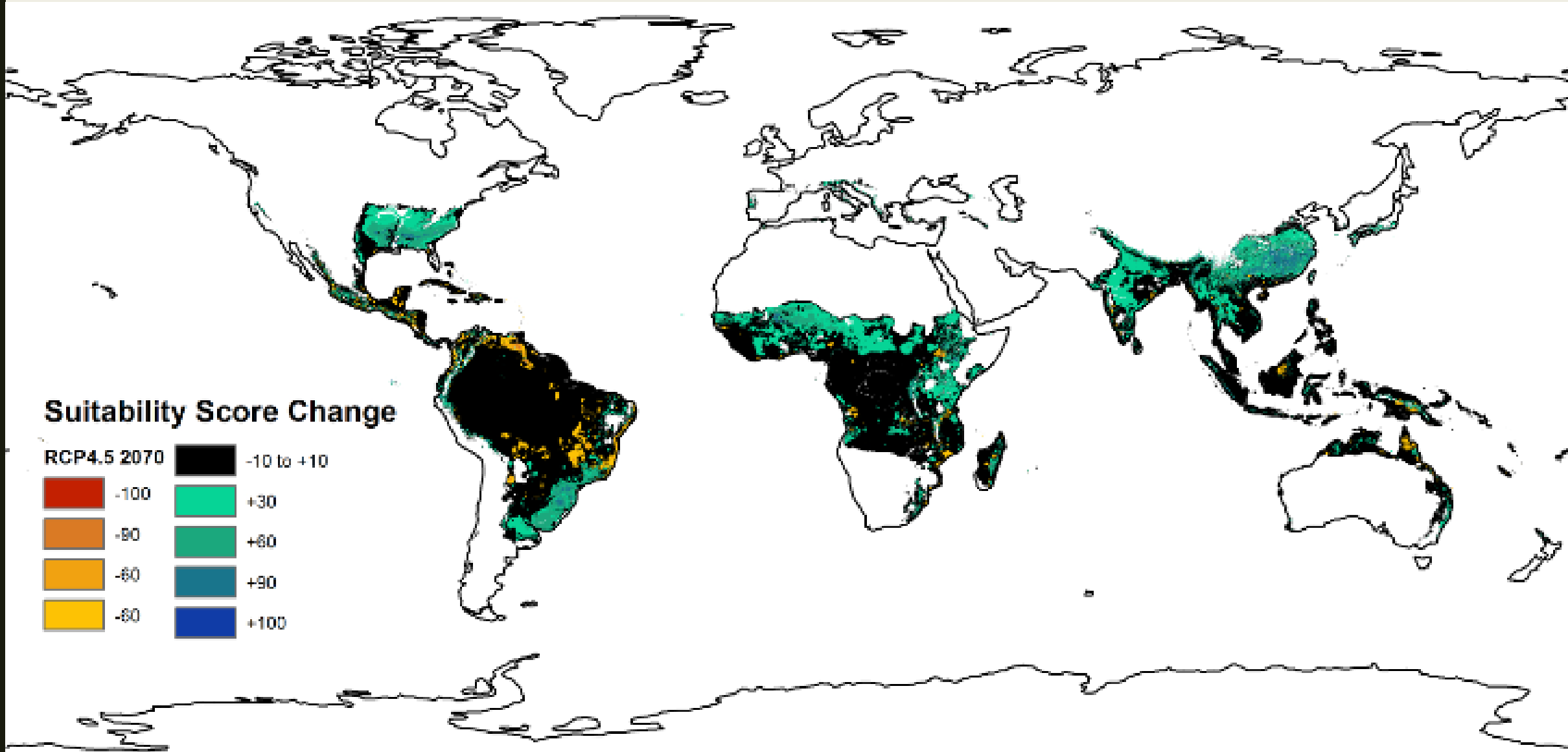
# 2070 GLOBAL SUITABILITY – RCP4.5



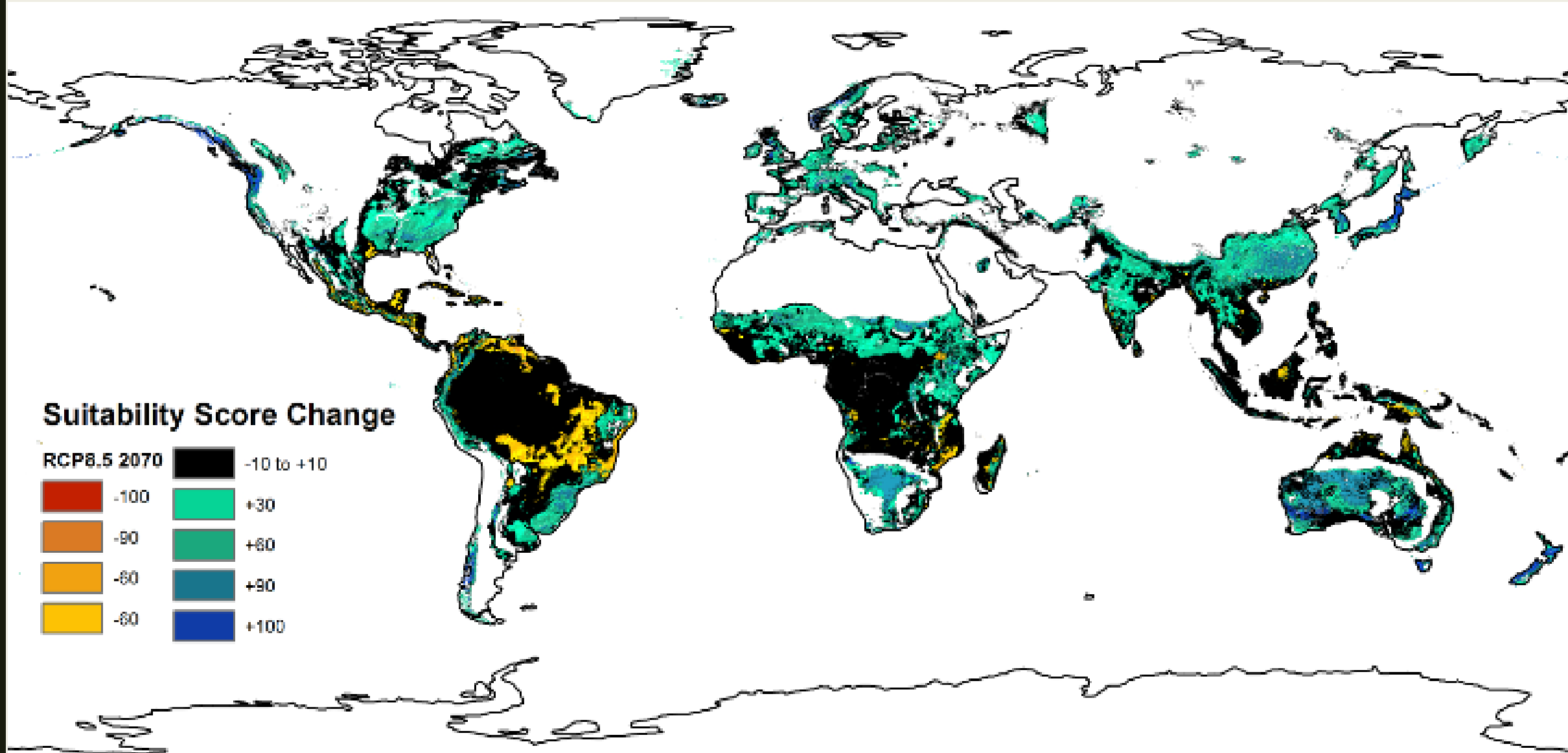
# 2070 GLOBAL SUITABILITY – RCP8.5



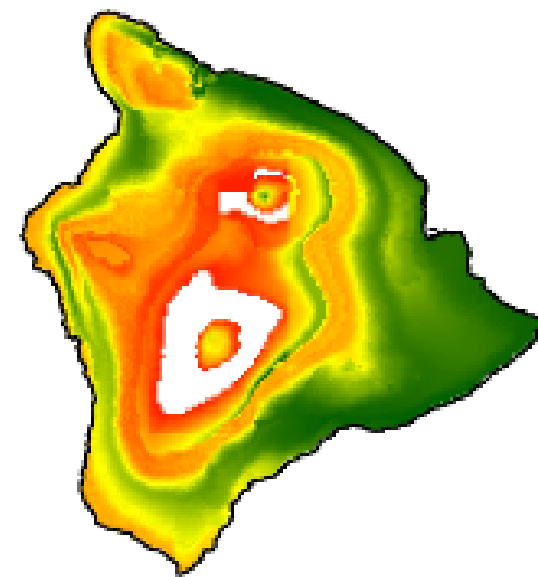
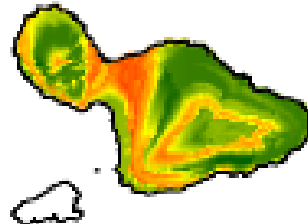
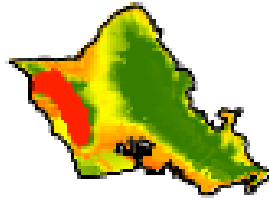
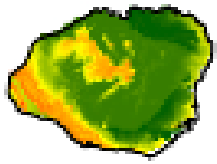
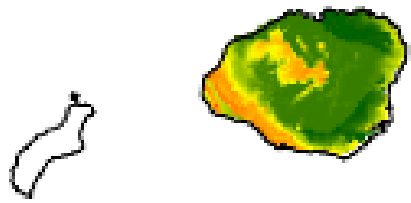
# GLOBAL SUITABILITY CHANGE - RCP4.5



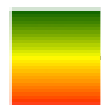
# GLOBAL SUITABILITY CHANGE – RCP8.5



# HAWAI'I SUITABILITY - RCP8.5



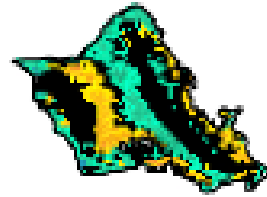
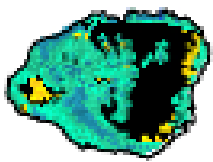
## Suitability Score



High : 100

Low : 0

# HAWAI'I SUITABILITY CHANGE

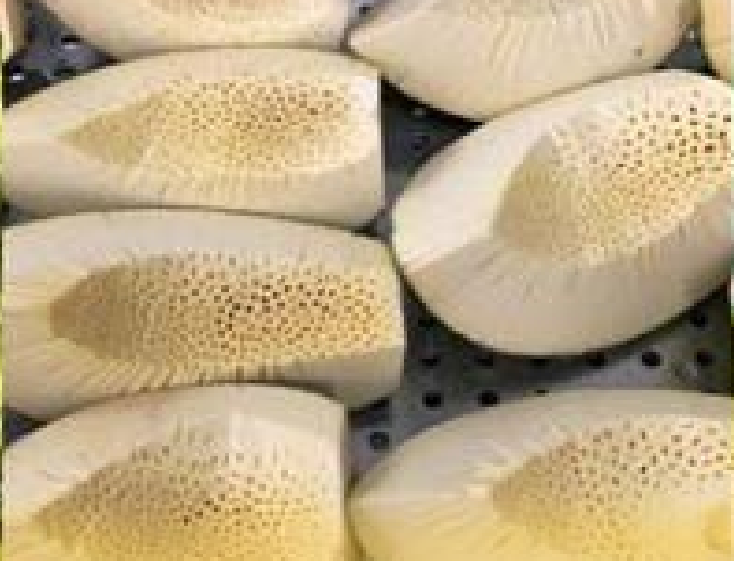


## Suitability Score Change

RCP8.5 2070







# MAHALO

