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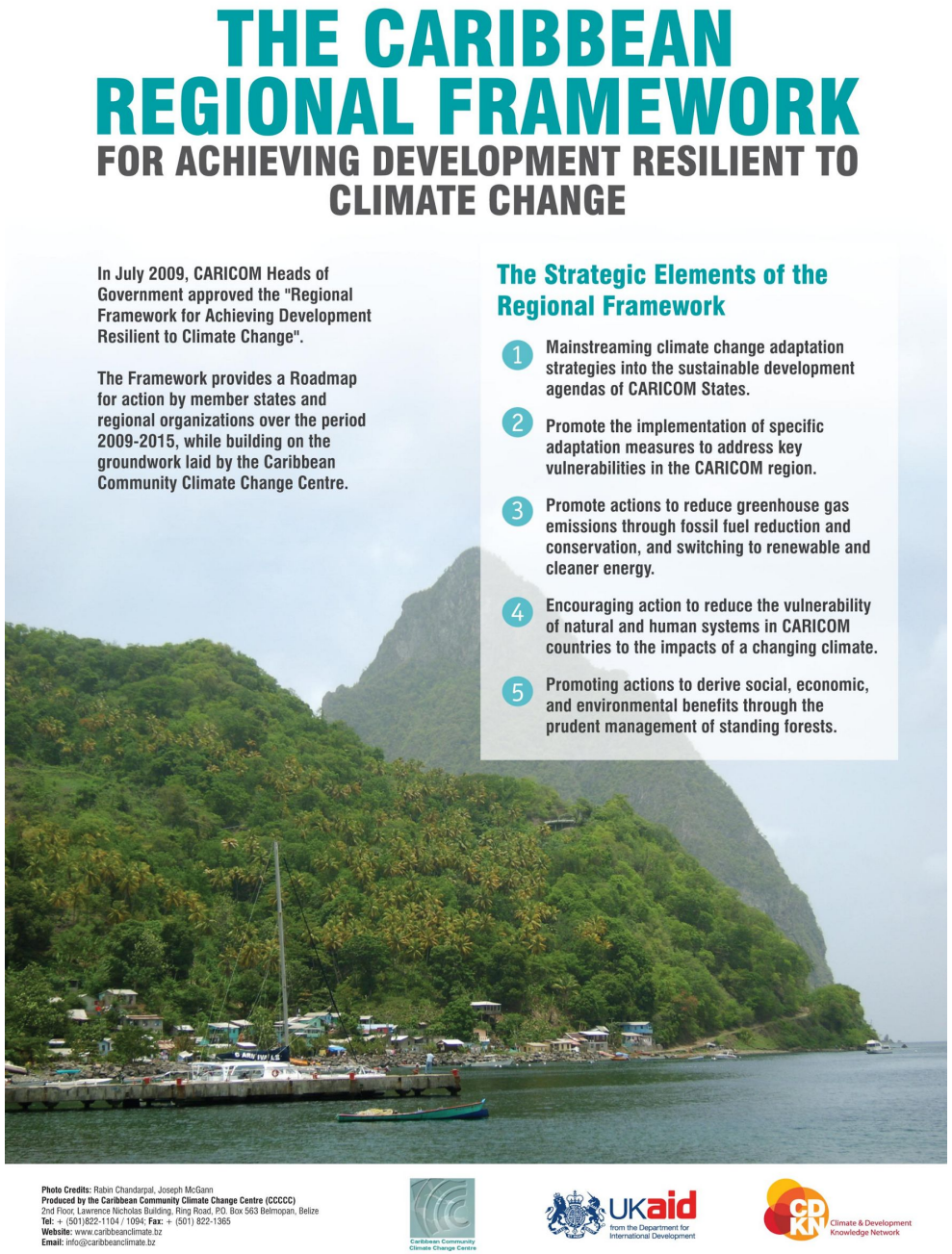
Promoting Food Security in a Changing Climate: Insights from the Caribbean

Kevon Rhiney
Department of Geography
Rutgers University
E-mail: kevon.rhiney@rutgers.edu

Introduction

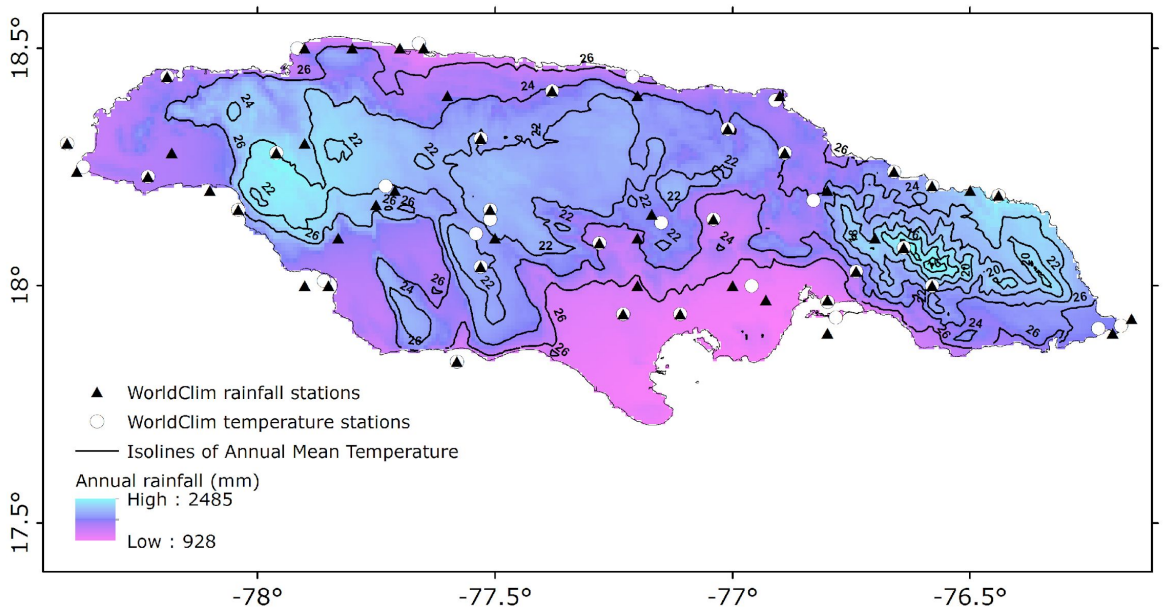
- Caribbean considered a climate change hotspot (Gamble et al., 2010; Simpson et al., 2009; IPCC 2007, 2014)
- Climate impacts will not be uniformly felt; Compounded by regional characteristics
- **Agriculture is particularly at risk**.
- Food security is a multidimensional issue. "Double burden" of malnutrition. **Farming households among the most food insecure**
- Focus here is on agricultural production.



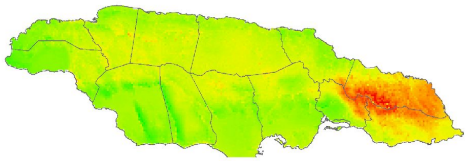
Caribbean Agriculture in a Changing Climate

Climate-Induced Threats	Other Threats
Climate extremes	Erosion of traditional overseas markets
Shifting seasonal rainfall patterns	Low domestic capacity, high food imports
Longer term shifts in AEZs	High and unstable input costs
Sea level rise	Limited R&D
Introduction of new pests and diseases	Small fragmented farms, labour intensive
	Restrictive land tenure systems
	Poor policy coordination

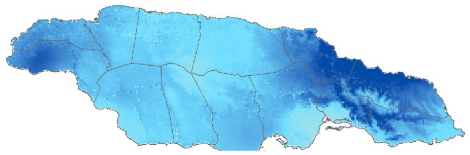
Long term shifts in Climate



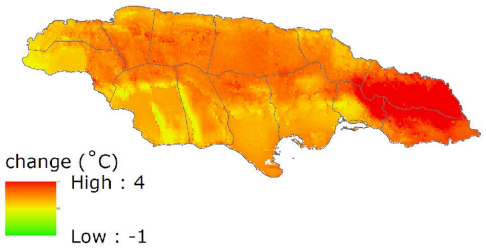
Temperature change by 2080 (RCP 2.6)



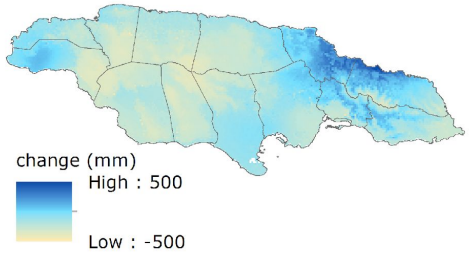
Rainfall change by 2080 (RCP 2.6)

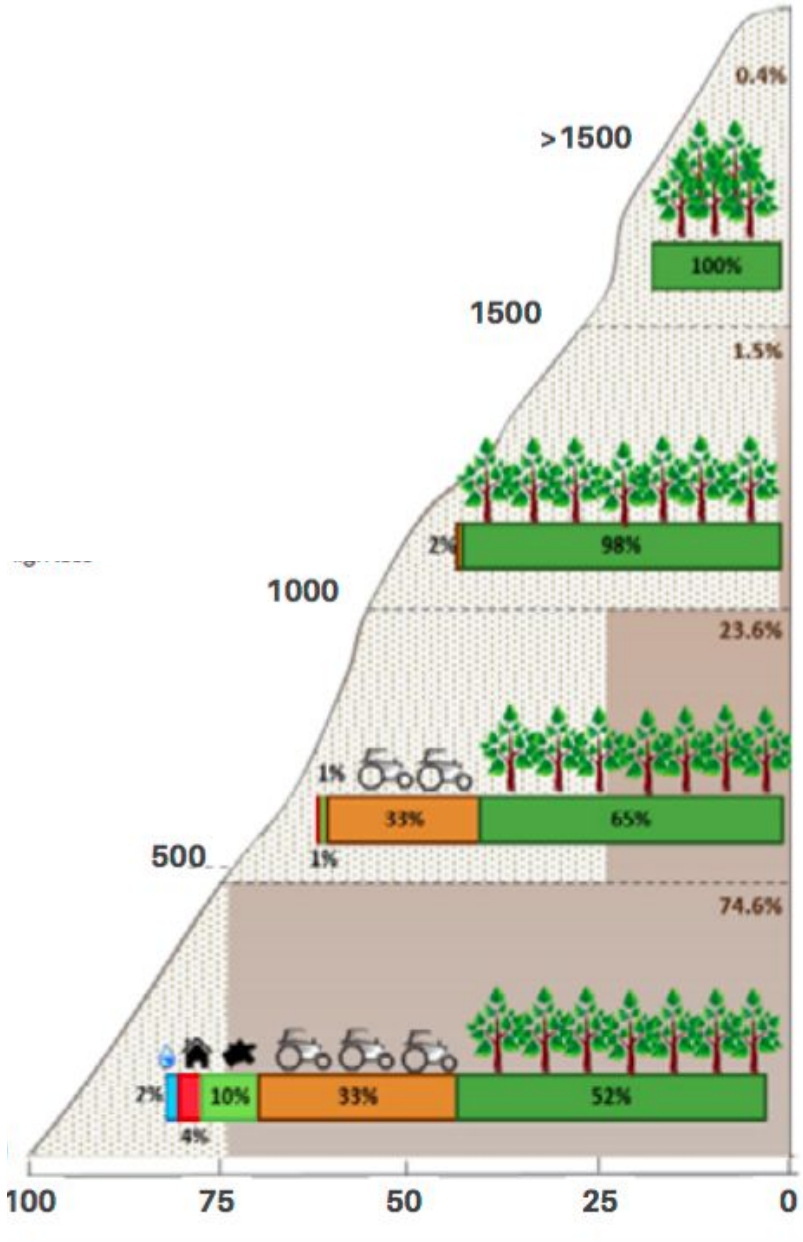


Temperature change by 2080 (RCP 8.5)



Rainfall change by 2080 (RCP 8.5)

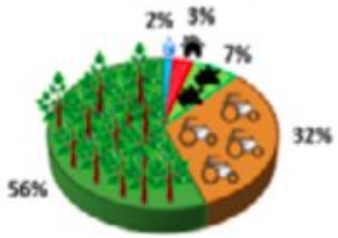




Jamaica

maximum altitude ~2250 masl

Total Land Use



Artificial

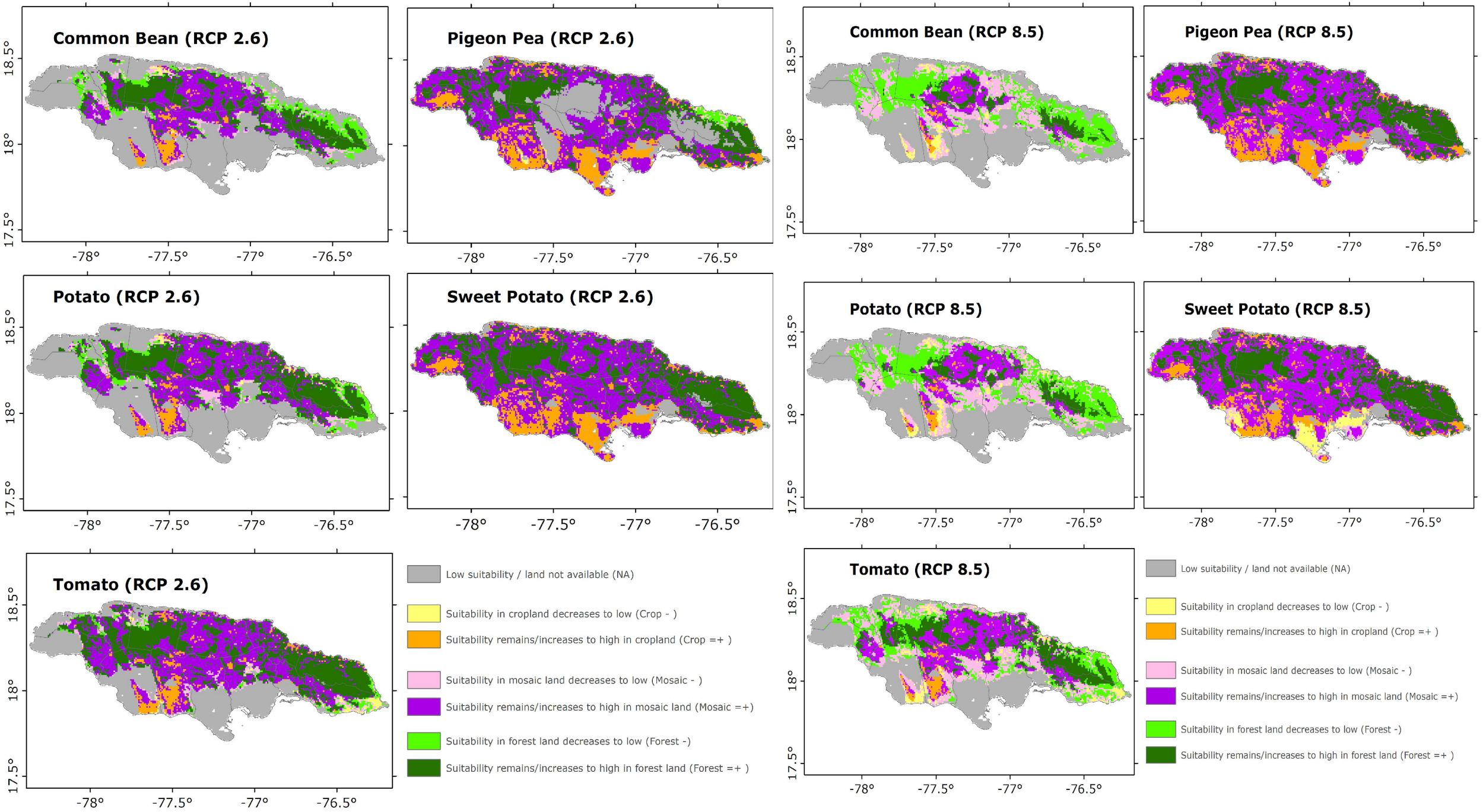
Cropland

Pastures/Savanna

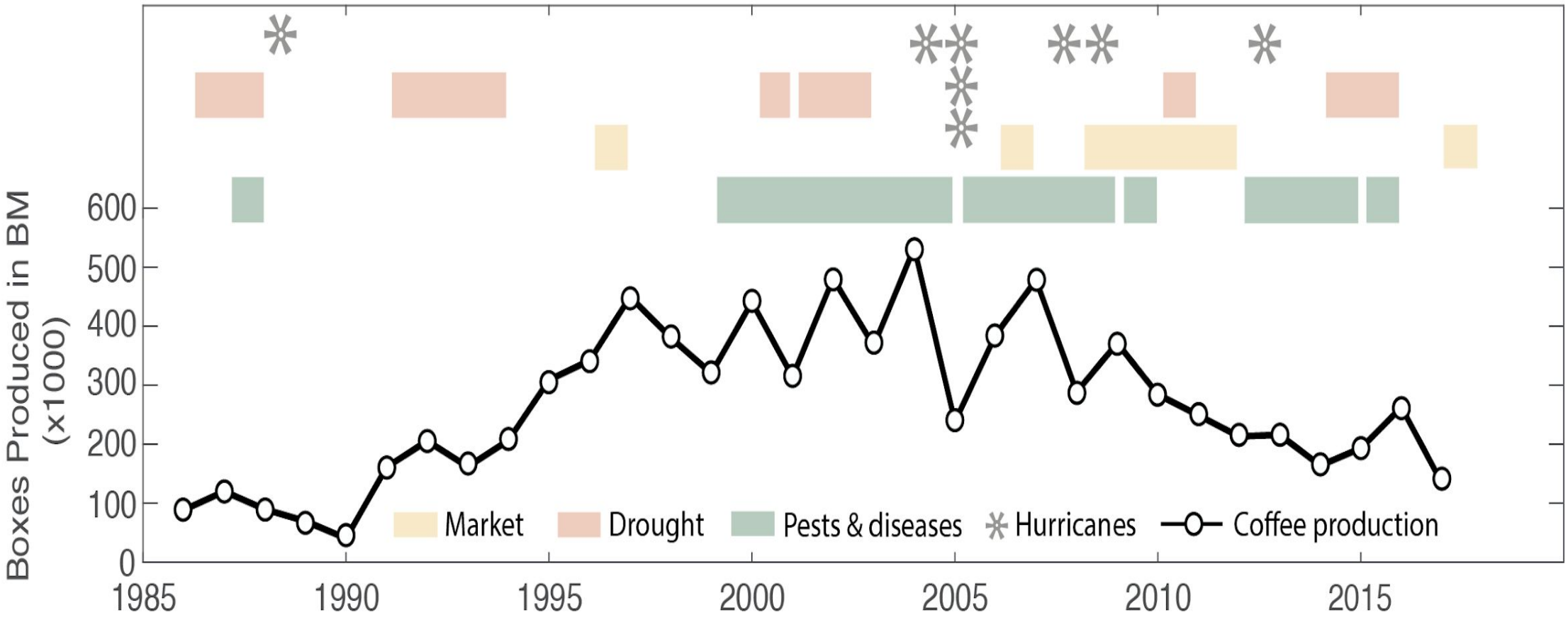
Wetlands

Forest

Available land (%)


Common Bean (RCP 2.6)
Pigeon Pea (RCP 2.6)
Common Bean (RCP 8.5)
Pigeon Pea (RCP 8.5)
Potato (RCP 2.6)
Sweet Potato (RCP 2.6)
Potato (RCP 8.5)
Sweet Potato (RCP 8.5)
Tomato (RCP 2.6)
Tomato (RCP 8.5)
18.5°
18°
17.5°
-78°
-77.5°
-77°
-76.5°
Low suitability / land not available (NA)
Suitability in cropland decreases to low (Crop -)
Suitability remains/increases to high in cropland (Crop =+)
Suitability in mosaic land decreases to low (Mosaic -)
Suitability remains/increases to high in mosaic land (Mosaic =+)
Suitability in forest land decreases to low (Forest -)
Suitability remains/increases to high in forest land (Forest =+)

Sector is affected by a range of shocks and stresses

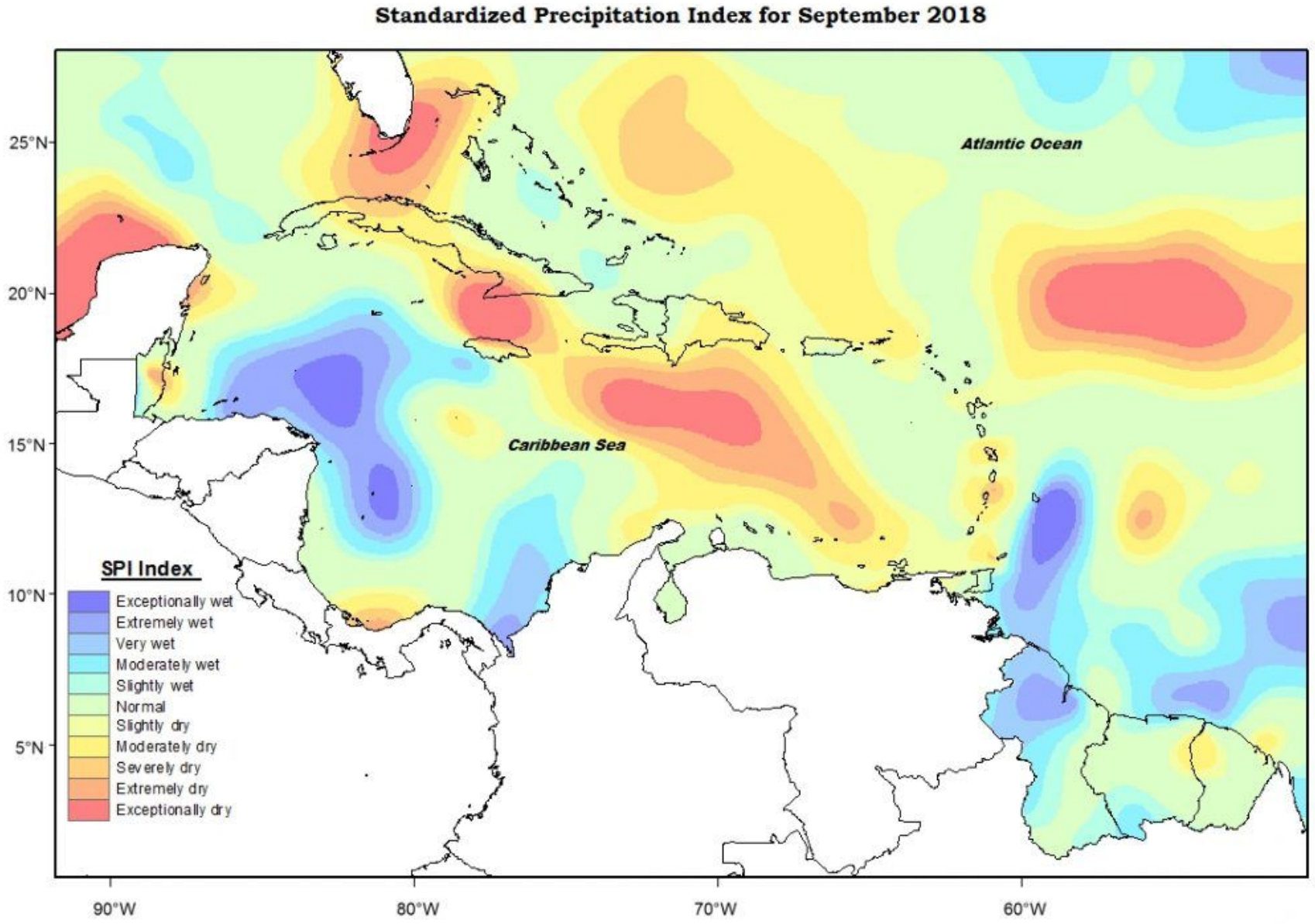


****Hazards that affected BM coffee production between 1985 and 2017 and BM coffee production.**

Current Response Pathways

Infrastructure	Science & Innovation	Capacity Building
Protected forms of agriculture	**Climate information services**	Climate mainstreaming
Irrigation schemes	Crop breeding	Crop insurance schemes
Climate and weather monitoring	Seed banks & Tissue culture	Promoting farm-level adaptation, ADRM, EBA etc.
Post-harvest infrastructure	**Crop varietal research**	Extension services

Potential Role of Climate Information Services



The collating, packaging and distributing of weather and climate information to specific end users

Early days yet, with mixed results.

Identifying climate tolerant cultivars

- Three-year long project
  - Screen crop cultivars to determine drought and heat tolerance
  - Crop climate niche modeling
  - Farmer led trials
  - On-farm monitoring and end-line survey
  - Policy formulation
- Funded under the Pilot Program for Climate Resilience (PPCR)
- Demand-led and inter-disciplinary
- Several risk factors nonetheless

A Porometer (SC-1 Decagon Device) being used in the field to measure transpiration

Greenhouse facility at UWI St. Augustine, Trinidad

Future Considerations

- Replicating and scaling up initiatives
  - Cost implications
  - Uneven and bounded knowledge systems
- Developing robust and flexible adaptation systems
  - Nurturing a flexible policy environment
  - Consider climate and non-climate factors
- Attend to systemic drivers of vulnerability
  - Over-emphasis on (neoliberal) resilience
  - Consideration of post-colonial context