

The development of the Caribbean Drought Monitoring and Forecasting dataset (*CarDrought*): making climate data accessible to local farmers in the Dominican Republic

DIMITRIS HERRERA

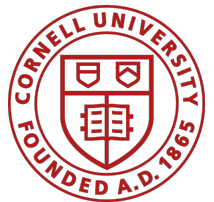
GRADUATE STUDENT

DEPARTMENT OF EARTH AND ATMOSPHERIC SCIENCES

CORNELL UNIVERSITY

ADVISOR: DR. TOBY R. AULT

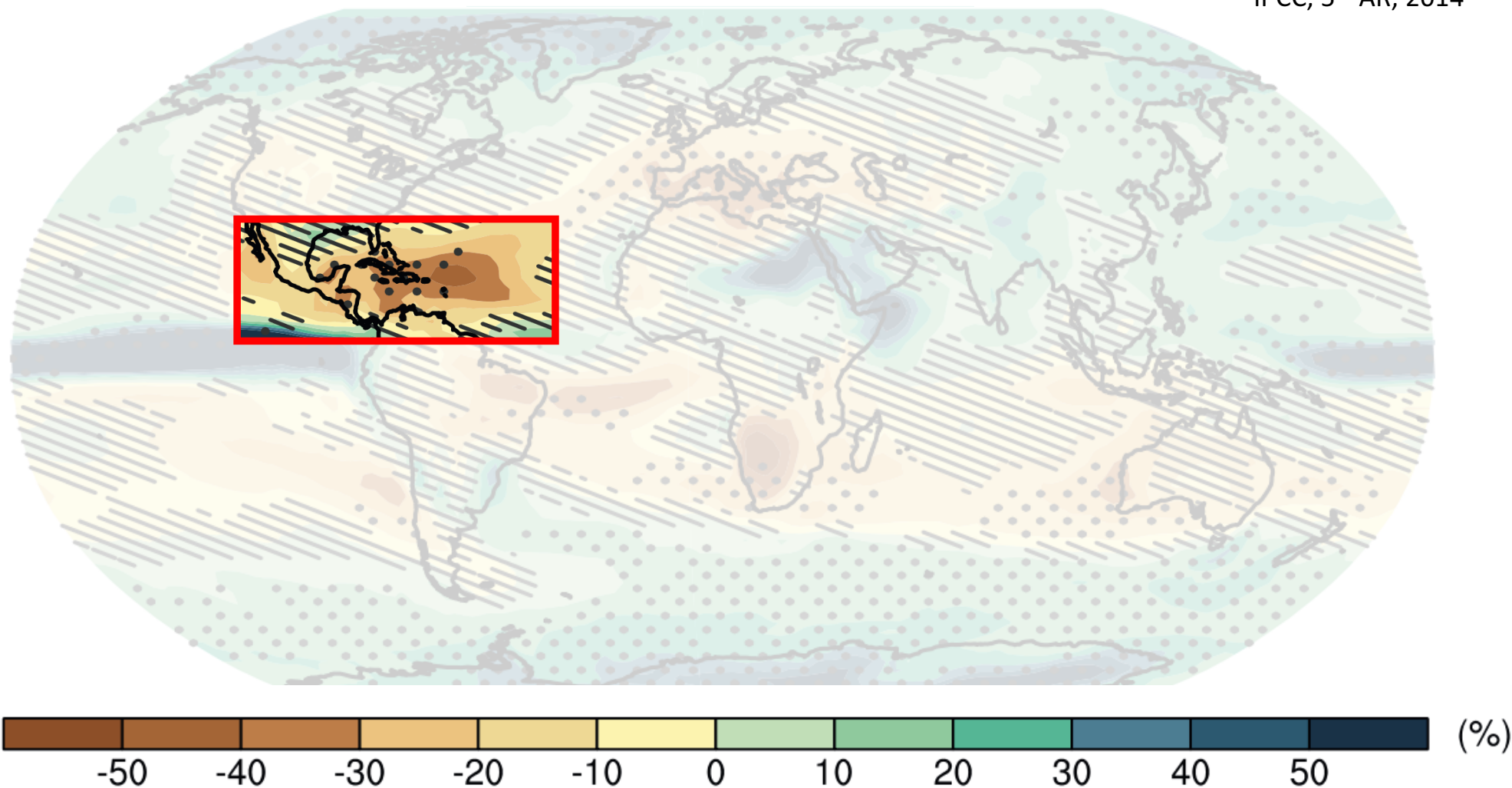
ASP GV PROGRAM HOST: DR. JOHN FASULLO




Background and motivation

2081-2100 - JJA

IPCC, 5th AR, 2014





Up to

50%

less **rain**





Caribbean Faces Widespread Drought, Water Shortages

by ASSOCIATED PRESS

Puerto Rico, Cuba, and the Dominican Republic are bracing themselves for a bone-dry summer as a severe drought is affecting the region.

Be Thankful, California. At Least You're Not Puerto Rico.

By Eric Holthaus



Rice farmers in the Dominican Republic expect they could lose 80 percent of their crops this season given the dry conditions.

Historic drought in the Caribbean is causing huge losses for farmers as the region suffers the driest conditions in more than five years.

FAO: sequía devastó la siembra

Water, Water Everywhere? Caribbean Adds to Global Drought

Cuba Suffers Through The Worst Drought Of 'The Last Century'

More than 1 million residents in the Caribbean country are now relying on trucked-in water to survive.

🕒 08/26/2015 01:36 am ET | Updated Aug 26, 2015

Country's 'worst drought' in 20 years; water levels critical: EFE

🖨️ Print ✉️ Email ☆ Bookmark 📁 Save to my profile 💬 7 Comments - last on May 14 at 5:00 AM



Low level at Tavera-Bao

[+ Zoom Picture](#)

Santo Domingo.- Dominican Republic faces its worst drought in the last 20 years on low rainfall since 2014, while the water current reserves are considered critical, EFE reports.

Santo Domingo Technology Institute (ITEC) water resources expert Martin Melendez said the country went through a similar situation in 1997 and, as then, from the lack of rain attributed to the climatic phenomenon El Niño.

He called the situation in the north "very critical" to the point that if it doesn't rain in June, "we will not have water to supply the Cibao (north region)" said Melendez, based on reports of low levels at the Tavera-Bao dams.

1st

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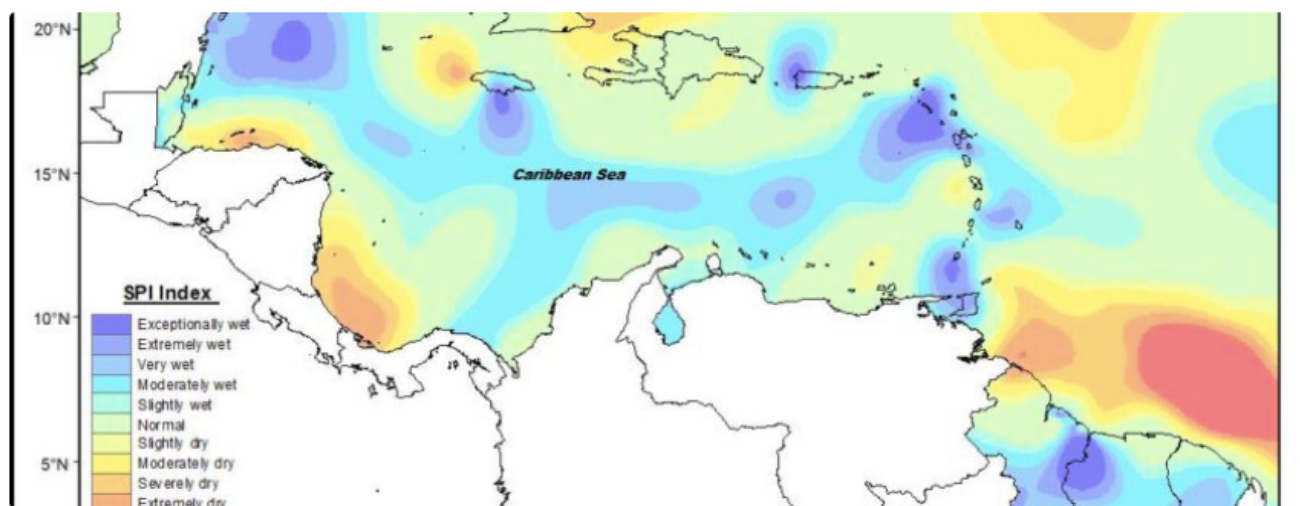
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SPI Monitor June 2017

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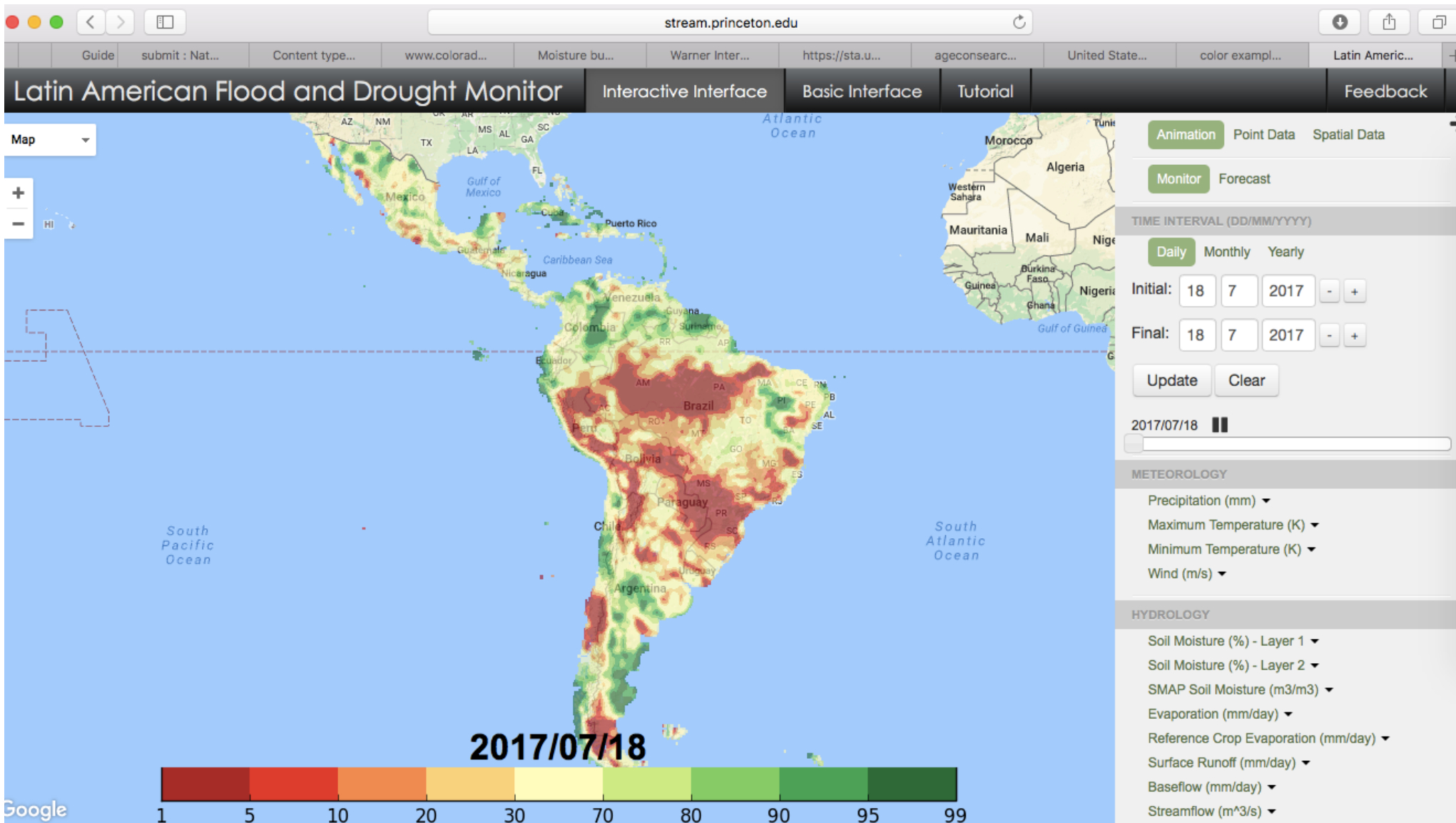
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SPI Monitor December 2016
January 18, 2017 - 12:11 pm



My proposed work as WISE Intern



[1] Meeting with farmers in SW Dominican Republic.

[2] Participation in the XVIII Science Congress in the Dominican Republic.

The banner features a dark blue background with a large, stylized 'XVIII' in light green. The text 'CONGRESO INTERNACIONAL DE INVESTIGACIÓN CIENTÍFICA' is displayed in white and green. A red button with the text 'Más información' is located at the bottom right. On the left side, there are three informational boxes: the first shows the dates '7-9 junio 2017' with a calendar icon; the second shows the location 'Biblioteca Pedro Mir Universidad Autónoma de Santo Domingo- UASD República Dominicana' with a location pin icon; and the third shows contact information 'Información: congresocicmescyt@mescyt.gob.do www.mescyt.gob.do' with an information icon.

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XVIII CONGRESO INTERNACIONAL DE INVESTIGACIÓN CIENTÍFICA [Más información](#)

My work as WISE Intern at NCAR

Research proposal for future research

Research proposal title:

**The development of the Caribbean Drought Monitoring and Forecasting dataset
(CarDrought): making climate data accessible to local farmers in the Dominican Republic**

Author:

Dimitris A. Herrera

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ABSTRACT

United States Drought Monitor

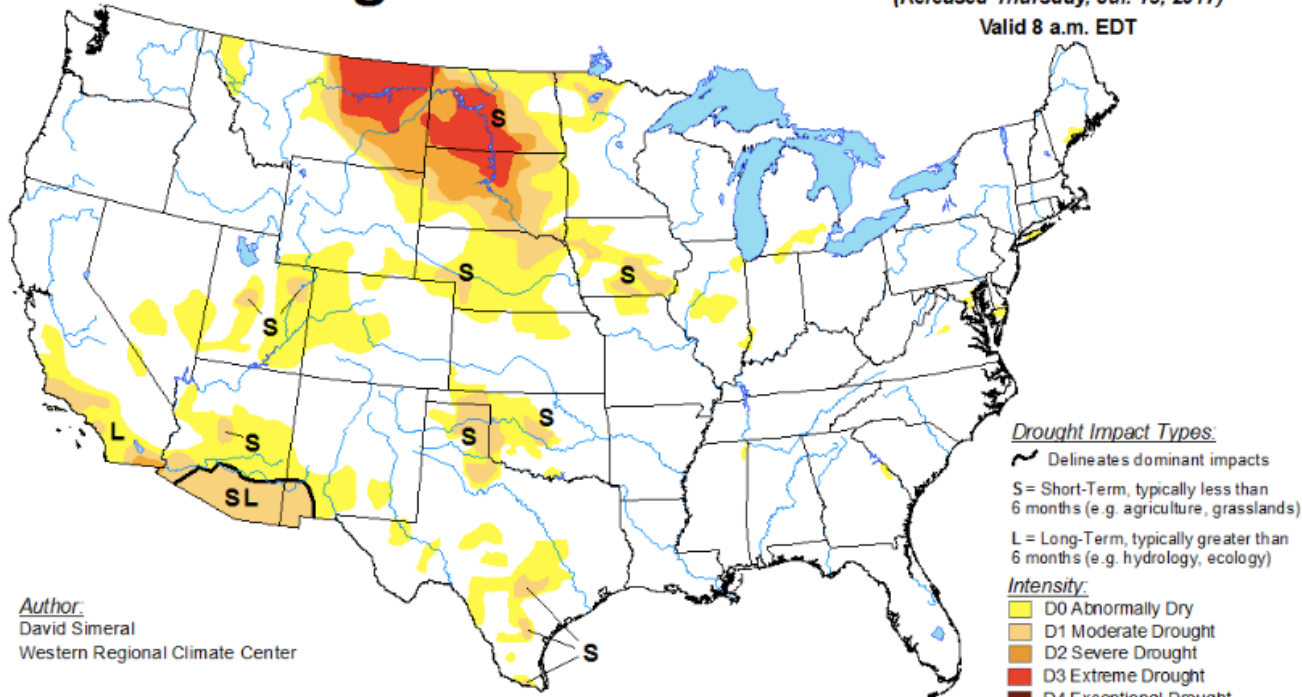


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U.S. Drought Monitor

July 11, 2017
(Released Thursday, Jul. 13, 2017)
Valid 8 a.m. EDT



Author:
David Simeral
Western Regional Climate Center

Current National Drought Summary

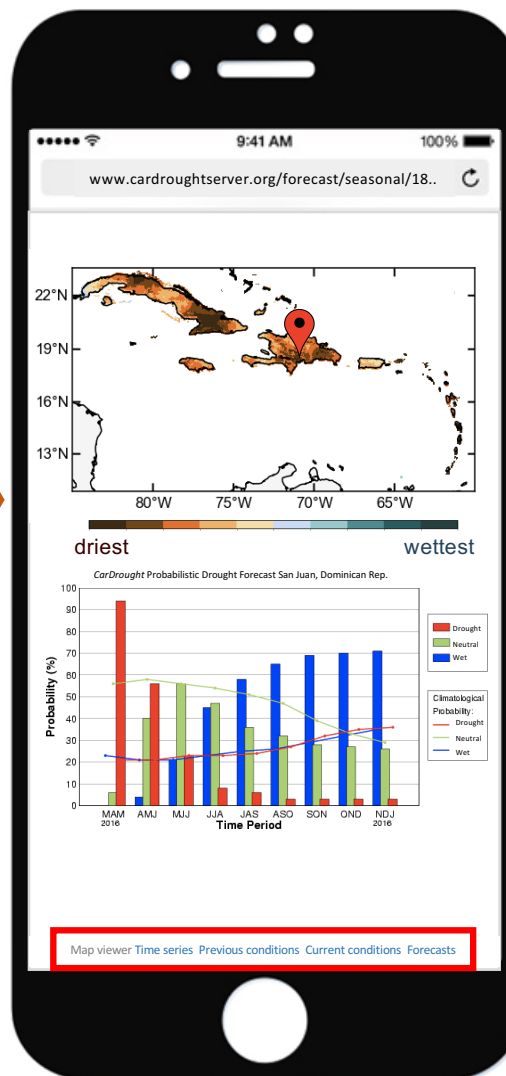
Summary

This U.S. Drought Monitor week saw hot and dry conditions persist across the western U.S as a ridge of high pressure anchored over the region exacerbated drought conditions in eastern Montana as well as elevating fire danger across the region. According to the National Interagency Fire Center, ~70 large wildfires are currently burning across the West. On Friday and Saturday, daily high-temperature records were broken at various locations including: Las Vegas (116°F), Los Angeles (98°F), Phoenix (118°F), Reno (104°F), Boise (104°F), and Salt Lake City (104°F). Some relief from the heat came as monsoonal circulation returned to the Southwest

The Northeast

Mid-Atlantic

The Southeast



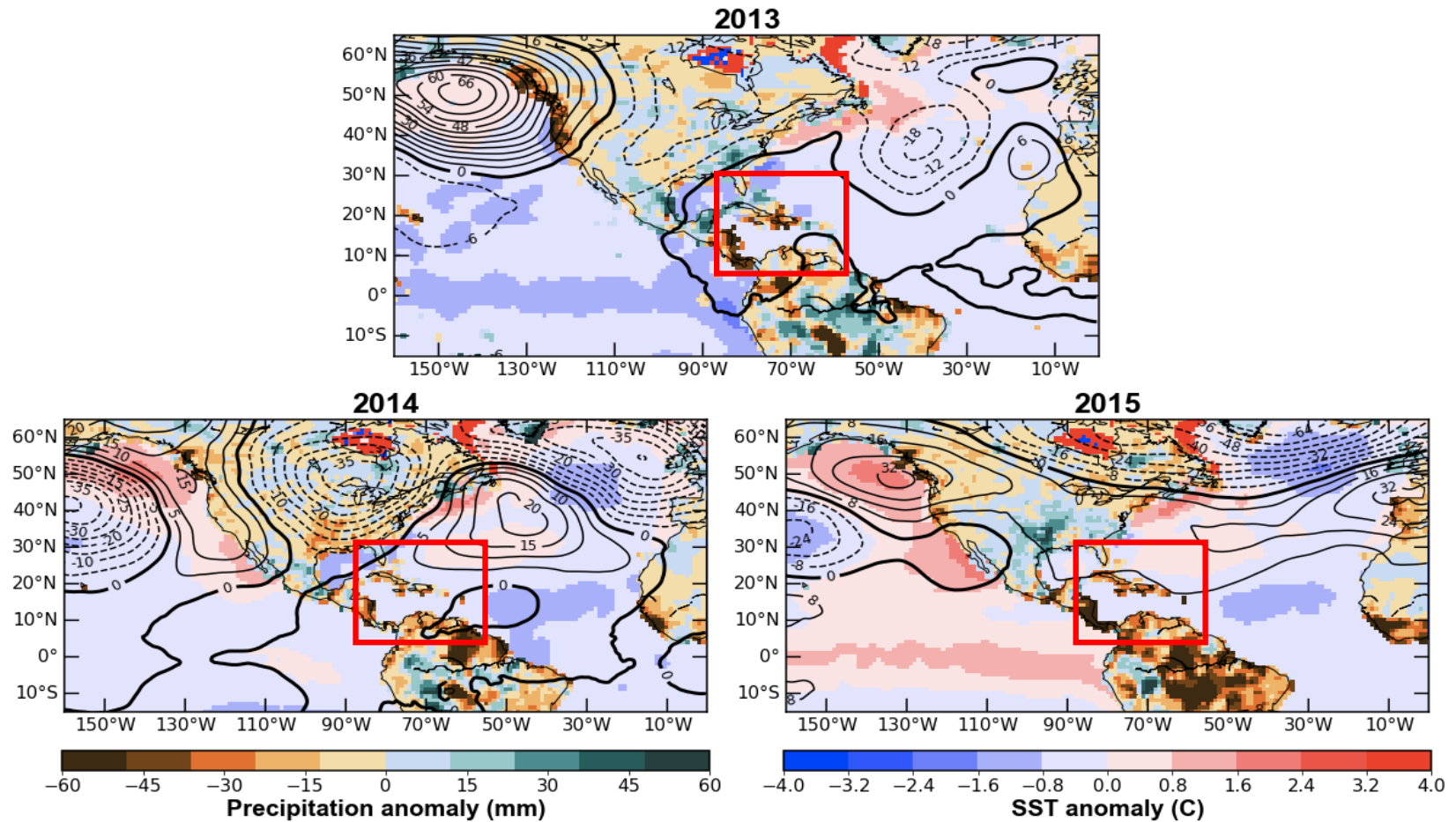
Research proposal for future research



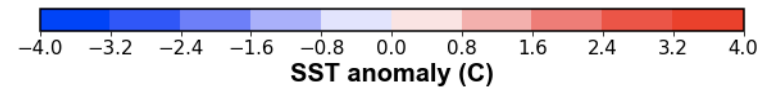
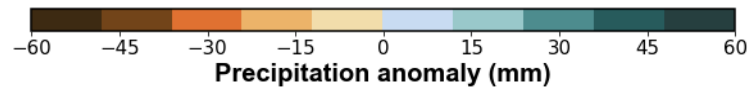
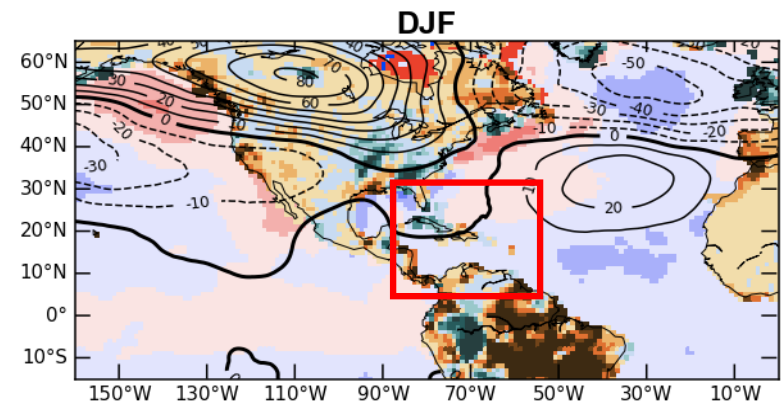
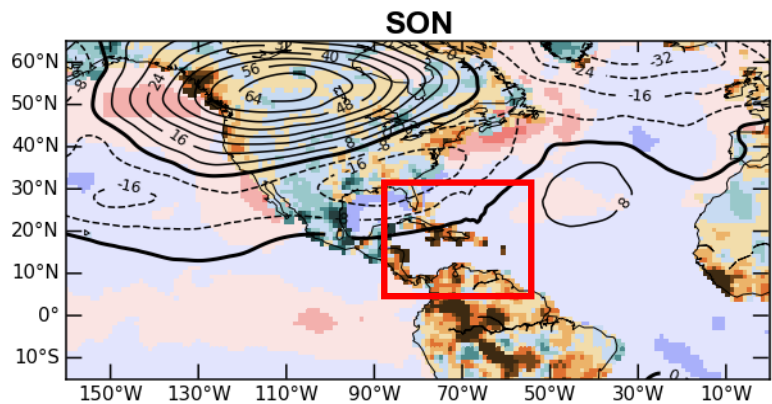
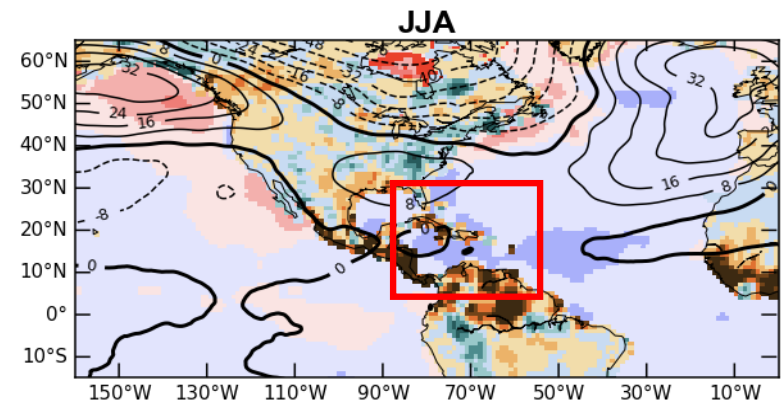
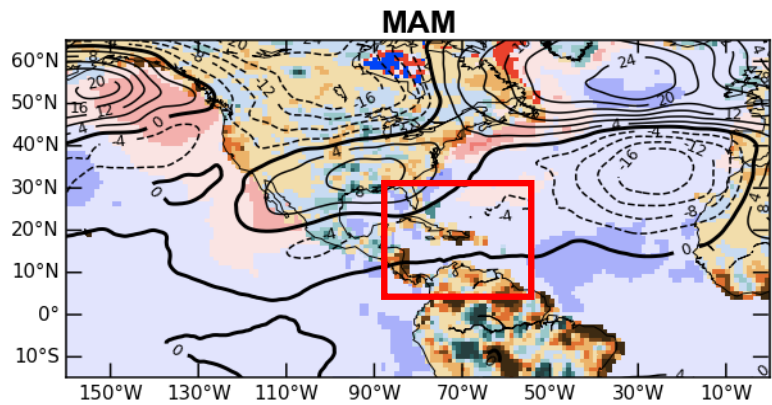
United Nations
Educational, Scientific and
Cultural Organization



Dynamical features behind Caribbean drought



Dynamical features behind Caribbean drought



My WISE experience

Networking

```
graph LR; Networking[Networking] --> RAL[RESEARCH APPLICATIONS LABORATORY (RAL)]; Networking --> AAP[AVIATION APPLICATIONS PROGRAM (AAP)]; Networking --> NSAP[NATIONAL SECURITY APPLICATIONS PROGRAM (NSAP)];
```

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Liz Hoswell LAB ADMINISTRATOR

AVIATION APPLICATIONS PROGRAM (AAP)

Matthias Steiner DIRECTOR

Bob Barron + James Pinto DEPUTY DIRECTORS

NATIONAL SECURITY APPLICATIONS PROGRAM (NSAP)

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Laurie Carson DEPUTY DIRECTOR

CLIMATE SCIENCE & APPLICATIONS PROGRAM (CSAP)

Lawrence Buja DIRECTOR

Olga Wilhelmi DEPUTY DIRECTOR

A remarkable history of contributions

TESTING + EVALUATION



To Flee or not to Flee?

That is the question hurricane researchers and forecasters aim to answer

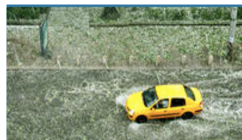
NATIONAL SECURITY



R&D on Atmospheric Transport and Dispersion of Hazardous Materials

Atmospheric releases of hazardous materials, either accidental or intentional,...

HIGH IMPACT WEATHER



Should I Stay or Should I Go

Storm Surge Perceptions, Communications and Response

SURFACE TRANSPORTATION



Promoting Vehicle Safety, Mobility, and Environmental Efficiency

Improving Weather and Road Condition Analyses and Forecasts

AGRICULTURE + FOOD



Decision Support Tools for Farmers

Weather is the critical factor in the success of a harvest.

RENEWABLE ENERGY



How advanced forecasting is making it easier to integrate solar onto the grid

Utilities and grid operators back research to make solar more predictable.

AVIATION



Tornadoes, Microbursts, and Silver Linings

How the Jumbo Outbreak of 1974 helped lead to safer air travel

HUMAN HEALTH



Forecasting to fight meningitis

NCAR's custom outlooks provide guidance to large-scale immunization program

WATER RESOURCES



Decision Support Tools for Farmers

Weather is the critical factor in the success of a harvest.

Future plans

- Conclude my graduate studies.
- Create the *CarDrought* dataset.
- Pursue a postdoc(?)

Especial acknowledgements



Warner Internship for Scientific
Enrichment (WISE)



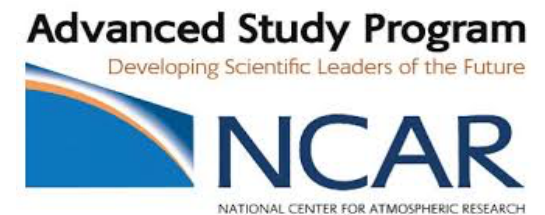
Dr. John
Fasullo



Dr. Toby Ault



Research
Applications
Laboratory



ASP Graduate Visitor
Program

Thank you