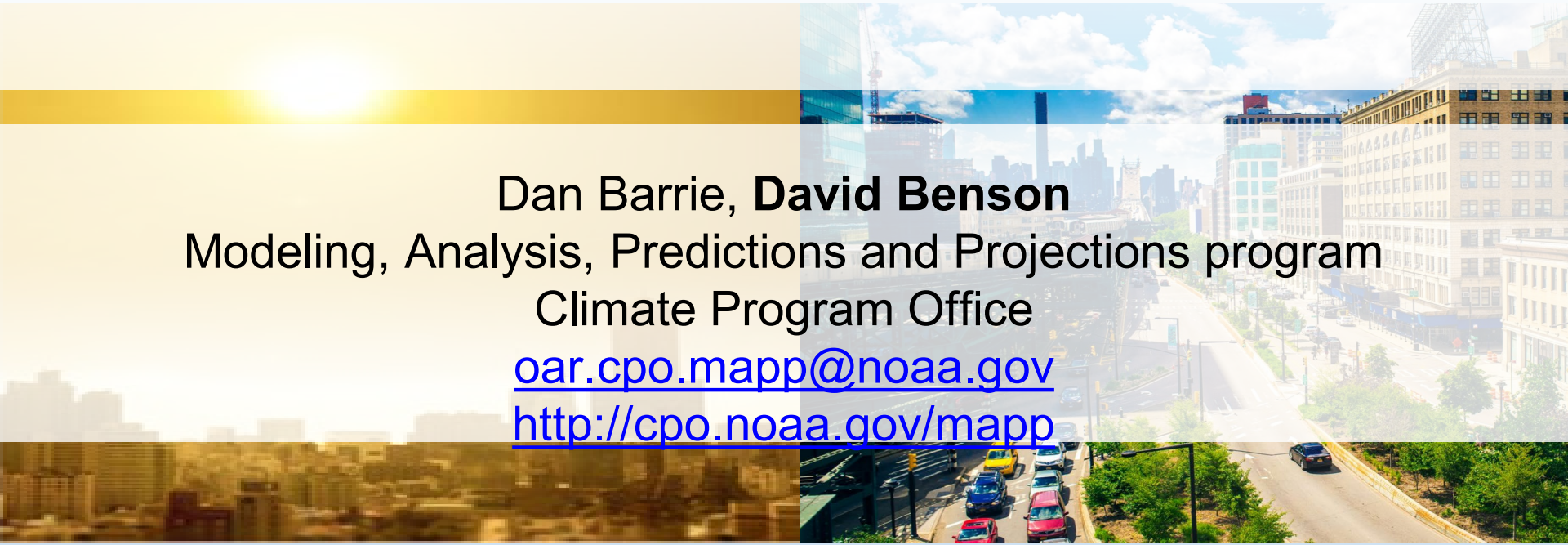
MAPP
Modeling, Analysis, Predictions, and Projections

CLIMATE PROGRAM OFFICE
ADVANCING SCIENTIFIC UNDERSTANDING OF CLIMATE, IMPROVING SOCIETY'S ABILITY TO PLAN AND RESPOND

Recent Strides in Enhancing NOAA's Climate Change Information Services and Risk Mitigation Capabilities



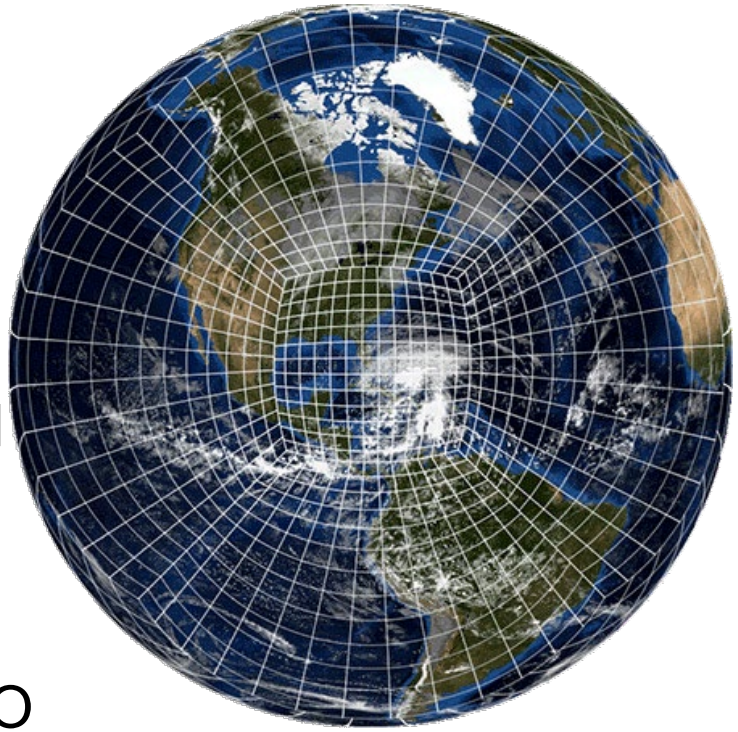
Dan Barrie, **David Benson**
Modeling, Analysis, Predictions and Projections program
Climate Program Office
oar.cpo.mapp@noaa.gov
http://cpo.noaa.gov/mapp

20th Annual CPASW, May 9-11, 2023

MAPP
Modeling, Analysis, Predictions, and Projections

Introduction

- The recent changes in climate has led to efforts geared towards climate services and the stakeholders for risk management and better preparedness
- Currently, the need for consistent and reliable climate change information is yet to be met in a timely and consistent manner.
- Some efforts have been made by CPO and the MAPP program to address this need:
  - climate projections for the 21st century
  - climate information for infrastructure engineering
  - rapid attribution of climate extremes



The GFDL Finite Volume Cubed-Sphere Dynamical Core (FV3). (Credit: NOAA)

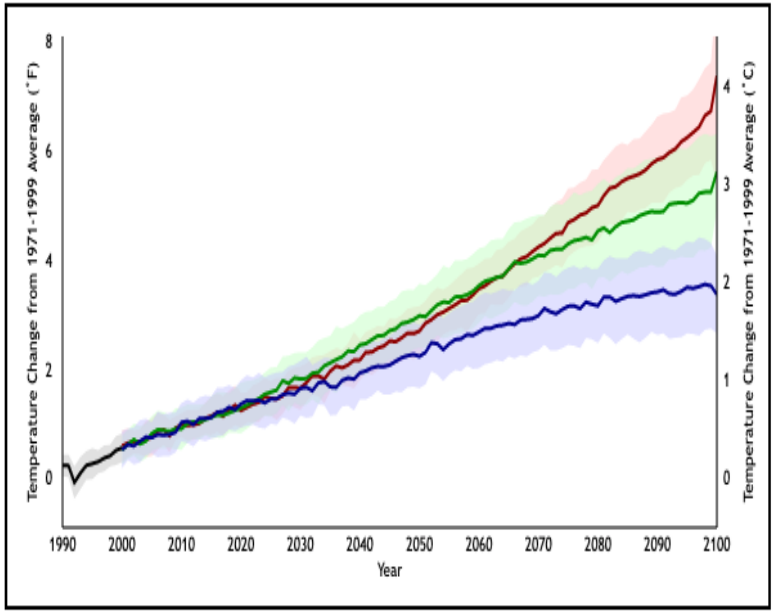
MAPP
Modeling, Analysis, Predictions, and Projections

Climate Projections for the 21st century

- In the United States, climate information need is **currently met in a heterogeneous fashion** depending on the forward-looking timescale -- through individual researcher-stakeholder interactions, bespoke data and information provision approaches that use a diverse array of methods
- NOAA is increasingly being asked by National-scale organizations to produce **consistent, reliable, transparent mid-to-long-range forward-looking climate information**.
- NOAA has a number of unique and preeminent capabilities that may be optimally assembled to meet this need, and has a mission requirement to serve as a provider of authoritative and transparent information services and products across a wide array of Earth system features

MAPP
Modeling, Analysis, Predictions, and Projections

Climate Projections for the 21st century



- MAPP is currently in the process of selecting research projects to test and build the science and structure needed to provide information on mid-to-long timescales
- This work is aimed at connecting NOAA's research and modeling capabilities with its product development and services capabilities (leveraging GFDL's SPEAR).
- It will explore the development of a NOAA multi-decadal projection capability that connects NOAA's research capabilities to experimental products.
- Research funded will address questions around the appropriate approaches to providing routine multi-decadal projections and accurate quantification of uncertainties

MAPP
Modeling, Analysis, Predictions, and Projections

Climate Information for Infrastructure Engineering

- There is a need for applying climate monitoring and projections information to baseline impacts and building infrastructural resilience
- In November 2021, NOAA CPO signed a cooperative agreement with the University of Maryland (UMD) Center for Technology and Systems Management and the American Society of Civil Engineers (ASCE) to accelerate the development of climate-smart engineering codes and standards
- This new initiative sets up a partnership with an influential code- and standard-setting body that is eager to use authoritative NOAA climate science

ASCE
American Society of Civil Engineers

MAPP
Modeling, Analysis, Predictions, and Projections

Climate Information for Infrastructure Engineering

- The partnership has resulted in meaningful engagement between NOAA scientists and engineering practitioners to deliver engineering-ready projections of precipitation, temperature, winds, and inundation.
- MOU signed at NOAA-ASCE summit on Feb. 2
- This collaboration provides a pathway for NOAA to align itself to take on the requests of other organizations like that need authoritative climate information for planning and risk management

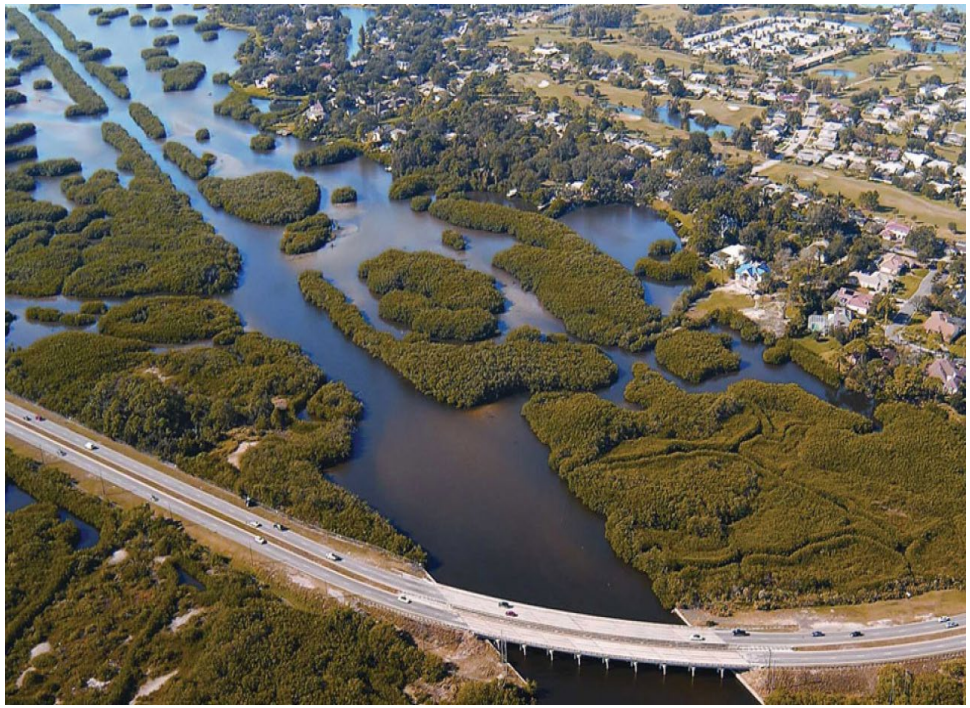
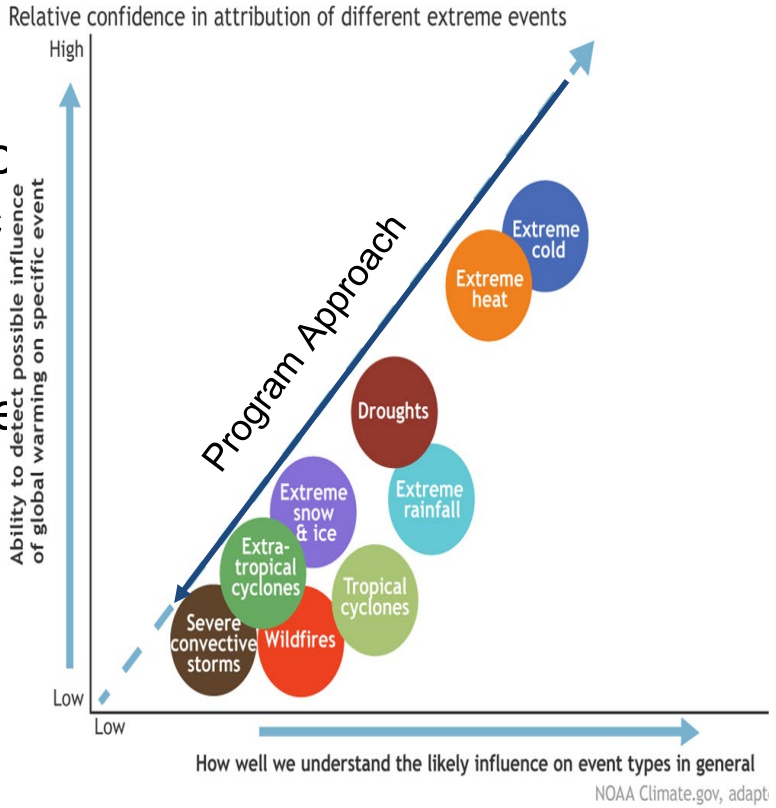


Image credit: Bipartisan Infrastructure Law | National Oceanic and Atmospheric Administration (noaa.gov)

MAPP
Modeling, Analysis, Predictions, and Projections

Rapid Attribution of Extreme Events

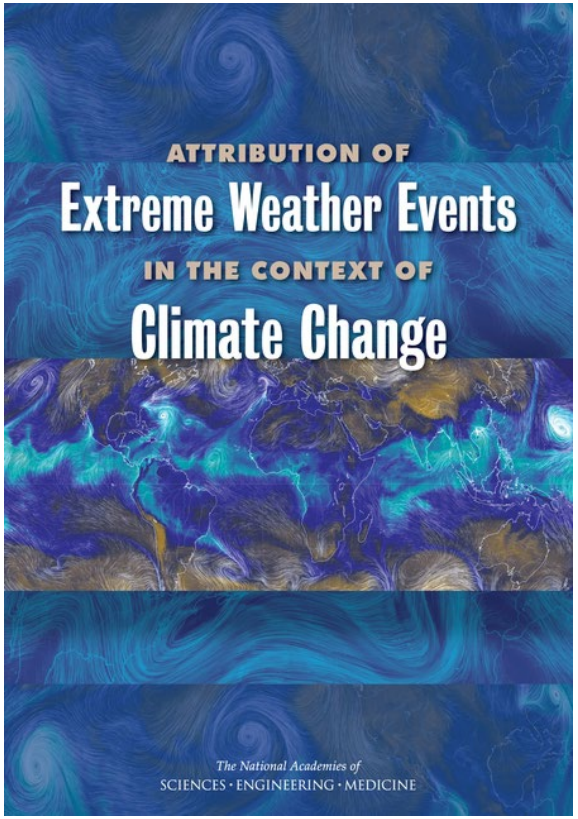


- Inspired by recommendations from the 2016 National Academies of Sciences repc NOAA embarked on the idea of systematic extreme event analysis
- In 2020, four CPO programs (CVP, COM, MAPP, Assessments) supporte an initiative to:
  - Improve our ability to delineate natural vs. anthropogenic contributions to extreme events
  - Develop a systematic, coordinated NOAA capability to evaluate the causes of extreme events for post-disaster adaptive action and resilience
- The goal is to provide information that can be used to build resilience in the aftermath of events, when communities are acutely focused on effective climate adaptation strategies

MAPP
Modeling, Analysis, Predictions, and Projections

Rapid Attribution of Extreme Events

- This project is led by NESDIS/NCEI, and scientifically supported by OAR/GFDL and PSL, and NWS/CPC.
- The project demonstrates the potential for provision of long timescale products and services by NCEI, leveraging and built on a platform of OAR's scientific excellence.
- The scientists involved are developing monitoring and analysis protocols for extreme heat and drought events.
- The project is in transition into a beta testing phase with a limited scope community of practice, engaging with stakeholders and regional managers to disseminate information using existing channels in the upcoming summer heat season



MAPP
Modeling, Analysis, Predictions, and Projections

Conclusion

- The growing need for climate information has spurred on various efforts within NOAA to provide reliable and authoritative products and services to stakeholders
- CPO and MAPP are at the forefront of developing the research and ensuring that NOAA's existing capabilities are fully utilized to address the problem at hand
- Efforts underway like the rapid attribution of extreme events showcase the possibility for research development to work concurrently with operational products delivery to service the needs of stakeholders
- Room for collaboration across programs, organizations and agencies to advance these efforts

MAPP
Modeling, Analysis,
Predictions, and Projections

Contact

David Benson
MAPP Program Analyst
Modeling, Analysis, Prediction and Projections program
Climate Program Office
david.benson@noaa.gov
oar.cpo.mapp@noaa.gov
http://cpo.noaa.gov/mapp