Climate Program Office Review

May 24-26, 2022

Pre-Recorded Presentation

Supporting Review Activity Area

1: Climate Science / Earth System Science and Modeling

Modeling, Analysis, Predictions, and Projections Program

Dan Barrie, Program Manager; Courtney Byrd, Program Specialist; David Benson, Program Specialist

Overview

- **Briefing Purpose:** Overview of MAPP
- **Context:** Subactivity for Activity Area 1; MAPP is part of CPO's Earth System Science and Modeling Division and supports the development and application of climate models

MAPP 101

MAPP was formed in 2010 to support research advancing NOAA's climate models and their applications including climate monitoring and projections, and focused work supporting the drought, marine ecosystem, coastal, and extremes agency mission spaces.

Program Manager: Dan Barrie

Program Specialist: Courtney Byrd

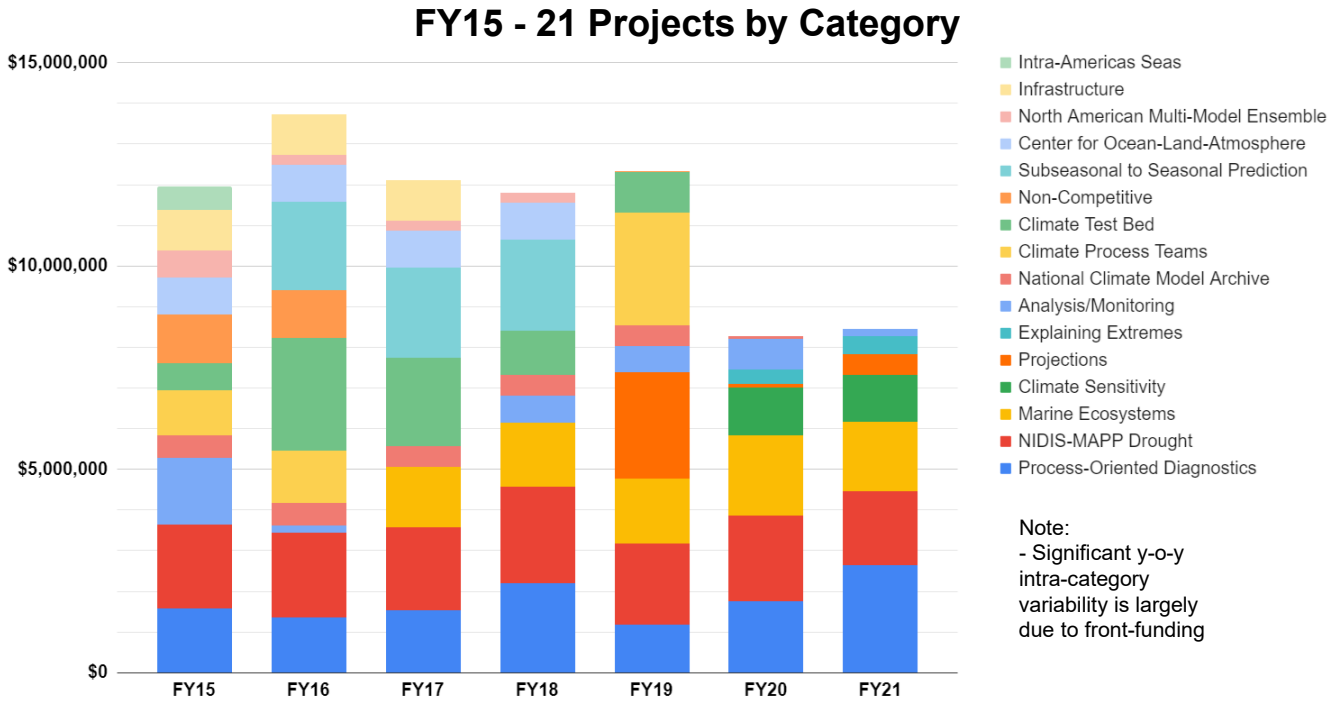
Program Analyst: David Benson

Program Director: Annarita Mariotti (on detail, OSTP)

- ✓ *Supports National Climate Assessment efforts*
- ✓ *Extends GFDL's research capacity*

Program components:

- $9.17M FY21 total budget
- Competitive projects were 100% of MAPP's FY21 research budget



Note:
- Significant y-o-y intra-category variability is largely due to front-funding

MAPP 101, continued

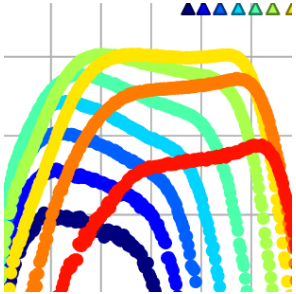
FY17-21 Main Program Areas

Marine Ecosystems

(FY17-19; FY20-22)

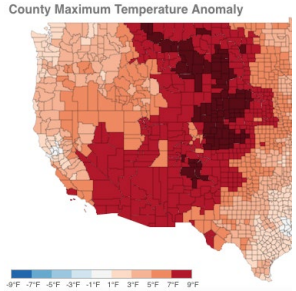
NIDIS-MAPP Drought

(FY17-19; FY20-22)



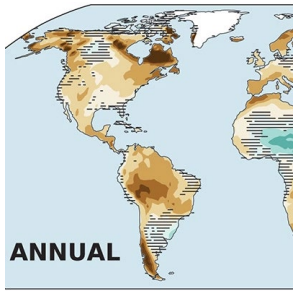
Model Diagnostics

(FY15-17; FY18-20; FY21-23)



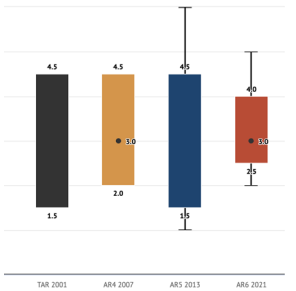
Analysis/ Monitoring

(FY18-20; FY21-24)



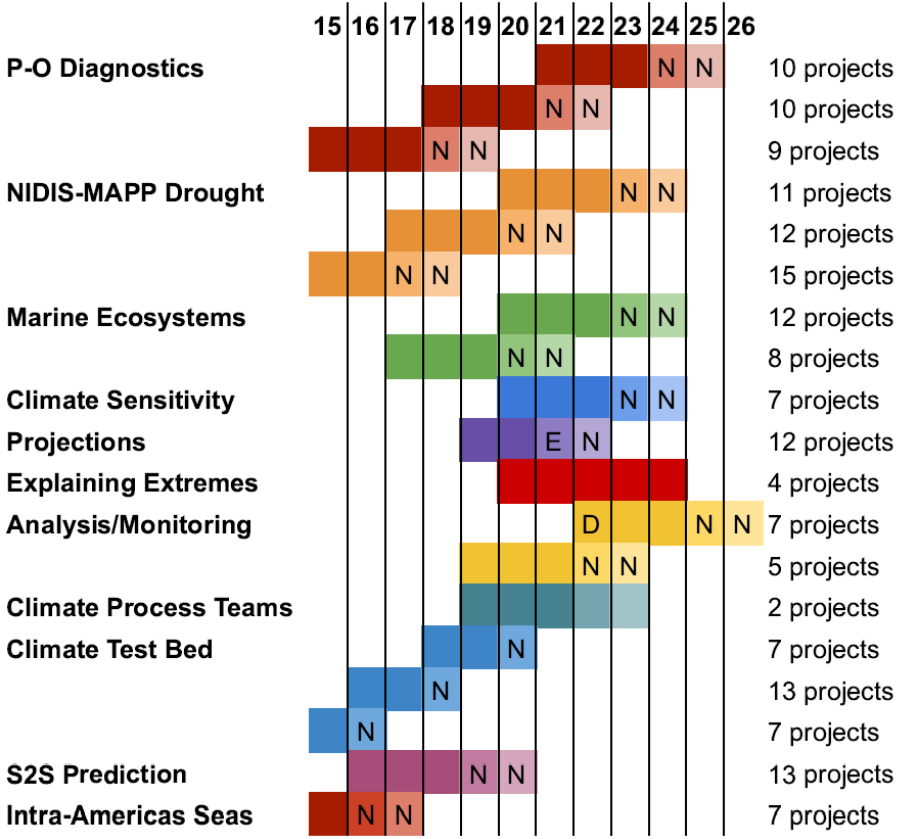
Projections

(FY19-21)



Climate Sensitivity

(FY20-22)

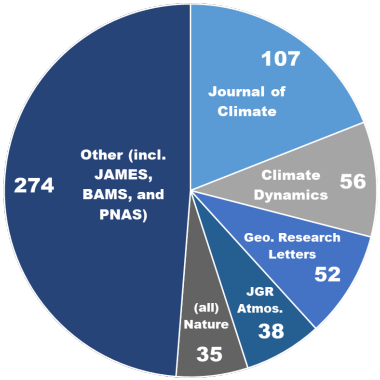


N = No Cost Extensions, E = Extension, D = Delay

Key Accomplishments (FY17-21)

Quality

Total Publications, by Journal (562 total)



Most Cited Publication, By Year

Huang, Jianping, et al. **(2017)** "Drylands face potential threat under 2C global warming target." *Nature Climate Change* — 269

866 — Beck, Hylke E., et al. **(2018)** "Present and future Köppen-Geiger climate classification maps at 1-km resolution." *Scientific Data*

Dai, Aiguo, et al. **(2019)** "Arctic amplification is caused by sea ice loss under increasing CO2." *Nature Communications* — 148

136 — Williams, A. Park, et al. **(2020)** "Large contribution from anthropogenic warming to an emerging North American megadrought." *Science*

Chiang, Felicia, et al. **(2021)** "Evidence of anthropogenic impacts on global drought frequency, duration, and intensity." *Nature Communications* — 12

Key Accomplishments (FY17-21)

Relevance

Strategic Partnerships

NOAA

- **OAR Labs:** GFDL, PSL, PMEL, CSL, GML, AOML
- **NMFS:** OSTI, FSCs (various)
- **NESDIS:** NCEI, STAR
- **NOS:** ONMS, NCOSS
- **NWS:** CPC
- **OAR Programs:** OA, CPO (Various)

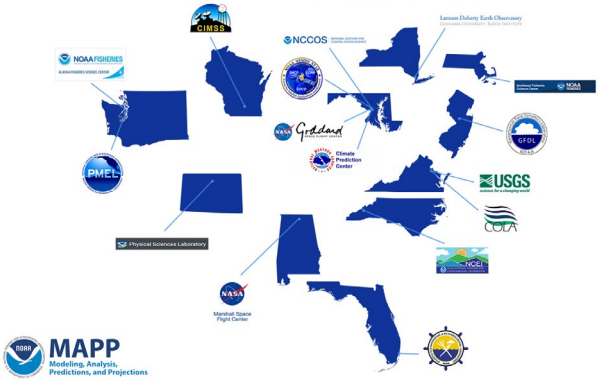
Academia: Universities in 24+ states

Federal agencies: DOE, NASA, USDA, DOI, USACE

Private sector: NOFO

Interagency: USGCRP, US GEWEX, CLIVAR

Actively engaged with various NOAA/CPO priorities: Climate and Fisheries Initiative; CPO Marine Ecosystems, Coastal Inundation, Heat, and Water Resources Risk Teams; Precipitation Prediction Grand Challenge; Climate Adaptation goals; National Climate Assessment; IPCC



Key Accomplishments (FY17-21)

Performance

In the past 5 years,

- Organized and led 10 Task Forces, each with 30+ Investigators
- Science Accomplishments
  - CMIP5TF, CMIP6TF, CSTF Contributions to NCA4/5
  - NIDIS-Relevant Accomplishments
  - Major foundational support for CFI
  - CTB R2O transitions; operational NMME
  - S2S Activities (SubX, S2STF)
- Provided 270M HPC core-hours to external collaborators
- 100-150 publications/year on average.
- Supported 10+ community workshops, and co-support for the National Climate Modeling Summ
- 2 CPTs in collaboration with DOE and NASA

321 Proposals received FY17-21

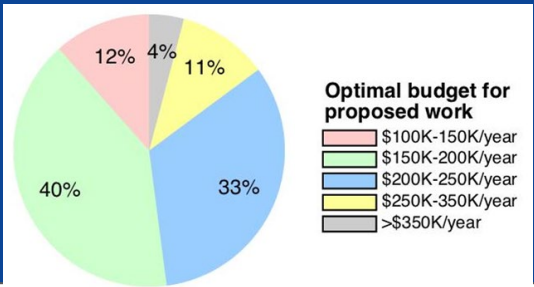
103 Proposals funded

32.1% success rate

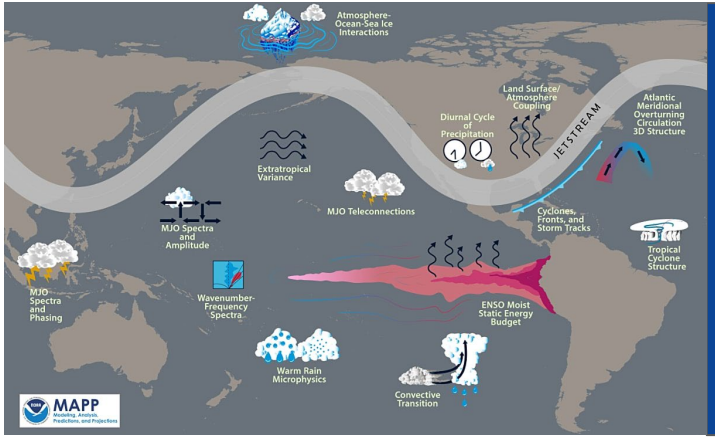
Anonymous survey of applicants and reviewers:

- healthy career stage mixture
- research topics motivate applications
- scientific quality perceived to be secondary to program relevance
- community wants new funding models
- integrate DEI considerations into scoring

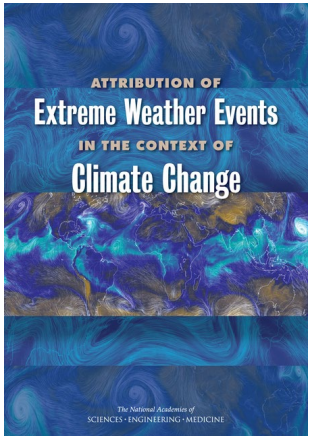
"The program is one of the more productive federal funding activities, and often has a clearer vision toward advancing NOAA/ climate science than others. It is always a treat to win a MAPP grant."

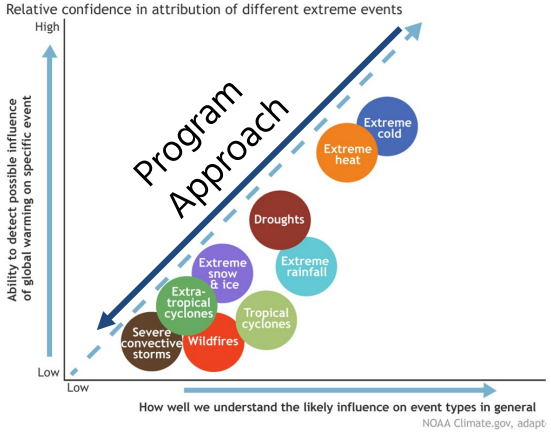


Key Accomplishments (FY17-21)

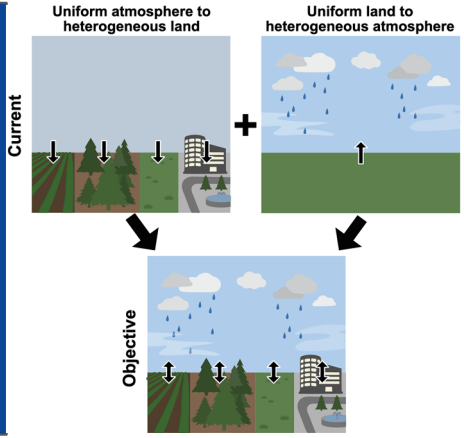


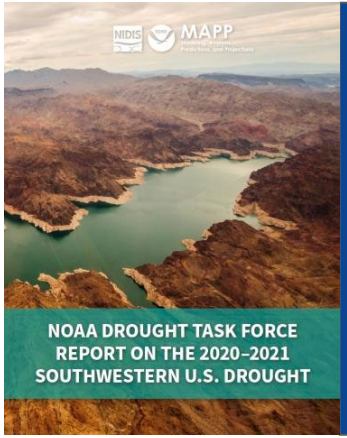
Transition of Model Diagnostics Task Force Software to GFDL





Climate Process Team: Coupling of Land Atmospheric Subgrid Parameterizations

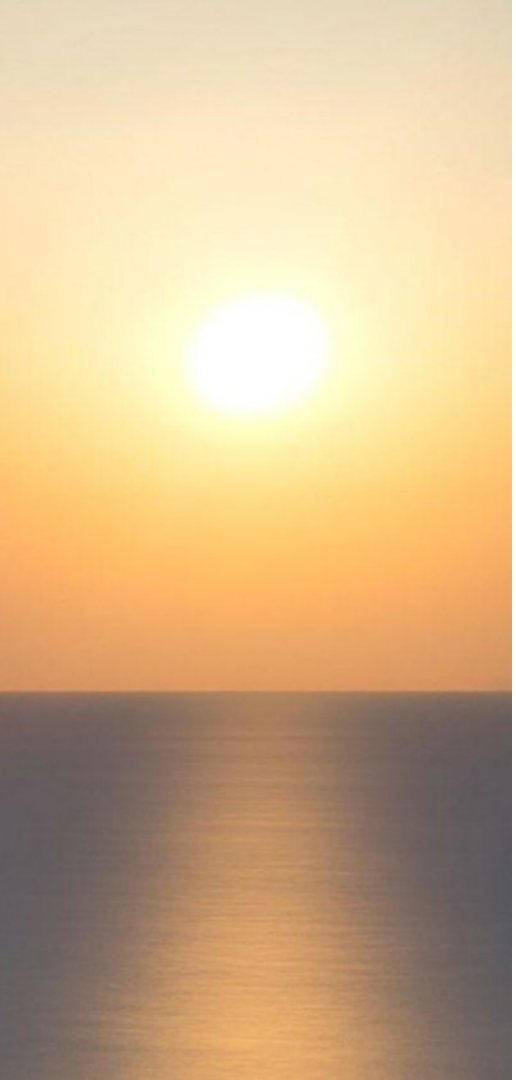




Drought Task Force report on the 2020-2021 Southwestern Drought

Lookahead

- **Drivers:**
  - Administration priorities (climate information, model fidelity/reliability)
  - NOAA priorities (PPGC, Climate Fisheries Initiative, Climate Adaptation/Mitigation)
  - CPO Risk Teams -- Ecosystems (Sanctuaries), Heat (Monitoring/Urban/Modeling), Inundation (Prediction/Monitoring), Water Resources (Pluvials focus)
- **Some Strategic Considerations:**
  - Grow applications of agency's climate modeling efforts. Deepen GFDL collaboration.
  - Understand role for MAPP w/r/t NWS model and product development.
  - Applied vs. foundational science balance.
  - Program excellence -- how can we improve program function and administration to maximize outcomes?
- **FY22**: National Marine Sanctuaries solicitations: (1) collaborative solicitation with ESSM/COM; (2) inter-program/line office (MAPP, NCCOS, OAP, IOOS) multi-stressor impacts



Links

- **Main MAPP site:** https://cpo.noaa.gov/mapp
- Searchable, indexed MAPP project database: https://cpo.noaa.gov/Divisions-Programs/Earth-System-Science-and-Modeling/MAPP/Funding-Opportunities-Funded-Projects