

Climate Program Office Review

May 24-26, 2022

Welcome

Dr. Wayne Higgins, Director Climate Program Office



Climate Program Office

Video: NOAA's CPO



Climate Program Office

CPO Overview

Outline



- Congressional Mandates & Current Drivers
- CPO Vision and Mission
- What does CPO do?
- Engagement and Partnerships
- Accomplishments & Indicators of Excellence
- Leadership
- Workforce
- Budget
- Priorities & Changes Ahead
- Activity Areas for the Review
- Structure of the Review

Legislative Drivers



CPO works in direct response to Congressional authorizations & mandates



Climate research:

- National Climate Program Act, 15 U.S.C. §§ 2901-2908;
- Global Change Research Act of 1990, 15 U.S.C. §§ 2921-2961

International climate research:

 International Cooperation in Global Change Research Act of 1990, P.L 101-606, 15 U.S.C. §§ 2951-2953

Drought research:

National Integrated Drought Information System
Reauthorization Act of 2018, P. L. 115-423, 15 U.S.C. § 313d

Weather research:

 Weather Research and Forecasting Innovation Act of 2017, 15 U.S.C. § 8501;

Climate Crisis



Tackling the climate crisis

Priority 1: "Ensure NOAA is seen as the primary authoritative provider of climate information and services. From the individual to the business to the tribe to the government, NOAA should be the agency that people turn to for reliable, accessible, relevant, actionable, easy-to-use climate information."

-Dr. Rick Spinrad September 30, 2021

Current Momentum Around Climate Information & Services



Intra-agency	Interagency	International
NOAA Priorities	EO 14008, Section 211(d)	Paris Agreement
President's Budgets (FY2022 (execution); FY2023 and FY2024	EO 13985 // Advancing Racial Equity and Support for Underserved	COP26 // Preparing for COP27
(planning)) FY2023 OMB-OSTP R&D Priorities Memo	Communities through the Federal Government USGCRP 5th National Climate Assessment and Decadal Strategic	PPGC and WCRP/WMO
Department of Commerce Strategic Plan (2022-2026)	Plan (2022-2031)	WMO Climate Services
Department of Commerce Climate Adaptation Plan (2021)	Dr. Lubchenco's Challenge Letter to the USGCRP	IPCC
NOAA's Climate Mission Service Area	NSTC Subcommittees (especially SOST, SRST, SGCR)	Arctic Council
NOAA Climate and Fisheries Initiative (CFI)	ICAMS Subcommittee on Climate Information Services	UN Ocean Decade
NOAA Fisheries Climate Science Strategy (NCSS)	Interagency Working Groups for drought, wildfire, heatwave, coastal resilience, flooding	National Intelligence Estimate: Climate Change and International Responses Increasing Challenges to U.S. National
NOAA Climate Science Strategy Regional Action Plans (RAP)	White House Environmental Justice Advisory Council	Security Through 2040
NOAA Diversity and Inclusion Strategic Plan (2020-2024)	National Climate Strategy	
Extensive experience and boots-on-the-ground	Agency Climate Adaptation and Resilience Plans	

NOAA Organizational Structure





National Environmental
Satellite Data and
Information Service

National Marine Fisheries

National Ocean Service

NOAR NOOLAND ATMOSPHERIC ADMINISTRATION OF COMMERCE

National Weather Service

Oceanic and Atmospheric Research

Climate Program Office

Office of Marine and Aviation Operations

CPO Alignment



- **the NOAA mission*** to understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources.
- **the OAR mission** to conduct research to understand and predict the Earth system; develop technology to improve NOAA science, service, and stewardship; and transition the results so they are useful to society.

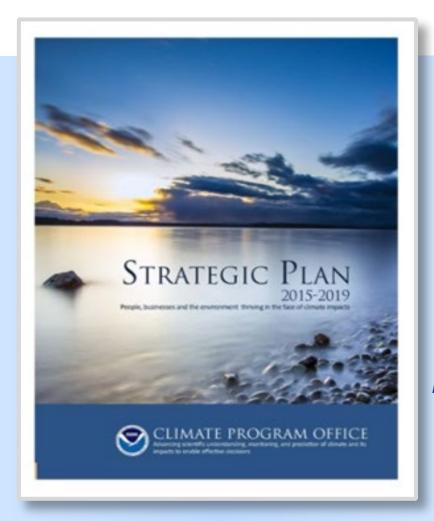
^{*}A new NOAA Strategic Plan (FY22-FY26) will be released in June 2022. NOAA last published a Strategic Plan in 2008.

Vision and Mission



CPO Vision

People, businesses, and the environment thriving in the face of climate impacts



CPO Mission

We advance scientific understanding, monitoring, and prediction of climate and its impacts to enable effective decisions

What does CPO do?



CPO is the heart of NOAA's climate science & services enterprise

RESEARCH to advance understanding, prediction & applications

Competitive Research Grants Programs
Field Campaigns (FIREX, ATOMIC, Water Utilities)
Model Development
Predictions & Projections

COMMUNICATION & EDUCATION to build literacy and promote awareness & use of climate data, tools, & services

Climate.gov

U.S. Climate Resilience Toolkit

Stakeholder & Educator Training

Climate Literacy

Public Webinars

NIDIS & NIHHIS*

National Climate
Assessment

CPO Risk Areas

RESEARCH & PARTNERSHIPS to build adaptive capacity

Interdisciplinary Adaptation Sciences (society, ecosystems & fisheries)

International Adaptation (research & partnerships)

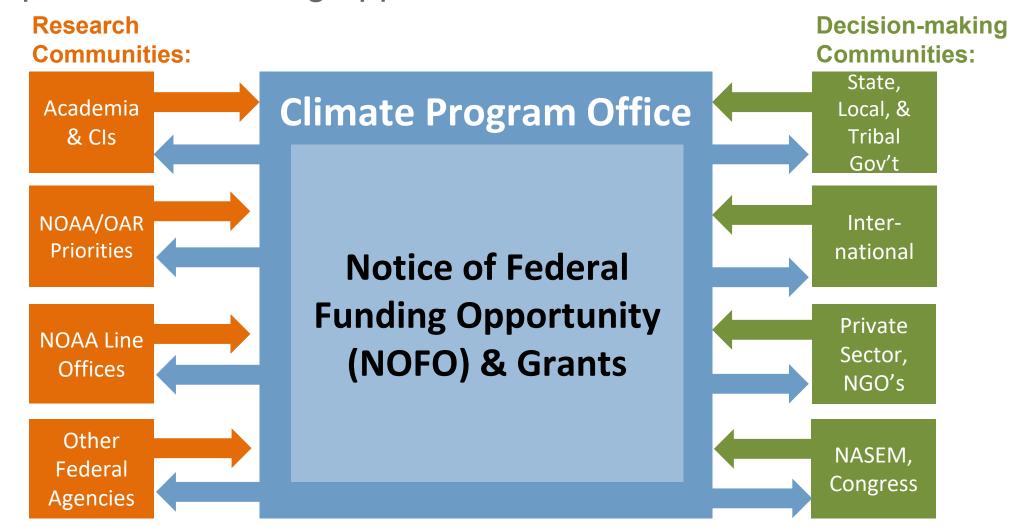
RISA

*NIDIS: National Integrated Drought Information System NIHHIS: National Integrated Heat Health Information System

Engagement: Funding Opportunities



CPO works with the broad research & decision-making communities to gather inputs for its funding opportunities.



Engagement: Collaborations and Partnerships



Government

OAR Research Laboratories & Programs

NOAA Line Offices (NESDIS; NMFS; NOS; NWS)

U.S. Government Agencies

U.S. Global Change Research Program (USGCRP)

Interagency Council for Advancing Meteorological Services (ICAMS)

International Agencies (e.g. IPCC, WMO)

State and Local Government Organizations



Other Collaborations

Universities & Cooperative Institutes

NCAR/UCAR

U.S. Private Sector (PPP's)

U.S. Non-Government Organizations

Professional Societies (e.g. AMS; AGU; ASCE; ASAP; APA)

Climate Leadership Organizations (e.g. Water Utility Climate Alliance)

Engagement: Climate Working Group (CWG)



CPO benefits from the advice of the NOAA Science Advisory Board (SAB) Climate Working Group (CWG):

- Coastal Inundation at Climate Timescales White Paper (Review; Aug 2021)
- Climate and Fisheries Initiative Implementation Approach (Review; Aug 2021)
- Advancing Earth System Prediction (White Paper; Mar 2021)
- Precipitation Prediction Grand Challenge Strategy (Review; Aug 2020)
- Opportunity for COVID-19-related Earth System monitoring and prediction efforts (Letter to SAB; Apr 2020)
- Subseasonal-to-Seasonal-to-Decadal (White Paper; Dec 2019)
- NOAA's Climate & Global Change Postdoctoral Program (Review; Aug 2019)

CPO by the Numbers (FY2021)



62
NOAA and nonNOAA employees

\$75.2M

Annual Budget

130

New grant awards each year

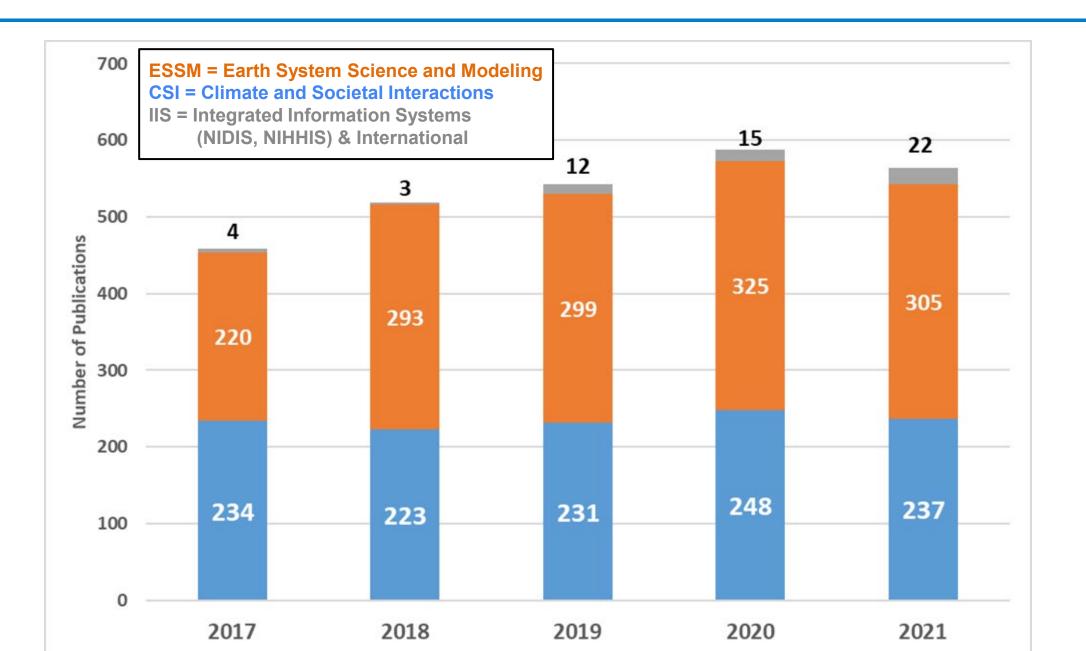
as well as 125 grant contributions, interagency agreements and reimbursable agreements

>500

Sponsored peerreviewed publications

CPO-Supported Articles Per Year (2017-2021)





CPO Highly Cited Articles (ESSM)





"Influence of high-latitude atmospheric circulation changes on summertime Arctic sea ice." Ding et al. (Mar 2017) Nature Climate Change

CVP



173 citations

122 news stories



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

MAPP

879 citations

5 news stories



"Arctic amplification is caused by sea-ice loss under increasing CO2."

Dai, et al. (Jan 2019) Nature Communications

COM FY14

148 citations

25 news stories



"Key indicators of Arctic climate change: 1971–2017." Box, et al. (Apr 2019)

Environmental Research Letters



166 citations

70 news stories



"Twofold expansion of the Indo-Pacific warm pool warps the MJO life cycle." Roxy, et al. (Nov 2019) Nature

CVP FY17/18 32 citations

32 news stories



"Large contribution from anthropogenic warming to an emerging North American megadrought." Williams, et al. (Apr 2020) Science

FY19

136 citations

338 news stories



"A comprehensive quantification of global nitrous oxide sources and sinks."

Tian, Hangin, et al. (Oct 2020) Nature

AC4 FY13 31 citations

146 news stories



"Majority of US urban natural gas emissions unaccounted for in inventories." Sargent, Maryann R., et al. (Nov 2021) **Proceedings of the National Academy of Sciences**

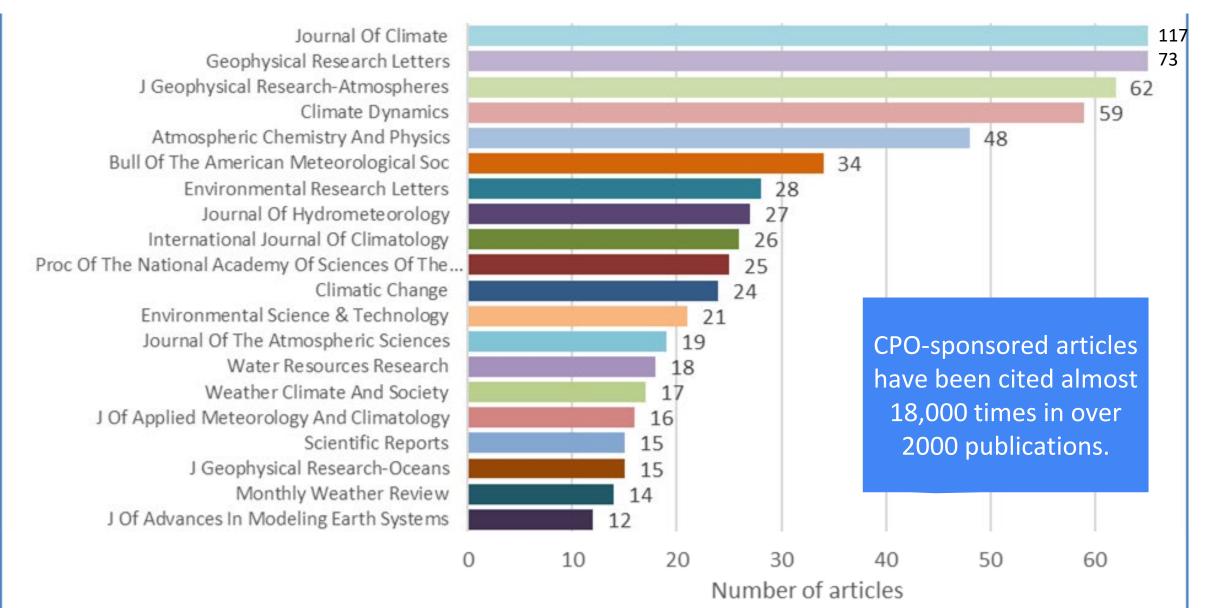
0 citations

36 news stories

AC4 FY17

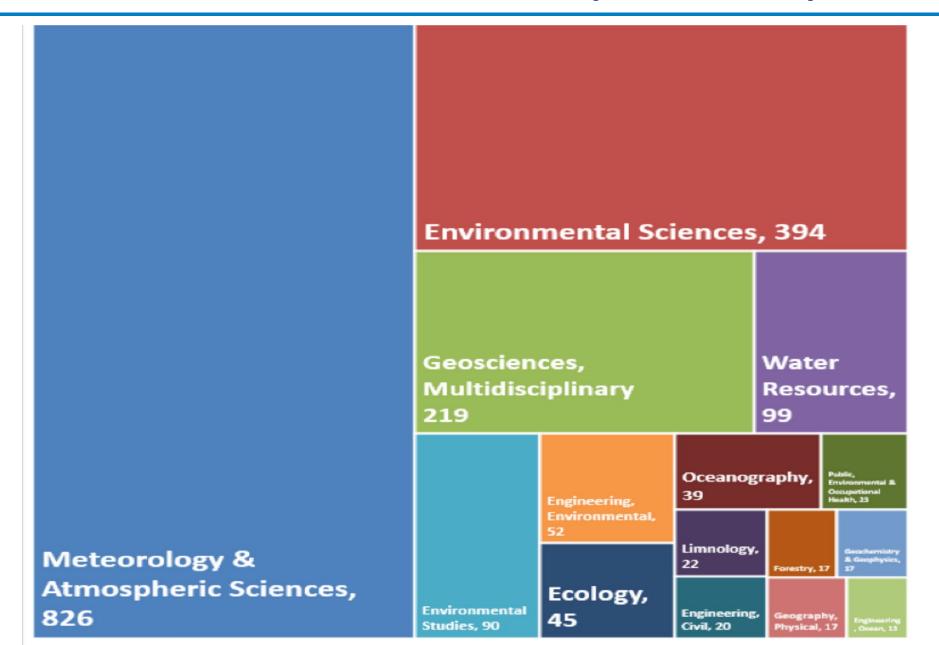
CPO Articles Per Journal (2017-2021)





Top Research Areas of CPO Articles (2017-2021)





Field Studies and Campaigns



Fire Influence on Regional and Global Environments Experiment (FIREX)







NOAA-NIST Longitudinal Study on Small and Medium Business Disruption and Resilience in the Context of Complex Events: COVID-19 and Natural Disasters









Years of the Maritime Continent





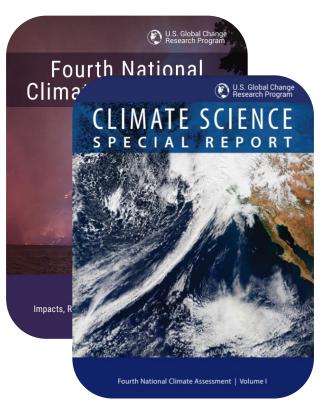


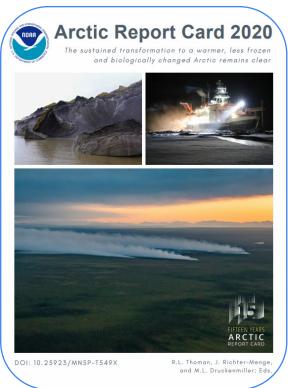
Tropical Ocean – Global Atmosphere (TOGA) Coupled Ocean Atmosphere Response Experiment (COARE)

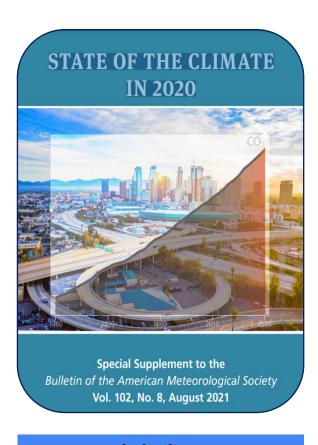


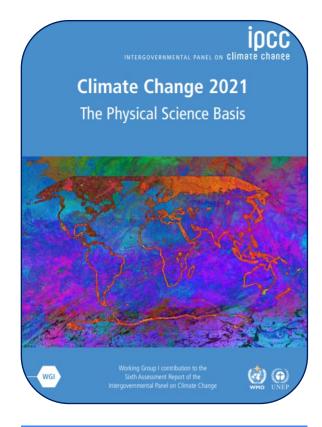
Highly Influential Assessment Reports











407 citations 2,800+ news stories 2018 11 citations 1,000+ news stories 2020 4 citations ~770 news stories 2021 12 citations 4,000+ news stories 2021

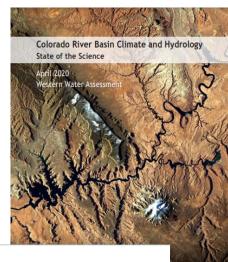
Relevance: Research Informing Decisions











pırca

PACIFIC ISLANDS REGIONAL CLIMATE ASSESSMENT

Climate Change Vulnerability Study





Louisiana Morbidity Report



November, 2019

Office of Public Health - Section of Environmental Epidemiology and Toxicology P.O. Box 60630, New Orleans, LA 70160 Phone: (888) 293-7020

DEPARTMENT OF http://ldh.la.gov/index.cfm/newsroom/detail/5293

Environmental and Occupational Edition

SECRETARY

Volume 1, Number 1

Distribution of Extreme Heat Days across Louisiana

Anna Reilly, Ph.D., M.P.H.; John Anderson, M.Sc.; Barry Keim, Ph.D.; Derek Thompson, M.S.

Building Resilience in an **Urban Coastal Environment**

Integrated, Science-Based Planning in Jamaica Bay, New York



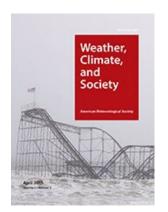
Social Science IMPACT



Influencing a generation of science policy **scholarship**



"Climate information services for adaptation: what does it mean to know the context?" Guido, et. al (2020) 6 Citations



"Moving toward the Deliberate Coproduction of Climate Science Knowledge." Meadow et al. (2015) **364 Citations** Putting engagement scholarship into practice to support capacity building for adaptation and planning



South Central RISA Team's
Simple Planning Tool for Oklahoma and Arkansas

Winner of 2019 Route Fifty Navigator Award and the Oklahoma Chapter of the American Planning Association's award for Outstanding Public Outreach, Program, Project, Tool, or Community Initiative Strengthening
partnerships to support
peer to peer learning and
network development





Climate.gov Content Views (2021)



Climate.gov Pageviews:

8.9M

All Sections (36% growth over FY20)

5.5M

News & Features

2.2M

Maps & Data

1.2M

Teaching Climate & CLEAN

Social Media Views:

3.3M

Facebook & Instagram

1.1M

Twitter

208K

Video Services
(Youtube & Vimeo)

33K

Weekly newsletter subscriptions

US Climate Resilience Toolkit Content Views (2021)

516K
USCRT
Pageviews

5:1
Benefits-to-Cost Ratio*

173K
Climate Explorer
Pageviews

20:1
Benefits-to-Cost
Ratio*

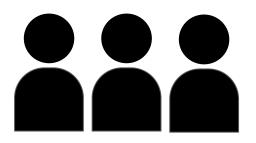
*Source: NEMAC (2020)

*Source: USDA Forest Service (2021)

Drought.gov Performance by the Numbers (2021)



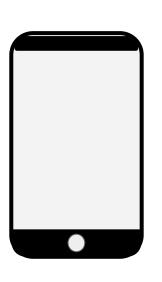




1.2 Million

Users from all 50 states, U.S. territories, & across the globe

Drought.gov provides actionable information for decision makers, the media, & the public



146%

increase in mobile phone users (vs. 2020)

Drought.gov is responsive and mobile-friendly, with improved accessibility



120

Media outlets used Drought.gov in their communications

Drought.gov is a trusted resource for easily shareable drought information

CPO Education by the Numbers (2017-2021)



Fellows
(13 Knauss, 1 PMF)

24
HS, Undergraduate & Graduate Interns

6,530 K-12 Educators Supported

State Standards
Influenced by
Climate Literacy

CPO Supported:

33
Climate & Global
Change Post Docs

AMS Graduate Fellows

12 SOARS Proteges

37
OAR Lapenta
Interns

CPO Awards & Recognition





National

- AMS Fellows (4)
- AMS Special Award
- Lead authors of highly cited journal articles and assessment report chapters
- Keynote and invited conference presentations
- Climate & Global Change Postdoctoral Fellowships
- Sea Grant Knauss Marine Policy Fellowships
- State Dept. Embassy Science Fellow
- Pacific Coast Geographers President's Award
- Switzer Environmental Fellowship

State/Local/Tribal

- Samuel Proctor Award (FL Historical Society)
- COAST GRA (California State University)
- Mayoral Special Recognition (Monroe CO, FL)

DOC/NOAA/OAR

- DOC Gold Medalists (1)
- DOC Silver Medalists (6)
- DOC Bronze Medalists (5)
- NOAA Administrator's Award (3)
- NOAA Albritton Communicator Award (1)
- NOAA NESDIS Collaboration Award
- NOAA NOS Peer Rafting Award
- NOAA EEO Diversity
- NOAA Order of Sherman's Lagoon (4)
- NOAA Team Member of the Month (1)
- OAR Outstanding Scientific Paper Award (1)

International

- Master of Ceremony (U.S. Center @ COP26)
- Early Career Scientist Award—International Union of Geodesy and Geophysics
- Conferences and Workshops (keynote and invited presentations)

CPO Service





DOC/NOAA/OAR

- CPO high quality peer review panels for grants
- CPO & OAR DEIA & EEO Committees
- NOAA Weather, Water and Climate Board
- NOAA Climate Team
- NOAA Water Team
- NOAA Modeling Team
- NOAA Service Delivery Team
- NOAA One Health Team
- NOAA Social Science Committee
- NOAA Regional Collaboration Team

Other Federal Agencies

- USGCRP SGCR
- USGCRP Interagency Working Groups (8)
- White House IWG on Extreme Heat
- USDA Water Information & Services
- NSF, NASA Review Panels
- National Academy of Sciences Committees

State/Local/Tribal Agencies

Vermont Drought Task Force

National Organizations

- AMS (Executive Council; Fellows Committee; Finance Committee; Enterprise Decision Support)
- AASC (Awards Committee)
- Research Programs (CLIVAR & GEWEX Panels;
 Water Research Foundation Panels)
- Field Campaigns and Citizen Science
- National Conferences and Workshops (Symposia; Sessions; Town Hall meetings)

International Organizations

- WMO / World Climate Research Programme
- WMO / Global Framework for Climate Services
- North American Commission for Env. Coop.
- Great Lakes Water Quality Agreement
- Arctic Monitoring and Assessment Programme
- UNFCCC (e.g. COP 26)
- IPCC (e.g. WG Assessments)
- Global Heat Health Information Network

Universities

- Adjunct Faculty (UMD; FSU; UNL; JHU; Catholic U,
- M.S. and Ph.D. Committees
- Cooperative Institutes (CISESS EC; CIMMS)



Recognition from Customers





"On behalf of the Department of Environmental Quality and the State of North Carolina, I would like to thank you for your contributions toward shaping the NC Climate Risk Assessment and Resilience Plan.

NC DEQ Secretary & current EPA Administrator Michael S. Regan











"[Western Water Assessment] has been instrumental in helping us identify and address climate change vulnerabilities"

Levi Brekke, Acting Chief of Research and Development, U.S. Bureau of Reclamation



"Above all else, you demonstrated the essence of "One NOAA"

NOAA Administrator Rick Spinrad following COP26



"From my observations in Barbados, the ATOMIC project was a resounding success"

RADM Tim Gallaudet, former Dep NOAA Administrator

CPO Organizational Leadership & Structure



ASD: Administrative Services Division

CEE: Communication, Education and Engagement Division

CSI: Climate and Societal Interactions Division ESSM: Earth System Science & Modeling Division IIT: Innovation, Integration and Transition Program

NIDIS: National Integrated Drought Information System Program

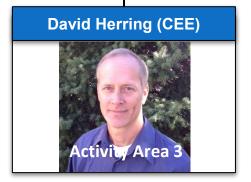
















Scientific Leadership in the Climate Community







DOC/NOAA/OAR

- Chair, NOAA Climate Team
- Member, Weather, Water and Climate Board
- Member, NOAA Modeling Board
- Lead, Precipitation Prediction Grand Challenge
- Co-Chair, Climate and Fisheries Initiative
- Federal Advisor, Arctic Report Card
- Task Force Lead (drought; model diagnostics;
 CMIP6; marine ecosystem; Cx sensitivity)
- OAR Climate Portfolio Steward
- Vice-chair, OAR DEI Committee
- Member, OAR Awards Committee
- Co-Lead, Lapenta Internship Program

Other Federal Agencies

- Chair, USGCRP SGCR
- NOAA Principal, USGCRP
- Interagency Council for Advancing Meteorological Services (ICAMS) detail to OSTP & co-chair on Climate Services

National Organizations

- Research Programs (CLIVAR; GEWEX)
- Field Campaigns and Citizen Science
- Editors / Reviewers (AMS Journals)
- Vice-Chair, AMS Board on Environment & Health
- President, Chinese American Oceans and Atmosphere Association
- Led "Filling the Gaps", with Water Research FDN
- National Conferences and Workshops (Symposia; Sessions; Town Hall meetings)
- National Academy of Sciences Committees

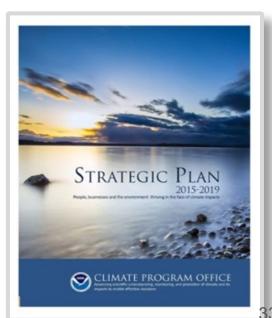
International Organizations

- U.S. Principal, Global Framework for Climate Services
- Chair, Arctic Monitoring and Assessment Programme
- Chapter leads, IPCC WGI and WGII
- Lead, Blue Carbon Inventory Project
- WMO Climate and Health Focal Point
- Intll Conferences and Workshops (Symposia; Sessions; Town Hall meetings)

CPO Strategic and Annual Planning



- All CPO scientific objectives and strategies are aligned with OAR and NOAA Strategic Plans, OAR Implementation Plan and OAR Annual Operating Plan (AOP).
- All CPO AOP milestones are included in staff Performance Plans.
- All CPO AOP milestones are tracked and have been successfully completed over the past 5 years
- CPO exceeded all AOP targets and measures over the past 5 years.
- Mid-term and annual performance reviews for all CPO staff
- Effective tracking and managing of projects, including through NOAA Research & Development Database
- Involvement in OAR and NOAA budget planning
- Timely responses to all OAR & NOAA data calls (inc. reports to Congress)



CPO Business Processes by the Numbers (FY2021)



- 235 grants processed and tracked
- \$79.6M dollars executed (budget executed above the 99% level with low carryover)
- 64 Cooperative Agreement / Cooperative Institute actions tracked
- 14 interagency transfers processed
- 19 contract actions processed
- 141 NOAA funds transfers executed
- 6 federal hiring packages completed

CPO is a Blended Workforce





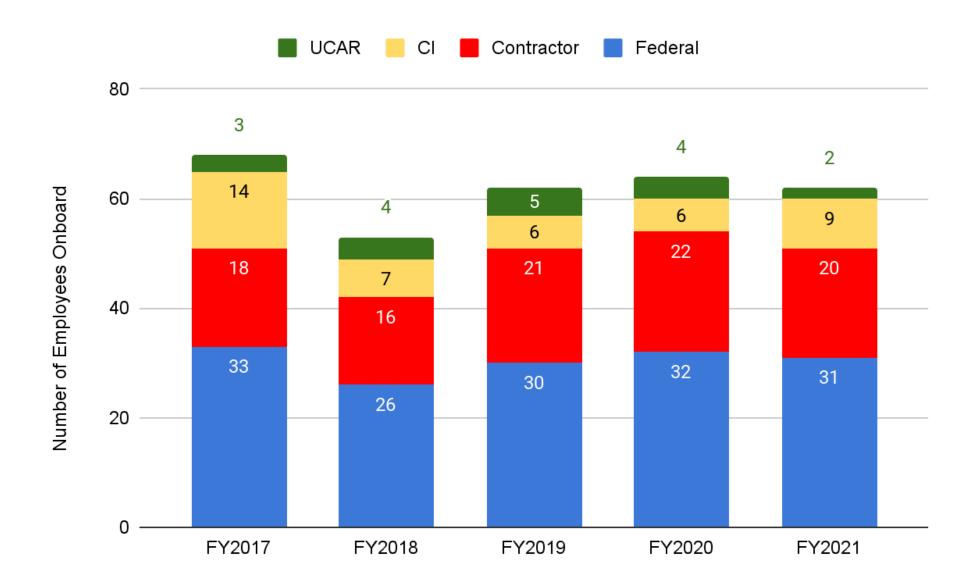






CPO Workforce by Fiscal Year





CPO Workforce by Division (FY2021)



ASD: Administrative Services Division

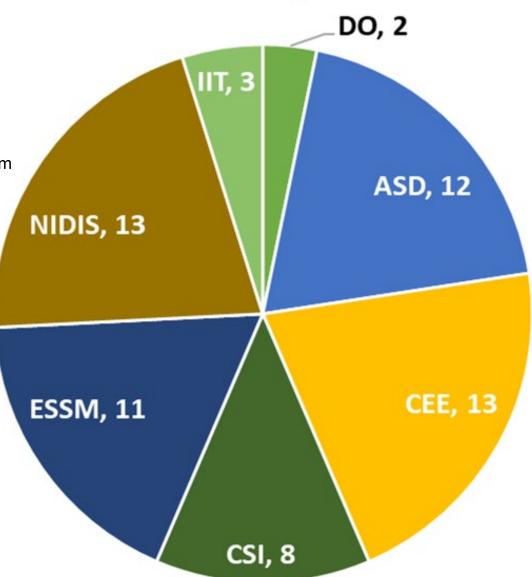
CEE: Communication, Education and Engagement Division

CSI: Climate and Societal Interactions Division

DO: Directors Office

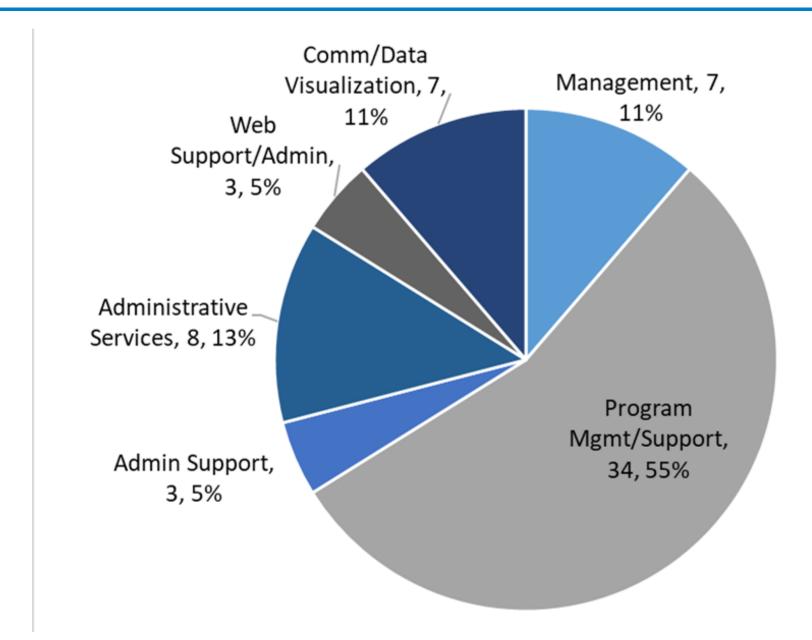
ESSM: Earth System Science & Modeling Division IIT: Innovation, Integration and Transition Program

NIDIS: National Integrated Drought Information System Program

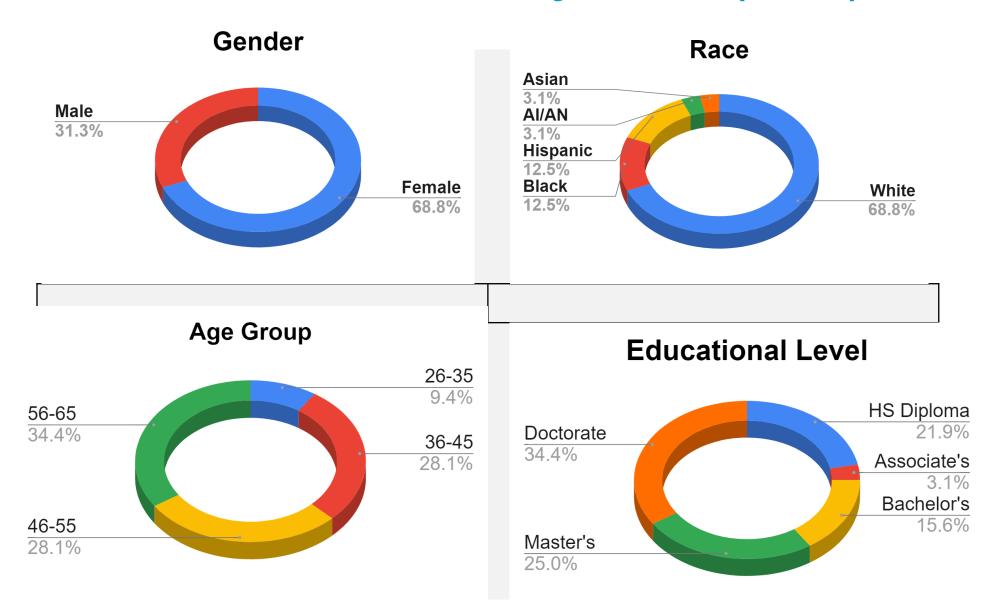


CPO Workforce by Function (FY2021)

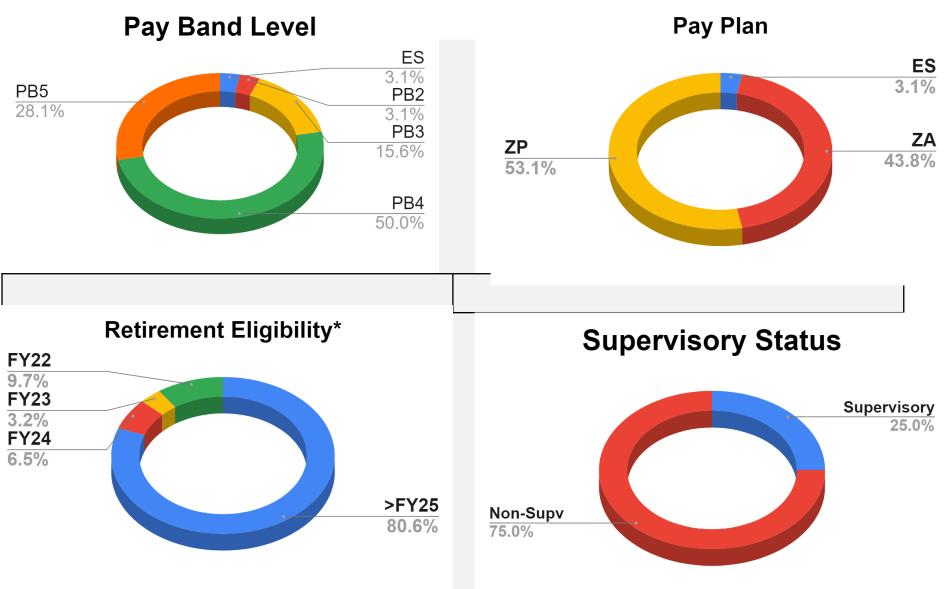




CPO Federal Staff Diversity Profile (FY21)



CPO Federal Staff Profile (FY21)



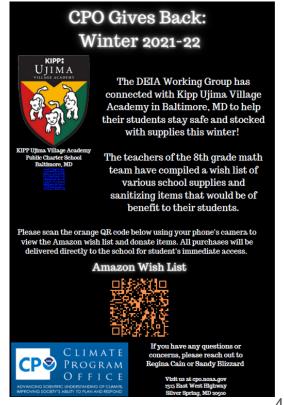
^{*}Based on years of service

Diversity, Equity, Inclusion, and Accessibility

VISION: CPO reflects and leverages the talent and diversity of its employees to ensure people, businesses and the environment continue thriving in the face of climate impacts.

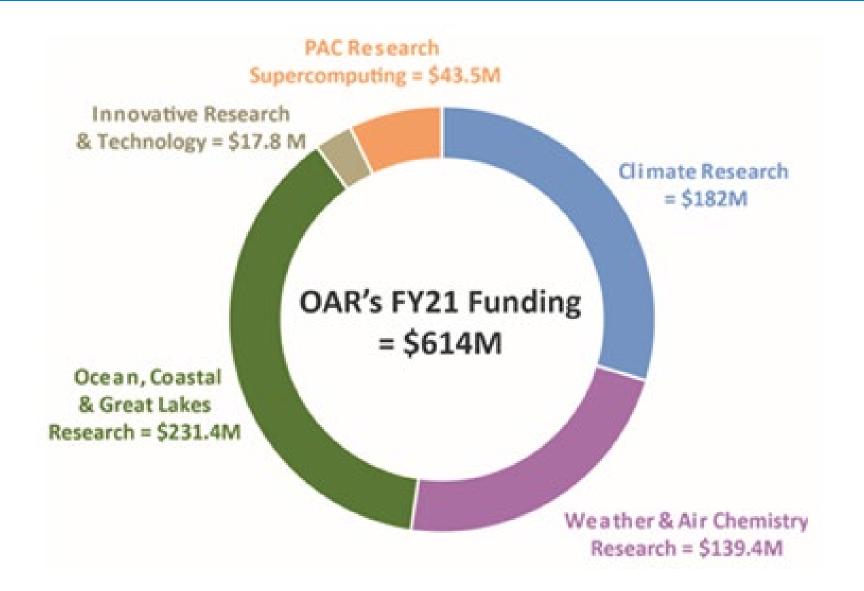






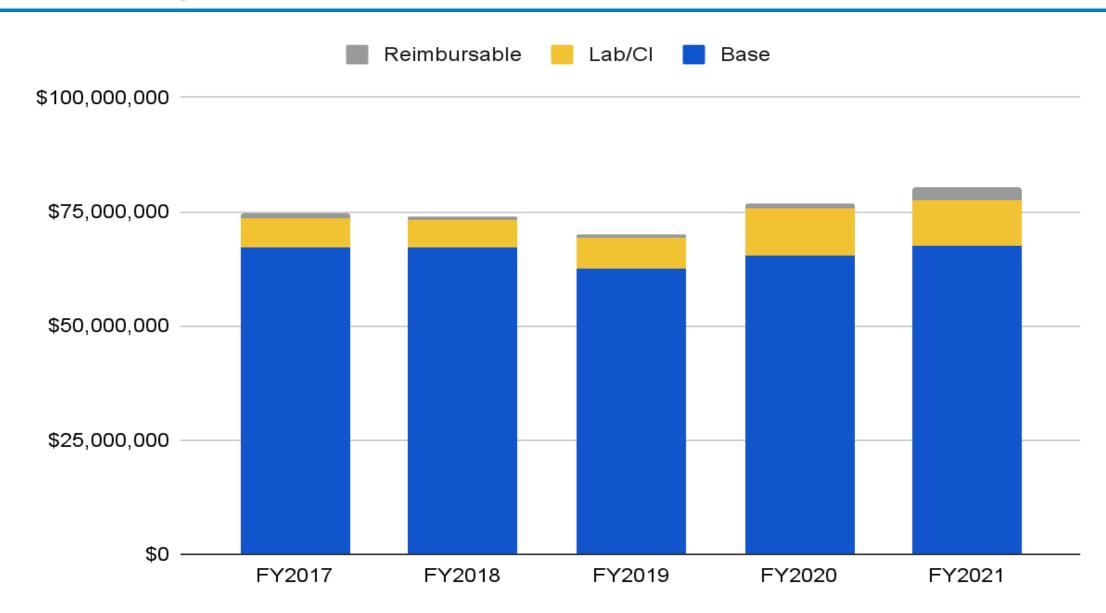
OAR FY 21 Budget





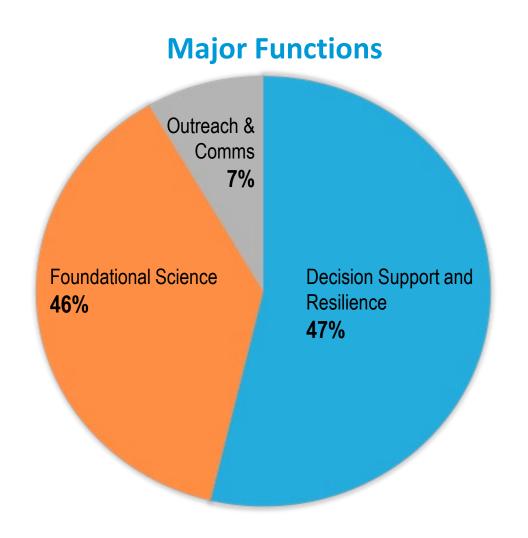
CPO Budget

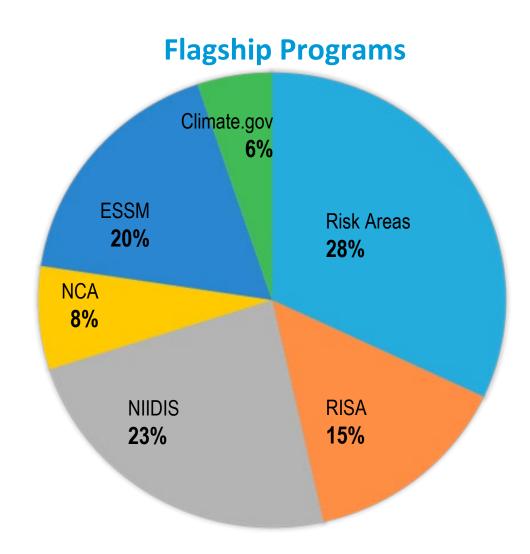




CPO FY21 Expenditures (% of total portfolio)

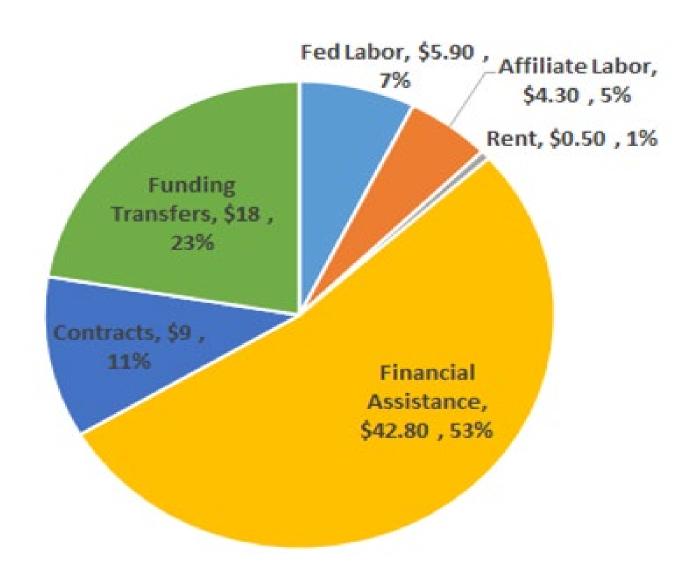






CPO FY21 Expenditures by Category (\$M)





CPO Director's Priorities



People

- Incorporate diversity, equity and inclusion into CPO core values & culture
- Ensure fair, inclusive, and transparent decision making
- Focus on employee performance, training, and recognition

Research

- Advance climate science to improve understanding of Earth's changing climate.
- Research to advance understanding of the societal impacts of climate change
- Improve coordination / collaboration to ensure research benefits NOAA & the Nation

Communication

- Increase public access to climate-related information for planning and resilience activities, coupled with capacity building and training.
- Increase access to and support the use of data, information, and services;

Future Changes in the Operating Landscape for CPO



How should CPO adapt to changes in the operating landscape that include:

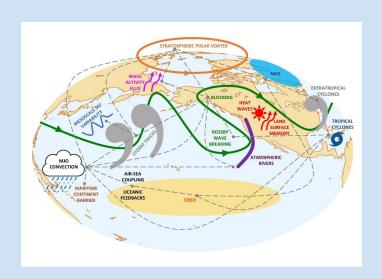
- new sources of funding for climate research, heightened participation, and increased commercial presence that are changing "who" is executing both basic and applied research?
- a workforce with interdisciplinary skill sets which will be increasingly valuable and sought by high-paying commercial organizations?
- expectations of immediacy that continue to put a strain on long-term science and innovation and that increase the importance of how the value of the science is communicated?
- increasing demand for climate information & services to tackle the climate crisis?



Climate Program Office

Activity Areas for the Review

Activity Area 1. Climate Science / Earth System Science and Modeling



Science Themes



Advance understanding, modeling, prediction, and projection of the Earth's atmosphere, ocean, land, and cryosphere as an integrated system, including:

- Process studies and field campaigns
- Earth system observations and monitoring
- Predictability studies of climate phenomena
- Testing for transitions of R2O and R2A
- Improving model representations of key processes and prediction technologies
- Lead national assessments
- Applying Earth system and climate models to societally-relevant challenges
- Projecting future climate variability & change
- Coordinating joint federal research activities

Activity Area 2. Climate and Societal Interactions



Science Themes



Support societally relevant and interdisciplinary climate science focused on adaptation to reduce vulnerability and risk

- Identify opportunities for use of climate knowledge and information
- Enhance community resilience
- Connect innovative science to preparedness, adaptation and resilience challenges
- Lead regional and national assessments
- Support research that includes the private sector,
 NGOs, interdisciplinary teams and the social sciences at large

Activity Area 3. Communication, Education, & Engagement



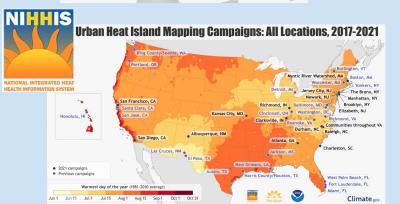
Science Themes



- Promote awareness, appreciation, and support for CPO's investments in climate science and services
- Promote public climate literacy and help people find and use NOAA's maps, data, and information services through managing and maintaining <u>Climate.gov</u>
- Coordinate and support interagency efforts to help
 U.S. communities & businesses understand & manage
 their climate-related risks & opportunities, including
 building resilience to climate-related hazards through
 the U.S. Climate Resilience Toolkit (CRT)

Activity Area 4. Integrated Information Systems (IIS)





CPO is home to two interagency-driven IIS's that are responsive to the increasing societal demand for climate information that is actionable, accessible, and equitable:

- The National Integrated Drought Information System (NIDIS), established by Public Law (authorized in 2006; 2014 & 2019 updates), is mandated to establish a national drought early warning system that helps the nation to proactively understand and manage drought risks and impacts.
- The National Integrated Heat Health Information System (NIHHIS), which is emerging and getting Congressional attention, seeks to improve Federal, state and local planning, preparedness and response for extreme heat and its health impacts.

Activity Area 4. Climate Risk Areas Initiative





Goal: advance climate science and reduce impacts in key societal climate risk areas for which NOAA's mission is well aligned.

The climate risk areas are currently:

- Coastal Inundation
- Marine Ecosystems
- Water Resources, and
- Extreme Heat

Other motivations:

- increase cohesion across CPO
- strengthen partnerships inside and outside of NOAA

Activity Area 5. Portfolio Management, Administration, & Organizational Excellence



CPO *aligns* its portfolio against the science and service needs of NOAA, external stakeholders and partners, and *balances* its support across the R&D continuum from fundamental to applied R&D and research transitions to operations and applications.



- Ensure portfolio balance of competitively-based & directed research funding
- Implement budget formulation and execution, grants management, human resources, and property management
- Manage personnel actions, responses to grants and budget inquiries, domestic and international travel support, space planning, facilities support, and acquisition management
- Provide research and training opportunities to students and early career professionals at all levels
- Promote equal employment opportunities to an increasingly diverse talent pool in key mission areas
- Foster an inclusive office environment that embraces the diversity of its employees



Climate Program Office

Structure of the CPO 2022 Review

Structure of the Review



Prior to the Review

Review the overview videos for each Activity Area

During the week of the Review

- A Lead-off presentation & discussion session with OAR leadership, portfolio stewards
- Interactive Q&A on the pre-recorded CPO Overview presentation
- An introduction and in-depth discussion of each Activity Area
- Closed Review Panel Activity Area Stakeholder Sessions
- Discussion with NOAA Line Office Representatives
- Review Panel discussion and writing time each afternoon
- All Review materials can be found on the Review webpage: https://cpo.noaa.gov/



NOAA Climate Program Office

Thank You!