



# Climate Program Office Review

May 24-26, 2022

Pre-Recorded Presentation

Supporting Review Activity Area 2

Climate and Societal Interactions

## **The Climate and Fisheries Adaptation Program (CAFA)**

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<sup>2</sup>NOAA Fisheries Office of Science and Technology

# Overview



- **Briefing Purpose:** Overview of the Climate and Fisheries Adaptation (CAFA) Program
- **Context:** Subactivity for Activity Area 2; CAFA is part of CPO's Climate and Societal Interactions Division
- Joint partnership between CPO and NOAA Fisheries



# Adaptation Sciences: Program Foci

## NOAA-CPO AdSci Program

**Mission:** To advance the knowledge, methods and frameworks needed to move society beyond incremental adaptation toward more widespread, connected, adaptive pathways, and resilience strategies with clear economic and societal co-benefits.

**Lines of Effort:** AdSci's current programmatic foci (Adaptation Pathways, Water, Coastal, Fisheries and International) are shown in this graphic, highlighting AdSci's unique research and partnerships.

### Ad. Pathways

**Focus & Activities:** Research designed to advance knowledge about key drivers and conditions that shape and enable adaptation across multiple temporal and spatial scales (e.g., socioeconomic considerations and adaptive behaviors, risk perception, public awareness and education)

**Examples of Key Partners:** Research community, decision and policy makers in focused sectors

\*NOFO Focus in FY22

### Water

**Focus & Activities:** Funding research, leading studies, producing webinar series, and supporting communities of practice focused on the needs of stakeholders within the water resource management sector

**Examples of Key Partners:** NOAA NESDIS, OAR, and NWS; and major US water, planning and utility NGOs

\*NOFO Focus in FY21

### Coastal

**Focus & Activities:** Funding research, engaging in communities of practice, to better understand the interactions, impacts, and vulnerabilities of the coastal built and natural environment in a changing climate

**Examples of Key Partners:** NOAA, NMFS, Academics, NGOs

\*NOFO Focus in FY21

### Fisheries

**Focus & Activities:** Advancing understanding of climate related impacts on fish stocks and fisheries and fishing dependent communities; develop tools and information to promote adaptation and resilience of the nation's fisheries and fishing dependent communities

**Examples of Key Partners:** NMFS, Academic, and Federal Partners

\*NOFO Focus in FY22 & FY23



### International

**Focus & Activities:** Supporting technical collaboration, knowledge development and peer-to-peer learning through internationally-focused partnerships

**Examples of Key Partners:** State Department, NCEI, NOAA/OAR PSL, NOAA MPA Center, EPA

\*Potential NOFO Focus: FY23

# CAFA 101: Promoting sustainable and resilient fisheries



**CPO Program Manager:** Jennifer Dopkowski

**NOAA Fisheries Program Manager:** Roger Griffis

**Knauss Fellow:** Marina Cucuzza

**Fisheries biologist:** Jay Peterson

## CAFA Calls for

### Proposals

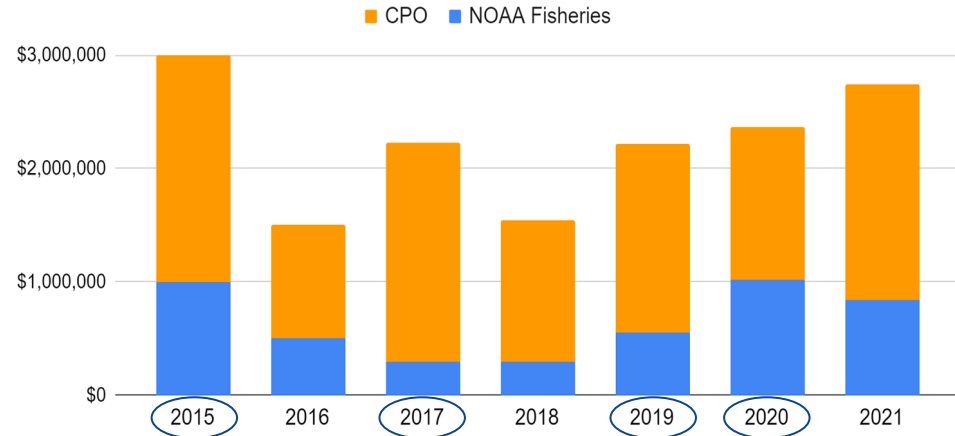
**2015:** *Climate impacts on fisheries and fishing-dependent communities in the Northeast*

**2017:** *Climate impacts on fisheries and fishing-dependent communities in the Northeast/Mid-Atlantic and California Current*

**2019:** *Resilience of Northeast fishing communities*

**2020:** *Advancing integrated ocean modeling and decision support frameworks*

## CPO and NOAA Fisheries Funding CAFA Funding by Year

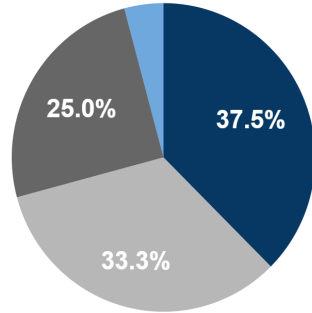


# CAFA Program by the Numbers



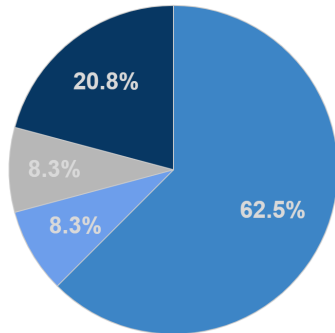
## Types of Projects Funded by CAFA

- Modeling
- Integrated (ecological/modeling, social science)
- Integrated (ecological, social science)
- Conference



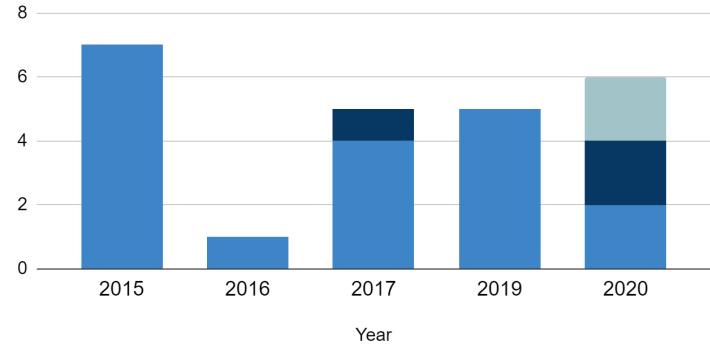
## End User of CAFA Projects

- Fisheries Managers
- Academia/scientific community
- Individuals (fishers, communities, supply chain)
- Managers and individuals



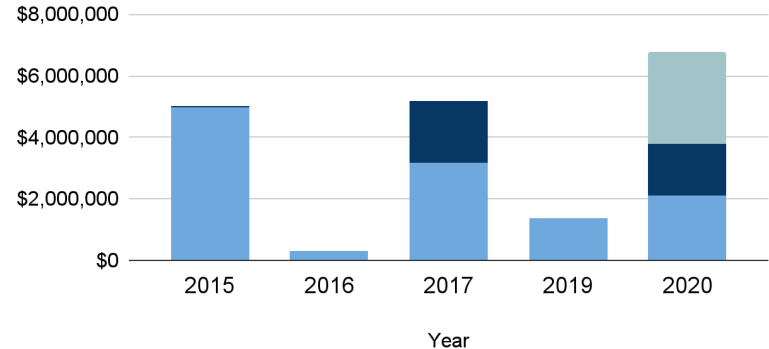
## Number CAFA Projects Funded by Region

- Alaska
- West Coast
- Northeast



## Funding for CAFA Projects by Region

- Alaska
- West Coast
- Northeast





# Key Accomplishments (FY17-21)



## Quality *Total Publications: 90*

Alexander, M. A., S. Shin, J. D. Scott, E. Curchitser, C. Stock (2020), *The Response of the Northwest Atlantic Ocean to Climate Change*, Journal of Climate.

Holsman, K. K., A. Haynie, A. B. Hollowed, A. J. Hermann, W. Cheng, A. Faig, J. Ianelli, K. Kearney, A. Punt, J. Reum. (2020). *Ecosystem based fisheries management forestalls climate-driven collapse*. Nature Communications. 11:4579.

Zang, Z., Ji, R., Feng, Z., Chen, C., Li, S., Davis, C.S. (2021), *Spatially varying phytoplankton seasonality on the Northwest Atlantic Shelf: a model-based assessment of patterns, drivers, and implications*. ICES J. Mar. Sci.

Smith, S. L., Golden, A. S., Ramenzoni, V., Zemeckis, D. R., & Jensen, O. P. (2020). *Adaptation and resilience of commercial fishers in the Northeast United States during the early stages of the COVID-19 pandemic*. PloS one.

## CAFA Research Advances:

- **Climate-related Information**
- **Decision-maker Capacity**
- **Climate-Ready Management**
- **Resilience and Adaptation**



Article | Published: 05 August 2020

### Thermal displacement by marine heatwaves

Michael G. Jacox , Michael A. Alexander, Steven J. Bograd & James D. Scott

*Nature* 584, 82–86 (2020) | [Cite this article](#)

6712 Accesses | 25 Citations | 697 Altmetric | [Metrics](#)

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RESEARCH ARTICLE

230 Save	119 Citation
18,159 View	145 Share

**Projecting shifts in thermal habitat for 686 species on the North American continental shelf**

James W. Morisy , Rebecca L. Setten, Robert J. Latour, Thomas L. Frolicher, Richard J. Seagraves, Main L. Pinsky

Published: May 16, 2018 • <https://doi.org/10.1371/journal.pone.0196127>

Article	Authors	Metrics	Comments	Media Coverage
				

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# Key Accomplishments (FY17-21)



## Relevance

### Strategic Partnerships:

- **NOAA Fisheries Science Centers:** AKFSC, NEFSC, NWFSC, PIFSC, SWFSC
- **OAR Labs:** ESRL, GFDL
- **NGOs:** GMRI
- **Federal:** USGS, FWS, Fishery Management Councils

**Academia:** Oregon State University, Rutgers University, URI, WHOI, among others

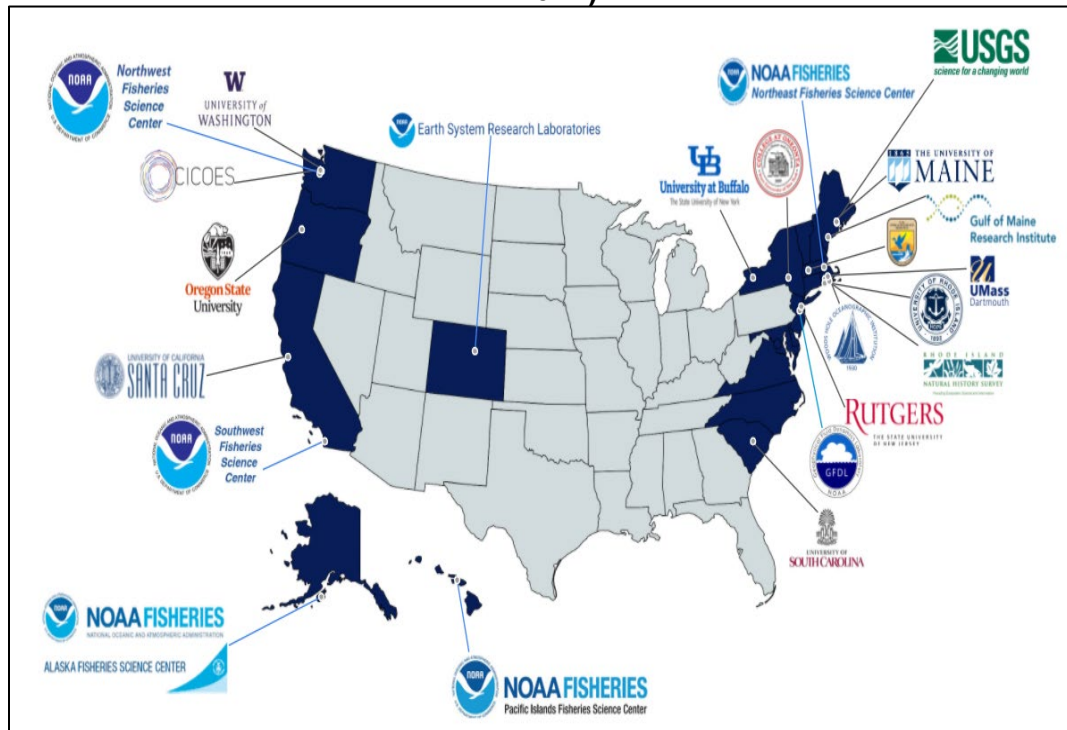
**Actively engaged with key NOAA/CPO priorities:** Climate and Fisheries Initiative (CFI), EBFM, CPO Strategic Plan, NOAA Fisheries Climate Science Strategy, CPO DEIA Strategic Plan FY21-25

**Tools and Products :** GMRI Data Dashboard, Ocean Adapt, ACLIM

**Specific Mandates:** Magnuson-Stevens Act; Department of Commerce Climate Action Plan; Sec. 216(c) of E.O. 14008 (Tackling the Climate Crisis at Home and Abroad)

**Responds to priority needs:** U.S. National Climate Assessment; NOAA Fisheries Climate Science Strategy; Regional Action Plans; CFI

### CAFA-Funded Labs and Institutes (FY2017-2022)



— NOAA Labs and Science Centers

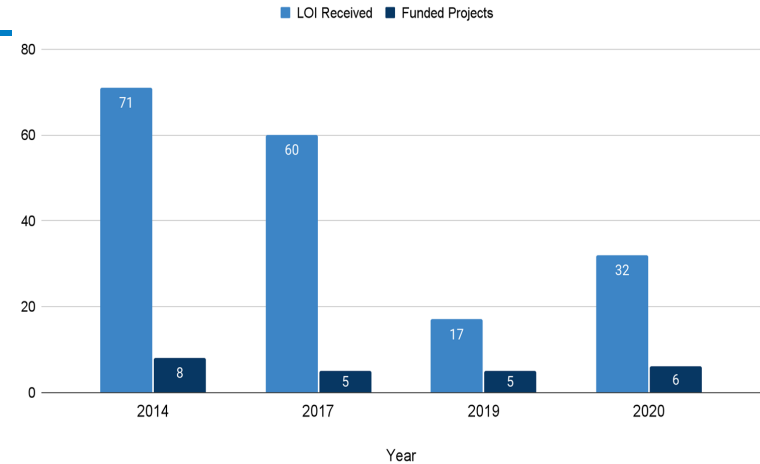
# Key Accomplishments (FY17-21)

## Performance

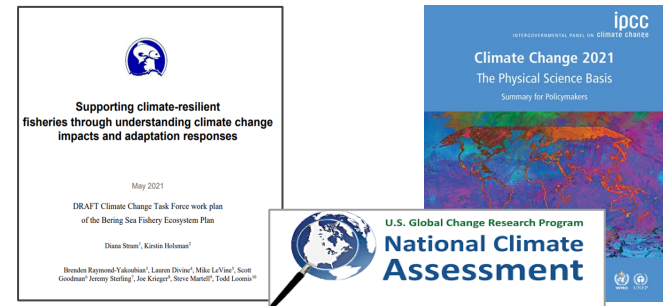
In the past 5 years,

- 24 projects funded across 5 regions
- **11 stakeholder workshops**
- 73 students supported
- PIs contributing to NCA and IPCC reports
- Contribute to climate-informed stock assessments & regional fishery management actions
- **Social-ecological vulnerability assessment framework developed for fishing communities**
- 3 fishing community adaptation profiles developed in the NE
- Development of MSE **decision-support tools to evaluate best management options** in a changing climate
- **PI Community of Practice** developed (FY2020 PIs): learning network to advance innovation

CAFA LOI Received vs Funded Projects



- Significant needs
- Focused calls over time
- Limited budget





# FY 2020 - 5 projects (\$5.9M over 3 years)

## Develop Management Strategy Evaluation Frameworks

- Integrated modeling framework

- 4 regions (NE, West Coast, Gulf of Alaska, Bering Sea)

- Downscaled physical and biological models coupled to:

Ecosystem models

Socio-economic models

- Fishermen decisions and impacts
- Community impacts
- Trade-offs

- Regional pilot programs for the cross-NOAA Climate and Fisheries Initiative (CFI)

### Global Climate Models (x 7)

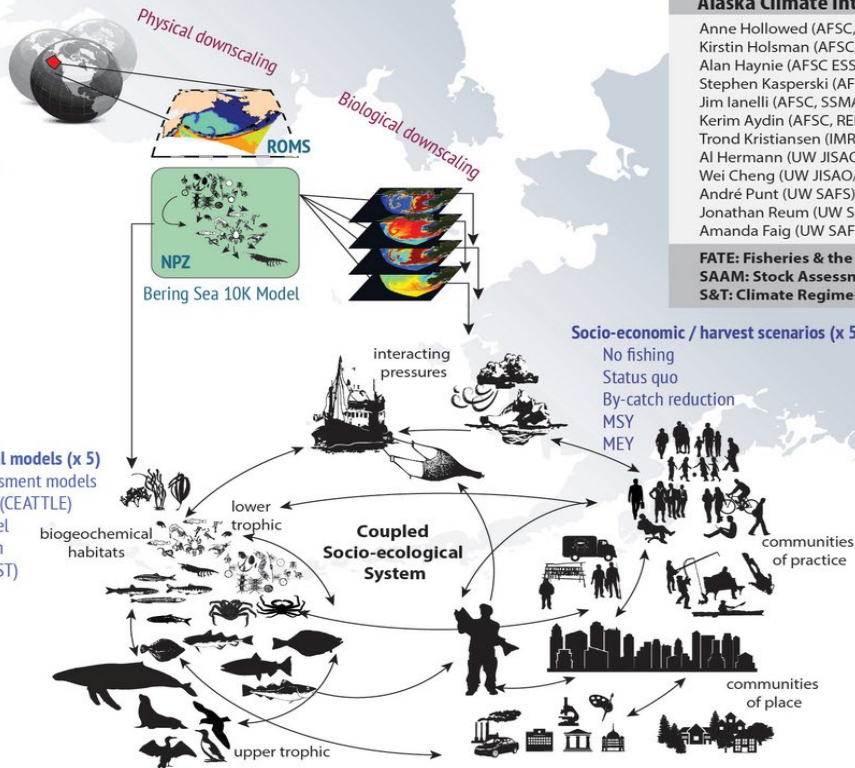
ECHO-G  
MIROC3.2 med res.  
CGCM3-t47  
CCSM4-NCAR-PO  
MIROCESM-C-PO  
GFDL-ESM2M\*-PO  
GFDL-ESM2M\*-PON

### Projection Scenarios (x3)

AR4 A1B  
AR5 RCP 4.5  
AR5 RCP 8.5

### Climate Enhanced Biological models (x 5)

CE- single species assessment models  
CE- multispecies model (CEATTLE)  
CE- Size spectrum model  
CE- Ecopath with Ecosim  
End-to-End model (FEAST)



### ACLIM

#### Alaska Climate Integrated Modeling Project

Anne Hollowed (AFSC, SSMA/REFM)  
Kirstin Holsman (AFSC, REEM/REFM)  
Alan Haynie (AFSC ESSR/REFM)  
Stephen Kasperski (AFSC ESSR/REFM)  
Jim lanelli (AFSC, SSMA/REFM)  
Kerim Aydin (AFSC, REEM/REFM)  
Trond Kristiansen (IMR, Norway)  
Al Hermann (UW JISAO/PMEL)  
Wei Cheng (UW JISAO/PMEL)  
André Punt (UW SAFS)  
Jonathan Reum (UW SAFS)  
Amanda Faig (UW SAFS)

#### FATE: Fisheries & the Environment

SAAM: Stock Assessment Analytical Methods  
S&T: Climate Regimes & Ecosystem Productivity



# Strategic Lookahead

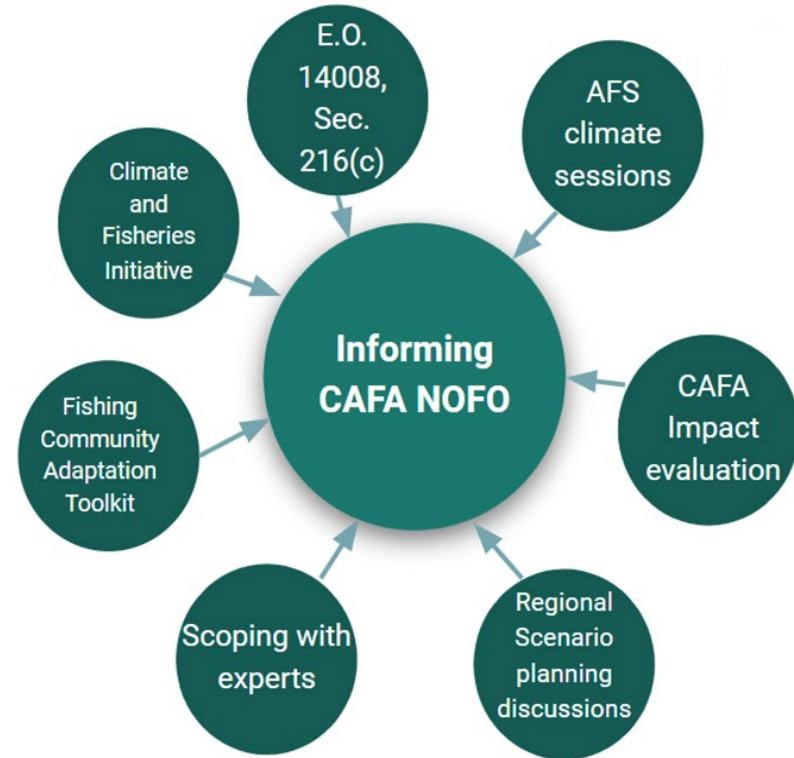


## Looking back:

- CAFA addresses significant research needs for climate-ready fisheries management
- Expanded focus from **climate impacts to groundfish in the NE** to addressing complex fisheries adaptation and management challenges including social and ecological resilience

## Looking forward:

- Tools to **advance climate-ready fisheries and fishing dependent communities** (e.g., Fishing Community Adaptation Toolkit)
- Increase focus on **diversity, equity and inclusion, engaging marginalized and underserved communities** & integrating different knowledge types into fisheries decision-making
- **Expand geographically and grow partnerships**
- Support Climate and Fisheries Initiative implementation
- Continue to enhance program **communications & evaluation** (e.g., tracking and assessing metrics)



Some of the many sources informing future CAFA call