CLIMATE VARIABILITY & PREDICTABILITY

RESEARCH TO ENHANCE OUR PROCESS-LEVEL UNDERSTANDING OF THE CLIMATE SYSTEM

How can we better understand and anticipate the global and regional impacts of climate variability and change?
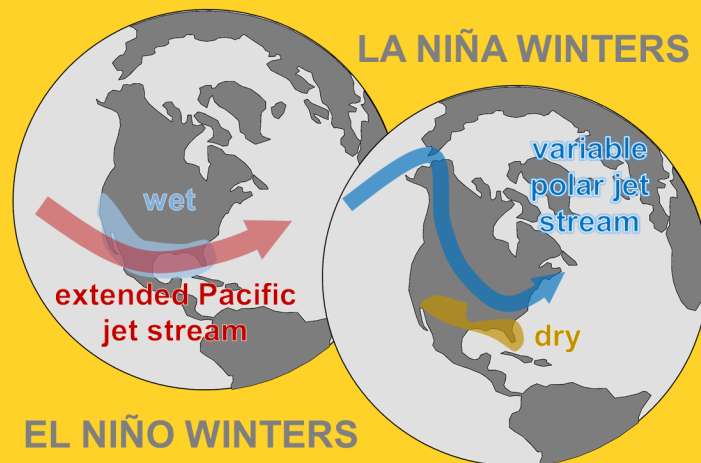
What foundational knowledge, through observation, modeling, analysis, and field studies, do we need in order to improve climate models for short-term predictions and longer-term projections to improve our ability to assess risk and inform decision-making?

How can we close the predictability gap between weather models and climate models to inform areas of progress toward seamless weather-to-climate modeling for temperature, precipitation, and other information important to society and decision-making?

2017-2021 BY THE NUMBERS:

2
field campaigns completed

3
climate process teams

10+
workshops

90-120
publications per year

120
projects

Answering these key questions is the main mission of the Climate Variability and Predictability (CVP) program, a vital part of the Climate Program Office, situated within NOAA's Office of Oceanic and Atmospheric Research.

Natural climate variability patterns—El Niño / La Niña, the Madden-Julian Oscillation, the Arctic Oscillation, and others—produce extreme weather and water events that impact Americans' lives and livelihoods. To achieve its mission, CVP invests in NOAA mission-critical research, which is carried out at NOAA and other federal laboratories, NOAA Cooperative Institutes, and academic institutions.

LA NIÑA WINTERS

variable polar jet stream

wet

extended Pacific jet stream

dry

EL NIÑO WINTERS

PUBLIC DEMAND

Public demand for improved predictions with longer lead times is increasing. Decision makers are increasingly asking for accurate forecasts and predictions at timescales longer than traditional weather forecasts, especially at the subseasonal to seasonal timescale (from weeks to several months) for use in planning, prioritizing, and budgeting. Although there have been recent improvements in seasonal predictions, there are processes and sources of predictability in the climate system which, if better understood, could help us improve subseasonal to seasonal predictive skill.

VISIT CPO.NOAA.GOV/CVP

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

CVP
Climate Variability and Predictability

OAR.CPO.CVP@NOAA.GOV

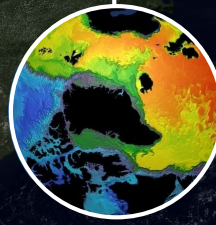# CVP PROGRAM RESEARCH AREAS

AIR-SEA INTERACTION AND CONVECTION

Investigating how heat is redistributed from the tropics to determine global weather and climate
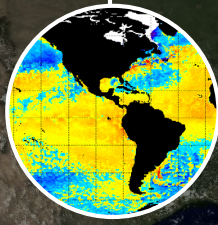
BRIDGING OBSERVATIONS AND MODELING

Using observations to improve the understanding and representation of Pacific climate in models

DECADAL VARIABILITY AND PREDICTABILITY

Predicting climate at the decadal timescale to enable long-term planning in a number of fields

SPECIAL TOPICS

Supporting research on key climate topics like extreme events and the effect of ocean change on fisheries

DECADAL VARIABILITY

Recent studies confirm that the ocean is the primary driver of climate variability on the decadal to multi-decadal timescales. Understanding the relationships between ocean and atmosphere is important to describe these variations, how strongly they interact, and how well our models simulate them. CVP supports research that identifies the sources of predictability on these timescales, leading to future improvements in decadal climate prediction.

REPRESENTING PRECIPITATION IN MODELS

Many extreme events and their impacts to American people and businesses are associated with too much or too little precipitation. NOAA developed the Precipitation Prediction Grand Challenge (PPGC) Strategic Plan to further align NOAA's research efforts on improving precipitation prediction skill. Its main goal is to provide more accurate, reliable, and timely precipitation forecasts across almost every timescale. CVP is engaging in the PPGC by sponsoring research dedicated to key processes that influence model error in the simulation of precipitation, focusing on the subseasonal to seasonal timescale.

Contributions to CVP Research

Ronald H. Brown research ship

Observations from satellites, ships, flights, buoys, and other platforms

New ideas about how the components of the Earth System interact and change

Feedback on future research areas and collaboration with other scientific groups
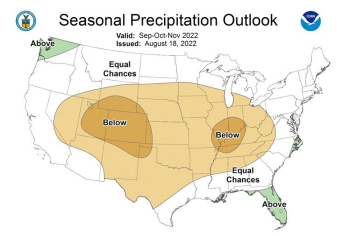
CVP
Climate Variability & Predictability

Studies of climate processes and mechanics

Field campaigns coordinating observations and analysis

Climate Process Teams connecting observations, theory, and modeling

Outcomes from CVP Research

NOAA Climate Prediction Center

Improved seasonal forecasts for industry, agriculture, and hazard preparedness

Better understanding of ocean circulation and how it may change in the future

Increased forecast skill and accuracy for individual components like sea ice

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