

Observations and Monitoring at the Climate Program Office

Dr. Wayne Higgins
Director, Climate Program Office
Ocean Observing and Monitoring Division
Community Meeting
May 9, 2017



Outline

Impacts of Changing Conditions

Role of the Climate Program Office

Critical Role of Observations and Monitoring

Take Away Messages

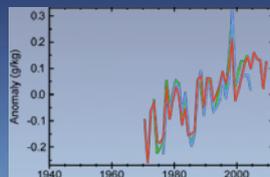
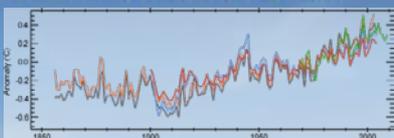


Changing Conditions

What do we know?

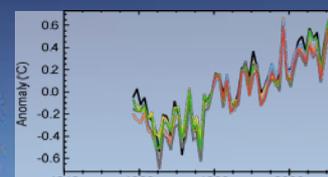
Ten Indicators of Changing Conditions

↑ Air Temperature over Ocean

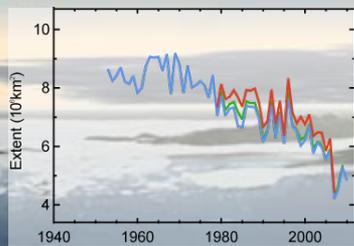


↑ Humidity

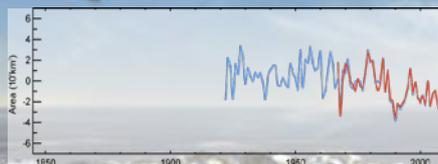
↑ Temperature of the Lower Atmosphere



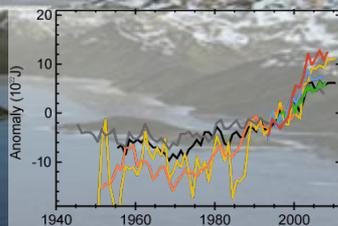
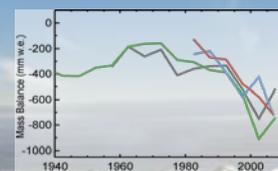
↓ Arctic Sea Ice



↓ Snow

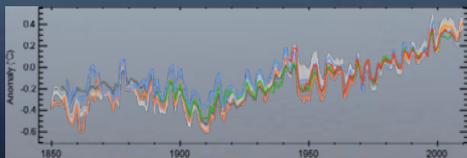
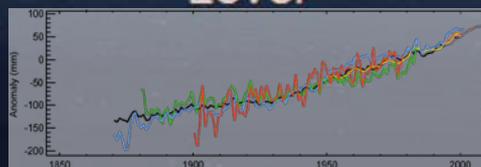


↓ Glaciers

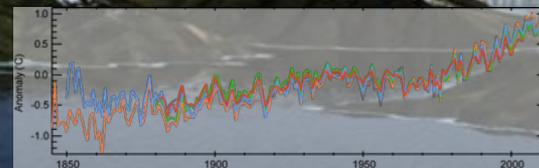


↑ Ocean Heat Content

↑ Global Sea Level



↑ Sea Surface Temperature



↑ Air Temperature over Land

Source: National Climatic Data Center

Why do we care?

Economies and Livelihoods are at risk



Life and Property



Aviation



Maritime



Space Operations



Forests



Emergency Management



Commerce



Ports



Energy



Hydropower



Reservoir Control



Infrastructure



Construction



Agriculture



Recreation



Ecosystems



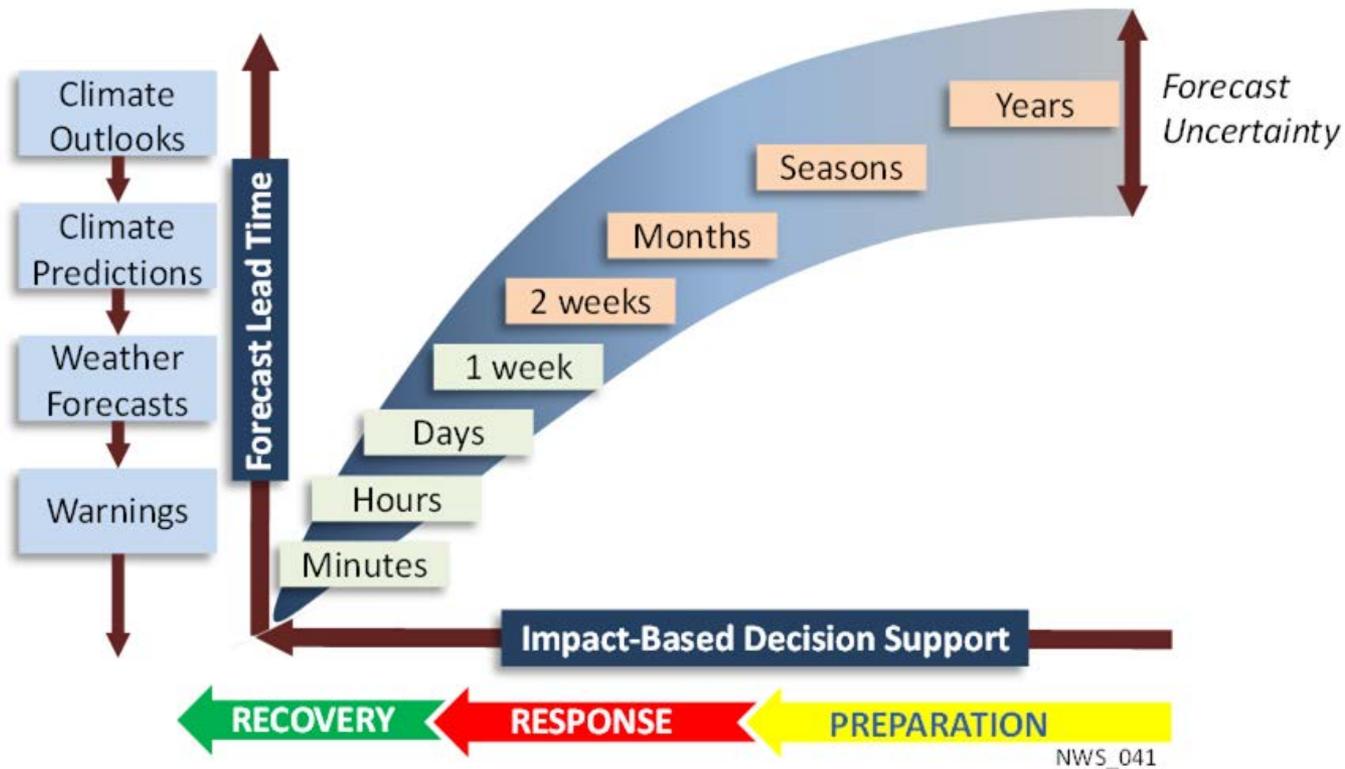
Health



Environment

What information is needed for decisions?

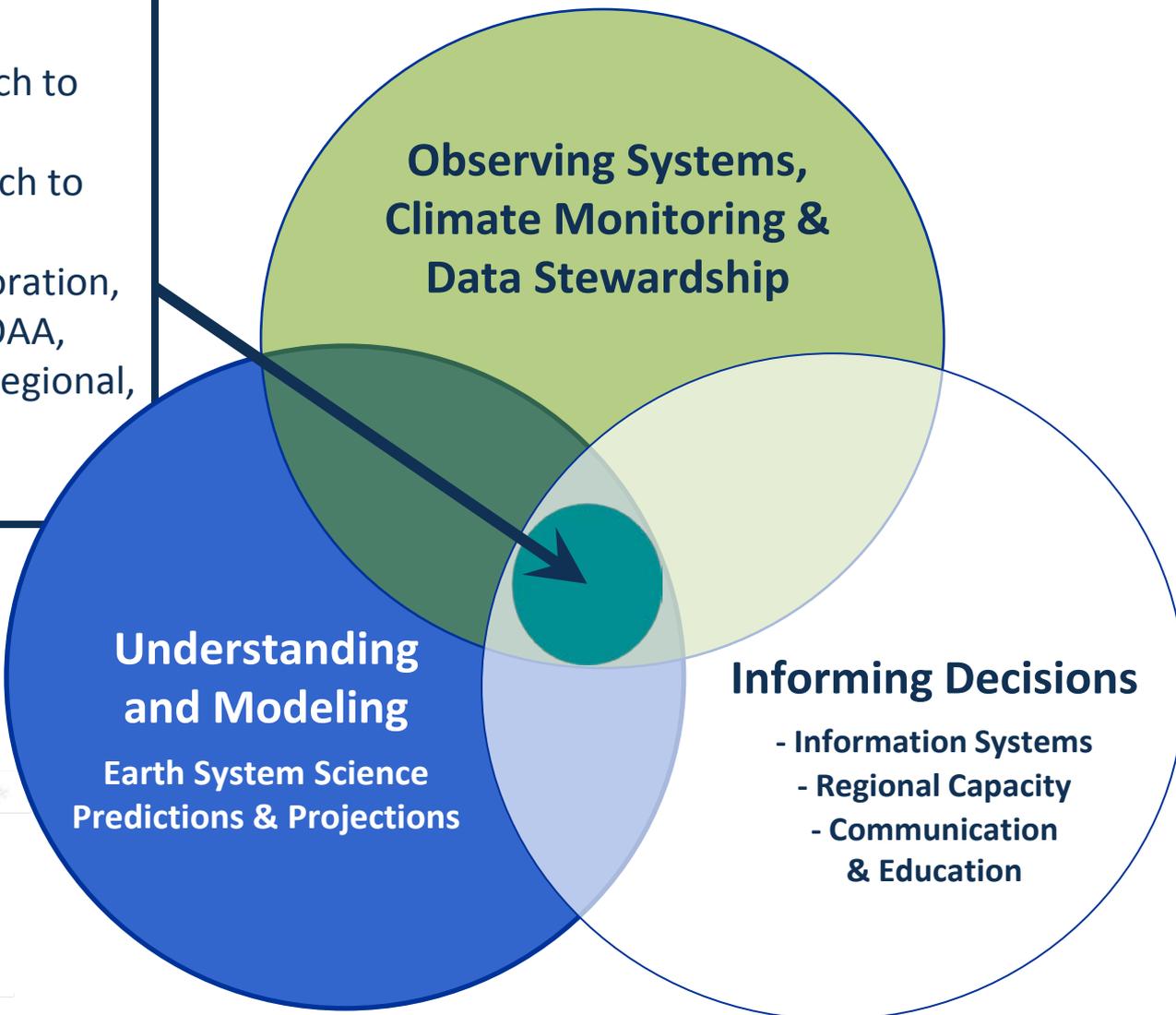
Timely, credible, useful -- across all time scales



Role of the Climate Program Office

CPO's Unique Value:

- Support mission-driven research to advance understanding
- Accelerate transition of research to operations
- Facilitate coordination, collaboration, and integration (CPO, OAR, NOAA, Interagency, academia, local, regional, national, international)



**Understanding
and Modeling**
Earth System Science
Predictions & Projections

**Observing Systems,
Climate Monitoring &
Data Stewardship**

Informing Decisions

- Information Systems
- Regional Capacity
- Communication & Education

Critical Role of Observations and Monitoring

Observing Systems

- The ocean observing systems provide information for climate research and prediction, and also for weather, ecosystems, commerce, and the environment



2015 SEA ICE MINIMUM FOURTH SMALLEST ON RECORD



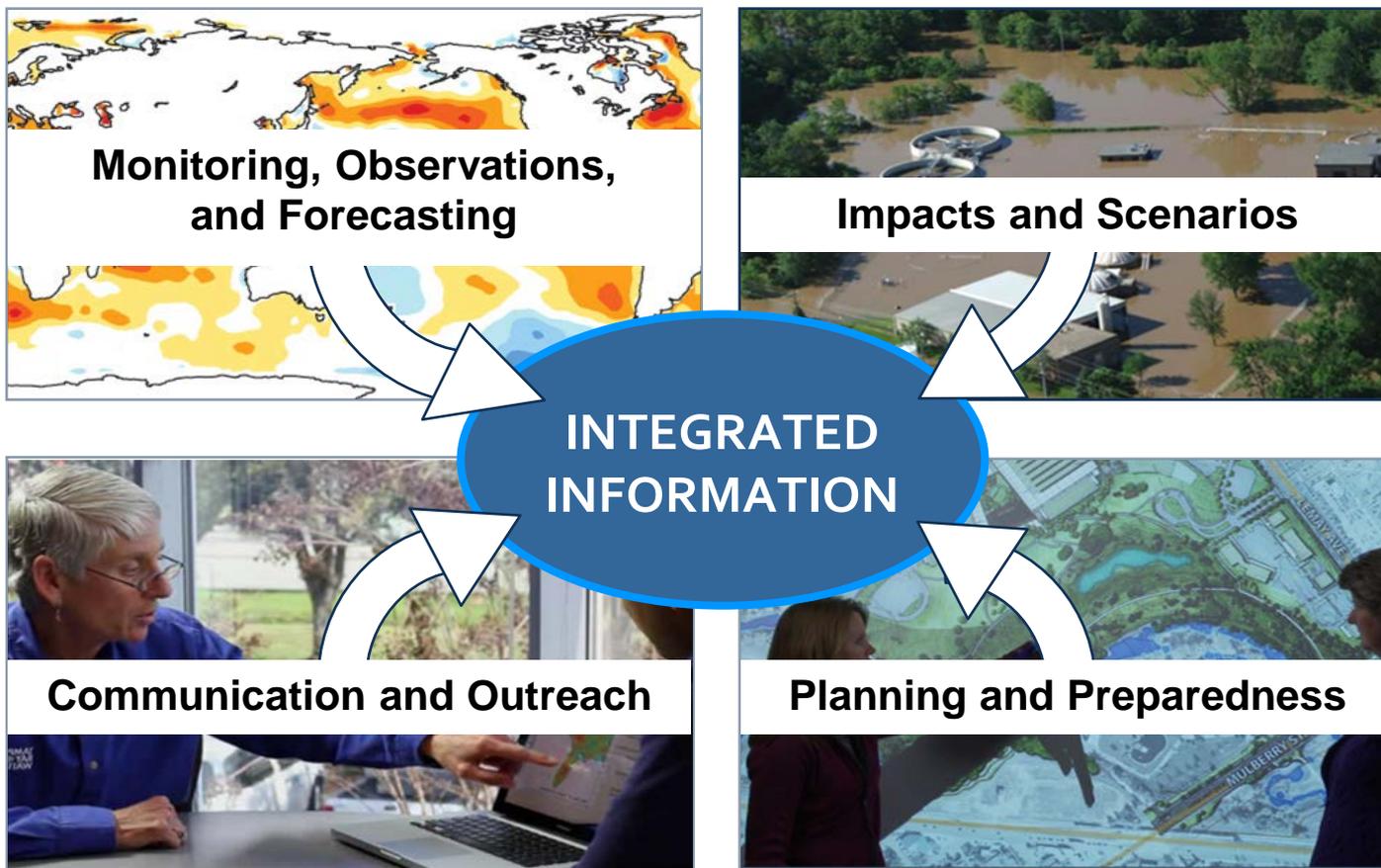
Data and Products

- The wider use of the observing system and related data and products is emphasized to address climate challenges.

Leadership

- Support for nearly half of global ocean observations
- Commitments to:
 - maintain world-class climate research, observations, data and products
 - provide useful products and services to decision makers
 - communicate the value and impact of the climate observing system

Critical Role of Observations & Monitoring: Integrated Information Systems



The systematic development, analysis, and communication of relevant information about and coming from areas of impending risk to anticipate risk and opportunities and inform development of strategic responses.

Critical Role of Observations & Monitoring at CPO (OOMD Strategic Plan)

CPO leads / supports many activities where observations & monitoring are key to addressing climate-related challenges

- + **Marine ecosystem changes:** *What are the links between the physical characteristics of the global oceans and marine ecosystems?*
- + **Coastal inundation:** *How and why are global, regional, and local sea level changing?*
- + **Subseasonal to Seasonal (S2S) forecasts:** *What observations and monitoring are needed to improve the skill of intraseasonal to interannual climate predictions?*
- + **NIDIS/Water:** *What is the ocean's role in climate variability and change, including extremes (such as drought and tropical cyclones)?*
- + **NIHHIS/Extremes:** *What primary data sets and indicators best help us monitor and communicate changes in extremes (e.g. heat) and impacts on society (e.g. human health)?*
- + **GHG impacts:** *What role does the global ocean play in the uptake, storage and distribution of atmospheric carbon?*

CPO FY17 Research Competitions

Climate Observations and Monitoring (COM)

1. Ocean Climate Information and Products
2. Global Change Climate Indicators and Data Products for Assessment

Earth System Science (ESS)

3. Atmospheric Chemistry, Carbon Cycle, & Climate (AC4): Synthesis Research: Urban Emissions and Emissions from the Oil & Gas Sector
4. Climate Variability & Predictability (CVP): Observing and Understanding Processes Affecting Intraseasonal Oscillations in the Maritime Continent Region

Modeling, Analysis, Prediction, and Projections (MAPP)

5. Advancing Drought Understanding, Monitoring and Prediction
6. Research to Explore Seasonal Prediction of Coastal High Water Levels and Changing Living Marine Resources

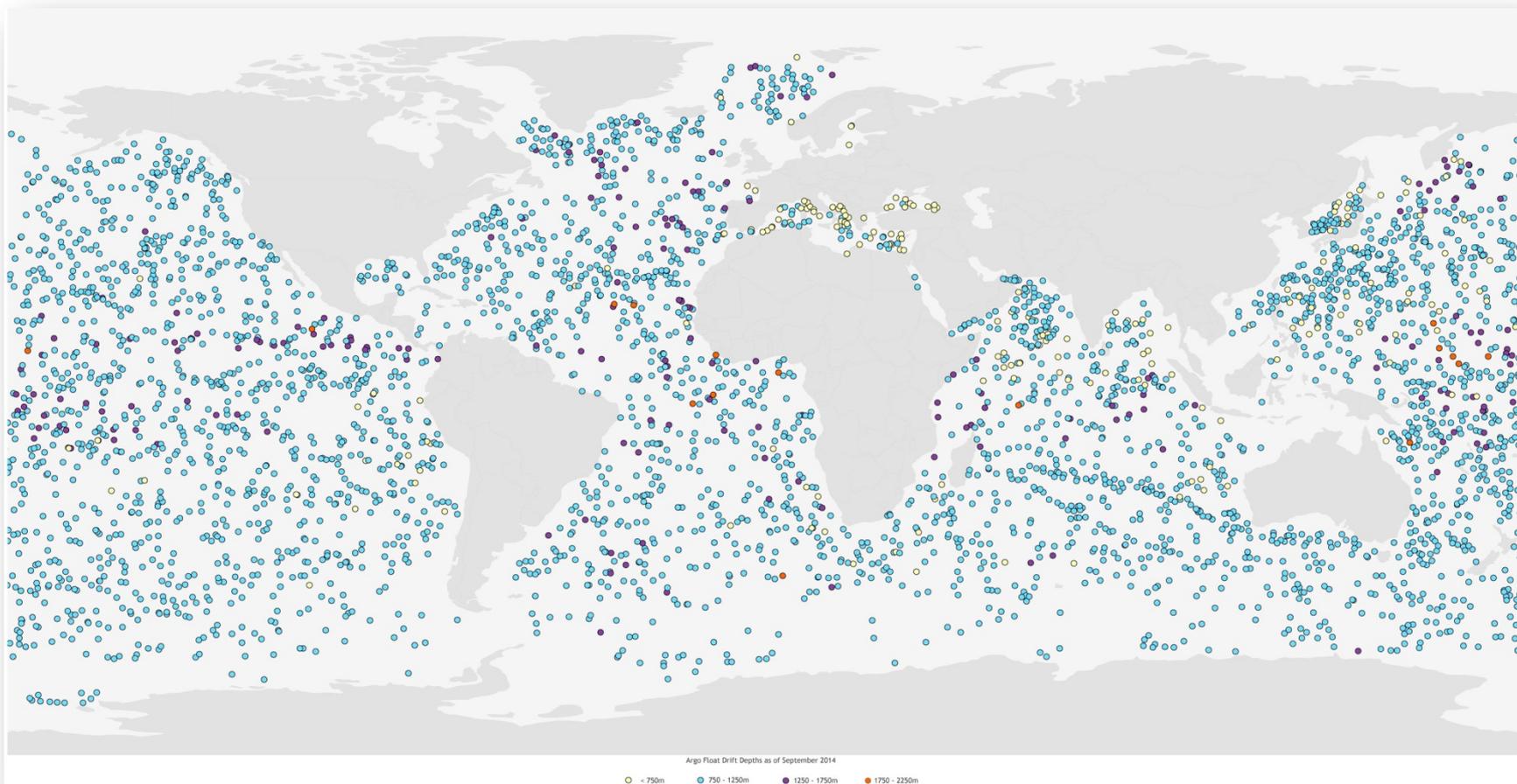
Climate and Societal Interactions (CSI)

7. COCA – Supporting Resilient Coastal Communities in a Changing Climate

Take Away Messages

- **CPO is spearheading activities where observations and monitoring play a critical role in addressing climate-related challenges.**
- **CPO is strengthening its partnerships and networks across OAR, NOAA, with other federal agencies, academia, and in the broader national and international communities.**
- **In response to increasing societal demand for climate information, CPO is advancing communication tools to provide access to climate data, information and applications.**
- **CPO's investments in observations and monitoring are foundational to earth system science, modeling, predictions and projections, and decision support.**

Thank You. Questions?



Argo Float drifts as of September 2014.