

# CLIVAR: CLIMATE & OCEAN VARIABLE & OCEAN variability, predictability and change

OOPC 2018  
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- **22 years ago, CLIVAR was established** as one of the core-projects of the World Climate Research Programme, building on **WOCE** and **TOGA**,
- The CLIVAR legacy includes the
  - **implementation and development of major multinational observing networks** in all ocean basins;
  - development of **ocean and climate re-analyses**, bridging observations and modeling through data assimilation
  - development of **ocean-climate models, initialized decadal climate predictions building on o&c reanalyses.**
  - **all ingredients for the COP21 success!**



## New CLIVAR Goals (I)

- **Expanding process understanding** (ocean mixing, heat and freshwater fluxes, sea-ice control of buoyancy fluctuations, upwelling and shelf interactions in boundary currents, cross-equatorial transport, tropical-extratropical interactions...)
- Expanding **understanding of oceanic constraints** on global transient climate sensitivity.

## New CLIVAR Goals (II)

- **Quantitative characterization and physical understanding of internal variability** and of the impact of external forcing on intrinsic modes of variability
- **Identifying regional impacts** of a changing climate upon (regional) sea level, ocean heat content, cryosphere and the water cycle

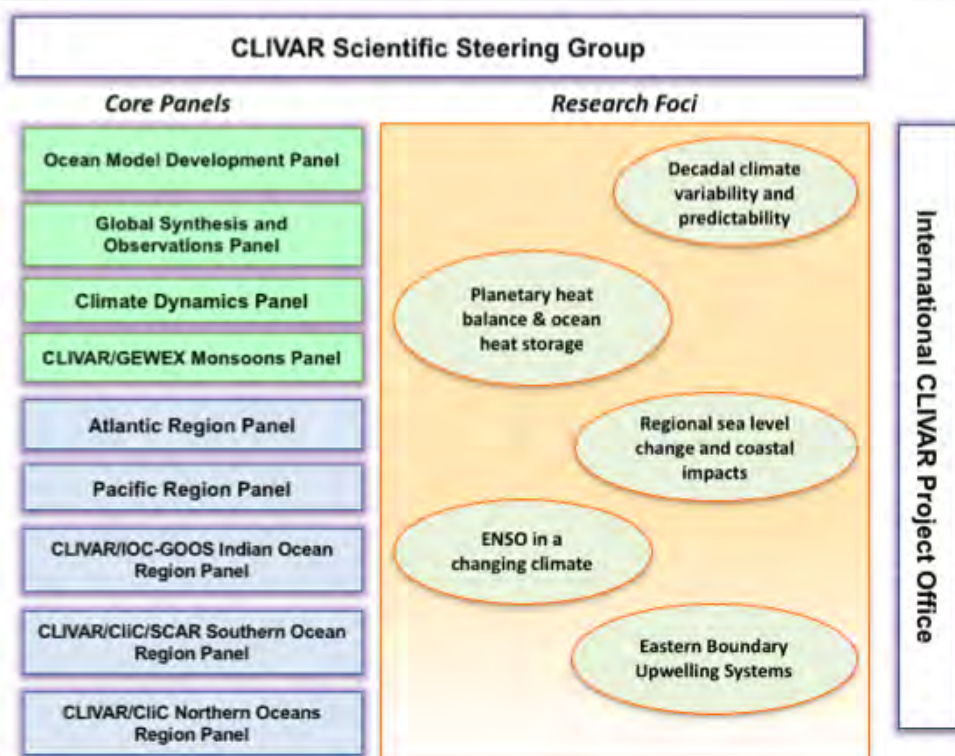
## New CLIVAR Goals (III)

- Providing **regional climate information and seamless predictions across timescales**, from intraseasonal to multidecadal
- **Quantifying predictability** of the climate system, including the predictive skills of extreme events in a transient climate
- Facilitating the **provision of actionable forecast information**, also for developing economies

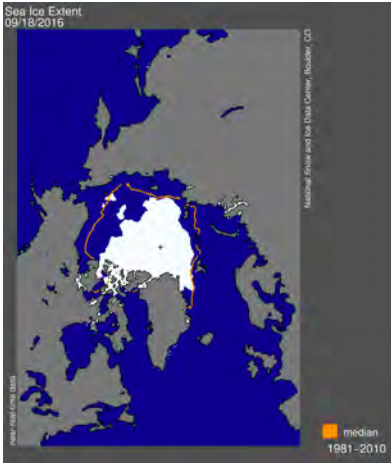


## New CLIVAR Structure

CLIVAR Panels



# New CLIC/CLIVAR Panel: NORP



An International Panel to Coordinate and Facilitate Activities on the Role of the Northern Oceans in the context of the Global Climate System from a Coupled Ocean-Air-Ice Perspective

Founding Chairs:  
Amy Solomon and John Fyfe

Will also be concerned with the Arctic observing system (similar to SORP in the Southern Hemisphere).

**INTAROS, SOOS**

# Observing System Review

- CLIVAR will revive its role in defining observing system requirements for climate; enhance interaction with OOPC.
- CLIVAR will contribute to review observing requirements in various basins.
- Short-term:
  - Tropical Atlantic review
  - Indian Ocean Observing System (IndOOS)
  - Input for TPOS: letter submitted.
- Preparation of joint input with US-CLIVAR for OceanObs'19: whitepaper on the need for an climate observing system in the ocean.



# GC Sealevel

- Generation of report on observing requirements for sea level by GC Sea Level (2018), including coastal regions.
- Regular assessments of global sea level changes, net and by component (budgets).
- Calls for a reprocessing of many data sets.

# GSOP Activities

- Global and regional observations, including satellite observations
- Ocean and coupled reanalysis/syntheses
- Surface fluxes

# IQuOD initiative

- The **overarching goal of the IQuOD initiative** is to produce and to freely distribute the highest quality, complete and consistent historical subsurface ocean temperature global database (to maximum extent), along with (intelligent) metadata and assigned uncertainties, and some downstream added-value products.
- This goal will be achieved by developing and implementing an internationally-agreed framework. No individual group has the expertise/resources to complete the above task.



# GSOP TOR

1. **Develop, promote and seek to implement strategies for the synthesis of global ocean, atmosphere and coupled climate information.** Methods will include observation-based syntheses and model-based syntheses e.g. Reanalyses.
2. **Define CLIVAR's requirement for globally sustained observations and promote the use of resulting data sets in global synthesis efforts.** Provide strategic advice and supporting evidence in collaboration with WMO and IOC bodies, to help sustain, evolve and optimize the global ocean observing system based on new science and reanalysis insights.
3. **Develop metrics to evaluate ocean and coupled syntheses,** to promote the utility of synthesis products for climate applications, including initialization of coupled forecasts, detection/attribution of climate change and variability, and determining the oceans role in the global heat, water and biogeochemical cycles.
4. **Provide strategic advice and direction to CLIVAR/WCRP data management and processing activities within the Framework for Ocean Observing, related to production of climate quality global ocean synthesis products.**
5. Liaise and collaborate with WCRP Councils, Panels and Working Groups in identifying the requirements for, and coordinating the development of, a sustainable Earth system monitoring and prediction system.



# CLIVAR and OOPC

- CLIVAR and OOPC used to have very close links.
- In the past communication went through GSOP.
- In fact GSOP and OOPC organized the last two OO conferences.
- Communication got interrupted after leaderships changes after OO'09.
- Close interaction needs to be revived. On CLIVARs side GSOP leadership and goals are being reviewed to better meet these needs.
- Basin panels are heavily involved in reviews of observing requirements.
- Generally: data needs identified during OO'09 still hold.



Thank you

