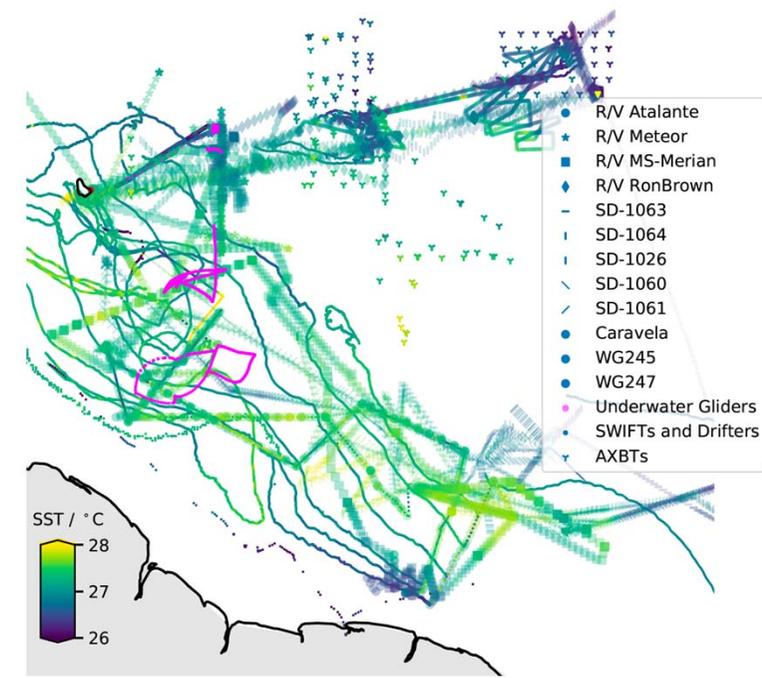
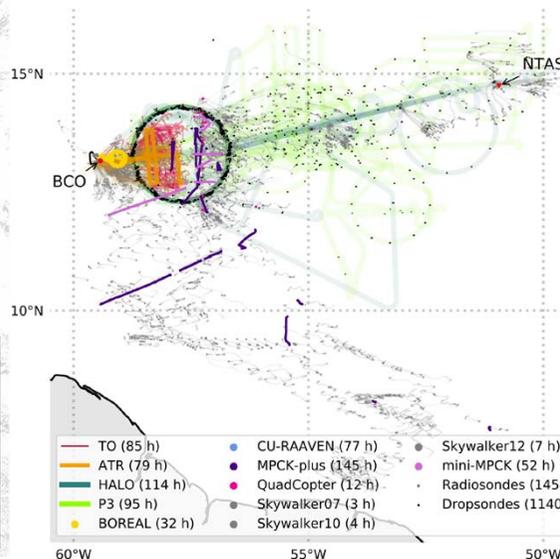
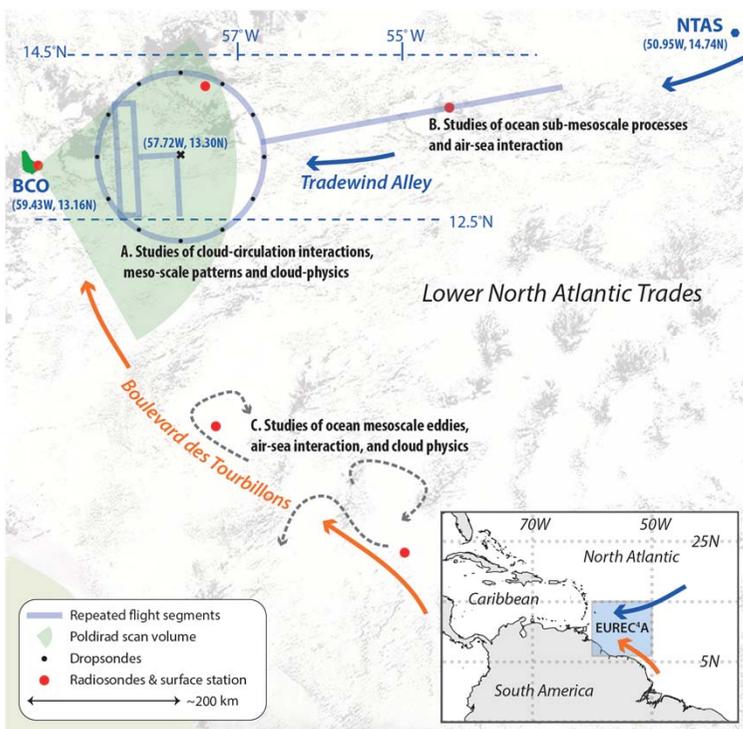


CLIVAR Atlantic Regional Panel 2020 Annual Report

Highlights

- Tropical Atlantic Observing Systems review
ARP co-chair Speich a lead author on the TAOS review, almost all ARP members contributed to the review
- AtlantOS: All-Atlantic Ocean Observing System
- Multi-disciplinary international fieldwork: ATOMIC/EUREC4A, Jan-Feb 2020

- AtlantOS



EIucidating the RoLE of Cloud-Circulation Coupling in ClimAte; Stevens et al., 2021, Copernicus ESSD (~750 authors)

AtlantOS (Young, Chidichimo, Lamont)

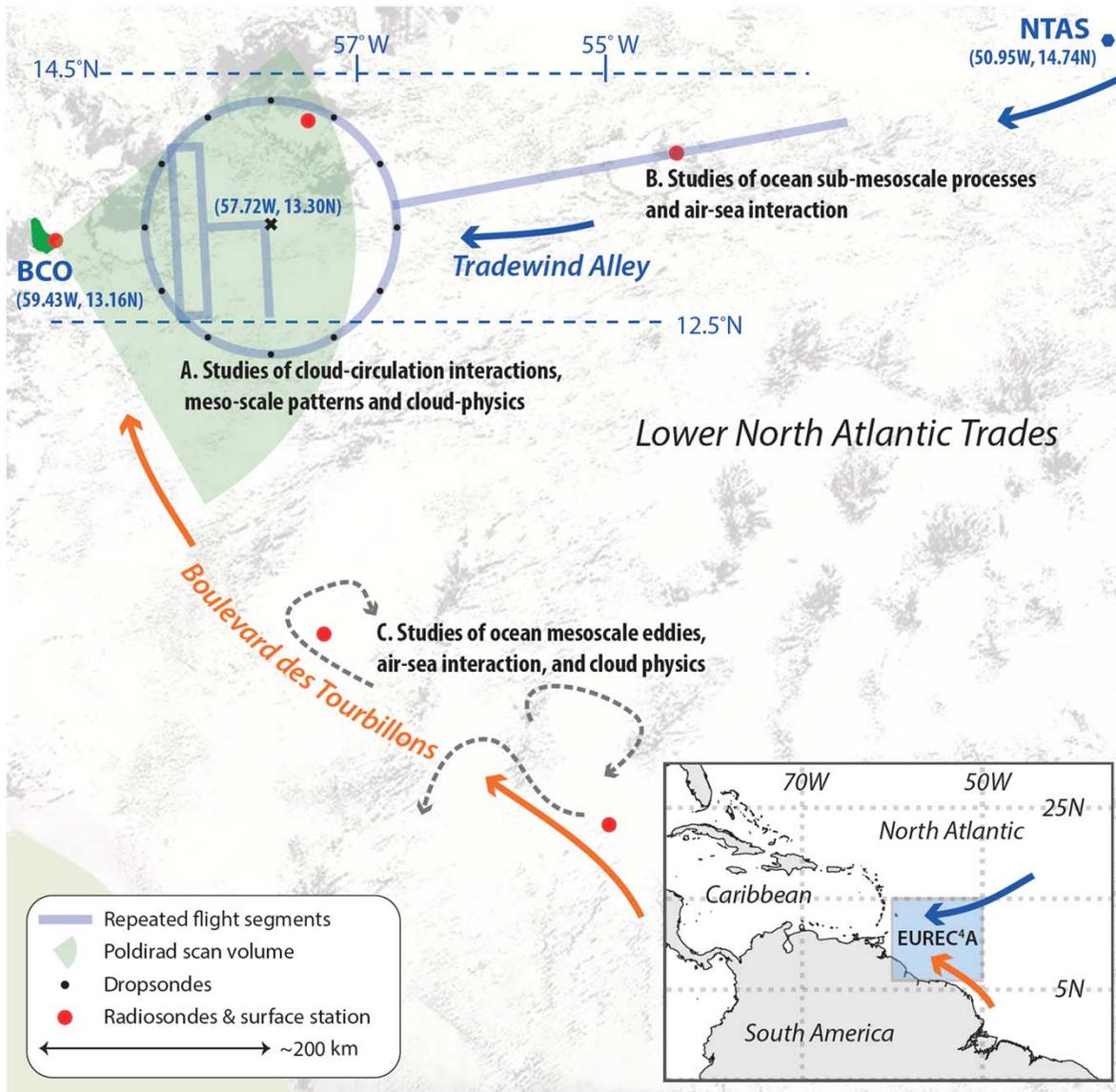
ARP members are present within the AtlantOS Program was formally announced at the First International AtlantOS Symposium (March, 2019) supporting an All-Atlantic Ocean Observing System to address the challenges and realize opportunities for society, the economy, and the environment. The AtlantOS Program (<http://www.atlantos-ocean.org/contact.html>) has the vision to **support the implementation of an All-Atlantic Ocean Observing System** that benefits all of us living, working and relying on the ocean. The approach being followed in the program is to advance the implementation of joint observational elements in the Atlantic to improve the basin-scale system and in particular to ensure that information meets societal needs. There is also activity around five case studies that are meant to both demonstrate and realize the benefits of basin-scale coordination.

The five case studies are on:

- Providing Basin-Scale Climate Services: Atlantic Meridional Overturning Circulation
- Carbon Uptake: Identifying Sinks and Sources
- Mitigating Impacts of Sargassum on Coastal Communities in the Tropical Atlantic
- Supporting Ecosystem Based Management for Fisheries in the Atlantic Upwelling Regions
- Networks to Predict and Explain Marine Animal Movements in a Changing Environment

A white paper was written (deYoung et al. 2020) and presented at the Ocean Obs'19 meeting at which several side-events around the AtlantOS program were also held. The AtlantOS program has applied for project status within GOOS and the GEO Blue Planet as it moves forward to implement its basin-scale program activities. The first case study, with its focus on AMOC, also complements the ARP focus on providing continuity on AMOC studies.

Is also connected to GOOS (which is global)

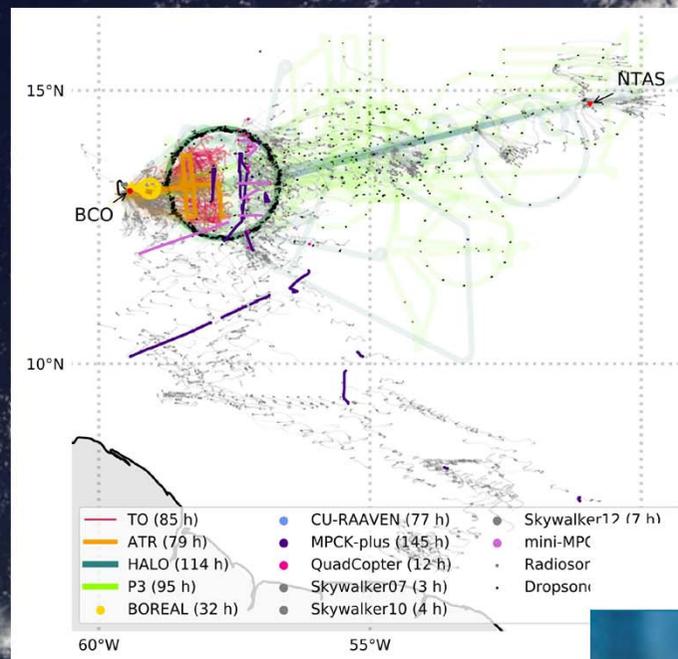
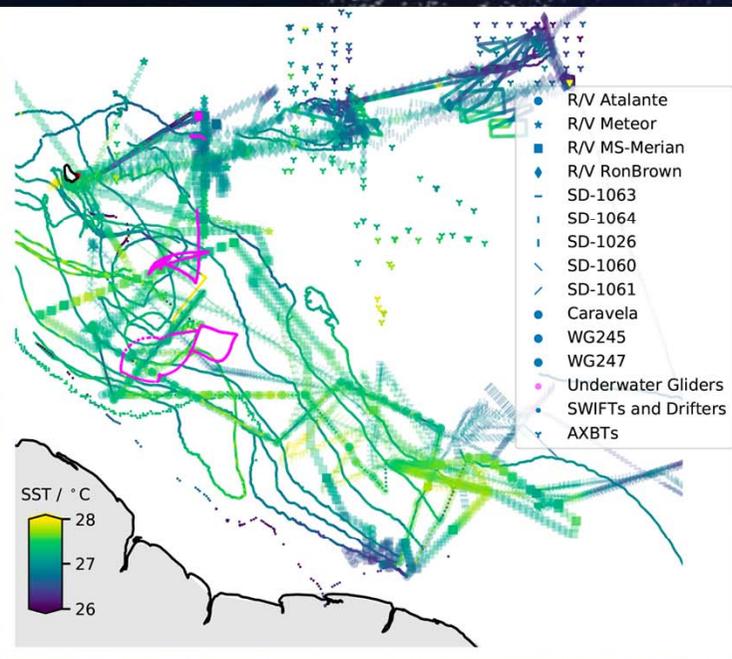


Elucidating the Role of Cloud-Circulation Coupling in Climate

Stevens, Bony, Farrell et al., 2021, Copernicus ESSD (~750 authors)

Driving science questions:

- Test hypothesized cloud-feedback mechanisms (does enhanced mixing at cloud base desiccate clouds in a warmer climate?)
- How much does rain development depend on cloud organization?
- How important are downdrafts and cold pools to the sub-cloud atmospheric structure?
- How important are coherent structures in the ocean to air-sea coupling?
- How do surface exchange processes vary with cloud regime?
- What model resolution is required to resolve these processes?



Earth System Science Data

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Special issue | Elucidating the role of clouds–circulation coupling in climate: datasets from the 2020 (EUREC4A) field campaign

WCRP- CLIVAR Workshop on Climate Interactions among the Tropical Basins (Online)

- Ingo Richter (Co-chair, JAMSTEC, Japan)
- Noel Keenlyside (Co-chair, Bjerknes Centre for Climate Research,
- Michael McPhaden (NOAA/PMEL, USA)
- Yuko Okumura (University of Texas at Austin, USA)
- Chunzai Wang (South China Sea Institute of Oceanology, China)
- Ping Chang (Texas A&M University, USA)
- Malte Stuecker (University of Hawaii, USA)
- Andrea Taschetto (University of New South Wales, Australia)

24 February (Wednesday)	25 February (Thursday)	26 February (Friday)
Current understanding of interbasin linkage	Approaches for understanding interbasin linkage	Working Groups discussions
Subseasonal-to-interannual time scales (Plenary talk 1)	Statistical methods (Plenary talk 5)	Time Slot 1.
Past Climates (Plenary talk 2)	GCM experiments (Plenary talk 6)	WG1: GCM experiments
Poster session 1	Poster session 3	WG2: theoretical approaches and intermediate complexity models
Break	Break	WG3: observations
Decadal time scales (Plenary talk 3)	Conceptual models and theory (Plenary talk 7)	WG4: paleo data
Climate change (Plenary talk 4)	Paleo proxies (Plenary talk 8)	Time Slot 2.
Poster session 2	Poster session 4	WG1: GCM experiments
Breakout discussion	Breakout discussion	WG2: theoretical approaches and intermediate complexity models
Plenary Session	Plenary Session	WG3: observations
		WG4: paleo data

- Provide an overview of the current scientific understanding of TBI.
- Identify knowledge gaps and shortcoming of current modeling approaches, as well as new observations, including paleo-proxies, that would contribute to a better understanding of TBI.
- Develop an experimental protocol for coordinated model sensitivity tests to advance the understanding of TBI and, in particular, its potential role in seasonal-to-decadal prediction. This will form the basis for a set of coordinated GCM experiments. The RF TBI will solicit the participation of modeling centers and research groups in these experiments.
- Discuss novel approaches for studying interaction among the tropical basins, including conceptual models, machine learning, and proxy data.

Planning of Joint CLIVAR/FIO 2020 Summer School (Robinson)

The Summer School on Ocean Macroturbulence and its role in Earth's Climate, originally planned for summer 2020 in Qingdao China , has been **delayed** until summer 2022

COVID impact

Seagoing science has been significantly impacted by the COVID-19 pandemic, with multiple cruises cut short, delayed or cancelled. Surveys of the impacts have been undertaken by GOOS and OceanSites, identifying areas of potential concern - particularly ship-based measurements using expendable bathythermographs (XBTs), interdisciplinary moorings, repeat hydrographic transects, gliders and animal borne sensors (<http://www.ocean-ops.org/reportcard/>).

The RAPID array at 26N was impacted as the UK cruise to service moorings was underway when the UK went into lockdown, and the ship was recalled mid-cruise. Since that time, some instruments have run out of expected battery power, and a mooring was fished and floated away from its anchor (an increasing risk with increasing deployment duration). NOAA buoy-tending cruises were delayed but are continuing, and much of the OSNAP servicing cruises were delayed but undertaken prior to the end of 2021.

Launching of CLIVAR AMOC Task Team

Background

- The US CLIVAR AMOC Science Team is sunsetting, after a decade in existence
- This leaves a gap in coordination of AMOC studies
- In order to make the coordination more international, CLIVAR ARP will form the CLIVAR AMOC Task Team, to fulfil some of the initial purposes of the US CLIVAR AMOC Science Team (ToR 1-3), and some pressing issues in the international community (ToR 4 & 5).
- We met with the AMOC Science Team in May 2020, September 2020 and Feb 2021 to decide initial ToR and form of the team.

First activity, for 2021:

Coordination of a virtual workshop on assessing observational strategies (ToR 5).

Terms of Reference

1. To promote and coordinate international collaborations amongst observational and modeling studies
2. To coordinate international workshops on AMOC science & impact topics
3. To produce a summary report with identified priorities of the AMOC community.
4. To improve data and product distribution from AMOC programs
5. To develop strategies for cost-effective, sustained monitoring of the AMOC (through an assessment of the observing system using e.g., Observation System Experiments or OSEs)

Future/Continuing Activities:

Launching CLIVAR AMOC Task Team

Finalise and Publish the TAOS review report

Work on mapping ARP activity upon the LHAs
(working group established led by Regina Rodriguez, Cochair of WCRP LHA 'My Climate Risks')

Joint CLIVAR/GOOS workshop

Continuing Ocean Decade ARP representation

ARP session convenerships
~quarterly meetings

Science Foci:

Atlantic Meridional Over-turning

Coastal sea level change

Air-sea interaction from the high-latitudes to the Tropics