

ARP Telecon Notes

Time: 13:00 -14:30 GMT, 18 March 2022

Participants: Eleanor Frajka-Williams (co-chari), Regina Rodrigues (co-chair), Paquita Zuidema, Dariia Atamanchuk, Susan Bates, Gregory Foltz, Franck Eitel Kemgang Ghomsi, Laura Jackson, Ingo Richter, Olga Sato, Tannecia Sydia Stephenson from ARP and Jing Li (ICPO)

Apology: Tarron Lamont.

1. Welcome new members and introduction of ARP

Following the self-introductions from ARP members, including Dr. Dariia Atamanchuk and Dr. Olga Sato newly recruited by ARP in 2022, Dr. Eleanor Frajka-Williams, co-chair of ARP, made [an overview](#) of the terms of reference of ARP, as well as the key activities and major achievements of APR over the past years, including the [Tropical Atlantic Observing System \(TAOS\) Review](#), [EUREC4A-OA/ATOMIC](#), [CLIVAR-FIO Summer School on 'Ocean Macroturbulence and its role in Earth's Climate](#), [Tropical Basins Interactions](#) (TBI) and etc.

2. Thematical areas of ARP in 2022

There are three suggested thematical areas for ARP in 2022:

- Atlantic Meridional Overturning Circulation (AMOC)
- Role of the Tropical Atlantic on Tropical Basin interaction (TBI)
- Ocean Extremes and Impacts

The brainstorming discussions around the thematical areas were targeted to the following aspects:

- To identify major emerging scientific issues related to Atlantic climate variability, foster research initiatives in Atlantic climate studies;
- To promote interactions (atmospheric, ocean, BGC and paleo) for interdisciplinary Atlantic climate studies and within other WCRP components (core projects, lighthouse activities, panels, etc.);
- To provide scientific and technical inputs into the implementation of methods for understanding climate variability;
- To advise and report to CLIVAR SSG on progress, achievements, new frontiers and impediments.

2.1 Atlantic Meridional Overturning Circulation (AMOC)

Dr. Eleanor Frajka-Williams briefly introduced the background of establishing the [CLIVAR AMOC Task Team](#) and its terms of references, the near-term plan, AMOC related meetings, coordination and projects. There are several AMOC meetings to be organized in 2022, including the [US AMOC Science Team Meeting](#) in June; the [EuroSea/OceanPredict meeting](#) (including observing system design) in June, and [Royal Society AMOC meeting](#) in December. The AMOC related coordination include: the [US CLIVAR AMOC Science Team](#), the CLIVAR AMOC Task Team, AMOC case study of [AtlantOS](#) (focused on impacts), AMOC data distribution of OceanSites, and etc. Other relevant coordination may include: [GRISO Greenland network](#), LabSea 2022, [IAPSO Best Practices Study Group for moored CTD measurement](#), and etc. The AMOC related projects include the active AMOC arrays (OSNAP, RAPID - 26°N, MOVE-16°N, 11°S, SAMOC, more?), related fieldwork, Horizon Europe EPOC (from July 2022), OSE tools: AMOC Metrics and etc. The AMOC TT plans to have its next meeting in May after the CLIVAR SSG and US CLIVAR AMOC ST meeting. See the [AMOC presentation slides](#) for more details.

Brainstorming on the AMOC thematic area mainly focused on the tipping point workshop, AMOC observation coordination, the missing component in the TT (atmospheric & BGC/carbon), connection to other AMOC-related activities, and the interaction with ARP and other CLIVAR panels. Key points from the brainstorming discussion are:

- Plan to organise a workshop on AMOC tipping points, need to decide scope, etc.
- To interact with ARP – ARP to advise on priorities/recommendations for observing.
- Future funding of AMOC observing systems not guaranteed.
- NACO (North Atlantic Carbon Observatory) and connections to ARP – tied to net-zero carbon.
- AMOC Task Team is mostly ocean, how about the atmospheric side?
- Impacts of AMOC changes – links to tropics and extremes/impacts.
- Cross-panel interaction with CLIVAR Ocean Modeling Development Panel (OMDP)?
- Connection to BGC/carbon is currently weak in AMOC TT but it is relevant to climate variability.
- Interest in the bottom circulation? Antarctic bottom water (AABW)?

2.2 The role of the tropical Atlantic on Tropical Basin Interaction

[Tropical Basin Interaction](#) (TBI) is a research focus (RF) of CLIVAR, which is co-chaired by Dr. Ingo Richter and participated by Dr. Regina R. Rodrigues as a member and Dr. Gregory Foltz as the WG3 coordinator from ARP. TBI RF aims to create a consensus on the mechanisms underlying TBI and how these contribute to predictability, and to promote research on how these interactions are affected by low-frequency climate variability and long-term climate change. There are now four Working Groups developed under the TBI RF: WG1 – GCM Experiments; WG2- Conceptual and Intermediate Complexity Models and Statistical Approaches; WG3 – Observation; WG4 – Paleo Data. Gregory briefly introduced the major tasks for WG3 – observation, which include: 1) preparing a list of existing observation efforts at multi-decadal and longer time scales, and to identify gaps in observations for achieving a better understanding of TBI; 2) creating a summary of the key points/recommendations from individual tropical basin reviews; and 3) interacting with the broader community at the CLIVAR/GOOS observation workshop titled ‘From global to coastal: Cultivating new solutions and partnerships for an enhanced Ocean Observing System in a decade of accelerating change (August 2022, Trieste, Italy), the 2nd Climate Observation Conference to be organized by GCOS and WMO (October 2022, Germany) and multidecadal TBI workshop in 2023 (Madrid, Spain).

The key points from the brainstorming discussion are:

- The TBI interested observation is multidecadal to climate timescale, e.g. a few hundred years. It may also be linked to the WG4 on paleo data. The interested parameters are both physical and biogeochemical and biological, and also considering the atmospheric teleconnections and interbasin throughflows (e.g. ITF).
- The ARP focused topic on the role of the tropical Atlantic on Tropical Basin Interaction is obviously linked to the activities of TBI RF. Perhaps this could also be linked to the North Atlantic and AMV (Ingo).
- Could definitely explore links with AMOC – including datasets, and recommendations for observing. Large AMOC changes affect tropics (shift in ITCZ etc.) which are communicated to other basins. Impacts on Indo-Pacific can be model dependent though – might be something to consider in terms of connections between groups.
- Could we link to regional sea level change, Steric (Thermo+halo) and variability in coastal upwelling system as part of the physical process (Franck). ARP members also showed interest in regional sea level variability and marine heatwaves and their drivers.
- It might be useful to have a meeting with the three region panels (Atlantic, Pacific, Indian) of CLIVAR to discuss TBI topics. Maybe just a few representatives from each panel (Ingo).
- Maybe ARP could comment/advise on the recommendations generated by the WGs?

2.3 Ocean Extremes and Impacts

Dr. Regina R. Rodrigues briefly introduced the [ocean extremes and impacts](#) focal area of ARP, with a focus on the WCRP Lighthouse Activity on My Climate Risk (MCR), which she

is co-chairing. In general, MCR LHA is a bottom-up initiative, implemented through regional hubs. It will develop a new framework for assessing and explaining regional climate risk using all the available sources of climate information, while the application of the framework will be specific and tailored to local concerns, and the framework itself is generic, flexible and applicable across various region types. The compound extremes always have impacts going beyond the coastal region, and include also the marine heatwave, acidification and deoxygenation issues in the open ocean. MCR LHA can provide socioeconomic expertise focusing on the impacts, hazards and risks aspects, while CLIVAR ARP can provide climate science expertise to study the causes of extremes, i.e. the sciences underlining climate risks, e.g. hurricanes in tropical Atlantic, AMOC tipping point, etc. The successful implementation of the MCR LHA depends greatly on the effective management of knowledge.

The discussion and comments on this thematic area focused on the function and funding support to the regional hubs of MCR LHA; examples/best practices for decision supporting systems in different regions (South Africa, USA); timely data updates in the decision-making tools; the coastal/regional impacts from larger modes of variability, and etc. The recaps from Mural are summarized below:

- In South Africa, we (DFFE/CSIR/SAEON) have developed a decision support system that translates science into information for stakeholders and policy-makers. This includes operational information on marine heatwaves, location of the Agulhas Current, SST anomalies. At this stage, it is quite rudimentary, but we are hoping to develop it further. The point that I really want to make though, is that the demonstration of IMPACT is now pretty much a pre-requisite for national funding ... so this focal theme is spot on (Jenny).
- There are many tools addressing the coastal impact, but NOAA has a tool (MARCO data portal) that shows fisheries, offshore wind development, and many others on the East Coast where I see a tie to what could be done here - **predicting fish, marine mammal, etc. habitat changes**.
- I also wonder about data format coming out of models for input into decision-making tools. The tools may all use GIS, but I don't know the details, but to think about **consistency so that multiple data sources could be pulled into local tools**.
- Interest in this activity from **small islands perspective**.
- Is **Sea level** a topic? Yes. Large mode variabilities do have impacts on regional sea-level change. However, it is important to know if the models have the same relationship between variabilities and the things that happen in nature.
- The scientific community can address - **how larger modes of variability impact local changes** (e.g. on the coast of Virginia)
- Another thing we have to think about is **how to update data in the decision-making tools in a timely way** - I'm thinking about providing 5-10 years predictions using interannual-decadal variability, but that means needing to update tools on that same timeframe.
- I would find it useful to investigate **larger modes of variability** (AMOC, NAO, etc.) on coastal/regional aspects of the ocean (salinity, temperature, etc.) that matter for habitat (seagrass, coral, fish, etc.) to better predict or understand the impacts of the larger climate on regional habitat.

2.4 Other relevant topics

Besides the abovementioned three focal themes, some additional ideas were generated through the brainstorming discussions.

Blog for Atlantic

Ingo suggested that it would be great to have a blog dedicated to the Atlantic, similar to the [NOAA ENSO blog](#), which could increase the visibility of ARP. ARP members could get this started by writing a few posts themselves, and by inviting guest posts. The posts can be monthly. Some possible topics may include...

Eastern Boundary Upwelling Systems

- Paquita Zuidema and Jennifer Veicht are also involved in the [CLIVAR Eastern Boundary Upwelling System Research Focus](#) (EBUS RF). Paquita is currently participating in writing the perspective manuscript on EBUS, together with the CLIVAR EBUS research foci co-chairs. The main purpose of the paper is to make recommendations for future research on EBUS. Paquita will distribute it to ARP for inputs once the first draft is ready.
- Other aspects of the Atlantic (that are also aligned with the EBUS RF) that we will begin work on later this year - 1. climate downscaling (incl. BGC) of the Benguela system based on CMIP6 2. Projections of the impact of the shifting subtropical high on the characteristics (frequency, intensity and ocean response) to upwelling favourable winds in the Benguela system (Jenny).

BGC-Argo Floats

- BGC-Argo can provide data needed for AMOC measurement. It could also provide nutrient data in the areas that currently lack measurements.
- It is critical to make use of the BGC-Argo data and show the benefit of sustaining the support of BGC-Argo deployment. The possible areas for using BGC-Argo data may include: Marine heatwave, acidification, low marine productivity and etc.

Turbulent 'melting pot' of Indo-Atlantic Waters

- A Horizon-Europe project that unfortunately wasn't funded was to look at the role of the Cape Basin (a turbulent 'melting pot' of Indo-Atlantic waters) in constraining leakage and water mass transformation into the Atlantic. I believe that Lisa Beal has an NSF funded project that was funded to work on this (Jenny).

3. Action items

- 1) ARP members to register their interests to the respective focal areas of ARP ([signing sheet](#)), and to meet by subsets of groups to discuss the particular activities to be organised on each focal theme, and/or how to link with existing activities;
- 2) [Mural platform](#) will remain open, new ideas can be continuously added.
- 3) To establish **ARP blog** at CLIVAR website with contributions written by ARP members and invited guests.
- 4) ARP members are anticipated to be more actively involved in the [CLIVAR-FIO Summer School on 'Ocean Macroturbulence and its role in Earth's Climate](#).
- 5) To solicit inputs from ARP members on the EBUS perspective manuscript (Paquita) and TBI WG3-Observation documents (Gregory).
- 6) The next ARP telecon will be organized in about three months.

Annex:

CLIVAR Atlantic Region Panel Telecon

Draft Agenda

18th March 2022, online, 13:00 -14:30 GMT

Time	Agenda Item
13:00 - 13:15	<p>1. Welcome new members/Quick introduction to ARP and all members- (Eleanor/Regina, 5 mins)</p> <ul style="list-style-type: none"> • Terms of Reference of ARP • ARP 2022 membership • ARP Annual Report (2020-2021) • Tropical Atlantic Observing System (TAOS) Review • EUREC-A-OA/ATOMIC • CLIVAR-FIO Summer School on 'Ocean Macroturbulence and its role in Earth's Climate • <p>* Group Photo of the telecon: Please smile :-)</p>
13:15 - 13:30	<p>2. Introduction to 3 ARP focal themes (5 min each)</p> <ul style="list-style-type: none"> • AMOC (Eleanor) • The Role of the Tropical Atlantic on Tropical Basin Interaction (TBI) (Greg?) • Ocean Extremes and Impacts (Regina)
13:30 - 14:00	<p>3. Discussion (30-60 mins)</p> <p>Discussion of identified focal themes (and any other suggested themes)</p> <p>How we'd like to engage as ARP (paraphrased from ToR):</p> <ul style="list-style-type: none"> • Identify major emerging scientific issues related to Atlantic climate variability, foster research initiatives in Atlantic climate studies • Promote interactions (atmos, ocean, BGC and paleo) for interdisciplinary Atlantic climate studies and within other WCRP components (Homes, LHAs, panels,...) • Provide scientific & technical input into implementation of methods for understanding climate variability • Advise & report to CLIVAR SSG on progress, achievements, new frontiers and impediments <p><i>Before the next meeting, please think about which focal theme you'd like to contribute to (or other Atlantic-related topics to bring ARP's attention to), and if there are specific actions ARP can take to advance the science, collaboration or monitoring of efforts.</i></p> <p>Your inputs can be put into the below online tool (Mural, tutorial):</p> <p>https://app.mural.co/t/clivar4598/m/clivar4598/1647336031896/46b4f8d4d7e7c62e7246c5d86a05f91001327320?sender=u4df579e91b2ebe80c2356442</p>