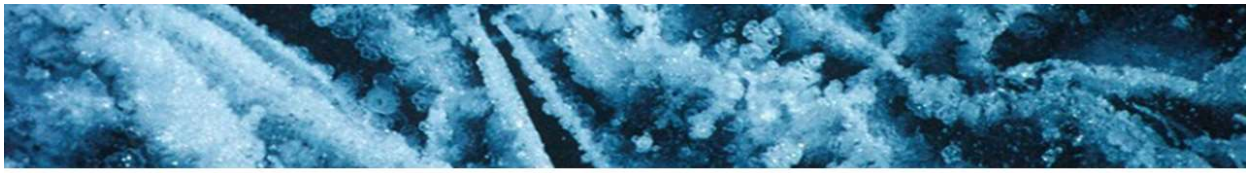
Ocean Cryosphere Exchanges in ANtarctica:

Impacts on Climate and the Earth system

OCEAN:ICE Kick off meeting

Milestone MS17



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https://ocean-ice.eu/

Document information Milestone report

Work Package	WP9 Project coordination, dissemination and outreach
Milestone no. & title	MS17 Kick off meeting
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Means of verification of the achievement of the milestone:

Delivery of meeting. Partner in charge of delivery of the milestone: UKRI-BAS.

Work Performed

The consortium met at Sorbonne University in Paris on the 7th and 8th November 2022. This event was also held virtually via Zoom. This meeting was in collaboration with the consortium for the H2020 funded project SO-CHIC (GA 821001, http://www.sochic-h2020.eu/) allowing for overlap to encourage knowledge exchange, collaboration and networking.

Goal of the meeting

The kick off event allowed the partners to better understand the significant objectives of the project, and how they can contribute to each task and outline plans for the coming months. Work packages leaders hosted working groups to refine planning and initiate the project's activities. Working groups of cross cutting themes were also hosted to allow synergy between work packages. The meeting was a success, with the partnership eager for the work of OCEAN:ICE to begin, and many interesting talks to fine tune the activities planned in the description of the action.

Participants

Representatives from all participants and partners were present at the meeting either in person or virtually. Participants of the in-person event: 63. Participants online: 15.

Agenda

The day 1 of the OCEAN:ICE programme (7th November 2022) revolved around an introduction to the project as a whole, and its component work packages, followed by an opportunity for the work packages to undertake breakout discussions focused on delivery of scientific and field objectives, and a final discussion encompassing crosscutting themes and coordination. At the end of the day there was an opportunity for the External Advisory Group members to feedback impressions and ideas to the Scientific Steering Committee. In parallel, a poster session was organised for the in-person part of the event.

The meeting was held in conjunction with the H2020 project SO-CHIC annual meeting (9-10th November 2022) and a combined Southern Ocean and Antarctic workshop on the 8th November 2022. The event brought together a good number of Southern Ocean and cryosphere scientists from OCEAN:ICE, SO-CHIC, but also from projects funded by the European Space Agency, UKRI and related projects from the EU Polar Cluster and beyond.

Files of the talks and a selection of posters can be found on the OCEAN:ICE Zenodo community: Ocean-Cryosphere Exchanges in ANtarctica: Impacts on Climate and the Earth System | Zenodo

The proceedings of the 8th November workshop will also be made available in Zenodo under the DOI and published on the website www.ocean-ice.eu

Agenda for 7th and 8th November 2022

Monday 7th November – OCEAN:ICE kick-off meeting

Zoom link for the day

Timings	Title/topic	Presenter
08:30 – 09:00	Registration and coffee	
09:00 – 09:10	Welcome from Sorbonne and overview of the week	JB Sallee
09:10 – 09:30	Welcome and introductions	Ruth Mottram and Andrew Meijers
09:30 – 09:50	Overview from EC project officer and Policy officer	Anna Starace, Larisa Lorinczi
09:50 – 10:10	Introduction to EPOC – part a) partner project	Eleanor Frajka-Williams
10:10 – 10:30	WP1 overview (15 minutes + questions)	Markus Janout, Pierre Dutrieux
10:30 – 11:00	**Break**	
11:00 – 11:20	WP2 overview (15 minutes + questions)	Nicolas Jourdain, Anna Wåhlin
11:20 – 11:40	WP3 overview (15 minutes + questions)	Ruth Mottram, Gael Durand
11:40 – 12:00	WP4 overview (15 minutes + questions)	Jan De Rydt, Frank Pattyn
12:00 – 12:20	WP5 overview (15 minutes + questions)	Elaine McDonagh, Petra Langebroek
12:30 – 13:30	**Lunch**	
13:30 – 13:50	WP6 overview (15 minutes + questions)	Ricarda Winkelmann, Tony Payne
13:50 – 14:10	WP7 overview (15 minutes + questions)	Antonio Novellino
14:10 – 14:30	WP8 overview (15 minutes + questions)	Andrew Meijers
14:30 – 14:50	WP9 overview (15 minutes + questions) •Introduction •Reporting duties to the EC (timeline) & Handbook •Communication and dissemination tools •Diversity, Equity and Inclusion in OCEAN:ICE	Sarah Coombs Chiara Bearzotti Ruta Hamilton WiPS-Renuka Badhe
15:00 – 15:30	**Break**	
15:30 – 16:25	Work Package working groups: WP1 – room 108 WP2 – room 106 WP3 – room 112 (max 16 pers) WP4 – room 114 (max 16 pers) WP5 – room 1815 (max 6 pers) - Tower Zamansky WP6 – room 1800 (max 6 pers) - Tower Zamansky WP7 - room 1003 (max 12 pers) - Tower Zamansky WP8 – room 1004 (max 12 pers) - Tower Zamansky WP9 **To access the tower Zamansky, you will be required to give your ID at reception to have an access pass**	
16:30 – 17:30	Cross-cutting themes: • Deep Uncertainty in Freshwater Fluxes (Room 108) • Bottom Water and Lower Cell (Room 106) • Oxygen Isotope Exploitation (Room 112 (max 16p)) • The Role of Pole(s) in the Global Climate System (Room 114 (max 16 pers))	
17:30 – 18:00	EAG (Expert Advisory Group) and SSC meeting	
19:30	**OCEAN:ICE networking dinner**	Restaurant 'Amore Mio' 13 Rue Linné, 75005 Paris

Tuesday 8th November - Southern Ocean & Antarctica Event

Zoom link for the day:

Timings	Title/topic	Presenter
08:30 – 08:50	Registration/coffee	
08:50 – 09:00	Welcome	Andrew Meijers, JB Sallee
09:00 – 09:10	EU Polar Cluster	Griffith Couser
09:10 – 09:25	PROTECT	Gael Durand
09:25 – 09:40	(virtual) PolarRes	Priscilla Mooney
09:40 – 10:55	TiPACCs	Svein Østerhus
10:00 – 11:00	**Poster session + coffee**	
Southern Ocean circulation		
11:00 – 11:20	(virtual) Understanding recent changes in Antarctic Sea ice and its interactions with the Southern Ocean	Kaitlin Naughten
11:20 – 11:40	Variability & change of the Southern Ocean carbon sink	Channing Prend
11:40 – 12:00	(virtual) How change in AA and atmospheric circulation impact change in SO circulation and feedback onto AA.	Matt England
12:00 – 13:00	**Lunch**	
Global and societal impact of SO and AA		
13:00 – 13:20	(virtual) Copernicus marine service in polar regions	Gilles Garric
13:20 – 13:40	(recorded) Aligning science objectives with decision makers needs	Nicole Biebow
13:40 – 14:00	Diversity and inclusion in Polar science	Renuka Badhe
14:00 – 14:10	**Short break**	
Antarctic ice-sheet & sea level		
14:10 – 14:30	Latest advance in our understanding from observations	Anna Hogg
14:30 – 14:50	(virtual) Toward coupled modelling of the Antarctic Ice Sheet	William Lipscomb
14:50 – 15:10	(virtual) Projecting SL based on improved AA understanding	Sophie Nowicki
15:10 – 16:00	**Poster session + coffee**	
16:00 – 17:00	Break-out in small thematic group with clear objectives: defining a list of key knowledge gap and potential approaches and synergies across projects Group 1 – room 108 Group 2 – room 106 Group 3 – room 112 (max 16 pers) Group 4 – room 114 (max 16 pers) Group 5 – room 116 (max 30 pers)	
17:00 – 18:00	5-min plenary intervention from each breakout group rep.	
19:00	**Cocktail and dinner joint session** To access the tower Zamansky, you will be required to give your ID at reception to have an access pass	Zamansky tower – 24th floor, room 2400

Direct links to the presentations of the work packages ca be found below:

- Introduction to OCEAN:ICE - Andrew Meijers, & Ruth Mottram. (2022, November 10). OCEAN:ICE KO meeting introductory presentation. Zenodo. https://doi.org/10.5281/zenodo.7310807

- WP1 - Pierre Dutrieux, & Markus Janout. (2022, November 24). OCEAN:ICE WP1 overview: Subpolar circulation, heat delivery and water mass export. Zenodo. https://doi.org/10.5281/zenodo.7355570

- WP2 - Nicolas Jourdain, & Anna Wåhlin. (2022, November 24). OCEAN:ICE Work Package 2 overview - Cryosphere-ocean interaction, processes and feedbacks. Zenodo. https://doi.org/10.5281/zenodo.7355708

- WP3 - Ruth Mottram. (2022, November 24). OCEAN:ICE Work Package 3 Overview - Antarctic ice-sheet modelling and freshwater fluxes. Zenodo. https://doi.org/10.5281/zenodo.7355763

- WP4 - De Rydt, Jan, & Pattyn, Frank. (2022, November 24). OCEAN:ICE WP4 Overview: Quantification of AIS 'deep uncertainty' and freshwater fluxes. Zenodo. https://doi.org/10.5281/zenodo.7357446

- WP5 - Langebroek, Petra, & McDonagh, Elaine. (2022, November 28). OCEAN:ICE WP5 Overview: Ice sheet impacts on global ocean circulation. Zenodo. https://doi.org/10.5281/zenodo.7372519

- WP6- Winkelmann, Ricarda, & Payne, Tony. (2022, November 28). OCEAN:ICE WP6 Overview: Role of Antarctica in the global climate: long-term impacts of short-term decision-making. Zenodo. https://doi.org/10.5281/zenodo.7373150

- WP7 - Novellino, Antonio. (2022, November 24). OCEAN:ICE WP7 Overview: Data Management. Zenodo. https://doi.org/10.5281/zenodo.7357459

- WP8 - Andrew Meijers, & Mottram, Ruth. (2022, November 10). OCEAN:ICE WP8 overview presentation. Zenodo. https://doi.org/10.5281/zenodo.7310820

- WP9 - Coombs, Sarah, Bearzotti, Chiara, & Hamilton, Ruta. (2022, November 7). Overview: OCEAN:ICE WP9 Project Coordination, Dissemination and Outreach. Zenodo. https://doi.org/10.5281/zenodo.7342404

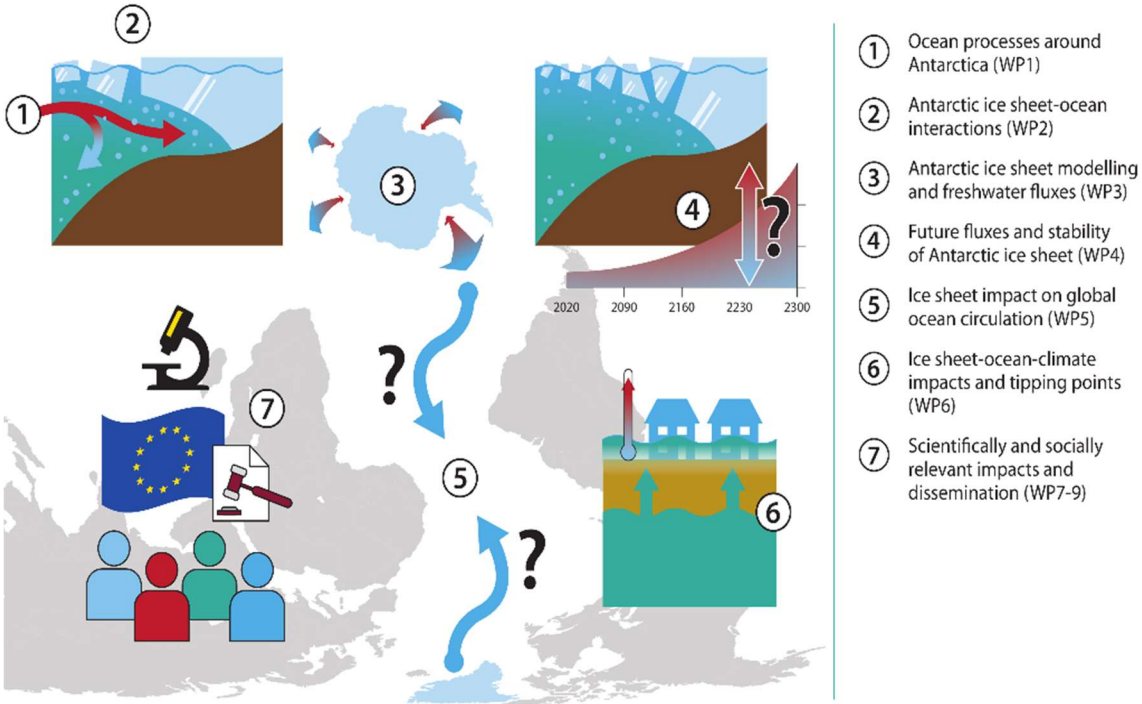

Fig.1: Pert chart of OCEAN:ICE, interlinkages between work packages.

Cross Cutting Themes

We have four cross cutting themes within the project, whose primary purpose is to make sure that work in the individual work packages support each other where appropriate and can be presented together as coherent storylines at the end of the project. As such to initiate open lines of communication, we held four meetings concentrating on each theme. These will continue as annual keeping-in-touch virtual meetings. A summary of the discussions in the cross-cutting themes is reported below.

Theme 1: Deep uncertainty in freshwater fluxes

Lead: Universite Libre de Bruxelles (F. Pattyn), partners: All

The drivers, magnitude and variability of freshwater flux from the polar ice sheets to the ocean is a central theme.

Summary of discussion points:

- There is still some confusion in the work packages about what is meant with “deep uncertainty” and how it is different from high-end freshwater fluxes associated with high-end scenarios. MICI is one of the processes associated with deep uncertainty, but MISI and sudden shelf breakup and damage may also lead to similar amounts of ice loss and freshwater fluxes. In principle, it covers processes for which it is not possible to define a probability.
- It is important to define what the different needs are across the different work packages.
- Not all ocean models use icebergs in a Lagrangian system. Some models are forced by salt fluxes.
- We must keep in mind that ocean models can only run a limited number of simulations; ice sheet models should therefore limit the number of proposed freshwater fluxes in time. All model runs should go to 2300.
- Tipping points may also be reached by the feedback between freshwater fluxes and ocean circulation.

Theme 2: Bottom water and lower cell

Lead: British Antarctic Survey (P. Abrahamsen), partners: WP1, WP2 and WP5

The formation of dense water around Antarctica, its export northward and interaction with similar waters formed in the North Atlantic is explicitly examined across seasonal to millennial timescales in work packages WP1, WP2 and WP5.

Summary of discussion points:

- Observations and metrics from WP1 feed into WP5 and WP6. There are also links to the project EPOC at the 34°S boundary, though they are concentrating on the upper cell rather than bottom water.
- WP1 is focussing on the source regions, such as Filchner Sill. There is work in SO-CHIC work package WP3 (Casimir de Lavergne, Pedro Llanillo) to link these regions to the Powell Basin and Orkney Passage. Modellers are looking at deep pathways in their models. JB Sallée (Sorbonne, SO-CHIC, partner in OCEAN:ICE) has deployed bottom-following floats as part of ERC project WAPITI, he has additional floats, but he is unsure whether to deploy these in the Ross Sea or in the Weddell Sea.
- There is need for clarification for the following questions: why AABW appears to be warming everywhere - across the Southern Ocean and farther downstream. Could there be links to the IPO in the Weddell sector? Could the observed trend be aliasing a longer (e.g. multi-decadal) cycle?
- Partner AWI have plans to perform model runs with (high-resolution) FESOM to ground-truth the lower-resolution models. These can in turn be used to test hypotheses for bottom water change over longer time scales. There will also be forced runs / perturbations with FESOM.
- We should try to entrain the SAMOC community into these discussions. In WP5, there are plans to add microcats to the SAMBA array to measure deep water salinity at 34°S.

Additional key questions to be still addressed include:

- How circumpolar are the observed trends in bottom water?
- Modelled overturning (lower cell) is much lower than some of the high exports observed in regions such as Orkney Passage. Are we measuring the right thing? Are we missing southward returns?

Theme 3: Oxygen isotope exploitation

Lead: CNRS-IPSL (C. de Lavergne), partners: WP2 and WP5

OCEAN:ICE exploits new observation tools, analysis techniques and model development utilising water oxygen isotopes in work packages WP2 and WP5.

Summary of discussion points:

- The opportunity to access historical d18O data from Fimbul Ice Shelf, Filchner-Ronne and the Southern Ocean.
- Elaine McDonagh (NORCE) will exploit Gebbie's inverse circulation estimate (task 5.2), which ingested the GISS d18O database. To reconstruct evolving surface boundary conditions, as much historical d18O data as possible will be used. This argues for a global compilation of historical data.
- Louise Sime works on d18O in UKESM, with an atmospheric focus. Both partners BAS and CNRS-IPSL are incorporating d18O in NEMO. The developments performed at IPSL aim to be sustainable and ultimately enter the reference NEMO code. In both cases, sea ice (i.e. the SI3 model) remains to be dealt with. The NEMO consortium plans to have a generic tracer module for sea ice, which should greatly facilitate the inclusion of d18O in sea ice.

- The availability of d18O data across the Weddell argues for including the whole Weddell Sea rather than merely the Fimbul ice shelf, in the regional configuration. The configuration developed by Ute Hausmann (CNRS-IPSL) could be a starting point.

Theme 4: The Role of Pole(s) in the Global Climate System

Task Leader: University of Reading (R. Smith), partners: All

While WP6 focuses explicitly on role of Antarctic in the global climate system, it draws heavily on the findings and expertise represented in the WP1-5 to produce a comprehensive understanding of the multiple processes and timescales involved.

Summary of discussion points and actions to be taken:

- WP3 will convene a meeting late January /early February 2023 to establish exactly which variables they need to deliver to which other WPs.
- WP3 works on EO datasets will largely consist of reworking and signposting existing products, but this can still be accommodated by WP7 who can then provide a transparent means of distribution within OCEAN:ICE and an easy access to documents.
- WP3 RCM simulations will be extended to provide detailed surface boundary conditions for ice models for the future too. PolarRES work will be leveraged. Ideallly, CMIP models (eg UKESM) could be run out to 2300 with diagnostics enabling the polar RCMs to be run longer too.
- WP6 will attempt to work with the modelling work packages of the EPOC project and talk to WP4 about their FWF output for our simulations.
- For all work packages: The EUCP storyboards are to be taken into consideration: https://eucp-project.github.io/storyboards/ . They may be a good example for ways to put together a storyline for different audiences, including for scientists inside OCEAN:ICE to show how everyone's work is leading to a global picture. There's still a need to demonstrate to non-expert audiences that the poles aren't simply a remote and irrelevant part of the world.

Executive Advisory Board (EAG)

On the 7th November 2022 the first meeting of the advisory board took place to allow the opportunity for the EAG to feedback impressions and ideas to the Scientific Steering Committee. The EAG was satisfied with the plans presented and its members are looking forward to following up on progress in the upcoming months. A list of the appointed EAG members can be found on the project website: Expert Advisory Group – OCEAN:ICE (ocean-ice.eu)

Communication on Social Media

We have collated all social media inputs from the kick off on the platform Wakelet. The wakelet of the meeting can be found here**:** OCEAN ICE Kick Off Meeting. Wakelet is a content curation platform that allows us to create and share work, and provides an ideal space for collaboration for a specific meeting or event.

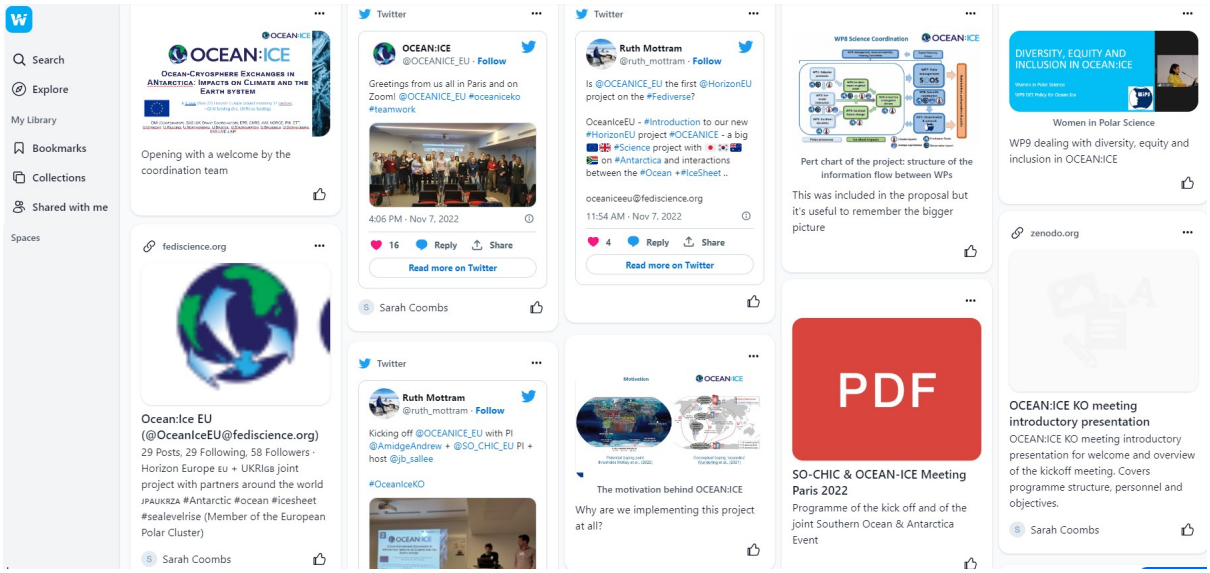

Fig.2: Wakelet of the kick off meeting.

Additionally, accounts on Twitter and Mastodon have been set up for the project:

- https://twitter.com/OCEANICE_EU
- https://fediscience.org/@OceanIceEU

With regards to Twitter, in the 28-day summary (1 November-28 November 2022) which includes the kick off meeting dates, the analytics indicate that the project has been increasing the profile visits by +1.639%, with tweet impressions +182,237%, an increase of +1,125% in mentions and +101 followers, The engagement rate was spanning from 5%-10% on the single tweets during this period, with an average impression per day rate of 456.