



Marine Working Group Meeting

Arctic Ocean Science Board (AOSB)

5 April 2014

09.00-18.00

Helsinki, Finland

The Dynamicum, Finnish Meteorological Institute

Draft Minutes

Participants:

WG MEMBERS PRESENT:

BERT RUDELS - FINLAND, CHAIR
JINPING ZHAO - CHINA, VICE CHAIR
ROLF GRADINGER - USA, VICE CHAIR
OLEG DITRICH - CZECH REPUBLIC
NAJA MIKKELSEN - DENMARK
KARI STRAND - FINLAND
MICHIEL RUTGERS VAN DER LOEFF – GERMANY
HEIDI KASSENS – GERMANY
STEINGRIMUR JÓNSSON - ICELAND
KOJI SHIMADA - JAPAN
HAJIME YAMAGUCHI - JAPAN
SUNG-HO KANG - KOREA
BAEK MIN KIM - KOREA
MARIT REIGSTAD - NORWAY
PAULINE SNOEIJNS LEIJONMALM - SWEDEN
MARY-LOUISE TIMMERMANS – USA
HUMFREY MELLING – CANADA

GUESTS AND OBSERVERS:

JACQUELINE GREBMEIER - PAG CHAIR
NATHALIE MORATA – ART CO-CHAIR
MATTHEW SHUPE – USA
JENNY BAESEMAN - CLIC
TOM DUNNING NEWBURY-US DEPT
EUN JIN YANG – KOPRI, SOUTH KOREA
JOO-HONG KIM – KOPRI, SOUTH KOREA
MIMI MIYOSHI – NIPR, JAPAN
PETER HARRISON – CANADA
CHEN HONGXIA- FID, SOA, CHINA
JOHN BENGSTON – NOAA, USA

LEE COOPER – USA
CHEN JIANFANG – SOA, CHINA
THOMAS SPENGLER- NORWAY
CHRISTINE DAAE OLSENG - NORWAY
CATHERINE LALANDE – AWI, GERMANY
SVETLANA MURZINA - RUSSIA
JAMES OVERLAND – NOAA, USA
MERI KORHONEN - FINLAND

WG MEMBER NOT PRESENT:

MORTEN HOLTEGAARD NIELSEN - DENMARK
GUDRUN MARTEINSDOTTIR - ICELAND
RANDI INGVALDSEN - NORWAY
WALDEMAR WALCZOWSKI - POLAND
JAN MARCIN WESLAWSKI - POLAND
MIQUEL CANALS - SPAIN
HEIN J.W. DE BAAR - THE NETHERLANDS
JEREMY WILKINSON - UK
STEFANO ALIANI - ITALY
URSULA SCHAUER – GERMANY
K.P. KRISHNAN – INDIA
FRANSCISCO GORDILLO – SPAIN
SHELDON BACON - UK

SECRETARIAT

VOLKER RACHOLD (IASC EXECUTIVE SECRETARY)
HIEKE MIDLEJA (IASC SECRETARIAT)
EMILY CHOY (APECS PARTICIPANT)
PAUL SUPRENAND (APECS PARTICIPANT)



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1 Opening and Reporting

1.1 WELCOME AND INTRODUCTIONS (BERT RUDELS)

Bert Rudels opened the meeting with an announcement that Leif Anderson (Sweden) stepped down from the MWG and is replaced by Pauline Snoeijs Leijonmalm (Sweden). Bert Rudels welcomed Pauline Snoeijs Leijonmalm and Humfrey Melling (Canada) as new members. Personal introductions were made by MWG meeting attendees.

1.2 REPORT FROM THE CHAIR (BERT RUDELS)

Bert Rudels provided a brief summary of activities over the last year, including the meeting at WHOI (21-22 OCTOBER 2013).

1.3 APPROVAL OF THE MINUTES OF THE LAST MEETING (VOLKER RACHOLD)

The Secretariat did not receive any comments on the minutes of the last meeting and they were approved.

1.4 ADOPTION OF THE AGENDA (BERT RUDELS)

The agenda was approved and adopted.

2 MAIN ISSUES

2.1 REPORTS ON MWG ACTIVITIES

2.1.1 IASC WORKSHOP INTERNAL MIXING PROCESSES IN THE ARCTIC OCEAN (BERT RUDELS)

The workshop was held on 21-22 October 2013 in Woods Hole, USA, where approximately 40 scientists attended. The workshop was organized thematically with introductions by invited speakers, presenting different processes present in the Arctic Ocean. The presentations were organized into four themes based on different mixing processes in the Arctic Ocean: upper Ocean mixing in the interior, mixing at the boundaries and interaction with the interior, and the large-scale picture.

The presentation is given in Annex 2.1.1.

2.1.2 DISTRIBUTED BIOLOGICAL OBSERVATORY (DBO) (JACQUELINE GREBMEIER)

Jacqueline Grebmeier outlined changes in persistence of sea ice, based on 5 sampling stations of high biodiversity and productivity, which are monitored for biophysical processes. Data archives and international collaborations for

sharing data were discussed. The 1st DBO Data Workshop (Feb 27th to Mar 1st, 2013) focused on four objectives: presenting results from 2010-2012 pilot study, data archiving, DBO site criteria, a DBO implementation. The 2nd DBO Data Workshop is planned for fall, 2014 to discuss international data collaborations and coordination of future activities with Pacific Arctic meeting for which Jacqueline Grebmeier requested IASC support (see Executive Session).

- **ACTION: Jackie Grebmeier et al. in prep, SOAR**

The presentation is given in Annex 2.1.2.

2.2 UPDATES ON UPCOMING ACTIVITIES

2.2.1 ARCTIC COD (ROLF GRADINGER)

Rolf Gradinger presented an overview of several research projects, and talked about Arctic cod species *Boreogadus saida* and *Arctogadus glacialis*, which are critical links in the transfer of energy in Arctic food webs. Rolf Gradinger presented a project proposal (ESSAS Annual Science meeting in Copenhagen occurred during ASSW 2014) to bring together experts from around the circumpolar Arctic to synthesize and review information on Arctic cod from the Pacific and Atlantic regions for future comparative analyses. There were eighteen oral presentations at ESSAS with a special edition in Polar Biology post-meeting. There is a need to review existing information and identify research needs in Arctic cod biology, spawning, copulation, nutrient value of larvae. Suggestions for future work included examining otolith microchemistry from sediment samples.

The presentation is given in Annex 2.2.1.

2.3 REVIEW OF IASC ACTIVITIES RELATED TO THE MWG

2.3.1 SECRETARIAL SUPPORT (VOLKER RACHOLD)

Volker Rachold presented the idea of creating a sustainable secretarial presence at IASC meetings, and opportunities for the involvement of early career scientists. Eight IASC fellows were selected for four working groups to assist with secretarial duties at ASSW 2014; Emily Choy and Paul Suprenand for MWG. Fellows will attend two consecutive Arctic Science Summit week meetings, with the intention to help facilitate the training of incoming fellows in the second year.

2.4 OTHER MARINE ACTIVITIES EXTERNAL TO IASC

2.4.1 PACIFIC ARCTIC GROUP (PAG) (JACQUELINE GREBMEIER)

Jacqueline Grebmeier presented information about the Pacific Arctic Group (PAG). PAG is consortium of individuals and institutes that have an interest in a Pacific perspective of Arctic sciences, which includes collaborations in Pan-Arctic frame work, coordination of Pacific-Arctic scientific activities, annual oceanographic cruises, which is important in the development of DBOs. There is a meeting fall of this year in USA as part of the ICARP III process highlighting research in Chukchi-Canada Basin region. A PAG book in the process of being published should be out in spring 2014, as well as an upcoming special edition of Deep Sea Research. DBO sites have been integrated into many country/organization sampling efforts, and future research includes opportunities to address research limitations, additional moorings to be included in the Chukchi Sea area, satellite. In the future there will be collaborations with MOSAiC and Martin Fortier (Beaufort Sea).

The presentation is given in Annex 2.4.1.

2.4.2 ARCTIC IN RAPID TRANSITION (ART) (NATHALIE MORATA)

Nathalie Morata's presentation was divided into four sections: ART structural renewal, transition proposal, PhD proposal, PhD training, and ART workshops, publications and science conferences. The ART Executive Committee held its first science symposium from 22 - 26 October 2012 in Sopot, Poland. In October 2013 new members of the Executive Committee were welcomed. The ART session, *Impacts of Climate Change on the Ecology, Biogeochemistry, and Biological Carbon Pump of the Arctic Ocean* took place on February 25 2014, in Honolulu. ART is putting together a proposal application for an EU Innovative Training Network to bring PhD researchers into the ART framework and carry out research from upcoming cruises under the second "active research" phase of ART. ART is planning its first official ART scientific project, "TRANSSIZ," which will take place onboard the RV Polastern in May/June 2015. The Polarstern research cruise Transsiz is planning to meet in Bermerhaven April 2014. The presentation included information on the ITN Marie Curie innovation network, priority sheets from ICARP III meeting, and the Arctic in Rapid Transition – European Training Network or "ART-ETN."

The presentation is given in Annex 2.4.2.

2.5 3RD INTERNATIONAL CONFERENCE ON ARCTIC RESEARCH PLANNING (ICARP III) (BERT RUDELS)

The IASC meeting is in Japan next year, 2015. Most of the ICARP III project proposals submitted in December 2013, were accepted in January 2014, and Working Groups are to present the activities on April 8 2014 at the ICARP III Common Day.

2.5.1 GREENLAND ICESHEET/OCEAN INTERACTION (GROCE) (MICHIEL RUTGERS VAN DER LOEFF AND URSULA SCHAUER)

Michiel Rutgers Van der Loeff presented his first project for ICARP III, the interaction between Greenland ice and the ocean. The objective of the project is to understand how marine terminating glaciers interact with warm currents from the Atlantic, marine ecosystems, and overall glacial stability. Signs of warming are focused on areas affecting glaciers, under the ice (ice tongue) or by bringing warmer deep waters to the glacier surface. ICARP III will be discussed at Bremen/Bremerhaven in the October 2014 workshop. In two years the GEOTRAC expedition on RV Polarstern in 2016 will look at a marine terminating glaciers mega site at 79°N.

The presentation is given in Annex 2.5.1.

2.5.2 SEASONAL ICE COVER (BERT RUDELS)

Bert Rudels presented a proposal submitted to IASC for investigating the consequences of the loss of year-round ice cover and an ice-free ocean to Arctic marine ecosystems. Stratification/stability is a key parameter that may affect mixing processes. Funding has previously been obtained from IASC. An ICARP III planning workshop will take place in October or November 2014, potentially at WHOI in connection with FAMOS.

- **Suggestion: Summarize ICARP II findings, successes and where there are still gaps, and select research questions based on data deficient areas identified in ICARP II summary.**

The presentation is given in Annex 2.5.2.

2.5.3 PAST GATEWAYS (KARI STRAND)

Kari Strand presented information pertaining to palaeo-climatology work with many temporal and spatial perspectives in order to understand future Arctic environmental change using palaeo-records. The overall objective of the project is to understand the Arctic environment using the palaeo-record, specifically the distribution of different ice sheets, history of past ice sheets and the rate of their disappearance. This project also includes research in the non-glaciated Arctic environment, such as the distribution of permafrost. IASC proposal is currently in preparation, but requires support from the other working groups. ICARP III planning meeting will take place in Trieste, Italy, on May 2014. Kari Strand would like to have PAST program run for the next 10 years offering some summer school opportunities.

The presentation is given in Annex 2.5.3.

2.5.4 CULTURE AND ARCTIC CLIMATE CHANGE (MARY-LOUISE TIMMERMANS)

Mary-Louise Timmermans presented an interdisciplinary research project (anthropology, palaeoclimate and contemporary climate, biology, etc.) to examine relationships between cultures and the Arctic environment. The research objectives are to understand how elements of the Arctic archeological record may be related to past changes in the climate, and to link these changes in past cultural shifts to environmental parameters. The ICARP III proposal builds on a scoping workshop to be held at Yale University (May 13-14, 2014), and includes a special session at the Fall 2014 AGU meeting (San Francisco, USA) and funds for a special journal issue on this interdisciplinary research.

The presentation is given in Annex 2.5.4.

2.5.5 MOSAIC (MATTHEW SHUPE)

Matthew Shupe presented the MOSAIC- observational campaign, which includes a central observatory (on ice breaking) with suite of measurements, interdisciplinary all acting together; distributed measurements, model grid-box scale to understand heterogeneity, e.g. array of buoys; modeling activities on a variety of scales to process information and up-scaling information to the bigger picture; modelling to pan-Arctic scales, drift goes from 2018 and go a full annual cycle in order to understand first year sea ice, ice dynamics, how biogeochemical processes affect surface productivity and aerosol production (e.g. Energy budgets of sea ice (radiation, ocean heat content, boundary layer processes, etc...), ice motion and deformation (age, ice-wave interactions, thickness, ridging, leads, etc...), and cloud precipitation aerosols (which determine ice added and melting, storms, etc...), which impacts larger scale processes such as variability, currents, atmospheric patterns. MOSAIC is awaiting funding, and the RV Polarstern is the vessel target for the ship-based activities and funding and logistics. MOSAIC needs collaborations with FARO and as well as with the IASC MWG to be helped with mid Arctic overwintering and monitoring.

The presentation is given in ANNEX 2.5.5.

2.5.6 LINKAGES (JAMES OVERLAND)

James Overland presented information regarding Arctic regional temperature anomalies, changes in the "jet stream" and thus climatic conditions world-wide. This leads to the loss of sea ice and snow which adds additional heat to the ocean and atmosphere, increasing the probability of the north-south wind flow.

The research objective of the project is to improve seasonal forecasts, especially with continued Arctic external forcing. The proposed Climate Sessions for ICARP III are (One-day each): Workshop towards moving towards a sea ice free Arctic, Mid-latitudes/ Arctic weather linkages, and Greenland in Transition: Surface and Ocean Processes.

The presentation is given in ANNEX 2.5.6.

2.6 PROPOSED ACTIVITIES

2.6.1 NEW ACTIVITIES/TASKS BROUGHT FORWARD BY THE MEMBERS

2.6.1.1 FOLLOW UP IN THE MIXING WORKSHOP (BERT RUDELS)

Bert Rudels removed this presentation from the meeting, as it was presented earlier (2.5.2)

2.6.1.2 NEW ACTIVITIES PROPOSED BY MEMBER OF THE MWG

No new suggestions or proposals on MWG activities were brought forward

2.6.2 NEW ACTIVITIES/TASKS FROM EXTERNAL INPUTS (ROLF GRADINGER)

Rolf Gradinger presented the Black Box project, which describes the period in the Arctic when there is no sunlight. The objective of the research project is to understand microbial activity and community patterns during the winter period. The RV Polarstern 2017/2018 cruise is planned to investigate project aims, with travel funds requested to support young scientists.

2.6.2.1 POLAR MARINE DIATOM WORKSHOP (ROLF GRADINGER)

Rolf Gradinger presented a plan for a polar marine diatom workshop to take place in Spain from 19-24 July 2015, which would include 50 participants and microscopes; hosted by Maria Angeles Barcena. The objectives of the meeting are to transfer the knowledge of taxonomy to the next generation of scientists and the correct identification of taxa for the past reconstruction of sea ice and ecosystem changes, as well as linkages between arctic and subarctic oceans. Funding was requested to support 8 students and 2 seniors.

The presentation is given in ANNEX 2.6.2.1

2.6.2.2 SCIENTIFIC COMMITTEE OF OCEAN RESEARCH (SCOR) (MICHIEL RUTGERS VAN DER LOEFF)

Michiel Van der Loeff presented the potential interactions of SCOR and MWG/IASC by inviting representatives to each other's annual meetings, co-sponsoring WGs and meetings, also asking MWG to nominate Associate

Members to SCOR WG, and encouraging cooperation on capacity building for Arctic Ocean science.

The presentation is given in ANNEX 2.6.2.2

2.6.2.3 ICE, CLIMATE AND ECONOMICS – ARCTIC RESEARCH CHANGE (ICE-ARC) (NAJA MIKKELSEN)

Naja Mikkelsen presented a project that combines natural sciences and socio-economic sciences, in order to examine the interconnectedness between sea ice, economics and social sciences. The project includes four work packages: observations, modelling, social impacts, and economic impacts. ICE-ARC: EU FP7 is a 4-year project, with 21 partners, and is EU funded (11,000,000 €). This interdisciplinary project includes marine, social and humanities, and cryosphere working groups.

The presentation is given in ANNEX 2.6.2.3.

3 NEXT MEETING

3.1 ASSW 2015

The 2015 meeting will be held at the ASSW 2015 in Toyoma, Japan on 23-30 April 2015, in conjunction with IASC's 25th Anniversary, the ICARP III and the 4th International Symposium on Arctic Research.

3.2 ASSW 2016

The 2016 meeting of the WG will be held in conjunction with the ASSW 2016 in Fairbanks, Alaska, USA.

