#### **ICE-ARC NEWS**







Winter 2014/15

# **PROGRAMME COORDINATOR: JEREMY WILKINSON** BRITISH ANTARCTIC SURVEY, UK

A significant event of this winter was the first ICE-ARC General Assembly Meeting, held in a warm Barcelona in November, and hosted by CSIC. Many members of the project had met previously in the Kick-Off meeting (Brussels, February 2014) - however there were several new faces to meet in Barcelona. The whole General Assembly (i.e. each partner) was represented at this meeting, and the majority of those involved in ICE-ARC were present. A Steering Committee meeting preceded the GA.



Although few of the Advisory Board were able to attend the meeting, AB member Bruce Forbes, Leader of the Global Change Research Group at the Arctic Centre in Finland was able to join us. We also welcomed two external speakers, Paul Berkman (University of California Santa Barbara), who is working with WP5 on the VIP Arctic cruise plans, and Leonid Yurganov (University of Maryland), who works in addition with the Russian partner, AME.

The meeting was very successful with presentations from all of the work packages (WP), from the WP leaders as well as some new post-docs. In addition, there was an evening poster session, aimed at aiding discussion on the background to some of the areas, and the aims for some upcoming fieldwork. As this is an early stage in the project, significant time was given to work package discussion sessions, to assist with planning of activities for the coming year.

Many thanks to all the staff at CSIC for their efforts in organisation, and providing the good weather!

Since the last newsletter a couple of noteworthy events to highlight include the release of a report on "The European Union and the Arctic : Developments and perspectives 2010-2014", which mentions ICE-ARC as a good example of a project that contributes to policy elaboration through a more integrated approach. We also had the release of US President Obama's Executive Order for Enhancing Coordination in the Arctic, and participation of ICE-ARC scientists in an important tri-national meeting between Canada, USA and the EU, that was aimed at enhancing collaboration opportunities for Arctic Science. The results of ICE-ARC are indeed timely.



Twitter @ICEARCEU Facebook https://www.facebook.com/ **IceClimateEconomics** 



http://instagram.co m/icearceu

### <u>MEETINGS AND EVENTS</u>

18-23 January 2015: Arctic Frontiers, Tromso. Attending: Jimena Alravez (EUR) (view abstract here), Jeremy Wilkinson

4 March: Joint WPI-2 Meeting UPMC, Paris

5 March: Steering Committee **Meeting** UPMC, Paris

12-17 April: EGU, Vienna

23-30 April Arctic Science Summit Week (ASSW) Toyama, Japan (includes EU-Japan-US workshop) Attending: Peter Wadhams, Jeremy Wilkinson, Kathy Law, Naja Mikkelsen, Doug Crawford-Brown, Elaina

2-5 June Ilulissat Climate Days Ilulissat, Greenland Attending: Rene Forsberg, Naja Mikkelsen, Jeremy Wilkinson, Elaina Ford.

7-10 July Our Common Future Under Climate Change Paris Attending: Rene Forsberg, Naja Mikkelsen, Jean-Claude Gascard

#### FURTHER DETAILS:

http://www.ice-arc.eu/events/

Join our mailing list: www.jiscmail.ac.uk/ICE-ARCmembers

Winter 2014/15

#### ARCTIC CIRCLE GENERAL ASSEMBLY **REYKJAVIK, ICELAND** 3IST OCTOBER-2ND NOVEMBER 2014

The Arctic Circle is designed to increase participation in Arctic dialogue and strengthen the international focus on the future of the Arctic. The meeting is hosted by Icelandic President Ólafur Ragnar Grímsson, and will be held annually in Reykjavik: this was the second assembly. The Arctic Circle brings together a wide range of attendees: from business - shipping, fisheries, oil companies, and tourism are large contributors; politicians - from Arctic states and those further afield; scientists; economists; and artists. ICE-ARC leaflets were handed out. The project and EU funding of Arctic research was discussed in plenary sessions by BAS director Jane Francis, Michael Karcher presented ICE-ARC and ACCESS work, and Peter Wadhams talked about trends in Arctic sea-ice loss and methane questions. The meeting was also attended by Advisory Board member Jan Gunnar-Winther (NPI). | Elaina Ford, BAS

## WP3: LIFE ON THE NORTH GREENLAND ICE

One distinctive aspect of the research being carried out in WP3 is that we work closely with people in northern Greenland as research partners. When we began planning our work in ICE-ARC and embarked on our first fieldwork in 2014, it was essential to anchor the project in the communities that are to benefit directly from the project. There is considerable interest in the Qaanaaq, Upernavik and Uummannaq areas in what we will find out from our analysis of sediment cores or the thickness of the fast ice, as well as in our ethnographic work and interviews about the changes people notice in the environment around them and how they anticipate the future. We resist the idea of the Arctic as a "scientific laboratory" and seek to understand the lived actualities of northern Greenland.

Central to ICE-ARC, of course, is the study of sea ice, its changing nature, and the local and wider regional and global implications of such change. Alongside our work to track and monitor such change, however, we



are concerned with understanding the importance of ice for northern communities and sustainable livelihoods. Planning for our 2015 fieldwork in winter and spring is underway and an important part of this is travelling with hunters on the sea ice as well as working in communities to map the social, cultural and economic importance of ice and living resources. As WP3 develops, its interdisciplinary nature is reinforced by its community-based participatory approach and by the contributions local knowledge can make to ICE-ARC's broader scientific per-

spectives. | Mark Nuttall, WP3 Leader, GCRC

### N-ICE2015- WPI

Important fieldwork for ICE-ARC is taking place within the Norwegian ice camp on board R/V Lance organized by the Norwegian Polar Institute from January to June 2015, as part of the N-ICE 2015, Norwegian young sea ICE cruise project. The RV Lance has been allowed to freeze into the ice north of Nordaustlandet 83.25°N 30°E, and will drift with the ice.



The main scientific objectives of the drift (upper ocean-sea icesnow, and atmosphere processes and interactions) are detailed in the N-ICE 2015 website. Beyond participating to the scientific objectives of the drift, UPMC-LOCEAN and CNRS-LEGOS+LATMOS scientists carry full testing of the IAOOS platform and of the new sensors to be added within ICE-ARC. The



IAOOS buoy is collecting information through the ocean, ice and snow and atmosphere (http://www.iaoos-equipex.upmc.fr/en/index.html, http://iaoos.ipey.fr/index.php?lang=en).

The ice camp is an excellent opportunity to thoroughly proof test the IAOOS platform in winter (so far IA-OOS platforms have been tested in spring-summer during drifts from the North Pole to the Fram Strait). In the harsh winter conditions, particular attention is paid to the behavior of the optical windows' protection, and lidar calibration for accurate tropospheric aerosol measurements.

N-lce camp is also a great opportunity to test new sensors to measure biogeochemical parameters in the ocean and new radiometry and in situ atmospheric sensors in real conditions. Indeed the ocean Pack RemA including a radiometer, a chlorophyll and a CDOM (coloured dissolved organic matter) fluorimeter and a backscattering detector has recently been implemented on the IAOOS profiler. pCO2 and pH sensors will also be tested before deciding which sensor to install on the IAOOS platform. Being on site, scientists have hands on the systems, can test various configurations and gather calibration data. These intensive tests are very timely as the first IAOOS array deployment will take place from R/V Polarstern during the German cruise TRANSARC II late summer 2015. N-ICE 2015, Norwegian Young sea ICE cruise, More Information:

http://www.npolar.no/en/expedition-field/n-ice2015/ | Christine Provost, WPI Leader, UPMC

Schematics of a IAOOS Buoy

# <u>A MAJOR SOURCE OF UNCERTAINTIES IN SEA ICE</u> MODELS REVEALED <u>WP2</u>

Sea-ice models compute the thickness and area of sea ice based on physical equations, which describe relevant natural processes. Some processes, however, cannot be fully resolved and require parameterizations, which allow effects of processes on scales smaller than the model grid to be simulated. For example, sea-ice ridges up to 10m thick exist in an otherwise considerably thinner ice floe, but sea-ice models use grid resolutions of several kilometres. Therefore sea ice thickness distribution (different thickness categories within the area of a grid box) has

to be parameterized.

Since the thickness of the sea ice determines how much heat exchange can take place between the atmosphere and the ocean, a realistic sea ice thickness distribution is essential. Many sea ice models parameterize this with a probability density function (pdf) of different ice thickness categories (see figure). The number of categories and the shape of the pdf have a strong influence on the simulated



ice volume. Many models use a uniformly shaped pdf with seven categories as suggested by *Hibler* [1984]. We found that a distribution

parameterization with 15 sea ice thickness categories leads to simulations with a more realistic sea ice area consistent to satellite derived observations (http://osisaf.met.no).

Another important parameter is the horizontal distribution of newly formed ice as it sets in. Even when using a very simple parameterization, a realistic sea ice volume can be achieved when varying the horizontal distribution. In summary, the chosen combinations of parameterizations in a model offer the potential for more realistic model results, but also pose the difficulty of ambiguous results; and are a source of uncertainty in model simulations and improvement | Kathrin Riemann-Campe<sup>1</sup>, Rüdiger Gerdes<sup>1</sup>, Cornelia Köberle<sup>1</sup>, Michael Karcher<sup>1,2</sup>, Frank Kauker<sup>1,2</sup>

## 6TH INTERNATIONAL WORKSHOP ON SEA-ICE MODELING AND DATA ASSIMILATION

The International Ice Charting Working Group Data Assimilation Working Group together with ICE-ARC held a workshop on Sea-Ice Modelling and Data Assimilation in Toulouse on 15-16 September 2014. The two-day workshop was hosted by ICE-ARC partner Mercator and 38 peoples from nine countries all over Europe and Canada attended.

The focus of the workshop was put on research and development related to numerical sea ice analysis and prediction.

The International Ice Charting Working Group (<u>IICWG</u>) was formed in October 1999 to promote cooperation between the world's ice centres on all matters concerning sea ice and icebergs. <u>More information</u>.



Winter 2014/15

## WP4 UPDATE

The WP4 meeting in Barcelona on the 20th of November picked up the threads from the previous meetings in Bremerhaven and Rotterdam. The discussion focused on the possibility of defining distinct scenario(s) for the Arctic climate under a given Representative Concentration Pathway (RCP), and the climate mechanisms by which the resulting polar amplification is likely to cause economic impacts around the globe, such as the growing number of extreme weather events in mid-latitudes (AWI, OASYS, BAS, CPC). It was proposed to perform case studies of the Arctic-driven impacts for the two representative economic sectors: agriculture and Arctic shipping (ECORYS, EUR). In addition, there is potential for applying dedicated macroeconomic models to a selected number of countries and regions, in order to obtain combined economic valuation of the impacts that may be caused by Arctic-driven extreme weather events (4CMR). The aim is to integrate these studies into the PAGE-ICE model in order to gauge the relevant global impacts (EUR, CHA).

In parallel, a number of discussions with Natalia Shakhova and Igor Semiletov (WPI) provided further insights into the dynamics of methane release from the deposits stored beneath the subsea permafrost in East Siberian Arctic Shelf (ESS). A 'stable sea floor' is transformed into 'closed taliks' due to warming, which could warm further to become 'open taliks' with the highest fluxes (hotspots). Taliks are layers of year-round unfrozen ground - open taliks are open to a lake; closed taliks are surround in permafrost.



Understanding the dynamics of the taliks' opening and the subsequent gas release are essential for building a credible addin for PAGE-ICE, which will quantify the global impacts associated with the Arctic methane. | **Dmitry Yumashev, RSM** 

#### **ICE-ARC NEWS**

## PROGRAMME OFFICE NOTICES

## PERIODIC REPORT

The end of the First Reporting Period is fast approaching - the timeline is shown right for work and deadlines to get to the final goal - a Periodic Report approved by the Commission.

#### The Reporting Period is 1st Jan 2014 - 31st March 2015

Periodic Reporting may seem a daunting task for those not familiar with it. The Programme Office and Work Package Leaders have the most work, but there are activities that ALL Partners have to do. It is the responsibility of the lead scientist for each partner to make sure these happen. There are in essence 5 parts to this:

- Technical reports on progress (i.e. what you've done this year) we'll send a template out for this - all partners.
- Summaries of progress on work to date Work Package Leaders
- Financial Reports online Forms C All partners
- ◆ Audits CFS if over threshold (€375,000)
- Management sections & summary Programme Office will do, but we'll need input on meeting attendance, dissemination activities etc - we'll be in touch!

#### Please note:

- If you don't keep to these deadlines, you will give the Task leaders and PO less time to review – please be considerate on their time!
- We cannot submit the report with any one contribution missing. Please don't hold payment up for everyone else.
- The 28th May is an absolute deadline.
- Lateness may well result in financial penalties by the EU, or the project being suspended.



# UPCOMING DELIVERABLES AND MILESTONES

Deliverable/ Milestone	Due
D4.21 Report on improved parameterizations within PAGE-ICE for each industrial sector	Apr 15
MS422 Input parameterization by sector	Apr 15
D6.03 Steering Committee Meeting Minutes 2015 Spring	May 15
D6.09 Advisory Board Meeting Minutes 2015 Spring	May 15
MSI2I Data from the 1st deployment of IAOOS platforms over the deep Arctic available to ICE-ARC partners	Jun 15
MS271 Skill assessment of SINMOD for the Arctic	Jun 15

The first scientific deliverable D2.71 from Ingrid Ellingsen, SINTEF, was submitted in December 2014 - on time! - This can be used as an **example of best practice** when writing deliverables. All deliverable reports and template are available in the shared ICE-ARC <u>dropbox</u> folder.

Thank you to those who contributed to this newsletter. If you would like to contribute to the next edition please send your text and images to <u>ice-arc@bas.ac.uk</u>. <u>Deadline</u>: 31 March 2015



Winter 2014/15