



## FINAL REPORT

### **IASC workshop on Arctic data rescue, citizen-science and collaborative research**

Icelandic Meteorological Office, Reykjavík – 11 & 12 November 2013

#### Organizers

Philip Brohan, UKMO Hadley Centre  
Trausti Jónsson, Icelandic Meteorological Office  
Rajmund Przybylak (IASC-A), Nickolas Copernicus University  
Kevin Wood, University of Washington, JISAO

#### Purpose

The purpose of this IASC-sponsored workshop was to develop new collaborations and research strategies based on data rescue and the use of large, high data rate, or previously technically intractable data sets. Progress in many areas of Arctic science is hampered by sparse and/or inherently difficult to interpret data. For example, large quantities of historical data are available that have not been utilized because they are not easily converted into a readily analyzable form, such as manuscripts, instrument traces, photographs and video/audio recordings. The workshop built on existing country programs with the potential for large increases in easily useable Arctic data across disciplines.

Workshop sessions focused on presentations by subject-area experts followed up on the afternoon of day 2 by an open-format discussion aimed at identifying data requirements and potential cross-discipline collaborations on science and/or technical means of data recovery and analysis. The workshop highlighted both the longstanding cultural gaps between disciplines but also fostered new potential collaborations and provided an opportunity to strengthen existing ones.

#### Participation

The workshop was attended by 22 people from a variety of disciplines including the atmospheric and ocean sciences, historical climatology, terrestrial ecosystems, anthropology, archive and museum curators, and information systems / web applications specialists. Eight countries were represented, including four national meteorological agencies, nine universities and three museums or archives. There were four Early Career Scientists (ECS) associated with IASC-A and IASC-T working groups.

## Agenda

### *Session 1 – The story of the Arctic from limited records*

Chair: Philip Brohan

This session was about the process of doing Arctic science with limited records: It's a critical and variable region, but historically very badly observed. What data have we got (or know of) and how can we use it?

### *Session 2 – What is intractable data, who's got it and how can we use it?*

Chair: Kevin Wood

This session was about making apparently intractable data useful. Examples included hand-written manuscripts, instrument traces, photographs and video/audio recordings. Where is it and how can we utilize it?

### *Session 3 and 4 – Arctic research: challenges on land, sea and air*

Chair: (Session 3): RajmundPrzybylak

Chair: (Session 4): Chair: Trausti Jónsson

### *Session 5 – Understanding long-term changes in Arctic sea ice*

Chair: Kevin Wood

### *Session 6 – What motivates the crowd: the game, a story, or compelling science?*

Chair: Trausti Jónsson

This session addressed the characteristics of successful citizen-science projects, in particular those factors most important for motivating broad participation from volunteers that is indispensable. We also addressed communication/outreach aspects as experienced by the scientists and designers of [Zooniverse](#) projects.

### *Sessions 7 and 8 – Nuts & bolts (round table)*

Chair: Philip Brohan

A 'how to' session on building citizen science research projects. Details of setting up a [Zooniverse](#) project were discussed, as was the design of the [Citizen-Archivist](#) dashboard at the U.S. National Archives and other citizen-powered projects. Questions around information technology, staff time, funding requirements, and other practical matters will be explored.

Participants had an opportunity to present problem cases and discussed ways to transform data into a useful form through public involvement.

Session 8 focused on brainstorming plans for one or more new projects – What science problem do we need to solve? What records do we need to retrieve and analyze to address it? What developments in citizen-science techniques are needed?

## Presentations

Takuro Aizawa (ECS), University of Tsukuba: *Arctic cyclones and polar vortex*

Philip Brohan, UKMO Hadley Centre: *The Old Weather experience: data rescue to reanalysis*

\_\_\_\_\_, *Old Weather community survey*

Jonny Day, University of Reading, NCAS-Climate: *Arctic predictability on seasonal-to-decadal time scales: the need for long term observations*

Eirik Førland, Norwegian Meteorological Institute: *Revitalizing old temperature and sea ice series in the Svalbard archipelago*

Phil Jones, University of East Anglia, Climatic Research Unit: *Hubert Lamb: his contributions and differences between science in the 1950s/60s and the 2010s*

\_\_\_\_\_, *Isotope reconstructions of Greenland temperatures: the importance of seasonality*

Ingebjorg Jonsdottir, University of Iceland: *Icelandic land registry since 1700*

\_\_\_\_\_ and Astrid Olgilvie, Stefansson Arctic Institute: *Drift ice around Iceland*

Trausti Jónsson, Icelandic Meteorological Office: *Icelandic perspective on climate and history*

\_\_\_\_\_, *Koch Sea Ice Classification*

Igor Krupnik, Smithsonian Institution, Arctic Studies Center: *Indigenous observations of sea ice and weather*

Chris Lintott, Zooniverse: *Citizen science at the Zooniverse: Galaxy Zoo to Snapshot Serengeti*

\_\_\_\_\_, *Designing a compelling user experience at Zooniverse*

Mark Mollan, NARA: *The digital future at the US National Archives*

Astrid Olgilvie, Stefansson Arctic Institute: *Using documentary sources to reconstruct the past climate of Iceland*

James Overland, NOAA Pacific Marine Environmental Laboratory: *Arctic sea ice and climate change*

Rajmund Przybylak, Przemyslaw Wyszynski (ECS), & Aleksandra Pospieszynska (ECS), NCU Torún: *Meteorological data rescue and evaluation at NCU*



**Rajmund Przybylak presenting his NCU group's data rescue work at the IASC workshop**

Mark Procknik, New Bedford Whaling Museum: *Whaling logbooks and the digital museum*

John Walsh (UAF-IARC) and Kevin Wood (UW-JISAO): *The pan-Arctic historical sea ice database: status and future improvements*

Stef Weijers, Universität Bonn & Jelte Rozema, Vrije Universiteit (IASC-T): *Dendroecology in the Arctic*

Dennis Wheeler, University of Sunderland: *Frozen Assets: the UK whaling logbook collection and climate change*

Kevin Wood, UW-JISAO & Philip Brohan, UKMO Hadley Centre: *The first ice station – the drift of the Arctic steamer Jeannette*

Halldor Johannsson, Arctic Portal: *Web-based environmental information in the Arctic & public participation*

Expected short-term results and long-term (5-year) legacy:

This workshop brought a diverse group of Arctic scientists together with archivists, curators and specialists in big data citizen-science. It is certain that a number of participants were able to obtain new perspectives and see how different approaches to data recovery and analysis could be applied in cross-cutting research. Participants from

humanities-focused areas were able to see how their particular areas of expertise and physical holdings could also have applications to Arctic science in ways they may not have considered before. Several new research proposals have been generated that are in some way connected to the workshop.

Synergistic objectives anticipated: Increase in easily available relevant historical data for all Arctic scientists; the leaders of active projects (i.e. Old Weather – Arctic) were familiarized with research objectives in other Arctic disciplines that could be fostered through data/information sharing or by contributing technical insight; all benefit from exploration of end-to-end ideas for data sources, technical processing, and research applications.



**Participants of the IASC workshop on Arctic data rescue, citizen-science and collaborative research, held at the Icelandic Meteorological Office, Reykjavík, Iceland on 11-12 November 2013**