



Workshop on polar-lower latitude linkages and their role in weather and climate prediction

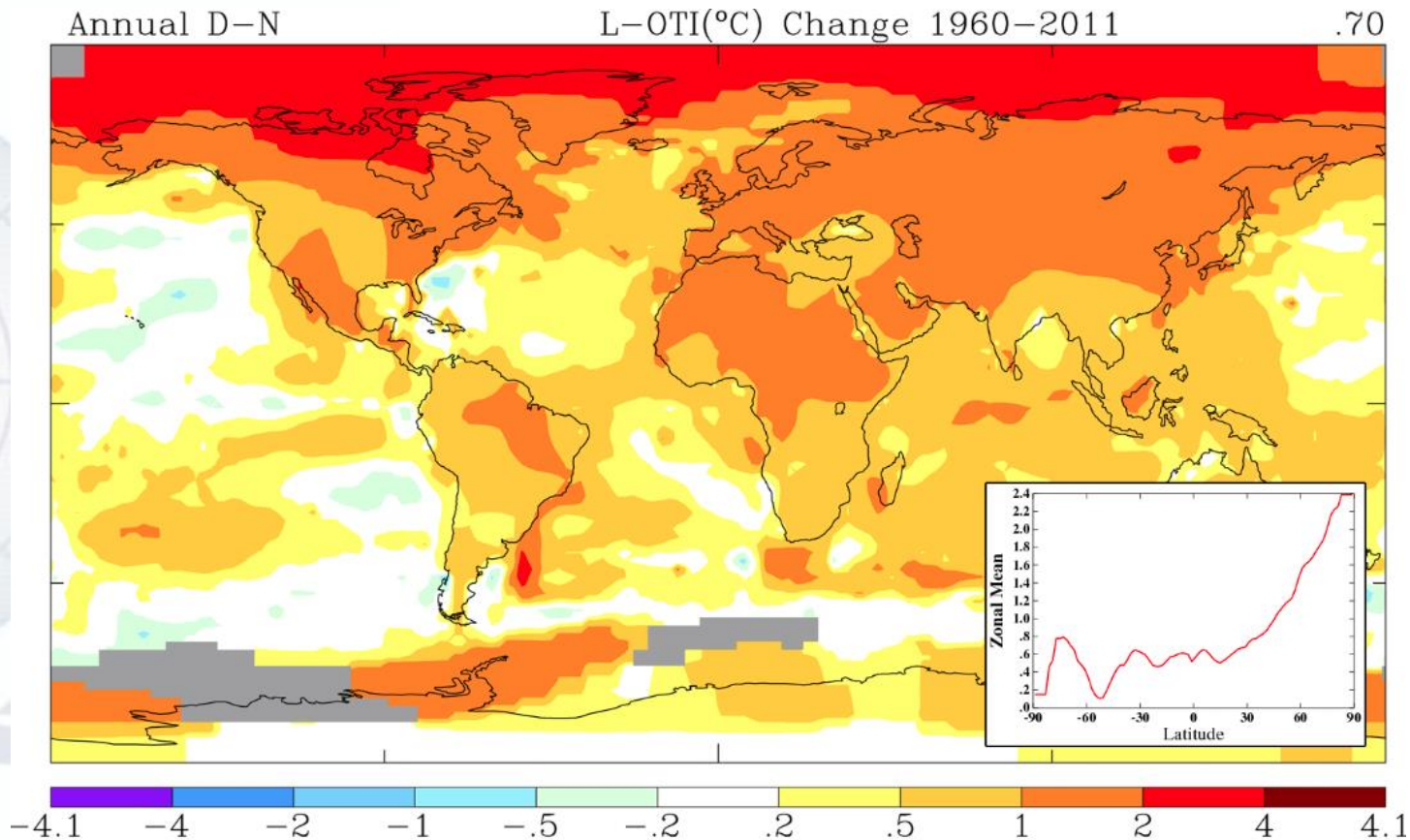
Barcelona, 10-12 December 2014

Background

An often quoted statement:

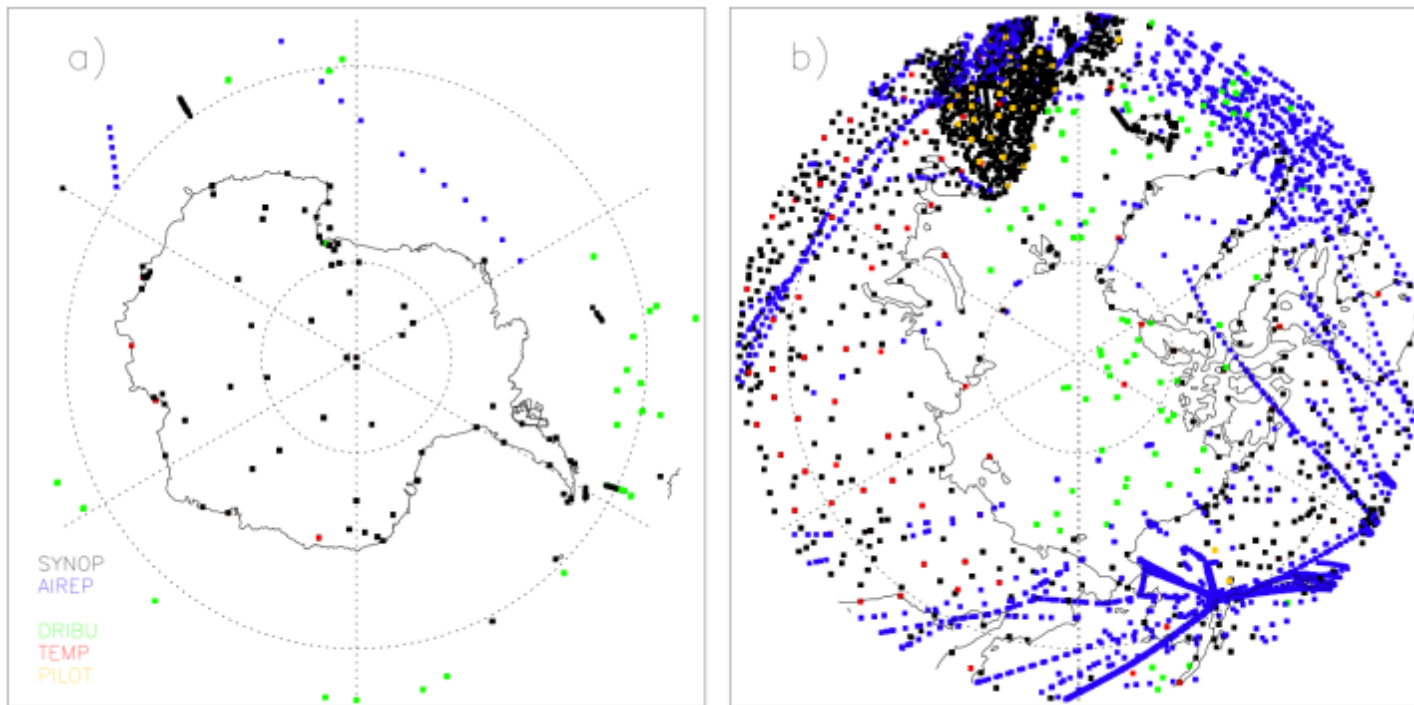
„What happens at the poles does not stay at the poles“

Arctic Amplification



Source: NASA GISS

Gaps in the global observing system



Synop, **AIREP**, **DRIBU**, **TEMP** and **PILOT**

Polar data coverage of conventional observations in the ECMWF operational analysis on 1 January 2012

Peter Bauer, ECMWF

Purpose of the workshop

- Discuss our current understanding of polar-lower latitude linkages → identify knowns and unknowns
- Identify possible ways forward in closing existing knowledge gaps
- Identify activities that will benefit from international cooperation (e.g. workshops, model intercomparison, etc)
- Set priorities for research, operations and services
- Develop a workshop document

Expected impact of workshop outcomes

- Inform science community → EOS article or similar
- Define the way forward for international programmes such as PPP and PCPI
- Provide guidance for funding agencies and policy makers
- Your own suggestions



Statement of Andrea Tilche – Head of the Climate Action and Earth Observation Unit – DG Research and Innovation – European Commission

The European Commission has a profound interest in the Arctic region, since the dramatic changing climatic conditions observed and predicted have severe impacts on the people living in the Arctic and are as well affecting people and societies outside the Arctic.

Recently published literature show that the predictability of weather and climate in the Northern hemisphere looks like to be strongly influenced by Arctic changes. The understanding of the physical phenomena and of the key drivers is of utmost importance, not only for long- or medium-term projections, but as well for weather forecast and for assessing the probability of extreme hydro-meteorological events.

We welcomed the initiative of the EU-funded project SPECS – in cooperation with other projects and with the World Weather Research Programme and the World Climate Research Programme – to organise the Barcelona workshop, by gathering there scientists from different continents for a very interesting scientific programme.

The European Commission looks very much forward to examining the output of your discussions, in order to decide on future research plans.

We are in fact currently reflecting on the priorities for the next biennial Work Programme 2016-17. We are thinking that the impact of Arctic changes on weather and climate may be worth of becoming soon a subject for a next Horizon 2020 call for proposals, opening a possibility for international transatlantic cooperation.

But I can speak as well in my role of co-Chair of the Arctic Working Groups established with the US and Canada within the respective bilateral scientific cooperation - Working Groups which have been established also in support of the Transatlantic Ocean Research Alliance. I can in fact say that my consideration of the relevance of the subjects discussed at the Barcelona Workshop is shared by the US and Canadian co-Chairs.

On the 21st January 2015, in Tromsø, in the margin of the Arctic Frontiers Conference, a Trilateral EU/US/Canada workshop for discussing joint scientific cooperation activities on the Arctic will take place. The impact of Arctic changes on the climate and weather of the Northern latitudes is part of the discussion agenda, and it may well result in decisions on joint activities.

The interest in interregional climate linkages (including the polar regions) is also reflected in a Cooperative Research Action that was recently endorsed by the Belmont Forum principals and that will be the subject of a future Belmont Call in early 2015.

Therefore, the subjects of the Barcelona workshop are of high priority in the climate change science/policy agenda, and we encourage you all to continue your research efforts in view of building a more robust and reliable forecasting framework which can help meteorological and climate services to deliver better predictions also at sub-seasonal and seasonal time-scales.

What is specific to this workshop?

- Truly international participation (78 participants from 20 countries and several international organisations)
- Atmospheric and oceanic linkages
- Both hemispheres are considered
- Linkages for prediction and services

Workshop structure

- Three scientific topics:
 - Atmospheric processes and mechanisms
 - Ocean processes and mechanisms
 - Implications for prediction and services
- Keynote presentations and challenger talks
- Plenary sessions broadcasted using gotowebinar
- Breakout groups (BOGs): four, agenda available
- Pre-workshop document
- Leave your keynote and challenger presentations to Gabriela, send the pdf of your posters to her and leave the BOG presentations to the chair/rapporteur of your session

Agenda

Wednesday 10 December

13:00 Registration

14.00 Introduction by local authorities

14:25 Welcome and introduction by organizers

14:45 Keynote and challenger presentations (Chair: Claude Frankignoul) **Keynote** and **challenger** speakers

Ocean

Michael Karcher: On Arctic Ocean dynamics and its links with lower latitudes

Richard Bintanja: Future changes in Arctic precipitation and their effect on the AMOC

Andrey Proshutinsky: Arctic freshwater reservoirs and their influence on climate

Hugues Goosse: How can we improve the prediction of decadal trends in Southern Ocean sea ice extent?

Matthieu Chevallier: Polar ice-ocean modelling: when local flaws can affect other latitudes

16:30 Coffee break

17.00 Keynote and challenger presentations (Chair: Gudrun Magnusdottir)

Atmosphere

Jennifer Francis: New evidence linking rapid Arctic warming with changes in mid-latitude weather patterns

Elizabeth Barnes: The impact of Arctic warming on midlatitude weather: Can it? Has it? Will it?

Ted Shepherd: How do we deal with uncertainty connected with atmospheric circulation?

Hisashi Nakamura: Extreme amplification of cold continental anticyclones associated with wintertime blocking highs

Bingji Wu: Arctic sea ice loss also promotes weakening of winter monsoon over East Asia

19.00 Ice breaker and poster session I

Agenda

Thursday 11 December

9:00 Keynote and challenger presentations (Chair: Geert Jan van Oldenborgh)

Atmosphere

James Screen: Evidence linking Arctic amplification to fewer mid-latitude cold extremes

Prediction and services

Thomas Jung: Polar-lower latitude linkages: The role of the Polar Prediction Project

Marika Holland: Challenges for improved prediction of polar-midlatitude linkages on seasonal to decadal timescales

10:30 Coffee break

11:00 Keynote and challenger presentations (Chair: Ileana Bladé)

Prediction and services

Jun Inoue: Arctic Research Collaboration for Radiosonde Observing System Experiment (ARCROSE)

Michael Sigmund: Towards improved and more relevant seasonal forecasts of the Arctic climate

Trond Iversen: Challenges: Arctic sea-ice, predictability, and high-impact weather prediction

Sabrina Plagemann: Components for improving skill in the polar regions in the MPI-ESM prediction system

12:30 Lunch and poster session II

Agenda

13:30 Breakout group sessions

	<u>Chair</u>	<u>Rapporteur</u>
<u>Atmosphere I</u>	Rodrigo Caballero	Erko Jakobson
<u>Atmosphere II</u>	Jim Overland	Shuting Yang
<u>Ocean</u>	Michael Karcher	Johann Jungclaus
<u>Prediction and services</u>	Cecilia Bitz	Carlo Buontempo

15:30 Coffee break

16:00 Breakout group sessions

18:00 Closing

20:00 Dinner at the Carpe Diem restaurant, Passeig Marítim de la Barceloneta 32, 08003 Barcelona

Friday 12 December

9:00 Breakout group sessions

10:30 Coffee break

11:00 Breakout group sessions

12:30 Lunch

13:30 Plenary session (Chair: Thomas Jung)

Summary of the breakout groups

15:00 Coffee break

15:30 Plenary session (Chair: Francisco Doblas-Reyes)

General discussion, plans for the future and final statements

17:00 Adjourn