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Bjerknes Centre
for Climate Research



The Norwegian Research School in Climate Dynamics:

A multi-disciplinary, multi-institutional approach

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Graduate Schools and Researcher Experience, Glasgow 4 Nov 2010

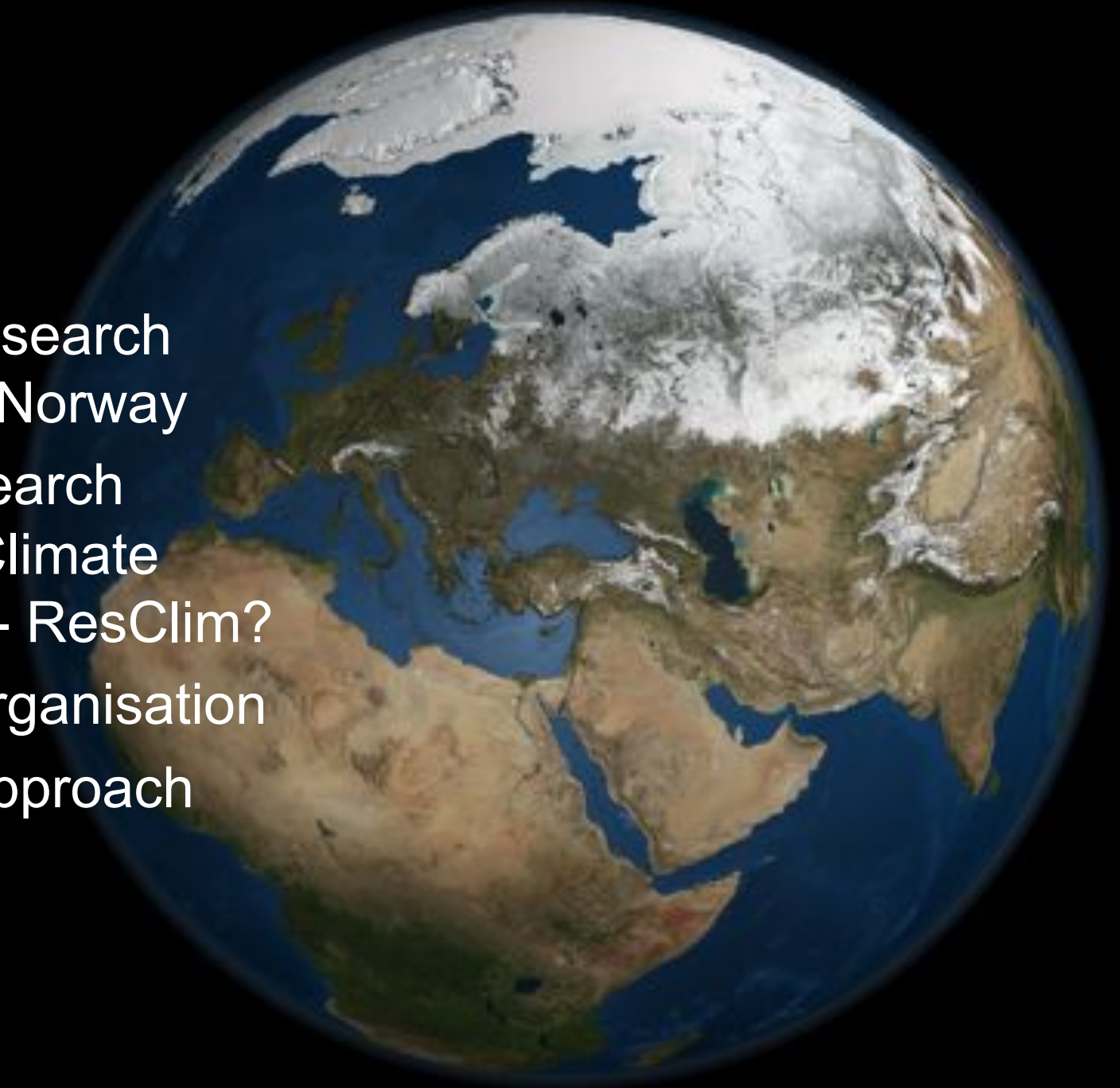
Bjerknes Centre for Climate Research

- ❑ Centre of excellence, 17 MNOK/yr, 2003-2012
- ❑ Four partner institutions
- ❑ Largest climate research community in Northern Europe (> 120 people, > 20 nations)
- ❑ Strongly involved in IPCC, runs a full Earth System model
- ❑ Strong national and international visibility
- ❑ New funding, 20 MNOK/yr 2010-2021



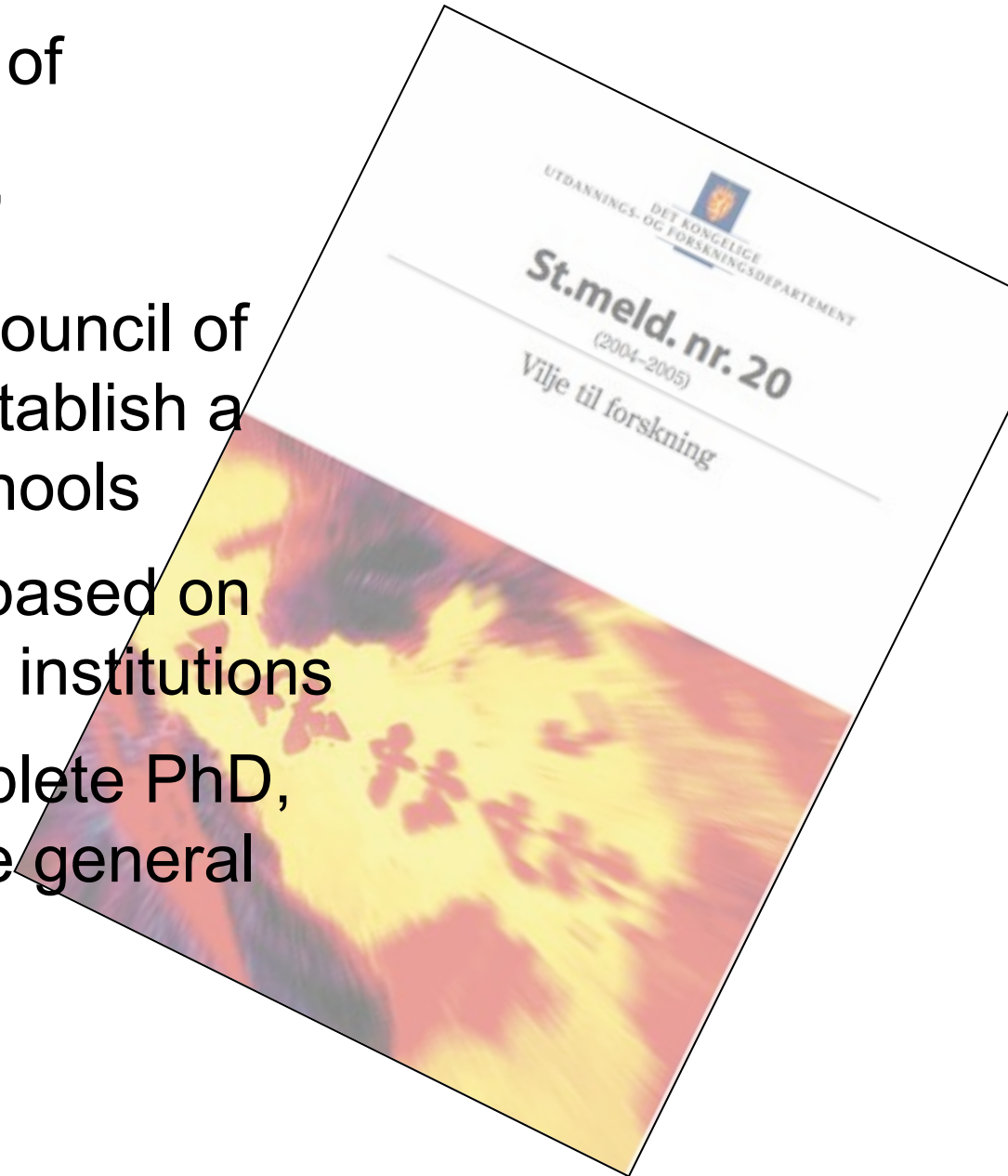
Overview

- ❑ National research schools in Norway
- ❑ Why a research school in Climate Dynamics - ResClim?
- ❑ ResClim organisation
- ❑ ResClim approach



Background: National research schools

- ❑ 2004: Report from Ministry of Education and Research
“*Commitment to Research*”
- ❑ Fall 2007: The Research Council of Norway (RCN) asked to establish a set of national research schools
- ❑ Thematically focused and based on networks between different institutions
- ❑ Goals: More students complete PhD, on less time, and with more general skills



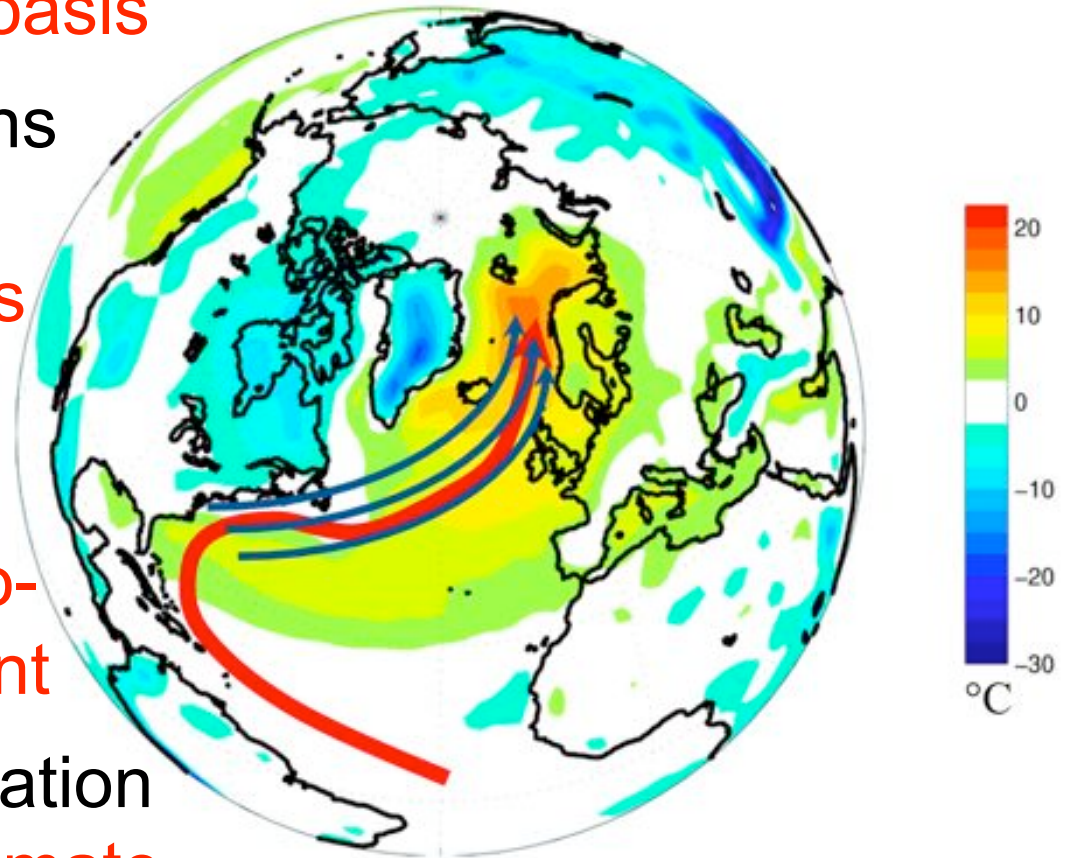
Proposal

- ❑ Spring 2008: Call from RCN, deadline 4. June
- ❑ Internal UoB process: 10 groups submitted preliminary proposals. Two groups got green light
- ❑ 10. September 2008: Results of RCN evaluation
 - 5 of 27 project funded
 - 3 MNOK (300 000 £) per year, 8 years
- ❑ Norwegian Research School in Climate Dynamics only within natural sciences
- ❑ Coordinated from Geophysical Institute, UoB

Why a national research school in
climate dynamics?

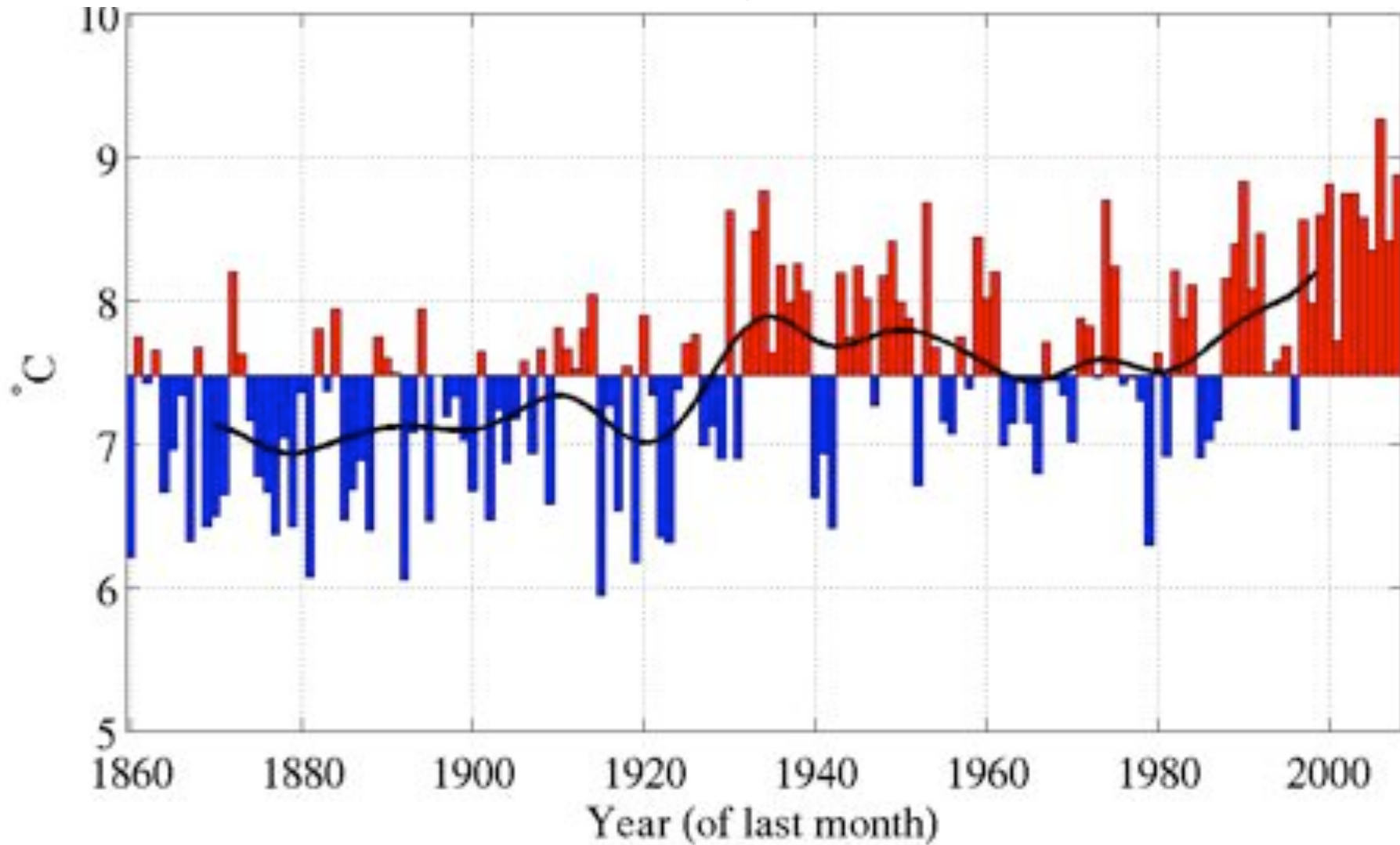
Climate studies - increasingly relevant

- ❑ Warm, moist winds + ocean transports => **Climate oasis**
- ❑ Heat transport variations + local feedbacks => **Large natural variations**
- ❑ Studies of natural variability: **Prerequisite for understanding regional climate development**
- ❑ Effective climate adaptation depends on **realistic climate scenarios**



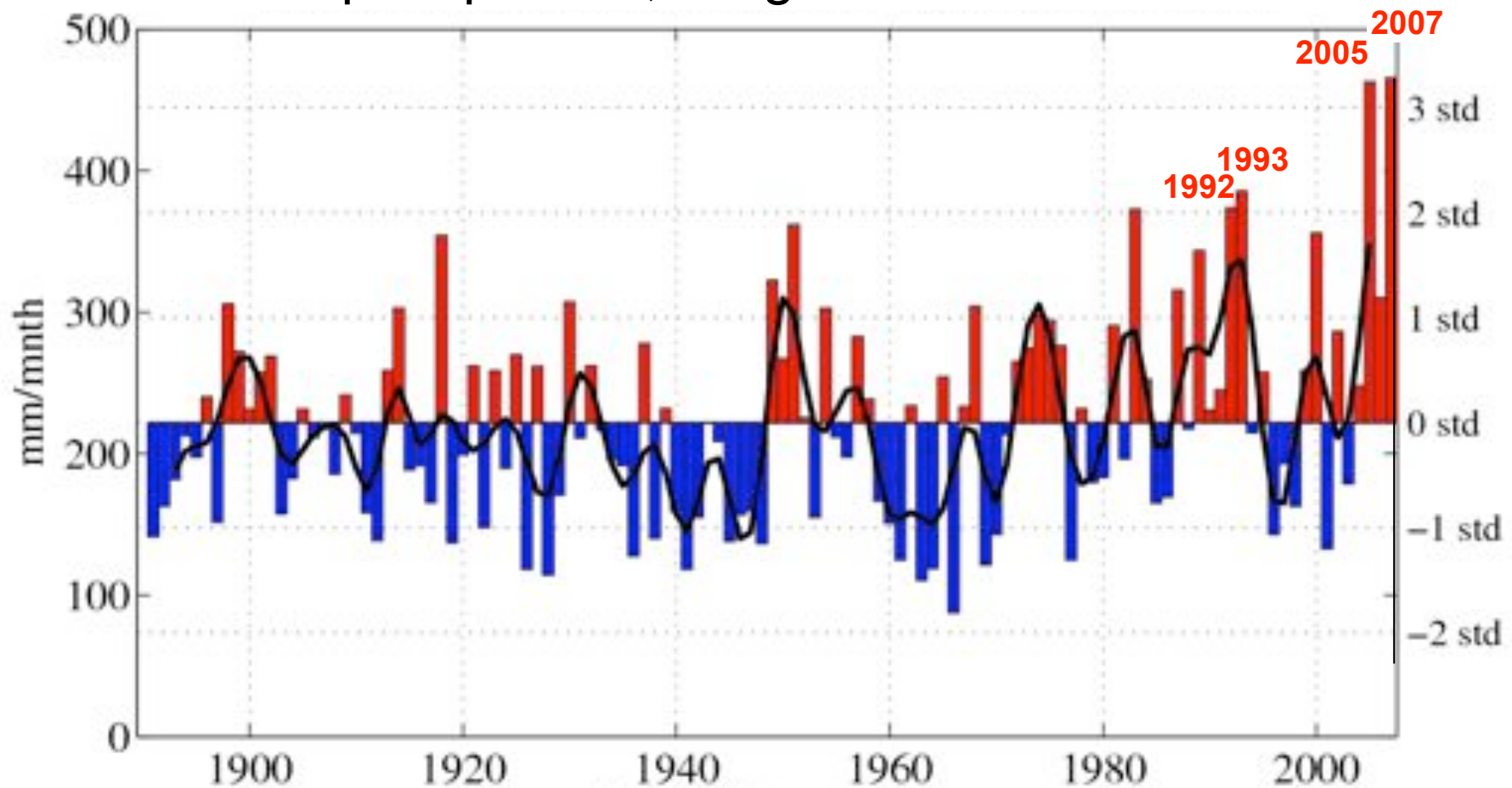
Warmer?

Annual mean temp, Bergen 1860-2008



Wetter?

Nov-Jan precipitation, Bergen 1890-2008



Nov 2004 - Jan 2005: 1387.8 mm

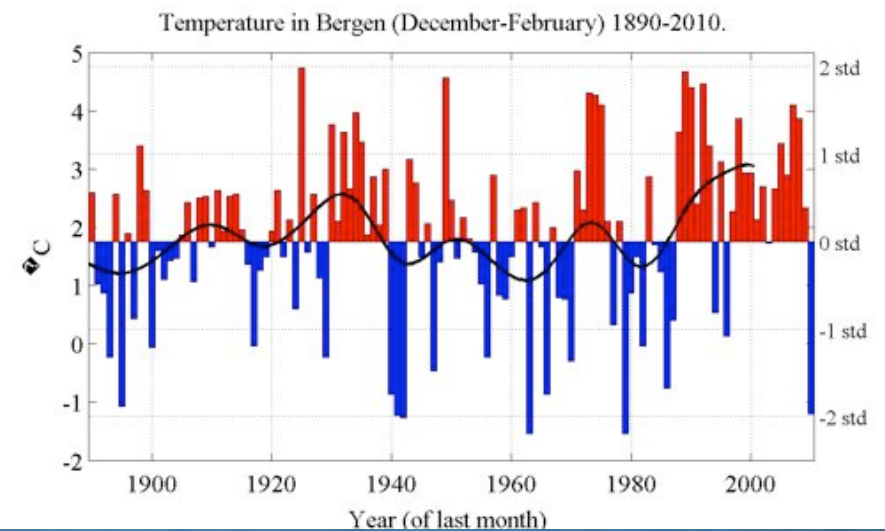
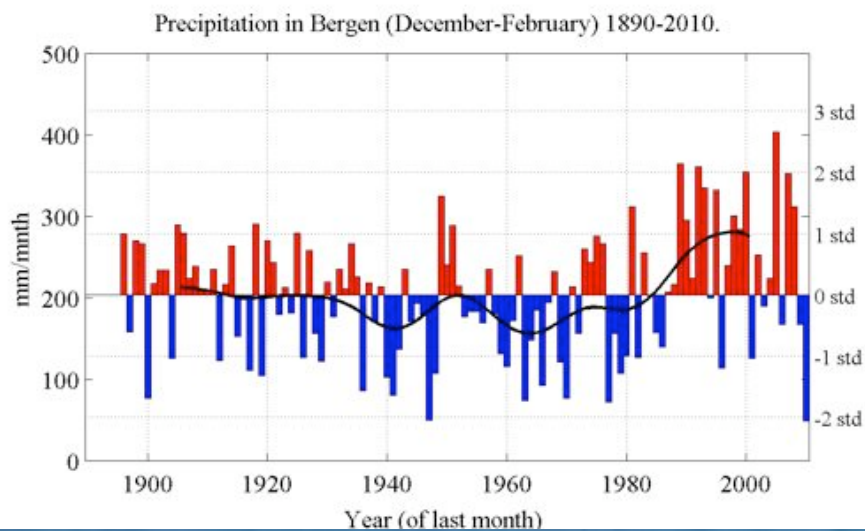
Nov 2006 - Jan 2007: 1397.7 mm

Wilder?

Sotra, 12th January 2005 after the storm "Inga"



Natural variability versus climate change



Key research questions

- ❑ Will natural variability amplify anthropogenic climate change?
- ❑ How sensitive is the climate to forcing (sun, aerosols, greenhouse gasses)?
- ❑ What are the feedback mechanisms?
- ❑ Will there be tipping points (surprises) in the climate system?



Need for a new type of scientists

- ❑ Expert knowledge in depth
- ❑ General knowledge – climate system complex interactions
- ❑ Networking and collaboration skills
- ❑ Communication skills
- ❑ Ability to take active parts in prediction, mitigation and adaptation to, climate and environmental changes



Need for improved research training

- ❑ Recent years, large increase in number of PhD students within climate studies (60-80)
- ❑ Three universities (Bergen, Oslo, Tromsø), >10 institutions (e.g. Institute of Marine Research, Norwegian Met Office, Norwegian Polar Institute)
- ❑ Many students feel alone, little interactions outside own institutions or own discipline
- ❑ Need for more collaboration nationally, internationally
- ❑ More for more focus on supervisors role

ResClim organisation



Activities in the school

- ❑ Intensive courses (1-2 weeks, 3-4 courses)
- ❑ International workshops (2 per year)
- ❑ International summer schools (1 per year)
- ❑ Biannual symposium, climate and challenges
- ❑ Annual meeting, students, supervisors, EB
- ❑ Research stays / international conferences
- ❑ Field work, laboratory costs
- ❑ Biannual courses, supervising skills

Guiding principles

- ❑ Students apply to the school through the web site. Justified by the supervisors, approved by steering committee
- ❑ Call for funding twice per year (early spring, early fall). Financial support only to core students from Norwegian institutions
- ❑ ResClim activities open to all students, only registered members eligible of financial support
- ❑ Based on expertise, other students (also abroad) can be invited to courses, workshops and summer schools
- ❑ ResClim organises ECTS awarding courses and issues certificates (diplomas) as proof of completion



- ❑ Summer school on Meridional overturning circulation
- ❑ Co-funded by SIU (with UoW & MIT)
- ❑ June 2009, Espegrend, Bergen





- ❑ Summer school on Ice sheet – ocean interaction
- ❑ Co-funded by SIU (with UoW & MIT)
- ❑ 8-19 June at FabLab in Lyngen, Troms



DecCen

Variability and Changes in the East Asian Climate

- ❑ Monsoon Variability, Teleconnections, and Impacts on Mid to Low Latitude Glaciers
- ❑ Austrian and Chinese co-funding
- ❑ 20-30 June, Obergurgl, Austria



Organisation

□ Secretariat







□ Steering committee

Ulysses Ninneman (UiB-GEO), Eystein Jansen (UNI), Igor Ezau (NERSC), Bjørn Ådlandsvik (HI); Lars Petter Røed (met.no), Frode Stordal (UiO), Morten Hald (UiTø), Ole Anders Nøst (Npolar), Anna Sjøblom (UNIS), Tore Furevik (UiB-GFI)

□ Evaluation board

Members of the evaluation board

| | | |
|---|--|-------------------------------------|
|  | <p>Anna Sempreviva <i>Atmospheric physics</i> Inst Atm sciences and climate National Council of Research, Italy</p> | European graduate training networks |
|  | <p>Jon Turner <i>Petroleum Geology</i> Postgrad transferable skills unit University of Edinburgh, UK</p> | Transferable skills |
|  | <p>Jean Lynch-Stieglitz <i>Palaeoclimatology/oceanography,</i> School of Earth & Atm sciences Georgia Inst of technology, USA</p> | Graduate training |
|  | <p>Helen Johnson <i>Oceanography/Climate and ocean modelling</i> Earth Science Department, University of Oxford</p> | Graduate training |

Members of the evaluation board



Ulrich Cubasch
Meteorology/Climate change, modeling
Inst of meteorology, Free univ of Berlin, Germany

Graduate training



Peter Jansson
Glaciology
Stockholm Univ, Sweden

Pedagogic training

The ResClim approach:

- ❑ Responsive to evolving expectations and demands on research training by students and supervisors
- ❑ Iterative approach to monitor and evaluate the school's performance and development:
 - (i) feedback (e.g. polls) from participants on specific activities
 - (ii) annual assessment from the evaluation board
 - (iii) a forum to discuss the overall goal and objectives of the school in light of the feedback from (i) and (ii):
The all staff meeting

The first all staff meeting: Geilo 22-24 March 2010

- ❑ A total of 64 participants, 40 students (+2 from China), 13 supervisors, 4 members of the evaluation board, 4 in secretariat, and 1 from Research Council
- ❑ Aim for students: To meet for the first time in order to
 - (i) get familiar with ResClim and its activities, and start building up a network
 - (ii) identify own expectations, perspectives and challenges
 - (iii) discuss ResClim's impact in research training and career development

Synopsis of PhD topics



– based on "speed collaboration" at first all staff meeting at Geilo

Key challenges seen from students

| Key challenges to be faced in the upcoming 6-12 months as described by the candidates themselves | | |
|--|--|--|
| Beginner | Mid-stage | Senior |
| <ul style="list-style-type: none"> Define the problem and make a plan Review the relevant literature Develop practical skills (lab work, programming, etc) Attend courses, workshops and summer schools Collect data and produce results Start building a network Acquire general knowledge on conferences, funding, etc. | <ul style="list-style-type: none"> Overview of your project: structure into papers/ thesis Be creative Prioritize your work; become more efficient Develop your writing skills: start writing your first papers Become more confident by (i) committing to what you are doing, and (ii) acknowledging the learning curve you have undergone so far Start arguing/defending your point(s) of view Maintain mental health | <ul style="list-style-type: none"> Put things into a bigger context and be able to summarize Time management Proposal writing Job seeking → Alumni? Stay motivated! |

Key challenges seen from supervisors

| <i>Supervising PhD candidates: Priorities and challenges</i> | | |
|---|---|---|
| Beginner | Mid-stage | Senior |
| <p><i>Challenges</i></p> <ol style="list-style-type: none"> Define the framework <ul style="list-style-type: none"> Project description Literature list Identify main methods Identify relevant courses Enthusiasm → motivation <ul style="list-style-type: none"> Allocate time Establish supervisor-student relation Challenge the student Communicate wishes and expectations Encourage early scientific writing and presentation | <p><i>Challenges</i></p> <ul style="list-style-type: none"> Devote time to the student Be enthusiastic and constructive Avoid sidetracks, limit work <p><i>How to keep students on track</i></p> <ul style="list-style-type: none"> Encourage positive thinking Encourage research visits to other institutions Encourage writing Be accessible <p><i>Recommendations to students</i></p> <ul style="list-style-type: none"> Don't hide, "use" your supervisor Communicate results enthusiastically Start writing Be aware of acquired skills, be confident Be curious, ask questions | <p><i>Challenges:</i></p> <ul style="list-style-type: none"> Work on the academic writing, e.g. write short and often; draft papers in working groups Clearly pose problem(s) <p><i>Career development</i></p> <ul style="list-style-type: none"> Active networking Experience research practices in other institutes Travel abroad Funding possibilities |

Course on Academic writing, Runde Environmental Centre, 23-27 August

- ❑ From Bergen Monday evening and return Friday lunchtime
- ❑ Program based on feedback from students and supervisors at Geilo.



Course on Academic writing, Runde Environmental Centre, 23-27 August



Why course in academic writing?

“ For all the books and papers you have read, for all the interviews, field notes or experiments you have undertaken, for all the conferences you have attended or departmental presentations you have given, at the end of it all you are assessed on what you have written”

“Writing is at the heart of a complex relationship between your personal, professional and intellectual development”

Daniel Soule in “Research Writing for Graduates”

1. Research Writing for Graduates

□ Part 1: Writing Foundations

- Defining the academic style
- Thinking about sentences
- Paragraph structure
- Reviewing and using the scholarly literature
- Referencing strategies
- Academic voice

□ Part 2: Building a writer's toolkit

- Free writing
- Summarising your research
- Critical reading form
- Writing a critical summary of literature exercise
- Starting to develop your research hypothesis
- Developing your research ideas

2. Writing a Journal Article

Part 1: Planning to write and writing a plan

Part 2: Writing an introduction to a journal paper

Part 3: Writing the body of a journal article

Part 4: In conclusion

Part 5: Peer review

Part 6: Writing an abstract and targeting a journal

3. Communicate to different audience

- How to extract and necessary information from a scientific paper and
 - Produce a press release
 - Produce a newspaper article
 - Produce a blog
 - Produce a twitter message
- Paper: “Modeling European winter windstorm losses in current and future climate”
- Students were particularly good at writing ‘sensational’ (and funny) tabloid newspaper articles

Feedback from students

□ Strengths

- *the ‘practical training’ with ‘lots of tips and practice’*
- *‘Inspiring! Great hand-outs. Great lecturer. Now I want to go home and start writing’*

□ Improvements

- *having the opportunity to bring more of your own work*
- *longer courses and more often, have opportunity to work on own papers between sessions*



Experiences after 1 yr in operation

- ❑ The research school is very much welcomed, both among students and supervisors
- ❑ The “all staff meeting” at Geilo was a success. Excellent feedbacks from students, supervisors and evaluation board
- ❑ Activities should reach as many students as possibly
- ❑ Transferrable skills training strongly needed
- ❑ A challenge to involve supervisors
- ❑ A challenge to involve partners outside Bergen
- ❑ More national & international collaboration