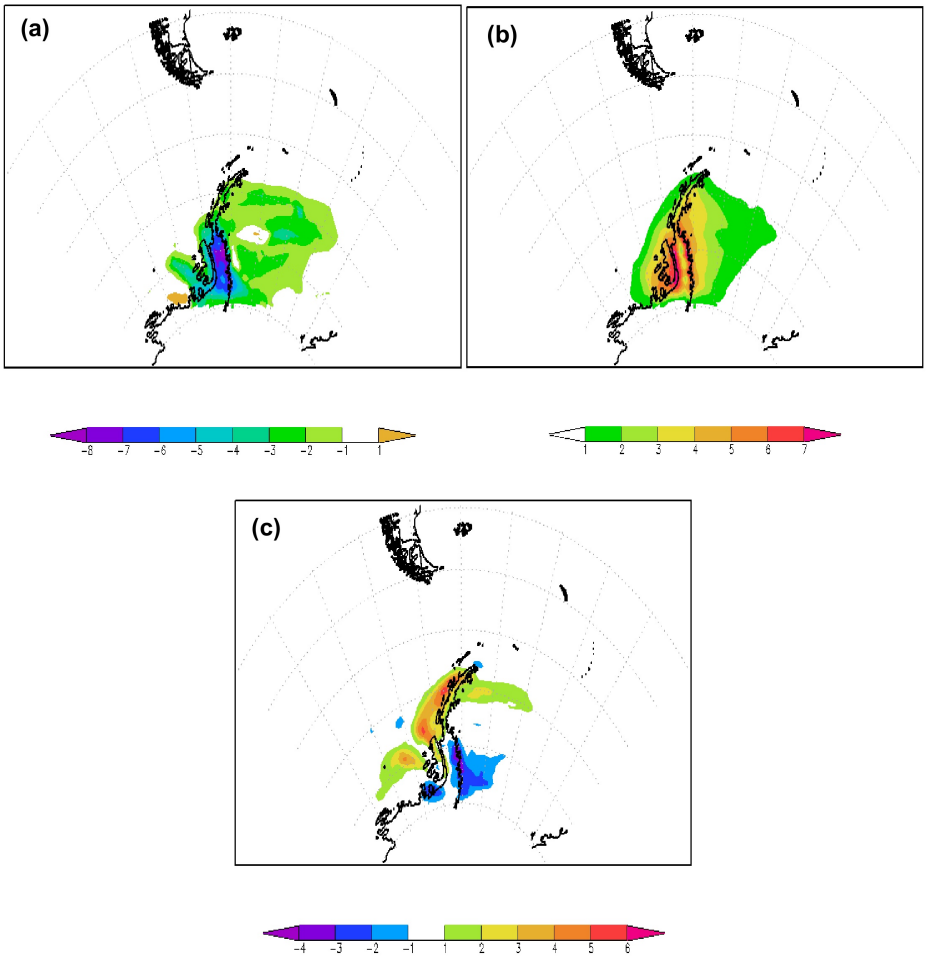
Atmospheric Sciences Section of AGU Newsletter

Volume 4, Issue 4 August 2010



Difference between the sea ice experiment and the control experiment: a) air temperature, b) sea level pressure, c) wind, from August 1 until August 30, 2002. (see AS Horizons - page 3)

AS Newsletter - Editorial -

Dear Readers,

This brief issue of our newsletter is perfect to enjoy during your vacations!

We are happy to bring you an interesting article about the development of BRAMS, a report of the last BALTEX meeting and an interview with Roger A. Pielke.

Please check the announcements, they include very interesting opportunities.

I would also like to take the opportunity to make a special mention to Alan Robock, as this is our first issue with Peter Webster as new president-elect. Thank you Alan for your support, continuous supervision and tireless work. Happy reading!

Juan A. Añel, Editor-in-Chief
EPhysLab, Univ. of Vigo at Ourense, Spain

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** Michel d.S. Mesquita - Bjerknes Centre for Climate Research, Bergen, Norway.*
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** Adilson Gandu - Dept. of Atmospheric Sciences, Univ. of São Paulo - Brazil.*
** Hans-Jörg Isemer - International BALTEX Secretariat, GKSS - Germany.*
** Marcus Reckermann - International BALTEX Secretariat, GKSS - Germany.*

Section News

Anne Thompson

You are now receiving electronic updates from AGU regularly. We have a new Governance structure in place and a new Board and Executive Committee. See them in the 3 August (Vol 91. No 31) issue of EOS.

I am pleased to tell you that the Section Awards (the Jim Holton Award for outstanding junior scientist and the Yoram Kaufman Award for "unselfish cooperation" in atmospheric sciences) have just been announced thanks to hard-working committees chaired by Alan Robock, Past President.

James Holton Winner - William Boos, Yale University

Yoram Kaufman Winner - Douglas Worsnop, Aerodyne Corp.

Details will appear in a future Newsletter.

Save Tuesday night of the AGU Fall Meeting for our annual AS Banquet. AGU is currently arranging the time and location for this. Note that this year, in addition to honoring our Holton and Kaufman winners, the Outstanding Student Paper awardees of the Fall 2009 Meeting will be recognized.

Most important: the deadline is fast approaching for Fall Meeting abstract submission.

See http://www.agu.org/meetings/fm10/ for submittal details - the deadline this year is 2 September, somewhat earlier than in the past few years. Atmospheric Sciences is sponsoring or co-sponsoring 56 exciting sessions.

AS Horizons

Sea Ice impacts on the temperature and circulation on the Antarctica peninsula: a study using the BRAMS model

N. T. Boiaski, L. M. V. Carvalho, A. W. Gandu and M. S. Mesquita

BRAMS logo. Source: http://brams.cptec.inpe.br

The weather and climate in the Antarctica Peninsula region are directly influenced by topographic effects and sea ice seasonality. The latter factor has not been properly represented in most regional atmospheric models, which compromises the skill of these models in regions where sea ice is present. Therefore, sea ice needs to be more realistically represented. The goal of this research is to improve the sea ice seasonality in the Brazilian developments on the Regional Atmospheric Modelling System – BRAMS. Here, an example of simulation will be discussed in which sea ice representation was improved by changing soil parameters in the model.

The BRAMS model is a joint project of the Atmospheric, Meteorological, and Environmental Technologies (ATMET), the Institute of Mathematics and Statistics, the Institute of Astronomy, Geophysics and Atmospheric Science at the University of São Paulo, and the Center for weather forecasting and climate studies at the National Institute for Space Research, funded by FINEP (Brazilian Funding Agency). It aims to provide a single model for the Brazilian Regional Weather Centers. It is a non-hydrostatic numerical model designed to simulate atmospheric circulations across a large range of scales.

The experiment discussed here was performed with a 40 km grid resolution, corresponding to 90x62 points (Fig. 1). In the vertical, 42 sigma levels were employed, with grid spacing starting at 70 m, increasing progressively with height at a stretching factor of 1.2 up to 1000 m. Vertical grid spacing above this height was maintained at 1000 m. Initial and boundary conditions were obtained from NCEP/NCAR reanalysis with 2.5° resolution. Land use was based on 1 km Advanced Very High Resolution Radiometer (AVHRR) data spanning April 1992 through March 1993 provided by the US Geological Survey (USGS). Topography (1 km resolution) was provided by USGS, and SST (1° resolution) was provided by NCDC/NOAA. The Chen radiation scheme, Mellor-Yamada vertical diffusion, Smagorinsky horizontal difusion, and Grell cumulus parameterization were used. Furthermore, the microphysics scheme resolved water vapor, rain, pristine, ice, snow, aggregates, graupel and hail as a generalized gamma distribution.

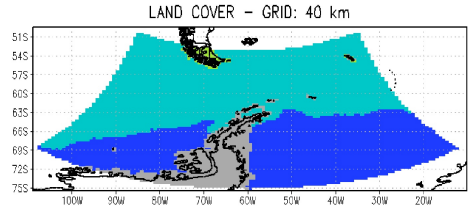


Fig. 1: Land cover (1992-93 USGS for grid 40 km: ice (grey), ocean (light blue), bare soil (green), sea ice from SST (dark blue).

Sea ice was improved in the model by using a linear regression equation between sea ice fraction and SST. The surface-atmosphere interaction was solved by the LEAF (Land Ecosystem-Atmosphere Feedback) model, which allows each grid cell to be divided into multiple surface types (patches). Simulations were performed with four patches. The first one was the ocean, the second and third were defined by land cover data from USGS, and the fourth is sea ice. Adjustments were made in the soil parameters for ice and sensitivity tests were performed to improve the model representation of sea ice in the Antarctica Peninsula region.

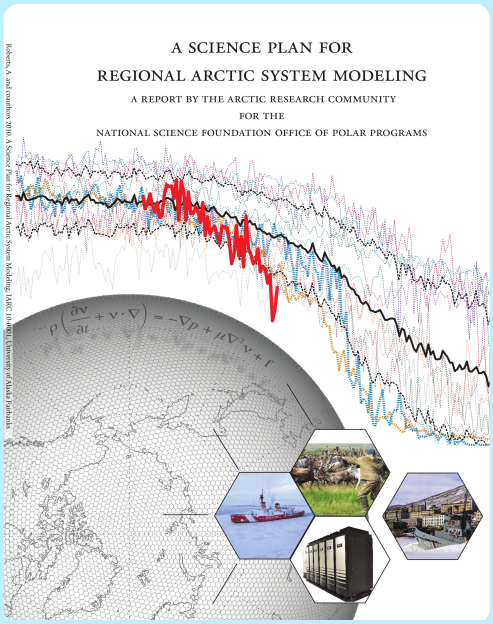
Preliminary results showed an improvement in the response of the atmosphere due to the sea ice seasonality when simulations were performed using soil parameters adapted to ice (see Figure 2 - cover). The variability of air temperature in the sea ice experiment was more realistic when compared with the control experiment, i.e., without the appropriate soil parameters adapted for sea ice (Fig. 2a). In association with the decrease in temperature, these simulations showed an increase in sea level pressure in the Antarctica Peninsula region (Fig. 2b). Furthermore, there was an intensification of the wind at the boundaries of the ice zone (Fig. 1), possibly associated with an increase in the horizontal temperature gradient due to a more realistic simulation of sea ice (Fig. 2c).

The next step in our research will be to perform a sensitive analysis with other soil parameters in order to understand the air-sea ice interactions. These experiments will improve the skill of the regional weather forecast in the Antarctica Peninsula and, consequently, they will contribute to our understanding of mesoscale process in a region with complex landscape and topography and positively impact scientific missions in the area.

Science Plan for Arctic System Modeling 2010-2020

A science plan for Arctic System Modeling, developed by the Arctic research community, has been recently published. This report for the National Science Foundation is the culmination of three science workshops and an extensive community review. It is available online at:

http://www.iarc.uaf.edu/publications/reports/IARCTP10-0001.pdf



6th Study Conference on BALTEX

Marcus Reckermann and Hans-Jörg Isemer

The Baltic Sea region in northern Europe has a rich cultural and scientific history. Long data series of climatological and environmental variables, some of which were not easily accessible before 1990, are now available for a larger research community. BALTEX, the research network for the Baltic Sea drainage basin, fosters the exchange of data and ideas across countries and scientific disciplines (see side box). Every 3 years, BALTEX organizes the so-called "Study Conferences" on islands in the Baltic Sea as multidisciplinary communication platforms for the research community in the Baltic Sea region, involving also water and environmental resources managers, policy makers and other stakeholders. Previous BALTEX Study Conferences took place on Gotland (Sweden, 1995), Rügen (Germany, 1998), Åland (Finland, 2001), Bornholm (Denmark, 2004) and Saaremaa (Estonia, 2007). On June 14 - 18, 2010, the 6th Study Conference on BALTEX took place on the sunny Polish island of Wolin on the southern coast of the Baltic Sea.

The conference was a great success. It was attended by 120 participants from 14 countries, mostly from states in the Baltic Sea basin: Poland, Germany, Sweden, Estonia, Russia, Finland, Latvia, Lithuania, Belarus and Denmark, but also from other countries such as Switzerland, Serbia and the USA. 69 oral presentations and 38 posters were presented, spanning the scope of BALTEX research: regional climate change, water, energy and biogeochemical cycles and transport processes in the regional Earth system, as well as water management and extreme hydrological events. Almost 2/3 of the contributions addressed cross-discipline topics, underlining the interdisciplinary nature of the conference and BALTEX in general. The beautiful location on the fine sandy beach of Wolin, together with the mostly sunny weather, contributed to the good spirit.

A number of presentations under the session heading "Climate variability and change in the past and future" dealt with the question of sea level rise in the Baltic Sea. It was shown that post-glacial land uplift will probably outcompete sea level rise in the northern Baltic Sea for at least the next 50 years; however, the southern Baltic Sea coasts of Denmark, Germany and Poland experience no land uplift, but a slight depression. This makes these regions especially vulnerable for sea level rise, calling for specific adaptation measures. An important unsolved question is whether or not sea level rise will accelerate in the future. A second emphasis of this session was an overview of recent efforts in regional climate modeling in the Baltic Sea basin, with a special view on uncertainties and detection and attribution studies. The session on "Water, energy and biogeochemical cycles in the regional Earth system" featured several presentations on nutrient and carbon cycles and budgets (including studies on seawater pH and acidification), as well as modeling efforts. It was also shown that new and efficient wastewater treatment plants built in Poland in the last two decades have caused a significant decrease of nutrient inputs to the Baltic Sea through the Polish rivers Odra and Vistula. This could be a great leap forward

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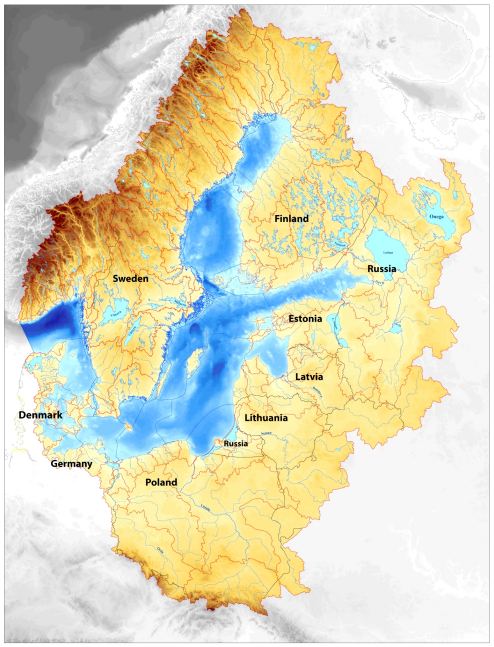


The Baltic Sea and its hydrological drainage basin in northern Europe.

BALTEX and the Baltic Sea region

BALTEX (the Baltic Sea Experiment) is an open research network of scientists involved in environmental research in the Baltic Sea drainage basin. It was founded in the early 1990s as the Continental Scale Experiment (now Regional Hydroclimate Project, RHP) within the Global Energy and Water Cycle Experiment (GEWEX) of the World Climate Research Programme (WCRP). BALTEX Phase I (1993-2002) was primarily focused on the hydrological cycle and the exchange of energy between the atmosphere and the surface of the Earth. BALTEX Phase II (2003-2012) has extended the scope of research to regional climate change, water management and biogeochemical cycles and transport processes in the regional Earth system. BALTEX is now a common science communication and data platform for scientist working in different disciplines describing the Earth System. Its overall goal is to integrate efforts in order to gain a better understanding of the water, energy and matter cycles in the Baltic Sea drainage basin in the light of climate change, and also, to foster the development of coupled models contributing to a regional Earth System Modeling of the Baltic Sea drainage basin. BALTEX activities include the organization of meetings and conferences, and the publication of reports and a newsletter. A major recent BALTEX achievement was the BACC report (BALTEX Assessment of Climate Change for the Baltic Sea basin), which was published in 2008 (see AGU AS Newsletter 2 (4), September 2008).

The study region of BALTEX is the Baltic Sea and its hydrological drainage basin, which constitutes a unique European water basin, creating specific demands on models and scientific concepts. The basin covers an area of 2.13 Million km², which makes up almost 20% of the European continent. 85 million people in 14 countries live in the basin, which stretches from the temperate and densely populated south to the subarctic rural north. The South is heavily industrialized, and intensive land use is common. The basin covers heterogeneous terrain including variable land surfaces with mountains, numerous rivers and lakes, with considerable seasonal, inter-annual, decadal and long-term variations, and integrates a wide range of human impacts and vegetation zones. The Baltic Sea, which is a unique brackish sea featuring a complex hydrography and variable seasonal sea-ice conditions, is one of the most intensely studied oceans in the world.

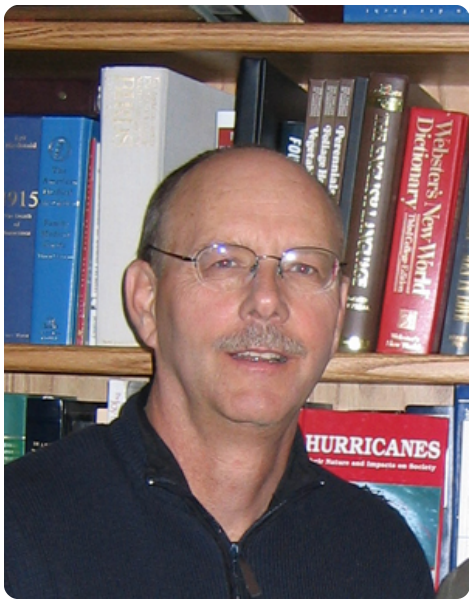
in reducing eutrophication in the Baltic Sea. The session on "Hydrological modeling, water management and extreme hydrological events" featured presentations on the variability of extreme events like storm surges, droughts and extreme precipitation, and recent attempts to forecast those events. A new project to exploit high-resolution modeling of surface currents for environmental management of the Baltic Sea (optimization of ship routing, identification of environmental risk areas, etc.) was introduced in several presentations. A dedicated session on "Regional adaptation to climate change" presented examples of regional adaptation projects in northern Europe. A special highlight was a multimedia presentation designed to be presented in a multimedia theatre dome, with the aim of demonstrating scientific findings on global and regional climate change in a comprehensive way to non-experts.

The conference was jointly organized by the Institute of Oceanology in Sopot, the University of Szczecin, the Research Centre of Agriculture and Forest Environment, Poznań, the West Pomeranian University of Technology, Szczecin (all Poland), and the International BALTEX Secretariat at GKSS Research Centre Geesthacht, Germany. A special journal issue featuring selected full papers presented at the 6th Study Conference on BALTEX will be published by Oceanologia. Further information on BALTEX and the 6th Study Conference, including a proceedings volume containing the extended abstracts of accepted presentations, is available at the BALTEX web site: www.baltex-research.eu.

Interview with Roger A. Pielke Sr.

Hans von Storch

Roger A. Pielke Sr. is currently a Senior Research Scientist at the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado and a Professor Emeritus of the Department of Atmospheric Science, Colorado State University. Pielke has studied weather and climate on local, regional and global scales using both models and observations throughout an over 40 year career. He has authored, co-authored and co-edited several books including "Mesoscale Meteorological Modeling" (1984; 2002), "The Hurricane" (1990), 'Human Impacts on Weather and Climate" (1995; 2006), "Hurricanes: Their Nature and Impacts" (1997) and "Storms" (1999). Roger Pielke Sr. was elected a Fellow of the AMS in 1982 and a Fellow of the American Geophysical Union in 2004. He has served as Chief Editor of the Monthly Weather Review and Co-Chief Editor of the Journal of the Atmospheric Sciences. He is currently serving on the AGU Focus Group on Natural Hazards (August 2009-present) and the AMS Committee on Planned and Inadvertent Weather Modification (October 2009-present). Dr. Pielke has also published over 350 papers in peer-reviewed journals, 50 chapters in books, and made over 700 presentations during his career to date. A listing of papers can be viewed at the project website: http://cires.colorado.edu/science/groups/pielke/pubs/. He is among one of three faculty and one of four members listed by ISI HighlyCited in Geosciences at Colorado State University and the University of Colorado at Boulder, respectively.



Roger A. Pielke Sr.

Prof Pielke, you are an atmospheric scientist - what were the main scientific issues you have tackled in your long professional career?

Our research team has investigated a wide range of climate processes. This includes studies in meteorology, hydrology, ecology and oceanography. Among our findings has been the clear demonstration of the close coupling between land surface processes and weather. I have also worked extensively to improve our understanding of the transport and dispersion of air pollution, as well as ways to reduce the risk from this environmental hazard.

How do you weigh the role and the potentials of models?

Models are powerful tools with which to understand how the climate system works on multi-decadal time scale as long as there are observations to compare reality with the model simulations. However, when they are used for predictions of environmental and societal impacts decades from now in which there is no data to validate them, such as the IPCC predictions decades into the future, they present a level of forecast skill to policymakers that does not exist. These predictions are, in reality model sensitivity studies and as such this major limitation in their use as predictions needs to be emphasized. Unless accompanied by an adequate recognition of this large uncertainty they imply a confidence in the skill of the results that does is not present.

You have become known for dissenting views in the present debate about the perspective of anthropogenic climate change. For example, you stress the role of land uses chances as another key driver in influencing our climate. Could you outline your position?

My perspective is summarized in a recent publication with 18 other Fellows of the American Geophysical Union in an EOS article titled "Climate change: The need to consider human forcings besides greenhouse gases" [*Pielke Sr. et al.*, 2009]. We wrote "the 2007 Intergovernmental Panel on Climate Change (IPCC) assessment did not sufficiently acknowledge the importance of these other human climate forcings in altering regional and global climate and their effects on predictability at the regional scale" and because "global climate models do not accurately simulate (or even include) several of these other first order human climate forcings, policymakers must be made aware of the inability of the current generation of models to accurately forecast regional climate risks to resources on multidecadal time scales."

If you were right, how would the range of options for response measures for limiting man-made climate change within certain bounds differ from what is commonly considered?

We need to recognize that the IPCC starts from an inappropriately narrow perspective that the human input greenhouse gases is the dominate environmental concern in the coming decades and then the IPCC presents policymakers with a resulting broad range of expected regional and local impacts. This is, however, at best a flawed significantly, incomplete approach.

The IPCC process should be inverted. In our 2009 EOS article that I referred to above, we recommend that the next assessment phase of the IPCC (and other such

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assessments) broaden its perspective to include all of the human climate forcings. It should also adopt a complementary and precautionary resource based assessment of the vulnerability of critical resources (those affecting water, food, energy, and human and ecosystem health) to environmental variability and change of all types. This should include, but not be limited to, the effects due to all of the natural and human caused climate variations and changes.

After these threats are identified for each resource, then the relative risk from natural- and human-caused climate change (estimated from the GCM projections, but also the historical, paleo-record, and worst case sequences of events) can be compared with other environmental and social risks in order to adopt the optimal mitigation/adaptation strategy.

The issues we should focus on can be summarized in this set of questions:

1. Why is this resource important? How is it used? To what stakeholders is it valuable?

2. What are the key environmental and social variables that influence this resource?

3. What is the sensitivity of this resource to changes in each of these key variables? (this includes, but is not limited to, the sensitivity of the resource to climate variations and change on short (e.g. days); medium (e.g. seasons) and long (e.g. multi-decadal) time scales.

4. What changes (thresholds) in these key variables would have to occur to result in a negative (or positive) response to this resource?

5. What are the best estimates of the probabilities for these changes to occur? What tools are available to quantify the effect of these changes. Can these estimates be skillfully predicted?

6. What actions (adaptation/mitigation) can be undertaken in order to minimize or eliminate the negative consequences of these changes (or to optimize a positive response)?

7. What are specific recommendations for policymakers and other stakeholders?

I have been commissioned as Chief Editor of a set of five books which will apply this bottom-up, resource based perspective.

You have retired a few years ago from your active duty as a professor at Colorado State University. Did retirement present for you a loss of opportunities, for instance with respect to teaching, or an opening of new possibilities?

I continue to work with graduate students at the University of Colorado, and at other institutions including Purdue University and the University of Alabama at Huntsville. I continue to be active in research and mentoring of younger scientists.

What would you consider the most two significant achievements in your career?

First, the opportunity to mentor graduate students and postdoctoral research staff, a number of who have become leaders in atmospheric and climate science has been an achievement I am proud of. Second, the perspective that climate is an integrated nonlinear physical, chemical and biological system, which requires the understanding of all components of the atmosphere, ocean, land and cryosphere, is starting to become more widely accepted. I have sought to promote this view over the last 20 year. This broader view of climate as a complex, nonlinear geophysical system is more scientifically robust than has been presented in the IPCC reports.

When you look back in time, what where the most significant, exciting or surprising developments in atmospheric science?

The ability to monitor the climate system from space has provided a much better understanding of climate as a system. We also are developing an improved recognition of the difficult challenges we face in seeking to skillfully predict climate decades from now. In terms of negative developments, the bias in the funding of climate science research which tends to exclude perspectives that differ from the IPCC viewpoint is a major concern. Also, the introduction in the last 10-15 years of the publication in peer reviewed research papers of climate forecasts and impacts decades into the futures. Their publication subverts the scientific process since these predictions are not testable until after that time period has elapsed.

Is there a politicization of atmospheric science?

Very definitely. There is a clear intent, for example, in the climate assessment report process to exclude scientists who disagree with the IPCC perspective from research papers and from funding. This was exemplified in the CRU e-mails, but it is a much wider problem as I have documented on my weblog, testimony to the U.S. Congress and in Public Comments.

What constitutes "good" science?

"Good" science is completed when hypotheses are presented and tested with real world data to see if they can be refuted. Unfortunately, the IPCC uses multi-decadal global climate model predictions as a basis for policy action yet these model predictions cannot be tested since we need to wait decades to obtain the real world data. Even in hindcasts of the last few decades, these models have shown no regional predictive skill.

What is the subjective element in scientific practice? Does culture matter? What is the role of instinct?

Science needs to advance by following the scientific method. This needs to be independent of culture or any other external influence.

For further reading about the opinions and views of Dr. Pielke Sr.'s refer to his blog: http://pielkeclimatesci.wordpress.com/

References

Pielke, R., Sr., et al. (2009), Climate Change: The Need to Consider Human Forcings Besides Greenhouse Gases, Eos Trans. AGU, 90(45), doi:10.1029/2009EO450008.

The opinions presented in the interview do not necessarily represent those of the interviewer or the AGU.

Opportunities

Note: You may be asked for your AGU member # to open the following links. Visit the AS Section website for links to other job opportunities not listed here.

Some of these job postings and others can be found at:

http://www.agu.org/cgi-bin/membership_services/joblistings.cgi

Atmospheric Sciences

* Tenure track faculty position at the Assistant or Associate professor level in mesoscale meteorology, Department of Atmospheric Science, Colorado State University, USA. Contacts: Prof. Richard H. Johnson (mesoscale@atmos.colostate.edu)

* Tenure track faculty position in atmospheric radiation, Department of Atmospheric Science, Colorado State University, USA. Contacts: Prof. Richard H. Johnson (radiation@atmos.colostate.edu)

* Tenure track Assistant Professor position in the area of mesoscale meteorology, Department of Atmospheric and Oceanic Sciences, McGill University. Contact: Dr. John R. Gyakum (mesoscale@meteo.mcgill.ca)

* Postdoctoral researcher in coupled GCM studies, The Center for Ocean-Atmospheric Prediction Studies, Florida State University, USA. Contact: search@coaps.fsu.edu

* Postdoctoral researcher in hidrology, The Center for Ocean-Atmospheric Prediction Studies, Florida State University, USA. Contact: search@coaps.fsu.edu

* Researcher in climate data analysis, The Center for Ocean-Atmospheric Prediction Studies, Florida State University, USA. Contact: search@coaps.fsu.edu

* Postdoc position in inverse modeling to assess emissions of industrial greenhouse gases, Scripps Inst. of Oceanography, University of California, San Diego, USA. Contact: Ralph Keeling (rkeeling@ucsd.edu)

* Associate Research Fellow in predictability of extremes in dynamical systems models for the midlatitude atmospheric circulation, Exeter Climate Systems research centre, University of Exeter, UK. Contact: Dr. Renato Vitolo (R.Vitolo@exeter.ac.uk)

* Postdoctoral Fellowship opportunity in sea ice research, Environment Canada, Toronto, Canada. Contact: Dr. Stephen Howell (Stephen.Howell@ec.gc.ca)

* International Climate Protection Fellowships, Humboldt Foundation, Germany. More info: http://humboldt-foundation.de/web/ICF.html

* Postdoctoral Research Assistant in climate physics, Department of Meteorology, University of Reading, UK. Contact: Valerio Lucarini (v.lucarini@reading.ac.uk)

* Postdoctoral Researcher in halogen chemistry modeling, Laboratory of Atmospheric and Climate Science, Toledo, Spain. Contact: Alfonso Saiz-Lopez (a.saiz-lopez@ciac.jccm-csic.es)

* 2 Research Associate positions (Ref. 101595 and 101679), NOAA National Climatic Data Center, Asheville, North Carolina, USA. More info: http://jobs.ncsu.edu/

* Postdoctoral opportunity (Ref. 101587), NOAA National Climatic Data Center, Asheville, North Carolina, USA. More info: http://jobs.ncsu.edu/

* Postdoctoral position for micro- and regional climate modelling, University of Goettingen, Germany. Contact: Prof. Alexander Knohl (bioklima-job@gwdg.de)

* Research Scientist/Associate in data assimilation, Nanyang Technological University, Singapore. Contact: Chee-Kiat Teo (ckteo@ntu.edu.sg).

* Postdoctoral Research Fellow (Ref. A1011122), Monash University, Melbourne, Australia. More info: http://www.maths.monash.edu.au/news/positions-vacant.html

* Postdoctoral position in atmospheric numerical modeling, CPTEC-INPE, Brazil. Contact Dr. Saulo Freitas (Saulo.freitas@cptec.inpe.br)

* Postdoctoral position in inverse modeling of CO, SRON, The Netherlands. Contact: S. Houweling (s.houweling@sron.nl)

* Atmospheric Science Lab Technician (Ref. 20100224), Department of Atmospheric Science at Creighton University in Omaha, NE, USA. More info: http://careers.creighton.edu.

* Postdoctoral fellows in Earth system modeling, Center for Ocean-Land-Atmosphere Studies, Calverton, MD, USA. Contact: (gates@cola.iges.org)

* Postdoctoral Research Position, Tropospheric Emission Spectrometer Group, Caltech-JPL, USA. Contact: Dr. John Worden (John.Worden@jpl.nasa.gov)

* Postdoctoral Researcher in clouds in climate models (Ref. 009145), Lawrence Livermore National Laboratory, USA. More info: https://jobs.llnl.gov

* Postdoctoral Scholar Opportunity in source apportionment of atmospheric pollutants, Environmental Chemistry and Technology Program, University of Wisconsin-Madison, USA. Contact: Prof. James Schauer (jjschauer@wisc.edu)

* Postdoctoral Scientists in aerosol-cloud-climate studies, Massachusetts Institute of Technology Center for Global Change Science, Cambridge, MA, USA. Contact: Dr. Chien Wang (wangc@mit.edu)

* Postdoctoral and/or Research Scientists in climate variability, predictability, and attribution, AOS Program, Princeton University, USA. Contact: Tom Delworth (tom.delworth@noaa.gov)

* Research Fellows (ARC Super Science) in atmospheric dynamics, Monash University, Melbourne, Australia. Contact: Prof. Michael Reeder (michael.reeder@monash.edu)

Interdisciplinary

* Tenure track faculty positions at the Assistant Professor level in Earth Systems Ecology, Pennsylvania State University (USA). Contacts: Kenneth Davis (kjd10@psu.edu), Department of Meteorology, or David Eissenstat (dme9@psu.edu), Department of Horticulture.

* Infrared Sounding Engineer, SERCO/EUMETSAT, Darmstadt (Germany)(Ref EUM-10-018). More info: http://www.serco.com/europe

* Tenure track Assistant Professor position, Department of Geography, Ohio State Univ., USA. Contact: Morton O'Kelly (okelly.1@osu.edu)

* ICOS Research engineer - GHG monitoring network -, Commissariat à l'Energie Atomique, France. Contact: Léonard Rivier (Leonard.Rivier@lsce.ipsl.fr)

* Research engineer position in high-performance computing on OASIS development, CERFACS, Toulouse, France. Contact: Valcke Sophie (valcke@cerfacs.fr)

* Assistant Professor Limited Term Position, School of Earth and Ocean Sciences, University of Victoria, Canada. Contact: Dr. Kathryn Gillis (seos@uvic.ca)

Student Opportunities

* Ph.D. positions in earth system modeling, International Max Planck Research School, Hamburg, Germany. More info: http://www.earthsystemschool.mpg.de/Application.html

* Ph.D. in Geoengineering, Faculty of Environment, University of Leeds. Contact: Piers Forster (P.M.Forster@leeds.ac.uk).

* Ph.D. Fellowship in paleoclimate modelling, School of Earth and Ocean Sciences, Cardiff University. Contact: Dr. Gregor Knorr (gregor.knorr@awi.de)

* Ph.D. on model evaluation of dust uplift, University of Leeds, UK. Contact: Dr. Peter Knippertz (p.knippertz@leeds.ac.uk)

* Ph.D. position in "exploring coherent structures using dual-doppler lidarsystems", KIT Karlsruhe, Germany. Contact: Katja Träumner (katja traeumner@kit.edu)

* Ph.D. position in "designing a CO2 space-borne mission concept", School of GeoSciences, University of Edinburgh, UK. Contact: Professor Paul Palmer (pip@ed.ac.uk)

Schools

NCAS Atmospheric Measurement Summer School 2010

Isle of Arran, Scotland. 7-19 September 2010.

http://ncasweb.leeds.ac.uk/arransummerschool/

Conferences

// SPARC DynVar Workshop 2 //

Boulder, CO, USA, 3 - 5 November 2010.

http://www.sparcdynvar.org/dynvar-workshop/

// AGU Fall Meeting 2010 //

San Francisco, CA, USA 13-17 December 2011.

http://www.agu.org/meetings/fm10/

// ESF-COST High-Level Research Conference on Extreme Environmental Events //

Cambridge, UK, 13 - 17 December 2010.

http://www.esf.org/conferences/10345

// AGU Chapman Conference on Atmospheric Gravity Waves and Their Effects on General Circulation and Climate //

Honolulu, Hawai 28 February – 4 March 2011.

http://www.agu.org/meetings/chapman/2011/ccall/

// AGU Chapman Conference on Climates, Past Landscapes, and Civilizations//

Santa Fe, New Mexico, USA 21 – 25 March 2011

http://www.agu.org/meetings/chapman/2011/ecall/

University computing requests for NSF-supported university projects at NCAR.

Application form and additional information for computational requests: http://www2.cisl.ucar.edu/allocations

Deadline: September 21, 2010

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