

Atmospheric Sciences

Section of AGU Newsletter

Volume 5, Issue 1 March 2011

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Ellen Mostley-Thompson being congratulated by President-Elect Peter Webster after delivering the 2010 [Jule Charney Lecture](#).

[Click here to watch the lecture.](#)



Tim Palmer being congratulated by President-Elect Peter Webster after delivering the 2010 [Jacob Bjerknes Lecture](#).

[Click here to watch the lecture.](#)

Dear Readers,

Welcome to the first issue of our 2011 newsletter!

This issue includes a stimulating article about the series of severe storms that hit US this past winter, an interview with Gabriele Hegerl, Professor at the University of Edinburgh and lead author in the upcoming 5th Intergovernmental Panel on Climate Change Assessment report, and an overview of an ongoing Indo-Norwegian research collaboration on climate change.

Do not forget to check our section on opportunities, schools and conferences.

I would like to show appreciation to all contributors that make this newsletter possible.

Thanks for reading,

Violeta E Toma, Editor-in-Chief
School of Earth & Atmospheric Sciences
Georgia Institute of Technology, USA

Newsletter Editors:

- * Anna Harper - Colorado State Univ., USA.
- * Michel d.S. Mesquita - Bjerknes Centre for Climate Research, Bergen, Norway.
- * Hans von Storch - Univ. of Hamburg, Germany.

Section News

AGU 2010 Fall Meeting

We congratulate the awards winners at the AGU 2010 fall meeting. Atmospheric Sciences Section celebrated its traditional dinner and several awards were presented. In this issue we include some pictures with the winners. Our cover presents **Ellen Mostley-Thompson** and **Tim Palmer** being congratulated by President-Elect **Peter Webster** after delivering the 2010 **Jule Charney Lecture** and 2010 **Jacob Bjerknes Lecture**, respectively. Picture below present Douglas R. Worsnop, the receiver of **Kaufman Award** and William R.Boos, the receiver of **Holton Award**.



Douglas R. Worsnop receiving the **Kaufman Award** from Past President Alan Robock at the Atmospheric Sciences Banquet.



William R.Boos receiving the 2010 **Holton Award** from President-Elect Peter Webster at the Atmospheric Sciences Banquet.

Forecasts and Impacts of Severe Winter Weather

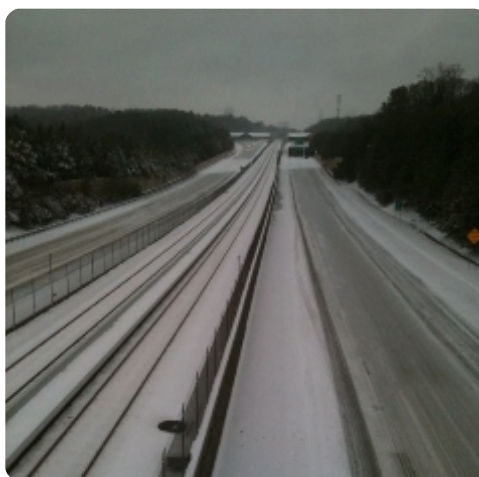
Winter of 2010–2011 in U.S.

Anna Harper

An approaching winter storm means something different for everyone. In the northeast, it can mean being buried under a couple of feet of snow. In the south, it can mean a beautiful yet terrifying layer of ice covering roads and trees. To some, it means the joy staying home from work or skiing in fresh powder. Storms can also dump snow on one part of a city and leave another part relatively untouched due to mesoscale effects like lake-effect snow and upslope winds. With such varied intensities and impacts, winter storm can be extremely difficult to forecast and to plan for. From the preparations before a storm to the assessment of a forecast, winter weather meteorology is an area that affects nearly everyone in the U.S. at some point each year.

Storm Forecasting

On a daily basis, forecasters at NWS Weather Forecast Offices (WFO's) strive to keep the users of their forecasts alert to upcoming storms. "We really try to have an open communication with travel managers and emergency managers," said Becca Mazur, a General Forecaster with the NWS-Cheyenne



Atlanta (GA 400): Unusual Rush Hour Traffic (01-10-2011 5:00 PM). Photo courtesy of Patrick Bowen.

WFO.

These efforts involve web-briefings and conference calls prior to a severe storm. During the briefing, forecasters explain the current meteorological conditions and expected effects of impending storms. The WFO's also answer calls from emergency managers, school superintendents, and travel managers.

Most cities also rely on forecasting services to plan for de-icer application, snow plowing and school closures. Denver, with an average annual snowfall of 54 inches, takes both a long- and short-term approach to preparing for winter weather. On the long-term, the city uses NWS forecasts and local weather channels for advanced warning of when a system is anticipated to enter the city. On the short-term, two forecasting services are used. Skyview

Weather provides daily forecasts with detailed information such as when a storm is anticipated to start and how much accumulation to expect. The Maintenance Decision Support System (MDSS) provides hourly updates and more details on what to expect. MDSS is led by NCAR's Research Applications Laboratory (NCAR/RAL).

"MDSS is really what we rely upon. It provides recommendations for de-icer usage, and information on when accumulation should begin. That has been invaluable for us," said Daelene Mix, Director of Communication for Denver Public Works. "In Denver, you never know what you're going to get," she said, making the hourly updates from MDSS important for planning how much staff to have on-hand and when to deploy de-icing and plowing gear.

In addition to traditional weather forecasts, city planners need pavement forecasts. "The pavement temperature is critical if moisture is present," said Mick Mercer, manager of the Streets Division in Loveland, about 50 miles north of Denver. Sensors in critical intersections provide updated information on the pavement temperature. "When we're pretty sure (about a storm) we try to get out with de-icer anywhere between four and eight hours before the onset of the storm," said Mercer.

White-out

Several U.S. cities have been in the news this year due to severe storms. Atlanta was hit with snow and ice in early January, effectively shutting down the city for several days, while New York and Philadelphia experienced a "Top 10" storm for snowfall in late January,

Announcement

James R. Holton Junior Scientist Award

In 2004, the Atmospheric Sciences Section of the American Geophysical Union established a Section Award for junior Atmospheric Scientists, the James R. Holton Junior Scientist Award. The Holton Award recognizes outstanding scientific research and accomplishments of early-career scientists in the field. This award is named in honor of James R. Holton, an outstanding atmospheric scientist, educator, and mentor. During his 38 years on the faculty at the University of Washington, he taught, advised and mentored a large number of students and junior scientists, and was awarded every major honor available in the atmospheric sciences including AGU's Revell Medal. His textbook "An Introduction to Dynamic Meteorology" (first published in 1972, now in its 4th edition), used at universities throughout the world, further extended his influence as an educator to generations of young scientists across the globe. The Holton Award will consist of a certificate, \$1,000, and dinner at the Section Dinner at the Fall Meeting, where the award will be presented.

Now is the time to submit nominations for the Holton Award. The deadline is June 1, 2011. To be eligible, candidates should be a member of the AGU, and be no more than three years past the award of the Ph.D. degree. Members of the AGU are encouraged to nominate deserving individuals. The nomination package should consist of four items, each no longer than two pages in length:

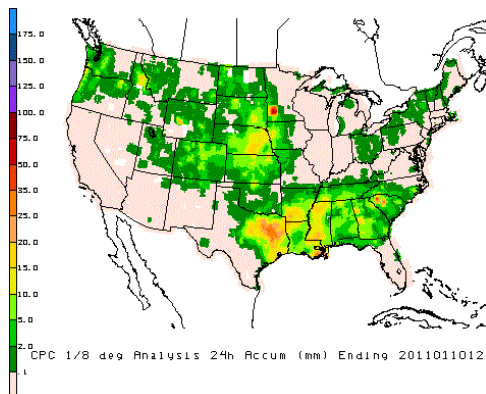
- a nomination letter,
- the candidate's curriculum vitae, and
- two letters of recommendation.

The nomination and supporting letters should clearly state how the nominated individual's research accomplishments are outstanding for one at his/her stage of career. Nominations must be submitted by June 1, 2011 (preferred as one combined pdf file) to Alan Robock at roboc@envsci.rutgers.edu.

according to NCDC records. Chicago received record-breaking snowfall in early February.

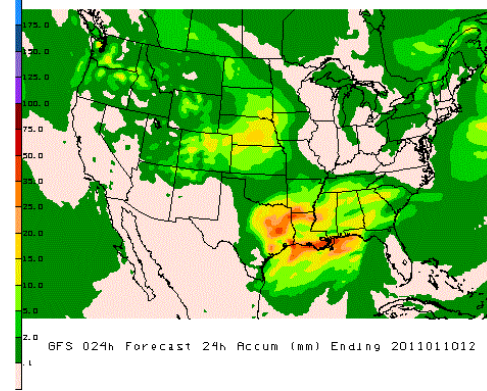
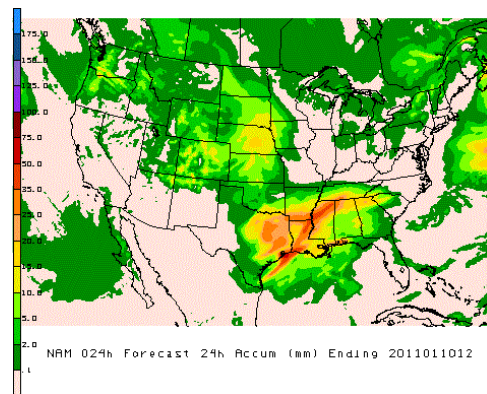
Forecasts leading up to the Atlanta storms on January 9-10 called for cold temperatures and unusually high snow amounts. On January 7, the city of Atlanta released a snow and ice response plan. Two days later, 3 to 7 inches of snow fell in the metro area. According to the NWS, the average temperature in Atlanta ranges from 33° to 52° F, and average snowfall each year is 2.2 inches. The combination of heavier-than-usual snowfall and below-average temperatures resulted in major issues for city and state roads. Between Sunday evening and Tuesday morning, 60% of flights were canceled at Hartsfield-Jackson International Airport, the world's busiest airport. It was quickly apparent that Atlanta's initial fleet of 10 snow plows and sand trucks were not adequate, and by Tuesday night a total of 58 pieces of equipment were being used for de-icing and plowing.

Atlanta residents were urged to stay home for most of the week, but that was not an option for some emergency workers. Becki Miller, a Nurse Anesthetist at St. Joseph's Hospital, went to work on Monday, the morning after the storm. According to Miller, the ice coating I-285, a major interstate that encircles the city, was so thick that the road wasn't visible through it. Her usual 13-minute commute took one and a half hours. "We were so unprepared here, it was very dangerous for people to be out," said Miller.



On February 1-2 Chicago saw its third largest snowstorm, which dumped 20.2 inches of snow at O'Hare International Airport. The forecasts from Midwest NWS WFO's were accurate, but sheer volume overwhelmed many areas of the city. On Lake Shore Drive, for example, almost 1,000 cars were stranded for six hours or more on Tuesday night, Feb. 2. 70 mph wind gusts resulted in white-out conditions and waist-high drifts. City planners were aware of the possibility of high winds on the lake, but left the road open since it is used by thousands of commuters to get home. A combination of severe weather, volume of cars, and a series of accidents on the road made conditions undrivable as the night wore on.

"In 31 years with the city, I haven't experienced anything like we did last night," Ray Orozco, the Chicago Mayor's chief of staff, said, at a news conference on the evening of



Analysis and forecast of 24 hr-accumulated precipitation for January 10, 2011. CPC (top left), NAM (top right) and GFS (bottom right) maps are presented.

Feb. 2. "We saw normal snow conditions, and the road was still passable. It was slow, but it was passable. Then we had those cascading

Announcement

Yoram J. Kaufman Unselfish Cooperation in Research Award

Now is the time to submit nominations for the Yoram J. Kaufman Unselfish Cooperation in Research Award, from the Atmospheric Sciences Section of the American Geophysical Union. This Kaufman Award is named in honor of Yoram J. Kaufman, an outstanding atmospheric scientist, mentor, and creator of international collaborations who worked on atmospheric aerosols and their influence on the Earth's climate for his entire 30-year career. Yoram was tragically killed in a bicycle accident just at the peak of his career at NASA Goddard Space Flight Center. He grew in the 1990s to be a leading light in aerosol research, both as an author of many new theoretical ideas and as a leader of field campaigns like SCAR-B. He also captained the first NASA Earth Observing System platform, Terra, as its Project Scientist. He advised and mentored a large number of students and junior scientists, and was known for his quick insight, great heart, deep wisdom, and outreach to national and international collaborators.

The AS Section made the second annual Kaufman Award at the Fall Meeting in San Francisco in December, 2010. The Kaufman Award citation reads: "The Yoram J. Kaufman Award for broad influence in atmospheric science through exceptional creativity, inspiration of younger scientists, mentoring, international collaborations, and unselfish cooperation in research." The Kaufman Award consists of a certificate, \$1,000, and dinner at the Section Dinner at the Fall Meeting, where the award will be presented. When the award is presented to a scientist from outside the U.S., it will consist in addition of a travel grant of \$500 specifically to attend the AGU meeting at which it is presented.

Now is the time to submit nominations for the Kaufman Award. The deadline is June 1, 2011. To be eligible, the candidate must be a member of the AGU, and be at least ten years past the award of the Ph.D. (or equivalent). The nomination package must consist of

- a nomination letter,
- the candidate's curriculum vitae, and
- three letters of recommendation, at least one from a collaborator of the nominee from a different nation.

The nomination and supporting letters should clearly state how the nominated individual has exhibited the qualities noted in the citation. Nominations must be submitted by June 1, 2011 (preferred as one combined pdf file) to Alan Robock at roboc@envsci.rutgers.edu.

events."

The Atlanta and Chicago storms illustrate that even with accurate forecasts, a city can be overwhelmed during a larger-than-usual storm. However, that does not mean that there is not room for improvement in both forecasting and working with users of forecasts.

After the Storm

After a storm passes, both forecasters and city planners assess their preparations for the event. The NWS produces verification statistics of storms. The Jan. 9-13 storm in the southeast and the Feb. 1-2 storm in Chicago were both well forecasted in terms of accumulation (see Figures).

Several steps are being taken to improve forecasts. Improved and enhanced observation

networks are crucial for model verification and forecast updates. Observations can pose a problem for the Cheyenne NWS office, which forecasts for 7 counties in Wyoming and 8 counties in western Nebraska. "We don't have a lot of observation sites, but we have a lot of territory to cover," said Mazur.

The GOES-R satellite series (<http://www.goes-r.gov/>) has the potential to dramatically improve observations of meteorological phenomena. "For observing and forecasting snow events, GOES-R will be beneficial for both large-scale snow producers like fronts and baroclinic zones, and more mesoscale features like lake effect snow," said Michelle Harrold, a research scientist at NCAR's Earth Observing Laboratory. The only downfall is that GOES-R's planned launch is not for another four years.

Mesoscale models are also on the forefront of forecast improvements. A handful of individual NWS WFO's use in-house versions of models such as WRF and MMF. These versions have a higher resolution than the operational models and can better capture mesoscale circulations that affect local snowfall amounts. "Areas that are affected by lake effect snow or have large orographic effects see a lot of benefit from these higher-resolution forecasts," said Harrold.

Another tool on the horizon for the NWS is the Rapid Refresh (RR) and High-resolution Rapid Refresh (HRRR) models, which will replace the Rapid Update Cycle (RUC) model. The HRRR has a 3-km resolution and will be nested within the RR (13-km resolution), and as the name suggests will refresh hourly. This product should be operational by this fall.

As far as societal impact goes, improving the timing of storm arrival can help city planners immensely. Part of what made the Chicago blizzard so severe was that snow started falling around 2:30 PM local time and by 6:00 PM up to 7 inches had fallen in the surrounding area (source: <http://blog.chicagoweathercenter.com/2011/02/>), just in time for Chicagoan's evening commute.

The Northeast and Regional Snowfall Impact Scales (NESIS and RESIS, respectively) can help planners put predicted snowfall amounts into perspective based on preceding historic storms. The NESIS and RESIS take into account area and amount of snowfall and population within the snowstorm's path to rank the severity of winter storms. Storms are ranked by category, with one corresponding to "noteable", three ranking as "major", and five ranking as "extreme". Since 1950, only two storms fall in the latter category: March 12-14, 1993 and January 6-8, 1996. According to the NESIS, the early February storm was "major"

Announcement Call For GEOScan Workshop



Participation and Registration

GEOScan Planning Workshop, March 27-30
2011 Annapolis, MD

To be held at: Historic Inns of Annapolis

<http://www.historicinnsofannapolis.com>

Workshop Registration and Information:

<http://workshops.jhuapl.edu/geoscan/>

Registration Deadline: 03/28/11

Abstract Deadline: 02/28/11

*Travel support will be provided based on need and available funds.

We are holding a 2.5-day workshop that is open to the entire Geosciences community for the planning of the GEOScan program. GEOScan is a grassroots effort envisioned as an NSF GEO facility from space that will bring a revolutionary capability of massively dense global observations onboard the Iridium NEXT satellite constellation. The dual theme concept of GEOScan involves System Science (SS) sensors on all 66 Iridium NEXT satellites as well as Hosted Sensor (HS) suites that can accommodate unique payloads in a standard multi-U, CubeSat-like configuration on individual satellites.

Both science goals and candidate sensor presentations are invited to be made the first two days, and the steering committee is expected to stay an additional half-day for preliminary selection. Please go to the workshop page for registration, workshop details and abstract submission. We look forward to your participation in GEOScan.

GEOScan:

- 66-satellite Iridium NEXT constellation, launching in 2015-2018.
- Polar orbit at 780 km, 86.4° inclination with 6 orbital planes.
- Program funding sought for ~3 System Sensors (same sensor on all satellites) and 30-40 Hosted Sensor suites.
- Candidate Sensors have ~1U and 1W of available space and power.
- Global, real-time data provides crosscutting opportunities for sponsors and the broader scientific community.

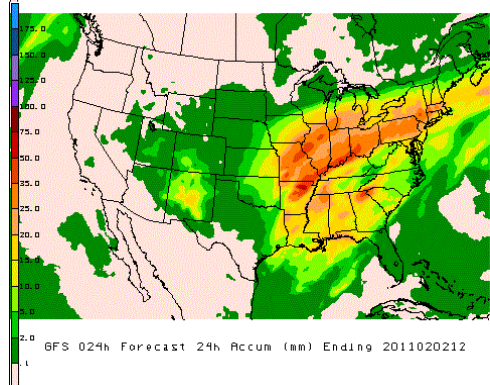
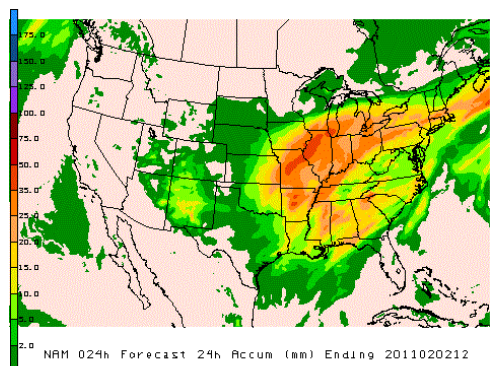
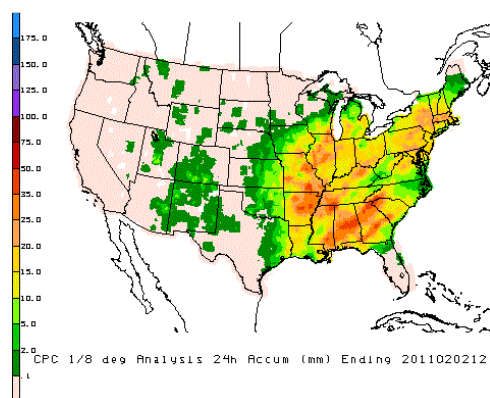
Workshop Outline:

March 27: Evening Icebreaker reception

March 28-29: Two full-day community presentations and discussions on science goals and candidate sensors.

March 30: (8am-noon) Steering Committee meeting, open to anyone interested in providing input for the Conceptual Design report.

Supported by: The National Science Foundation



Analysis and forecast of 24 hr-accumulated precipitation for February 02, 2011. CPC (top), NAM (middle) and GFS (bottom) maps are presented.

(<http://www.ncdc.noaa.gov/snow-and-ice/nesis.php>), and according to the RESIS the Jan. 10-11 storm was a category 2 ("significant").

Severe winter storms garner a lot of attention. From a meteorological point of view, they can be complex and challenging to forecast. From the point of view of city planners, they can be well-anticipated but still overwhelming. And people of any profession can appreciate the beauty of a fresh snowfall, or the annoyance of lingering cold and deep snow. In a national sense, this winter has not been highly unusual, but severe winter weather has still had notable impacts on several U.S. cities.

Interview with Gabriele Hegerl

Hans von Storch



Dr. Gabriele Hegerl, Professor at the University of Edinburgh.

Dr. Gabriele Hegerl is a mathematician by training. She obtained a Ph.D. in applied mathematics, on a topic of numerical fluid dynamics at Ludwig-Maximilians University, Munich in 1992. She worked on detection and attribution of climate change at the Max-Planck Institute for Meteorology in Hamburg to 1997, and then spent two years at the Department of Atmospheric Sciences at the University of Washington, Seattle, US, under a Feodor Lynen Fellowship by the Alexander von Humboldt Association. After research positions at Texas A&M University and Duke University she moved as a reader to the School of GeoSciences, University of Edinburgh in 2007 and was promoted to Chair of Climate System Science in 2009. Gabriele has contributed to the last three Intergovernmental Panel on Climate Change Assessment report, to the last one as Coordinating lead author and member of the summary for policymakers writing team, and is a lead author in the upcoming 5th report. She also serves and served on many research committees (US Climate Research Council,

CLIVAR expert teams) and advisory board. She is married and has two sons.

You have "moved" in different ways. Once from mathematics to atmospheric sciences, from Bavaria over to Hamburg, and then from U.S.A. to Scotland. Would you like to comment on these moves? Was it random walking or did you have an agenda?

I have indeed moved a lot although I definitely do not enjoy the process of moving! I applied to the Max-Planck Institute in Hamburg because the research topic of climate change interested me. I studied mathematics in Munich and pursued a Ph.D. there in numerical fluid dynamics. In my free time I had done a lot of hiking and skiing in the mountains, and I was surprised that the glaciers were often quite a bit further up the mountain compared to their position on the relatively old maps my friends and I had rented for our outings. That made me curious about climate change, which was just beginning to be discussed by the general public. And climate models also seemed wonderfully complex applications of numerical fluid dynamics. My time at Max Planck Institute was wonderful, and I never regretted my decision to go there, although it meant to accept a temporary position far from Munich rather than a permanent position in Munich. I applied fingerprint methods to recent observed temperature trends under the really inspiring guidance of Klaus Hasselmann and Hans von Storch, and what I learned there, for example, on the origin of low-frequency climate variability, and about statistical techniques in climate research, still influences me today. I also collaborated with climate modellers, for example, Uli Cubasch, on analyzing recent model simulations. This collaborative work environment in Hamburg was quite different from the environment during my Ph.D. and I found that to be much more fun. The next move then was to Seattle, on a Feodor-Lynen fellowship from the Alexander von Humboldt Association. My goal was to learn more about climate dynamics and the atmosphere. Also my husband to be was an American, so a move to the U.S. seemed like a good plan. The moves after that were all attempts to find suitable positions for two people at the same time, which was quite difficult – both at Texas A&M and at Duke I was on a soft-money funded research position, which on one hand gave me a lot of freedom to pursue my own research agenda, and to reduce my working time while my children were very small. On the other hand, I could never be quite sure what would happen when the next grant ran out. The move to Edinburgh offered a permanent position for both my husband and me. The fact that Edinburgh is back in Europe and closer to my family made the decision easier.

So the agenda behind moving was first one, then two careers in science. It was always hard to uproot and move on, particularly later, once we had children. It is of course a big adventure every time, and every move broadens one's perspective – things are done differently than at home in other countries and other work environments, and that questions one's prior assumptions and judgements, which I found quite a broadening experience.

How is the situation of females now in atmospheric sciences? Has the situation improved in the last ten years?

I think there is more consciousness now, compared to the beginning of my career, that there are a number of inequalities which are quite pervasive and not easy to overcome. There are now quite a few top female scientists in influential and highly respected positions. There is also a more widespread realization that diversity, not only in gender but also other aspects such as nationality and background, is an advantage. However, the representation of women in top positions is still limited; for example, many departments have only a small fraction of female professors.

Women have a number of difficulties to overcome. Much more often than men, women take breaks or sharply reduce hours when having small children. I have done that as well, and it was very rewarding but also a bit scary to realize that I was competing for funding and positions with people with very straight careers without interruptions and complications, people who could easily work long hours and pursue anything they wished to pursue. At the same time I felt I had to prove to myself that I am not a 'Rabenmutter' and that my wish to continue my research career did not short-shrift my children. I had very good at-home childcare. I still pick up from school one day a week almost every week, and I used to stay home first several, then one day per week to spend time with my kids, their friends, and attend playgroups and music classes. A science career is in many ways more flexible than corporate jobs, and allows working whenever it's feasible, during naptimes, and at night after the children are in bed. I also found my family to be a wonderful balance for the pressures of an academic career.

I realize that there are also men who are closely involved in rearing their children, and know cases where a father is the primary parent, but the majority are still women. A higher percentage of women in positions of leadership may help to raise consciousness of the need to balance family and work, and convince people that unorthodox work hours do not mean lack of commitment.

Integrating family and children is, of course,

not the only problem women face. I believe (and I have seen occasionally studies that seem to support this) that on average, women express themselves differently, and prefer collaborative to competitive situations more than men. This is sometimes interpreted as weakness. I have sometimes felt ignored with suggestions only to hear a male's identical suggestion enthusiastically welcomed. That experience seems not to be unique to me. There also sometimes seems to be a prejudice of what makes excellent science – the lone author paper challenging prior beliefs is still valued particularly high in some circles. I find collaborative papers, maybe with an interdisciplinary authorship, that address an interesting problem as completely as possible, at least as useful type of science, and one that I enjoy more.

Throughout my career, I have encountered wonderfully supportive colleagues, men and women, who encouraged and supported me. As more women make it further up the top (and that seems to be slowly happening), I hope that their skills will be better and wider appreciated. But there is still a way to go. Until then, it is important to encourage and support a diverse set of colleagues and enjoy the breadth that comes with it.

You worked for a while for a large international company - why did you move back to science?

My Ph.D. thesis was supported by the research department of Siemens AG in Germany. The Siemens research campus in Munich is a research environment, although under a corporate sponsorship, and with more applied priorities. Some of my colleagues there were scientists at heart as much as my university colleagues, but that was less the case for the leadership. When I interviewed for “regular permanent and pensionable” positions after my Ph.D. I found that the corporate world away from research just didn't attract me to the same extent that science did. After moving to the Max-Planck Institute I appreciated how much difference it makes to have an outstanding scientist rather than an administrator to lead the research groups – I found that environment fantastic.

What would be your advice for a young female student, who has to decide about going in to science?

My main advice to her would be to follow her interest and do what she would like to do most, irrespective if it seems rational, logical, or straightforward. My winding career path via mathematics and Max-Planck Institute, into the U.S. and back to Europe is an example of this working. My second advice is to find a supportive mentor whom she can trust and



At home: Gabriele and her son.

whom she can ask for advice on career questions. I found it incredibly important to be able to vent and worry aloud, and I had some wonderful, female and male, mentors. And then there is the not-quite-serious advice that it would help to find a mate with a moveable career....

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

I am quite proud of my work estimating the human contribution to late 20th century warming, and attributing it to greenhouse gas increases. I wrote one of the first papers showing that late 20th century warming trends were highly unusual in pattern and magnitude compared to long-term trends that can occur due to internal climate variability. The follow-up paper used several fingerprints to distinguish between climate change caused by different external drivers, for example, greenhouse gas forcing, aerosol forcing and solar forcing. Our paper introduced a new method to attribute climate change to causes which is, after excellent later modifications by Myles Allen and Simon Tett, still the main method used for this purpose.

I worked on a number of other topics, including changes in climate extremes, causes of climate change in the last millennium, estimating climate sensitivity. The latter was a fascinating and challenging topic and I would still like to improve on it. I am also proud of my contribution to the IPCC 4th Assessment report. I was coordinating lead author and member of the summary for policymakers writing team. Working on the IPCC report was an amazing experience, scientifically very rigorous, Susan Solomon's leadership was outstanding, and I learned lots from the excellent group of

colleagues that worked on that report.

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

I am not sure I can speak for atmospheric science as a whole. In terms of climate science, I find the increasing confrontation of models with data from longer timescales fascinating. Investigating to what extent models can reproduce changes in climate at times when the climatic mean state was quite different, and the forcings were different is a very useful test of climate models. The uncertainties are large of course. Related to that, I also find earth system modelling an amazing step forward. If we better understand the role of vegetation and carbon cycle changes in the past, this will give much better confidence into predictions. Another interesting development was the recognition in the late 90's that climate change is affecting modes of variability, and recently, that it is affecting precipitation and extremes.

Is there a politicization of atmospheric science?

No doubt climate science is politically relevant. The question of how to address climate change is a very difficult one, and one that needs input not only from climate scientists, but also economists, energy specialists, humanities, and much more. Therefore, climate scientists don't have all the answers. We have answers about the observed and projected changes in climate assuming certain emission scenarios, and some information about how much of a problem climate change might turn out to be, on what timescales it is reversible, and how much change to expect.

For me, this means that I am happy to provide scientific input, for example, through the IPCC, but I also believe it benefits the discourse if scientists avoid making direct policy recommendations, since we will not have all the information necessary for a good decision. On the other hand, it is important to try to ensure that the public and politicians are informed in a rational and effective way about what our scientific findings mean for them, and for the generations to follow. As a publicly funded scientist I believe it is my duty to provide information to society, via committees like the IPCC, and also via the media.

So, to address the question: of course the results of climate science are politically relevant. Although that makes it difficult to keep politics out of it, I believe that society and science benefit from some level of separation of science and politics. That is true for climate science to the same extent as for other sciences.

What constitutes "good" science?

Good science to me is asking an interesting question that can be addressed, and answering it objectively and rigorously. Identifying the interesting and important questions is a key part of good science and may well be the most important step. Good science means that the scientist is open-minded about what the answer may be, and sceptical about his or her theories. It should be welcomed when data raise questions about a theory or method, because that means we are about to learn something new and surprising, which after all makes science so much fun. A good scientist also should have not just a narrow problem in mind, but the broader context of a problem, and find and emphasize the most important aspect of a problem.

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

Instinct is very important – I followed my instinct in the somewhat twisted way my career went, and many people call it “gut feeling” that a result is right, or that something is either wrong or missing ‘instinct’. I am not sure it is instinct – I think our mind processes a lot of information in a semi-conscious manner and so we can’t always point the finger at what looks wrong, but this ‘instinct’ that something isn’t right often means that this contradicts other information we have. Society and culture may influence to some extent what questions we ask and how we ask them. But I also know that there are absolute truths – things that can be logically shown to be true, hypotheses that are supported by data, hypotheses that are not, or statistically unlikely to be, reconcilable with the data. Also, the scientific community as a whole, who continues to challenge each other and compete with each other, minimizes in my view the role of culture and the subjective element.

The opinions expressed in this interview do not necessarily represent those of the reviewer or the AGU.

An Indo-Norwegian Research Collaboration on Climate Change

Mesquita, M.d.S.^{1,2}, Veldore, V.³, Bhadwal, S.³, Jansen, E.^{1,2}, Bhardwaj, S.³, and Machineni, N.³

¹ Uni Research, Norway

² Bjerknes Centre for Climate Research, Norway

³ The Energy and Resources Institute, India

In today’s climate discussions, challenges persist to follow sustainable development due to different factors such as: large scale regional variations in availability of observed datasets for validation at desired scales, limited



A special event in The Delhi Sustainable Development Summit to discuss the status of the Indo-Norwegian project. Delegates from Norway and India were present. Photo source: TERI, India.

understanding and capabilities across regions in the quantification of observed climate change, present day climate variability and future expectations of the change. The latter could in turn have a high impact on the development pathways aimed for a sustainable future. We are presently in an era where the quantification of climate change impacts is essential and intrinsically linked with all life forms on Earth including ecosystems and livelihoods.

The challenges of climate change

The challenges in today’s global climate system can be mainly attributed to tipping points of different impacts due to climate change induced by human interventions. The progress in this direction would be to assess the nature of the tipping point, whether it is going to increase the occurrence of extremes or to change the intensity and the pattern of occurrence. The WMO (2010) report shows a snapshot of different spatial regions, where the increase in extreme events has been very prominent in the last decade. The assessment of these extremes, using state-of-art Earth System models, can provide feedbacks of all the processes in the Earth System to pave the way forward.

An Indo-Norwegian Project

In this context, an initiative has started between the frontier scientists at the Bjerknes Centre for Climate Research (BCCR) in Norway and The Energy Resources Institute (TERI) in India. The aim is to increase the understanding of the Earth System processes that would further facilitate impact assessments with finer

resolution information to approach towards defining adaptation strategies. India, a developing country, is extremely vulnerable to changes in climate owing to the fact that a large part of the population still relies on climate sensitive sources for a living. As part of this project, a special event was held during the Delhi Sustainable Development Summit 2010 to discuss the initiatives and the requirement of improved climate projections both at the global and local scales, for better impact assessments within the Indo-Norwegian project.

Professor Eystein Janse, Director of BCCR and Professor Arabinda Mishra, Director of the Earth Science and Climate Change Division at TERI shared their views on the importance of this project for future collaborations between Norway and India, and the value addition and capacity building required in a developing country like India for better impact and vulnerability studies.

This Indo-Norwegian project makes use of the Norwegian Earth System Model (NorESM) for the global simulations. The project is also aimed at downscaling the NorESM data using the Weather Research and Forecasting model, a state-of-the-art dynamical downscaling model developed at the National Center for Atmospheric Research in the United States. The model simulations will make use of the new AR5 scenarios of the Intergovernmental Panel on Climate Change. These scenarios are called Representative Concentration Pathways (RCP), which represent the radiation imbalance on top



The opening ceremony at The Delhi Sustainable Development Summit where several global leaders presented their perspectives on sustainable development under global change. Photo source: TERI, India.

of the atmosphere in the year 2100, as outlined in the “RCP handshake document” at: http://www.aimes.ucar.edu/docs/RCP_handshake.pdf. These are examples of some of the simulations and activities that will be carried out during the Indo-Norwegian project. The aim is to improve capacity building in the area of climate modeling through the use of Earth System modeling and regional downscaling at high resolutions.

Sustainable Development Summit

The 11th Delhi Sustainable Development Summit 2011, organized in Delhi, India, from 3-5 February, was a successful event. It gathered leaders from several countries, delegates from renewed international institutions as well as representatives from the private sector.

Dr. R. K. Pachauri opened the Summit and emphasized its main theme of “Tapping local initiatives and tackling global inertia”. The inauguration ceremony was followed by talks and panel discussions among prominent leaders such as HE Dr. Manmohan Singh, HE Mr. Hamid Karzai, HE Dr. Leonel Fernández, HE Mr. James A. Michel and Dr. Farooq Abdullah.

One of the highlights of the Summit was the special address by Prof. Jeffrey D. Sachs. In his

address, he showed that there is a trade-off between economic growth and reduction of carbon emissions. The carbon emissions can be addressed due to the technological options available that can foster significant reductions. It is important for each country to develop its own framework for transition to a low-carbon society using the technology available in the world. He also added that leadership should emerge from countries such as India to start creating a global framework to implement changes, not waiting for the U.S. to take the lead (Summit Bulletin, February 3, 2011).

Also during the DSDS meeting, the book “Oceans-The New Frontier” by Mr. Pierre Jacquet, Executive Director, French Development Agency, Ms. Laurence Tubiana Director of IDDRI, and Dr. Pachauri was released. It highlights the importance of Oceans as frontiers of knowledge, which needs to be understood with high accuracy. The overarching statement provided for this book is as follows “Oceans play a major role in climate regulation, food production, industry, transportation, leisure, species conservation and technological innovation. Many social, economic, environmental, cultural and political aspects of contemporary life intersect with oceans, making them a “new frontier” for human endeavour”. The book provides the escalating human dependency on planets resources, which has extended to oceans and blurring the boundaries between the mainland and oceans. Thus, the ability of global governance to regulate access to resources and services provided by the oceans so as to protect the ocean ecosystems is very crucial and has been text appropriately in this initiative.

The path ahead

The collaboration between different countries for climate research efforts is an important step. Several institutions and universities have such collaboration work with developing countries for climate research

initiatives. These projects constitute an important path towards raising awareness on climate change. They also contribute towards capacity building, to empower scientists with infrastructure and knowledge for science research.

Other steps ahead are also needed, such as fostering more long-term observational data at high-resolution. These data are important for the validation of high-resolution model outputs. Besides that, it is hoped that funding for fostering such bilateral work can be extended for many years ahead, and that many other institutions and developing countries can benefit from such collaboration work.

Contact info: michel.mesquita@uni.no

Announcement

2011 Network for the Detection of Atmospheric Composition Change (NDACC) Symposium

7-10 November, 2011

Saint Paul, Reunion Island, France

This is an International Symposium celebrating 20 Years of Global Atmospheric Research Fostered by NDACC/NDSC Observations. It is structured along five themes:

1. Long-term evolution and trends in ozone, atmospheric composition, temperature, aerosols, and surface UV radiation in the polar regions and at mid-latitudes
2. Tropical and sub-tropical observations and analyses
3. Interactions between atmospheric composition and climate, in collaboration with NDACC Cooperating Networks
4. Satellite calibration / validation
5. New observational capabilities

Abstracts are due by 1 June 2011. Information on the Symposium programme, abstract submission, registration, and logistics is now available at <http://ndacc2011.univ-reunion.fr>

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

1 Post-Doctorate in Cloud Dynamics (SAS2011-08), Max-Planck Institute for Meteorology.

2 PhD in Atmospheric Sciences (SAS2011-09), Max-Planck Institute for Meteorology

Faculty Position in Civil and Environmental Engineering at Ecole Polytechnique Federale de Lausanne (EPFL).

Interdisciplinary

Postdoctoral, Research and Visiting Research Scientists, Atmospheric and Oceanic Sciences, Princeton University.

Rosby Visiting Fellowship, Stockholm University.

University Professor-salary grade W3, Technische Universität Berlin.

W2-Professorship in Glaciology, Alfred Wegner Institute for Polar and Nature Research in the Helmholtz Association.

Student Opportunities

Institute on Earth-surface Dynamics, National Center for Earth-surface Dynamics (more info at: <http://nced.umn.edu/siesd2011>)

Conferences

// Advances in Lagrangian Modeling of the Atmosphere //

AGU Chapman Conference on Advances in Lagrangian Modeling of the Atmosphere

Grindelwald, Switzerland

10–14 October 2011

Abstract Submissions Deadline: 07 June 2011

// AGU Fall Meeting 2011 //

San Francisco, CA, USA 1317

December 2011.

Key Dates and Deadlines:

Session Proposal submission

Opens 25 February 2011 & Closes 20 April 2011

Abstract submission

Opens 8 June 2011 & Closes 4 August 2011

Student Dissertation Conferences

// Atmospheric Chemistry Colloquium for Emerging Senior Scientists//

Brookhaven National Laboratory, Upton, NY, July 21-24, 2011

Application Deadline: April 1, 2011

<http://www.asp.bnl.gov/ACCESS/>

//DISCCRS VI Interdisciplinary Climate Change Research Symposium Dedicated to the memory of Stephen H.Schneider//

La Foret Conference and Retreat Center Colorado Springs, CO, October 22-29, 2011

Application Deadline: March 7, 2011

<http://discrs.org/discrsposter.pdf>