

## **IMSC award 2004**

I have been asked to speak about IMSC and to honor this year's IMSC awardee.

IMSC – International Meeting on Statistical Climatology. The IMSC is a private effort by a group of people, called Steering Committee, who think it useful to have every 2-4 years a gathering of people interested in the application of statistical methods in climatology.

Originally this was pushed by Allan Murphy, who passed away almost 10 years ago. The first meeting took place in 1979 in Japan; I don't think that anybody from that meeting is in the audience today. But there is somebody, who has attended all meeting since, in Lisboa, Vienna, Toronto, Rotorua, Galway, Whistler, Lüneburg and now Cape Town – that is Albert Boehm, who has also given a talk at this conference. I guess, Albert is the only one who has done so – let's give him a hand. Thanks, Albert for your having supported this important effort for so many years. And thanks to Mrs. Boehm for allowing him to do so!

Allan Murphy's basic idea was that we need to bring together two communities in an interdisciplinarity exchange - mathematical statisticians and scientists working with climate, which is the statistics of weather. As always, the interdisciplinary exchange is difficult; the reason is that the two disciplines have two cultures, adopt different paradigms, and operate with different reward systems.

- Mathematical statisticians have to think about methods given a framework. As common in mathematics in general, the problems to some extent are modified to be treatable nicely while not being necessarily being relevant. Statisticians working with climate problems have to publish in statistical journals, which are adapted to the culture of mathematics. Problem of mathematical statisticians – there is sometimes a failure to understand the character of the problems and data, such as the ubiquitous interdependence, clustering of extreme values, simultaneous presence of externally caused variations and red-spectrum; infinite number of degrees of freedom.
- Climate scientists, on the other hand, want to describe, conceptualize and model the real world, want to forecast and construct scenarios, want to understand this one real world. - Thus, the challenge is the dynamical framework, and the work needed to assess the consistency of concepts and the real world, of fitting the models and the like, that is often considered a nuisance, a necessary but boring exercise not worth the

effort a real physical scientist. As a result, we see sloppy analyses, premature conclusions, the prevalence of wishful thinking and preconceived ideas without real support by data. The failure of proper education in statistics leads to re-invention, to misunderstanding of concepts, the inappropriate use of unwanted connotations of terms (probability, confidence band; significant); detection of the magic bullet.

In interesting observation is that the two communities have not really discussed if and why climate problems should be framed in a statistically.

- First, where is the random ness coming from in the climate system? Who is rolling the dice? In the process of observing weather variables, the answer is obvious. Likely, many of us have their own answer – I have mine – but we have not discussed this and have not reached consensus.
- Second: Is the sampling of our data consistent with conventional statistical analysis? We have only one time-limited realization of the climate record. That is the processes of building hypotheses and of assessing hypothesis is not really separated (except for short term problems).

Maybe, we can discuss these fundamental aspects apart of the usual string of more technical and exciting problems when we meet again in Beijing in 2007?

Even if IMSC has failed to discuss these fundamental questions, IMSC is helping to ease the understanding of climate problems by mathematical statisticians, and the usage of advanced methods by climatologists; it is an uphill battle, which can not be won – but why not trying it, to improve stats practice in climate field at least somewhat?

Likely, we could do better, we could bring in more theoretical physicists, econometrics, geostatisticians (we are in the homeland of Mr. Krig!). Please look into this, Xuebin and Xiolan, when preparing 10IMSC.

One way of promoting this effort, of bridging the gab between the communities, of encouraging rigor in climate sciences and adequate dynamical framing on the side of mathematical statisticians, is the IMSC award. We, the rather vaguely defined body of a steering committee of IMSC, want to acknowledge the efforts of an outstanding person. A

person who has significantly contributed to the understanding of climate problems by mathematical statisticians, and the usage of advanced methods by climatologists.

I am speaking about a person who has served as a reference of not overselling, of emphasizing the foundations and the basic principles of data analysis. A man who has attended many IMSC conferences, who has had the guts to openly “comment” on controversial themes; a person many editors rely on when needing thoughtful and fair reviews. A statistician and a gentleman (you may now exclude all females and myself as candidates; also all first-time attendees of the IMSC). A man with long-term deep interest in weather and climate, a man who is observing routinely the local weather, in order to have an own private data set to play with. A Scottish professor, who has written a series of books, on statistical inference, on forecast verification and, in my view most important, on EOFs. The EOF book, which is now available in its 2<sup>nd</sup> edition, is bringing together solidly, comprehensibly, and understandably the foundations of these often used, and often misunderstood eigenvectors, which we climate scientists use for a diversity of purposes. Ian Jolliffe’s book is an outstanding example of real interdisciplinarity, and we would strongly recommend that even more colleagues of ours will refer to this most valuable textbook, which may help avoiding errors due to naïve conceptions and wishful thinking about the basic statistical method of EOF analysis in climate science.

Ian, it is my pleasure to award the IMSC price to you. Thanks for your companionship and unwavering support in the past years.