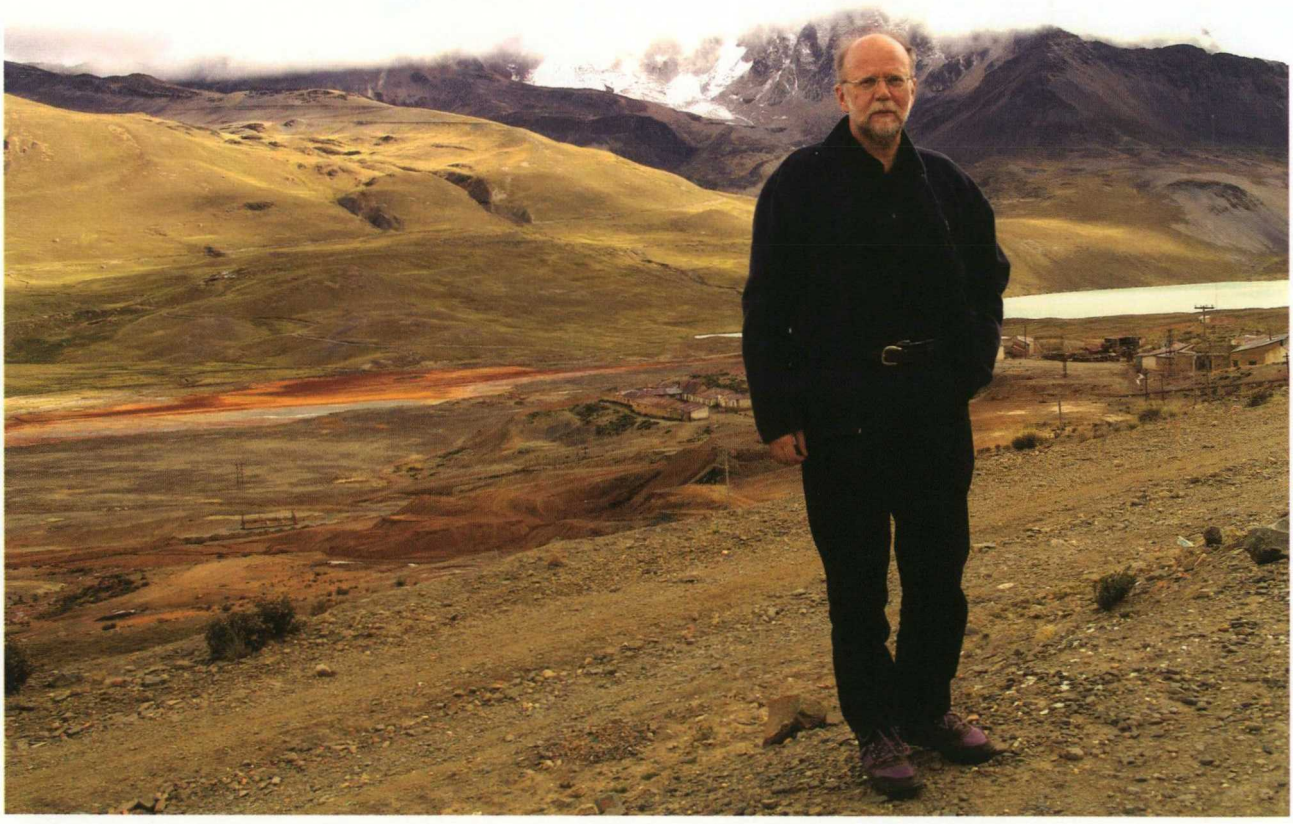
Interview with Prof. Zbigniew Kundzewicz

Mankind Must Adapt

Zbigniew Kundzewicz



Climate change is a fact, and glaciers all around the world are truly melting. The IPCC's incoming new climate report will strengthen these claims even more

Academia: Professor Kundzewicz, you were the only Pole to be listed among the authors of the Third Report of the IPCC (Intergovernmental Panel on Climate Change) on climate change in 2001. And so I can't help asking you about the fourth one, slated for publication in 2007.

Professor Kundzewicz: *In the process of developing the IPCC Third Assessment Report (TAR), I played the role of CLA (Co-ordinating Lead Author) of the chapter pertaining to Europe, in terms of the consequences of climate change, the strategy for adapting to such change, and our vulnerability to the related phenomena. I was in fact the only Polish CLA, although other Polish experts also made an important contribution to the TAR process, especially Professors Zdzisław Kaczmarek, Mirosław Miętus, Andrzej Kędziora and late Lech Ryszkowski. Polish specialists also reviewed various fragments of the report. For the Fourth Assessment Report (AR4) I will again play the role of CLA, this time for the chapter pertaining to water.*

Will the new forecasts be at least a bit less catastrophic?

I would not call the projections in the TAR catastrophic, although they do indeed predict various problems in certain regions and sectors of the economy - but also benefits in others. Nevertheless, positive changes are being forecast only in higher latitudes. For example, the conditions for agricultural production may improve in Scandinavia, yet on the other hand the warming of the northern climate will not by any means be favorable to polar ecosystems - the threat to the polar bear is now attracting a lot of media attention - or to the infrastructure built on permafrost, now ceasing to be "permanent."

What will change in the AR4 as compared to the TAR?

Above all, the evidence of global warming is stronger. Each year between 2001 and 2005 has rated as one of the six warmest years on record, since temperature records started to be kept worldwide in about 1860. This year, despite the cold first quarter seen in Poland, looks like it will also end up on the global list of the warmest years. July 2006 was the hottest on record in Poland. We can expect AR4 to contain the following assertions, believed to be "very likely": global warming is progressing and will progress ever more quickly; such warming is mainly caused by mankind, upon whose actions its speed depends; efforts to protect the climate by limiting emissions of greenhouse gasses into the atmosphere and capturing carbon dioxide, e.g. through afforestation, could slow temperature growth and rescue subsequent generations from the prospect of a five-degree temperature increase at the end of the 21st century. Yet climate warming is inevitable, and so mankind must adapt. The wealthy will manage to cope somehow, but the poor, already unable to bear the current climate change, will not be able to adapt to the changing conditions.

What about a possible global deluge?

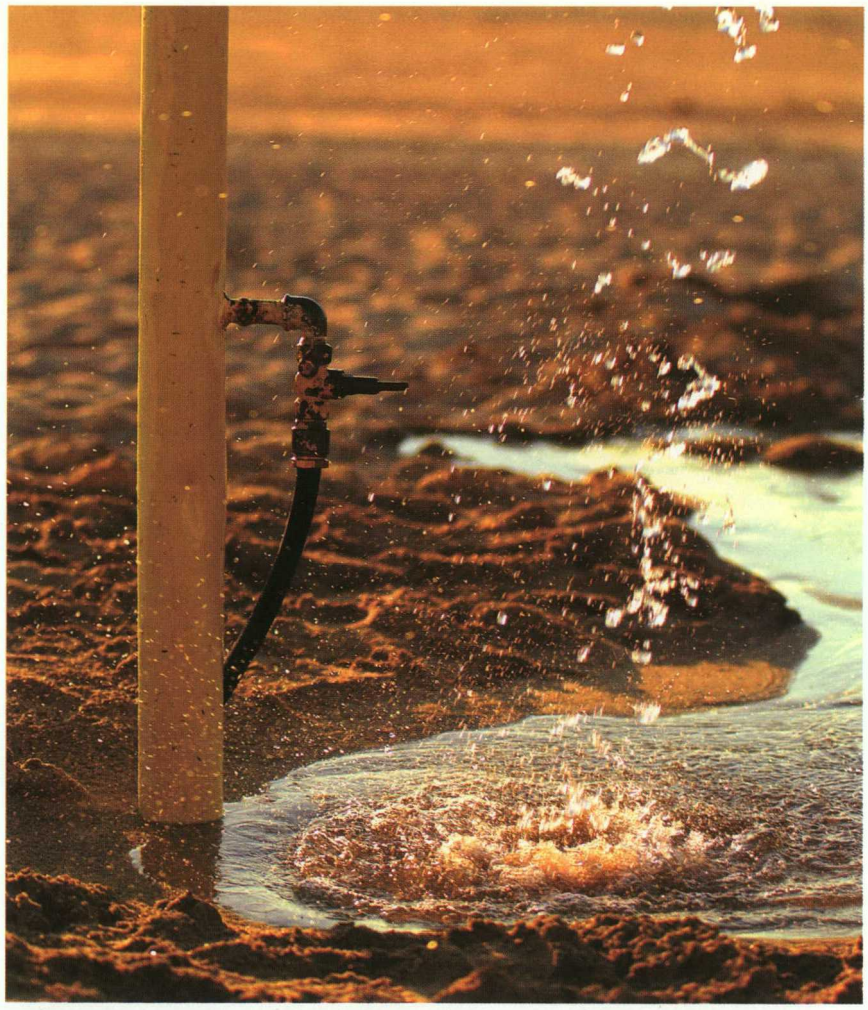
It will still be in the report. It is very likely that increased temperatures, or more directly the melting of alpine glaciers and Greenland ice sheet, will cause the level of the seas to go up to an extent that will even threaten the existence of small islands protruding only slightly from the water. To put it briefly, the new report will contain a better estimation of the likelihood of the projections, although in certain cases it will only indicate how we are increasingly more aware of how little we know.

What do such forecasts mean for Poland?

The impact of climate change will in our country be perceptible in many fields, such as health, agriculture, forestry, the water supply, insurance... Warmer water in lakes and the Baltic Sea may please some vacationers, provided that we manage to keep algae blooms under control. But heat waves will have a negative impact on the elderly and the ill. July 2006, significantly warmer than the long-term average, gave us a sample of what to expect in the future. A few decades from now such Julys will become commonplace, and the term "hot summer" will refer to temperatures much higher than now. However, although models of the global climate almost uniformly predict warming in Poland, in both winter and summer, the precipitation forecasts derived from various models differ, even disagreeing on what direction the change will take. Yet most models anticipate a drop in summer precipitation, which when combined with higher temperatures can be interpreted as increased drought risk – low water levels in rivers and lakes, low groundwater, and low water content in the soil. The ratio of summer precipitation to winter will decrease.

Europe has recently seen record floods and droughts. Are we already experiencing climate change?

The word "record" does not apply to flooding. Fortunately, no record has been set in this category in Central and Eastern Europe recently, i.e. since



Luc Gesselle

Given the increasing risk of droughts, unalleviated by more prevalently torrential rains, we should develop better water management strategies

2002, although it does seem that floods have occurred with increasing frequency. One-time extreme occurrences cannot be explained in terms of climate change. There has always been extensive natural variability in precipitation, and floods and droughts have plagued mankind since the dawn of time. But climate change, combined with other global changes such as demographic growth and its consequences, the urbanization of natural floodplains, are making extreme water-related events more frequent and more severe. Climate projections anticipate that the frequency and severity of droughts will increase in the inner areas of the continents – which include Poland as well. An increasing share of summer precipitation will come in the form of intense torrents, which could raise the flood risk.

Can we cope with this somehow?

There is no miracle cure to completely alleviate the flood risk to those who live near rivers. Embankments designed to withstand a "flood of the century" will fail if forced to face a "flood of the millennium" – something much less likely, but still possible. The best way of limiting flood damage is to abandon areas under threat. Droughts, in turn, can be alleviated through more efficient water use. Both floods and droughts can be alleviated by storing water when there is too much of it, so as to use it later when there is a shortage.

You have recently been much in demand as a climatologist in the Polish media. How does such a role suit you?

I feel a bit uncomfortable when the media portray me as a well-known climatologist. I have some trouble with categorizing myself, since I really do kind of "inhabit" more than one pigeonhole. I studied automatics, got my Ph.D., and then my D.Sc. in geophysics (hydrology). Now I am a professor of earth sciences. Starting in 1974 the fundamental field of my research work was water resources, although for a decade and a half I have been doing climate research, especially on the strong links between the climate and water resources. Media contacts do consume time, which I have very little of. But still, as you noticed, I don't avoid the media. As I take part in EU projects, I realize that one important group to which scientific research should be addressed consists of stakeholders. This includes media representatives, who need to be persuaded that what we are doing makes sense and yields interesting conclusions. Contacts with the media help me to organize material and force me to prioritize. An outside perspective, e.g. that of a journalist, can be insightful.

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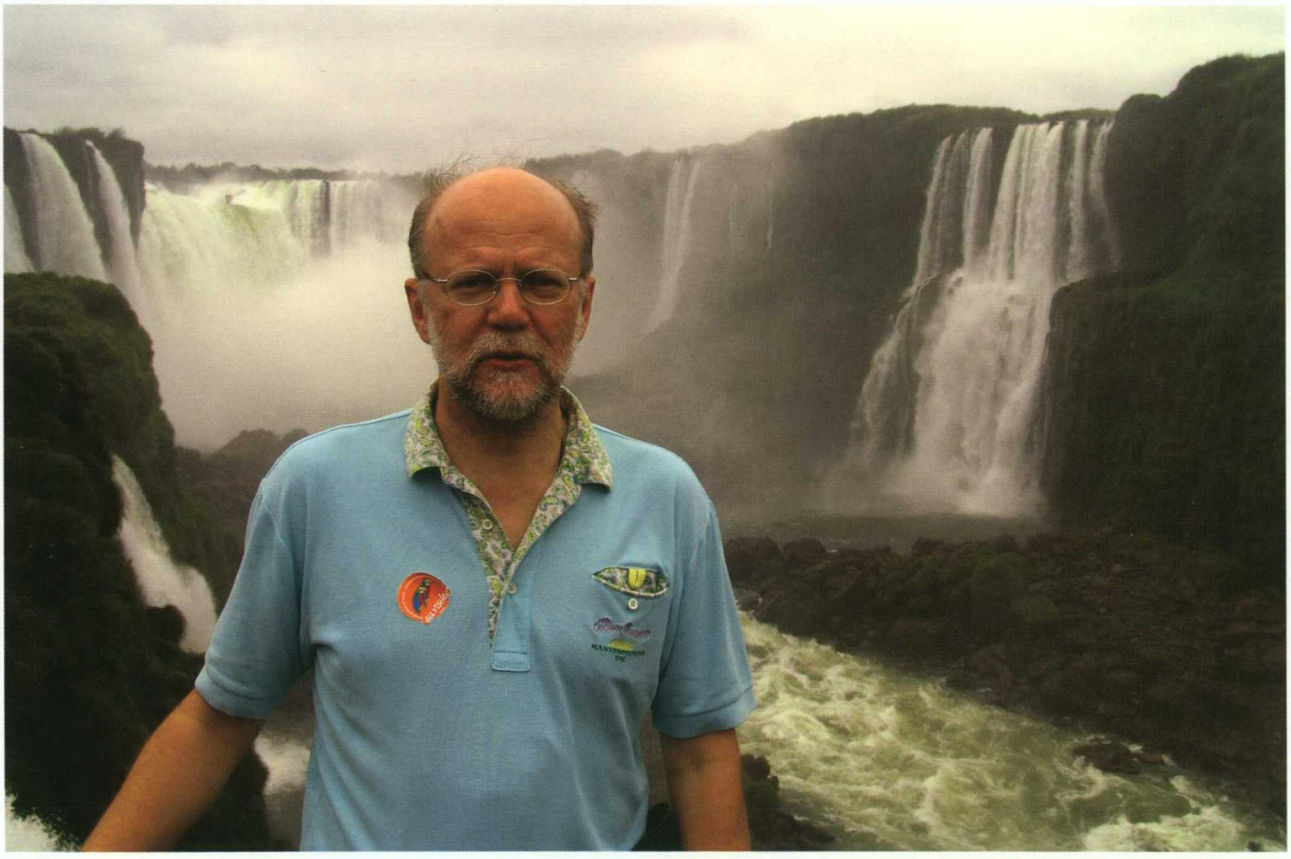

Professor Kundzewicz is a world-renowned expert on water resources – a highly multidisciplinary field involving hydrology, geology, climatology, law, and economics

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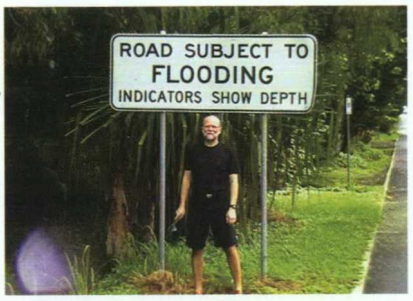

People will not succeed in halting global climate change any time soon. The only option is to adapt

However, one has to be aware of the risk of over-interpretation, the media's tendency to simplify and generalize things - positing general theories on the basis of individual findings.

In addition to working with the IPCC you lead two research teams, one in Poland, the other in Germany. How do you manage to reconcile so many duties?

I actually do even more than that. I probably take the greatest pleasure in the bimonthly journal published in England, the world's oldest hydrological periodical, which I have edited since 1997. When I became its editor-in-chief it was having trouble in obtaining materials and its impact factor index ranged around 0.3-0.4. Now I can afford to be very selective, rejecting two out of every three submitted articles on average. The impact factor reached 1.606 in 2005. That's quite a lot for the "water resources" category. Under my leadership the journal advanced into the top ten in the world in its field. I also recently took on an important post as a member of an advisory body for implementing the Seventh EU Framework Programme in the environment and climate field. Only about 20 experts were invited to do so, including only three from new EU members. My research teams in Poznań and Potsdam are not large, and so the administrative burden is fortunately bearable. Yet a lot of time does get taken up in applying for research projects, handling grants, and meeting a lot of reporting requirements. My team in Poznań is carrying out four EU research projects and one project commissioned by the Polish Ministry of Science and Higher Education. Essentially I have forgotten what it means to have free time, and I try to use every moment efficiently. In July I set aside a 9-day vacation for myself at the seaside, the longest I've had in years, but even so I spent several hours each day reading scientific literature, writing documents and email. It's hard to reconcile all these duties, and sometimes physically impossible, but I do my best to negotiate commitments, to adjust deadlines, and if possible send my younger colleagues. At times I come late to an event, dropping in like a meteor, deliver my paper and take part in the discussion, but then leave before things finish. Sometimes the same day I arrived.

What does your family say to all this?

They know that scientific work gives me great pleasure - I am doing what I really love. I really appreciate my family's understanding and support. My wife rightfully persuades me to slow down and to become more assertive. I do try, but I have always handled longer periods of work well and so I still allow myself to engage in extended stints of intense work. Of course, I dream of relaxation - of spending more time with my wife and children, practicing sports with my son - and sometimes I do manage to set aside some time, to recharge my batteries.

Can you tell us the secret of becoming a world-class expert?

I am a modest person. I owe my solid international position to a bit of talent, studying hard, and more than 32 years of persistent and intense research work. Plus of course a bit of luck, which I have always tried to take the best advantage of. Along the way I have met people who did not hamper me from pursuing my plans, and some who showed me goodwill.

I am certain that your interdisciplinary approach has also made a difference.

Yes, definitely. Water management is a domain that integrates many fields, including technical and natural sciences, economics and law. Water-related elements are scattered throughout various divisions of the Polish Academy of Sciences. Interdisciplinary interests do not fit in well with the structure of the Academy, which is dominated by classically compartmentalized domains, with quite limited communication between them. Yet the problems of the contemporary world are quite complex, and solving them requires many disciplines to be pulled together.

Interviewed by
Andrzej Pieńkowski
Warsaw, August 2006

Prof. Zbigniew Kundzewicz, professor of earth sciences, is head of two research teams at the Research Center for Agricultural and Forest Environment, Polish Academy of Sciences, and the Potsdam Institute for Climate Impact Research (PIK) in Germany. He earned his Ph.D. (1979) and D.Sc. (*habilitation* - 1985) from the PAN Institute of Geophysics in Warsaw. Since 1997 he has served as editor-in-chief of the bimonthly *Hydrological Sciences Journal*. Since 1998 he has worked as an author of Working Group II of the IPCC (*Intergovernmental Panel on Climate Change*), developing reports on the impact of forecast climate change on the environment, economy, and society. He is one of the two main authors of the chapter *Freshwater Resources and their Management* in the IPCC Fourth Assessment Report, to be published in 2007. He is also among the main authors of documents summarizing this report for the public. His research interests encompass a wide range of water resource related issues.