Climate and Society:
A New Research Area at IPRC

A new project, led by IPRC Executive Associate Director **Lorenz Magaard**, is starting at the IPRC. After meeting with **Wolf Grossmann**—a mathematician, socio-economist, and system scientist at the UFZ Center for Environmental Research in Leipzig and Halle, Germany—Magaard realized the significance of developing models that consider interactions between societal parameters and climate change. He invited Grossmann to spend five weeks this spring at the IPRC and SOEST. The third partner in this emerging effort is **Hans von Storch**, Director of the Institute for Coastal Research of the GKSS Research Center, Geesthacht, Germany, who visited the IPRC at the same time.

The key role in their project is played by Grossmann's ISIS model (Information Society Integrated Systems). This model describes interactions between such societal elements as economy, environment, human knowledge, and human attitude. It provides an analysis of past economic developments and transitions: an economy based on a new discovery begins, gathers steam, matures, and finally declines when another economy starts to take its place. The model considers how the evolution of an economy and the transition from a mature economy to a new one change human knowledge, human attitude, and the physical environment; it includes issues such as quality of life, education, training, and policies for support of the new economy. A past example of such an economic cycle and its impact on man and nature is the steam engine development. The model provides information to guide policy on how to best facilitate and support the economical and social transformation, while maintaining a healthy environment.

Recognizing that ISIS was missing an important element—the climate and climate change—Grossmann, Magaard, and von Storch are now working on integrating elements of climate risks (such as storms or flooding) and climate change (such as sea level rise) into the model. This effort is particularly timely. According to Grossmann, we are now in a process of economic transformation from a mature industry to a new, information-based economy (*information society*) that is evolving out of the new information and communication technologies (new ICTs). With the advent of ICTs, a large-scale demand for information and information-producing "machines" is emerging, together with many new types of jobs. This is accompanied by significant changes in social organization. The current transition is comparable only to the transition from the agricultural to the industrial age when, due to the steam engine, a big supply of energy could be accessed: fossil coal.

ISIS differs from other concepts of the society–climate interaction, in that society is not passively responding to climate and climate change, but is in the driver's seat. Environmental change is relevant as a constraint within which certain social and economic developments may emerge more, or less, favorably.

The project team is working on a pilot study of a world with two hypothesized regions: Region 1 is preferred—it has the mature industry, the new economy is sprouting here, people like to live here—but it is threatened by environmental extremes and changes. People don't like living as much in Region 2, it has little thriving mature industry and, therefore, almost no new-economic activity but it is less vulnerable to climate extremes. Business as usual would mean that the social and economic developments are mainly limited to Region 1, while Region 2 remains undeveloped. If an extreme climate event occurs, however, Region 1 would suffer greatly. The ISIS model helps policy makers and governments, for example, to compare the costs of such an extreme event in Region 1 with directing the ongoing course of economic development to the less dangerous Region 2. The model shows people the risks of setting up the new industries in Region 1 and reasons for encouraging them in Region 2. The team intends to expand this pilot study with more complex and realistic set-ups.

If ISIS is to be a policy tool that guides response to the new economy in an environmentally sound way, it must be developed now while the infrastructure for these new industries is still in its infancy.

Lorenz Magaard, Wolf Grossmann, and Hans von Storch