

# KlimaCampus Kolloquium

Prof. Klaus Keller

at the Invitation of the Institute of Oceanography  
of Universität Hamburg

## Climate Risk Management in the Anthropocene: From Basic Science to Decisionmaking (and Back)

More than a century ago, Svante Arrhenius quantified how burning fossil fuels warms the planet. He projected that anthropogenic climate change would bring benefits to cold regions. However, anthropogenic greenhouse gas emissions and the resulting climate change also cause complex risks. For example, anthropogenic climate change may drive a disintegration of the Greenland and West Antarctic Ice Sheets that would cause complex spatiotemporal changes in flooding risks. The objective to manage these and other climate risks has driven substantial investments in mitigation of greenhouse gas emissions and adaptation to climate change. In addition, funding agencies support research into geoengineering, the large-scale, intentional modification of the climate system. These actions pose the question: What are scientifically sound, economically efficient, ethically defensible, and sustainable climate risk management strategies?

This talk reviews current and suggests improved approaches to design and analyze climate risk management strategies. Choosing a climate risk management strategy requires navigating complex trade-offs across diverse objectives. In addition, this problem is imbued with deep uncertainty, where decisionmakers disagree about the appropriate problem framing, model structure, parameter values, and objectives. Neglecting this deep uncertainty can lead to considerable biases in risk assessments. Moreover, deep uncertainty can render the typically applied model of expected utility maximization a poor description of actual decisionmakers' preferences. Applying a robust decisionmaking framework can improve decision support, identify mission-critical basic science questions, simplify the integration of new scientific findings, and provide avenues to analyze coupled epistemic-ethical questions.

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