Research Projects from Associated PhD-Candidates

Dorothee Amelung

My research interests as a psychologist, and as part of the Heidelberg Marsilius project "Global Governance of Climate Engineering", cover all aspects of individual behavior in response to Climate Engineering technologies, and possible consequences. I am particularly interested in the aspect of risk and uncertainty (risk perception, risky decisions) as an important feature of complex problems. Therefore, I have been working on the risk acceptance of Climate Engineering, as well as on the question of how to deal with the complexity in this context.

- Dorothee Amelung, Dipl.-Psych. // Heidelberg University / Marsillus Kolleg // Supervisor: Prof. Dr. Joachim Funke

Melanie Bräunche

Climate Engineering and Human Genetics in a Comparative Perspective

I want to analyze the argument structures of both discourses with a focus on the associated metaphors and analogies. A comparison of risk structures of both discourses is also intended, which provides an opportunity to further elaborate the results of the CEIBRAL project.

- Melanie Bräunche // Heidelberg University / Institute for Political Science // Supervisor: Prof. Dr. Sebastian Harnisch

Stephan Ebert

The Blazing Sword of God. Medieval Perceptions and Reactions to Volcanic Induced Climatic Changes in the Empire North of the Alps.

Ice core data can reveal periods of strong historical volcanic eruptions. These eruptions had climatic impact of global dimension. How did society perceive such climatic transformations? Which explanations did people have and how did they react to these changes? Causing immense damage contemporary events like typhoons or hurricanes are often described as “apocalyptic conditions”. Can medieval tradition be the basis for such a vocabulary? Close connection to the SPP 1989 could provide interesting data by comparing historical and present approaches of Climate Engineering.

- Stephan Ebert, M.A. // TU Darmstadt // Supervisor: Prof. Gerrit Schenk

Hannes Fernow

Climate Change in the Age of Technical Reproducibility – Climate Engineering between Risk and Practice

Lack of experience with large-scale transformations of complex human-environment systems constitutes a major challenge for conventional approaches of risk management and climate ethics. Therefore, my research interest is the development of an alternative decision theory. Its methodological basis is formed by embedding arguments of philosophy of science and environmental ethics in historical concepts of risk, nature and technology.

- Hannes Fernow, M.A. // Heidelberg University / Department of Philosophy // Supervisor: Prof. Dr. Martin Gessmann

Daniel Heyen

My research focuses mainly on the role of uncertainty and learning in environmental decision making. In the DFG project "Information acquisition under fundamental uncertainty", I analyze the impacts of regulatory mandates under uncertainty on the incentives to undertake information acquisition. I was a member of the interdisciplinary Marsilius project "The Global Governance of Climate Engineering" (2009-12) in Heidelberg which brought together
young researchers from many different fields. During this time, I began my research on the intergenerational and strategic challenges of Climate Engineering technologies and got to know many people and ideas that currently come together in the SPP "Climate Engineering: Risks, Challenges, Opportunities?".

- Daniel Heyen, Dipl.-Math. // Heidelberg University / Dept. of Economics // Supervisor: Prof. Timo Goeschl, Ph.D.

Tronje Kemena

Climatic impacts of irrigated afforestation of the Sahara in a complex Earth System Model

Some scientists proposed afforestation of the Sahara as an applicable climate engineering method to counteract global warming. Past studies have primarily investigated the efficiency of carbon dioxide removal and estimated the realization costs. Possible impacts on climate were only treated aside and with simplified climate models.

Here we use for the first time a high-top state-of-the-art Earth system model, (NCAR's CESM-WACCM) to investigate in more detail changes in climate variability and circulation to a large-scale afforestation. We are interested in local changes but also in particular in global teleconnection patterns. A thorough analysis of the resulting regional and global changes will be presented, and the risks and feasibility of such large-scale afforestation projects will be reevaluated.

- Tronje Kemena, M.Sc. // GEOMAR, Kiel / Ocean Circulation and Climate Dynamics // Supervisor: Prof. Dr. Andreas Oschlies // Prof. Dr. Katja Matthes

Carola Kniebes

My current research focuses on the public perception of solar radiation management, afforestation and carbon capture and storage sub-seabed.

- Carola Kniebes, Dipl.-Vw. // Kiel Institute for the World Economy / The Environment and Natural Resources // Supervisor: Prof. Dr. Katrin Rehdanz

Judith Kreuter

Anthropogenic climate change is one of the greatest challenges of our time. The public, science and politics share this notion. The presentation of the phenomenon as a “crisis” in public discourse, however, could cause developments which have not been considered as of yet. While in the first four Assessment Reports by the Intergovernmental Panel on Climate Change (IPCC), the instruments of mitigation and adaptation play a central role, international scientific as well as political interest in Climate Engineering (CE) as a solution to problems caused by climate change is increasing. The thesis of this paper states that the perception and presentation of climate change as a crisis and the resulting state of exception could lead to the development and even deployment of instruments of CE, while alternative potential solutions are eliminated in public discourse. In that case, the development and deployment of CE instruments would not be based on sound scientific knowledge about the processes and backgrounds of the climate system, but rather on the fear of an even greater catastrophe.
The analysis of the above mentioned thesis is complicated by a common assumption about the situation of climate change which is often considered a necessary property of exceptional situations: Generally, climate change and its consequences for global society are considered unprecedented. According to this assumption, there is no past situation which can serve as precedence and which can inform and guide the search for a solution for the problem of climate change. This assumption is contested here. Instead, it will be presumed that the case of climate change is comparable to the case of antagonism during the Cold War: Both situations are considered “crisis” by their contemporaries, which, in turn, justifies the development and deployment of extraordinary measures; in one case, CE, and in the other, nuclear weapons. In both cases, the perception of “crisis” is based on objective as well as subjectively felt threads to values of a community; the situation has been communicated as a danger and has been accepted as such in the public sphere; the danger is considered global and the deployment of extraordinary measures is proposed.

- Judith Kreuter, M.A. // Münster University / International Governance // Supervisor: Prof. Dr.

Markus Lederer

Christine Merk

I research the public perception of Climate Engineering especially Solar Radiation Management. The focus is on understanding the impact of personal attitudes, values, and emotions on people's reactions when they are told about Climate Engineering, its benefits and its risks. The work is part of the project ACCEPT, which is funded by the German Federal Ministry for Education and Research.

- Christine Merk, M.A. // Kiel Institute for the World Economy / The Environment and Natural Resources // Supervisor: Prof. Dr. Katrin Rehdanz

Ronja Ritthaler-Andree

"Climate Justice and Climate Change Policy: The bargaining positions of China, USA and India within the UNFCCC and Kyoto Regime"

The dissertation examines the relationship between two topic areas of the current international environmental policy, which have not yet been connected, namely the debate on the just distribution of CO_2 mitigation measures in the context of the Kyoto Protocol and the discussion about big scale technical interference in the earth's radiation budget (CE). The study investigates the justifications used today for the participation (or non-participation) in the Kyoto mitigation process and how these justifications will or can be used in the future to legitimate additional CE measures, especially Carbon Dioxide Removal (CDR). The analysis is based on discourse analytical approaches as well as theories on global justice and so combines two approaches of current German CE research with studies on the formation of the mitigation regime. Firstly, the scientific research on physical limits and incompatible side effects of particular CE measures will be complemented by an analysis of the sociopolitical limits within the highest emitters (USA, China, India). Secondly, the assumptions of the prevalent economic studies will be scrutinized, which allot equal and homogenous preferences as regards CO_2 emission reductions or CE measures to societies with different historical experiences and political systems.

First, the study will examine similarities and differences of the legitimation of the previous emission reduction policy in the context of the Kyoto Protocol. The analysis will be based on Hajer's (2010) discourse theoretical approach and a quantitative and qualitative content analysis. Central to the justification of current emission reduction policies are arguments on participatory, distributive, and recognition-oriented justice, particularly the question of a historical carbon offset. As a second step, the analysis will compare the states' positions on the integration of CDR measures into the existing Kyoto Regime respectively the establishment of new international agreements. Subsequently, the study will discuss the implications of "sociopolitical limits" of the three emission reduction policies for the drafting of a post Kyoto Regime, which, apart from mitigation, would consist of further CDR measures and would reflect the results for shaping CE research in environmental economics.

- Ronja Ritthaler-Andree, M.A. // Heidelberg University / Institute for Political Science // Supervisor: Prof. Dr. Sebastian Harnisch

Isabell Schrickel

Two questions contour my PhD project: first, how can computer simulations be described as epistemological and technological conditions of the Anthropocene? And second: what future policies are obtained from their use as scenario techniques? In this context, I am interested in the role of geoengineering within geopolitical and economical environmental reaction portfolios in response to climate change.

- Isabell Schrickel M.A. // Leuphana University of Lüneburg / Institute for Advanced Study on Media Cultures of Computer Simulation // Supervisor: Prof. Dr. Claus Pias