

**PARALLEL SESSION A : BENEFITS OF DOWNSCALING
A3: FROM DATA TO INFORMATION - A DISTILLATION DILEMMA**

From regional climate scenarios to economics: identifying uncertainties and risks in the adaptation modelling chain

Kirsten HALSNÆS

Technical University of Denmark - Denmark

Planning and decision-making for instance in terms of supporting adaptation related to fundamental societal infrastructure such as transport, energy and water systems increasingly rely on quantitative information regarding climate change impacts and risks derived from combinations of different data sources e.g. climate, physical/environmental and socio-economic models and their inherent uncertainties. In practical terms it is however generally difficult to carry out full and unbiased analyses due to critical assumptions and methodological challenges related to key uncertainties along all steps of the modelling chain (scenarios, climate models, impacts models, economics, decision-making, etc.) which may be in parts related to lack of information crucial for determining future impacts and risks. For example at the regional or local scale such impact assessments are typically contingent on the availability and quality of high-resolution regional climate change projections made available through communities such as CORDEX. In this study we present the results of using a methodological framework for integrated analysis of extreme events and damage costs aimed at distilling information obtained through trans-disciplinary approaches while systematically identifying key factors and uncertainties in the modelling chain, which are relevant for specific adaptation decisions. The approach is here applied to a case study of urban flooding for the medium sized Danish city of Odense. We address a number of different combinations of climate scenarios/projections, damage cost curve approaches, and economic assumptions, including risk aversion and equity represented by discount rates. Considering a wide range of these different types of assumptions we find a very wide range of risk estimates, but we are also able to identify a range of robust decisions, and we investigate some of the major impacts of alternative assumptions. The study demonstrates that in terms of decision-making the actual expectations concerning future climate impacts and the economic assumptions applied are very important in determining the risks of extreme climate events and, thereby, of the level of cost-effective adaptation seen from the society's point of view.

Reference. Halsnæs et al. (2015) Key drivers and economic consequences of high-end climate scenarios: uncertainties and risks. *Climate Research* Vol. 64: 85–98

Kirsten Halsnæs¹, Martin Drews¹, Per Skougaard Kaspersen¹

¹Technical University of Denmark