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Expert elicitation as tool for climate and hydrological model uncertainty reduction

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As part of the ERA-NET Cofund for Climate Service from JPI-Climate, Expert Elicitation (EE) has been investigated as a tool for uncertainty reduction in the research project AQUACLEW in European case studies. Results from the elicitation can be compared to quantitative approaches to determine whether we have the knowledge and skills to differentiate good-performing models from an ensemble of models. EE could thus be a potential method to refine the climate-impact production chain, in cases where a quantitative validation of the ensemble is not feasible.
To implement the EE on selective case studies of AQUACLEW we have developed a framework of the procedure. This protocol is then used as training material by experts who are invited to a one-day workshop. In this document an introduction provides background information about the project including a short description of the five case studies involved in the elicitation. A subset of the EURO-CORDEX EUR-11 ensemble of climate models based on three General Circulation Models and four Regional Climate Models is described. Finally, the hydrological models used in three of the five case studies are described along with results on their skills to simulate the observations at the selected study sites.
As an example, the Danish case study focuses on agricultural production in central Denmark. Climate change in the Danish case is expected to affect soil moisture and wetness conditions during winter and spring, where more precipitation is foreseen, and dryness during summer and early fall, where less precipitation is expected. More wetness/higher groundwater levels during winter and spring will adversely affect the farming field work in connection with sowing as well as crop growth on water logged fields leading to needs for increased drainage of fields. Dryer summers will adversely affect crop yield and lead to needs for increased irrigation. Hence both flooding and drought has been examined together with the resulting effect on the root zone moisture content, the groundwater level and the river discharge. Focus is given to uncertainty of the projections of future conditions which is a function of both emission scenario, choice of climate model and agro-hydrological model.
The presentation will focus on the training material consisting of a structured, condensed text and comparable illustrations across case studies and selected modelling approaches. Results of the EE

workshop held in March 2020 will be discussed with lessons learned and viability of the EE tool.