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Seasonal predictions as a high-resolution large ensemble to study extreme events over recent decades

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Large ensembles of climate model simulations may be used to assess the likelihood of extreme events, which only have a limited chance of occurring in observed records. In this talk, we discuss how the ECMWF seasonal prediction system SEAS5 can be used to generate a 100-member ensemble over 1981-present. SEAS5 is a global coupled ocean, sea-ice, atmosphere model with a horizontal resolution of 36 km. We introduce an open and reproducible workflow to retrieve Copernicus SEAS5 data and evaluate the ensemble member independence, model stability, and model fidelity. We illustrate how the increased sample size may help risk estimation, detecting trends in 100-year extremes as well as analysing drivers of extreme events that are difficult to discern from limited observational records.