

Constraining near-term climate projections by combining observations with decadal predictions

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- Increasing demand for robust, reliable, and actionable climate information for the near-term future



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- subject to drift because of intrinsic model errors
- skill may be limited after a few years or even months depending on the region
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- Implementation of adaptation policies requires seamless and relevant information on the evolution of the climate over the next decades
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- → Opportunities of a blending method combining both observations and decadal predictions ?



Region: Northern Europe (NEU); variable: surface temperature

Historical simulations from CNRM-CM6-1 (30 membres)





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Atlantic Multidecadal Oscillation



N = 10 members best similarities with observed Atlantic Multidecadal Variability (AMV) over the 1970-2000 period



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N = 10 members best similarities with observed ERA5 surface temperature over the 1970-2000 period





. . .

Data and method

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. . .

Subset tas (10) Subset AMV (10)

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Trends in surface temperature over Northern Europe



10 years (2001-2009)



→ Overall reduction of the spread in AMV + decadal prediction dataset in comparison to historical or decadal predictions only

Trends in surface temperature over Northern Europe



10 years (2001-2009)



Trends in surface temperature over Northern Europe



Restrospective evaluation: each five years from 1961 to 2014



→ This reduction of the spread = overall consistent across the historical period + with no increase/decrease in the mean error

Conclusions and perspectives



- Preliminary work to develop a constraint method combining informations from observations and decadal predictions to provide seamless climate information for the near-term future
- First results with a method using the AMV to select a sub-ensemble of non-initialized climate simulations and then refining this sub-ensemble of trajectories by selecting a subset based on its consistency with decadal predictions seems promising
 - Decrease in the spread of surface temperature over Nothern Europe without change in the mean error
- Upcoming works:
 - Try other predictors (e.g. AMOC; SST subpolar gyres)
 - Apply this method in a perfect model framework (using one member as observations)