Royal Netherlands
Meteorological Institute
*Ministry of Infrastructure
and Water Management*

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KNMI LENTIS

LARGE ENSEMBLE TIME SLICE

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NEW & IMPROVED EC-EARTH ENSEMBLE

The impact of hydrological model structure on the simulation of extreme runoff events

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Geophysical Research Letters

RESEARCH LETTER
10.1029/2019GL081967

Key Points:
- Statistical models to describe extreme river discharge can be unreliable when multiple processes lead to extreme events
- Large ensemble model experiments (many simulation years) are suitable for analysis of extreme events and do not rely on statistical models

Added Value of Large Ensemble Simulations for Assessing Extreme River Discharge in a 2 °C Warmer World

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Impact of precipitation and increasing temperatures on drought in eastern Africa

Sarah F. Kew[1], Sjoukje Y. Philip[1], Mathias Hauser[2], Mike Hobbins[3,4], Niko Wanders[5], Geert Jan van Oldenborgh[6], Karin van der Wiel[6], Ted I
E.L. Otto[10]

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Environmental Research Letters

Regional differentiation in climate change induced drought trends in the Netherlands

Sjoukje Y Philip[1,3], Sarah F Kew[1], Karin van der Wiel[1], Niko Wanders[2] and Geert Jan van Oldenborgh[1]

Contents lists available at ScienceDirect

Renewable and Sustainable Energy Reviews

journal homepage: www.elsevier.com/locate/rser

ELSEVIER

Meteorological conditions leading to extreme low variable renewable energy production and extreme high energy shortfall

K. van der Wiel[a,*], L.P. Stoop[a,b], B.R.H. van Zuijlen[c], R. Blackport[d], M.A. van den Broek[c], F.M. Selten[a]

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SCIENCE ADVANCES | RESEARCH A

CLIMATOLOGY

Strong future increases in Arctic precipitation variability linked to poleward moisture transport

R. Bintanja[1,2]*, K. van der Wiel[1], E. C. van der Linden[1,3], J. Reusen[1,4], L. Bogerd[1], F. Krikken[1], F. M. Selten[1]

The Arctic region is projected to experience amplified warming as well as strongly increasing precipitation rates. Equally important to trends in the mean climate are changes in interannual variability, but changes in precipitation fluctuations are highly uncertain and the associated processes are unknown. Here, we use various state-of-the-art global climate model simulations to show that interannual variability of Arctic precipitation will likely increase markedly (up to 40% over the 21st century), especially in summer. This can be attributed to increased poleward

Identifying meteorological drivers of extreme impacts: an application to simulated crop yields

Johannes Vogel[1,2,*], Pauline Rivoire[3,4,*], Cristina Deidda[5], Leila Rahimi[5,6], Christoph Alexander Sauter, Elisabeth Tschumi[3,8], Karin van der Wiel[9], Tianyi Zhang[10], and Jakob Zscheischler[3,8]

KNMI – LENTIS: IN SHORT

- EC-Earth3_p5
- Large Ensemble Time Slice: 2 climatic periods
  - Present- day 2000-2010 with historical forcing
  - PD +2K 2075-2084 with SSP2-4.5 forcing
- 2 x 1600 simulated years

PURPOSE

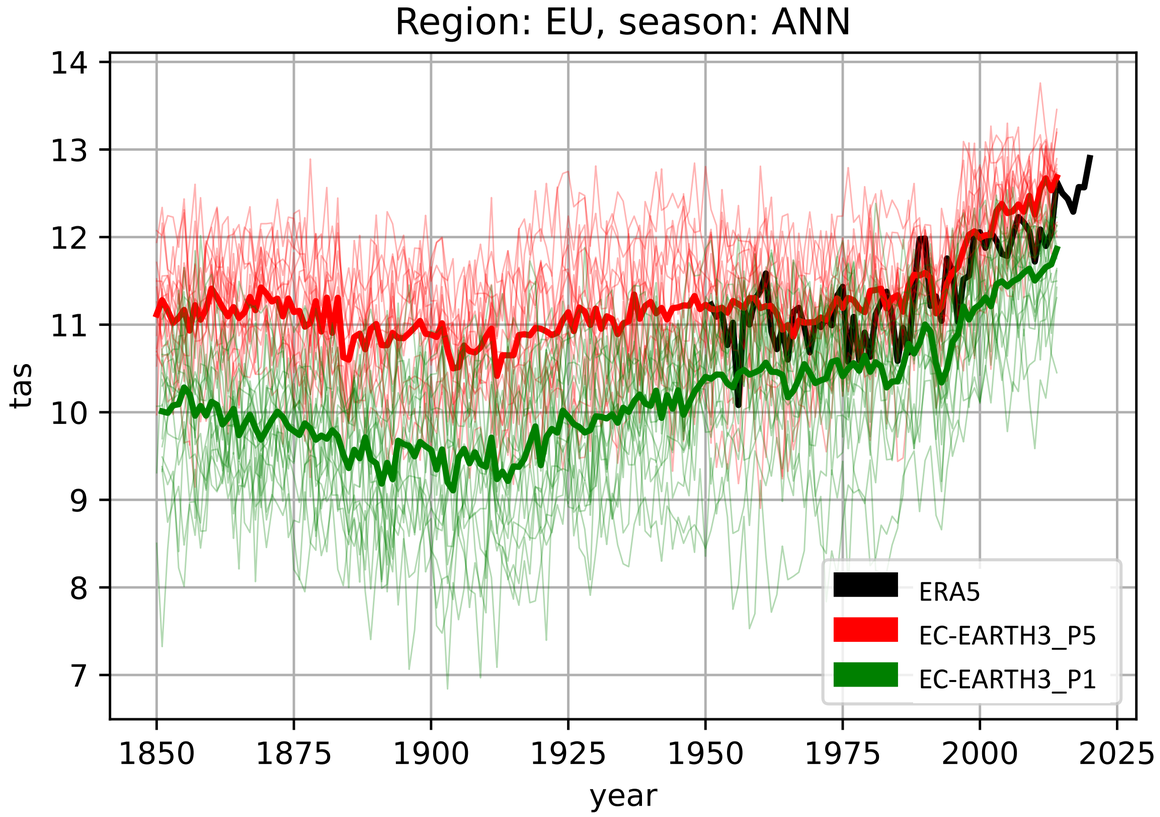
Generate enough data for studying climate variability and extreme events *now* and in a *future*, warmer climate state

KNMI – LENTIS: CMORIZED OUTPUT VARIABLES

- Daily and sub-daily (3hr, 6hr) surface water balance and surface energy balance variables
- Daily 3D atm variables RH, Q, T, U, V, W on plev8 (1000, 850, 700, 500, 250, 100, 50, 10 hPa)
- ATM, and LND data monthly. Further, also ocean, sea-ice variables

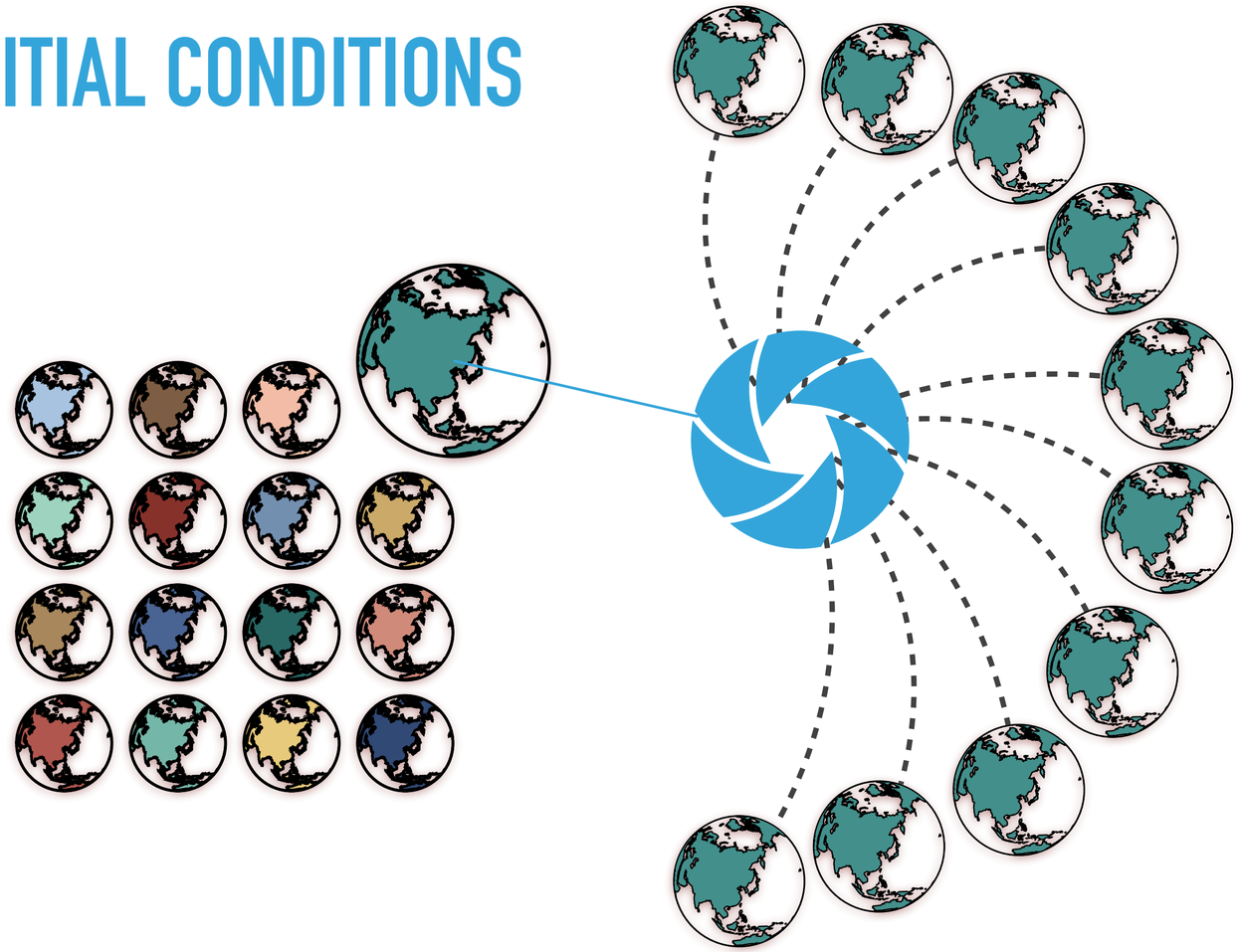
EC-EARTH3_P5 – 16 TRANSIENT PARENT SIMULATIONS

16 parents



16 parents started in 1850. All 25 years apart from the previous, branched from the 1850_PI spin-up.

INITIAL CONDITIONS



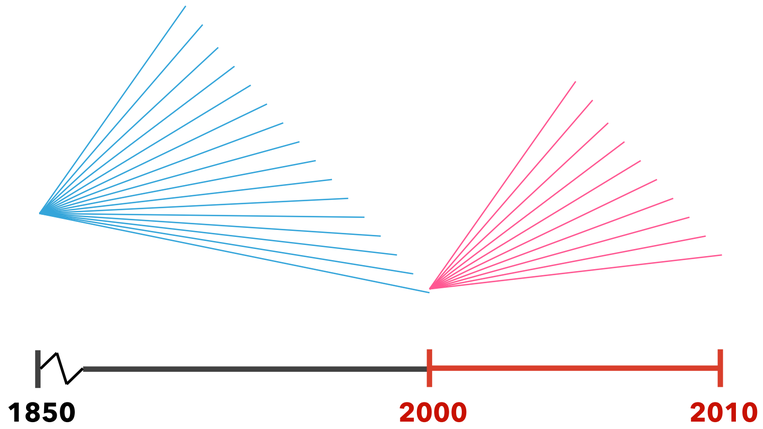
Micro perturbations in 3D atmosphere temperature field atmosphere

- 1 original initial conditions
- 9 seeds, i.e., variations of micro perturbations

TIME SLICE LARGE ENSEMBLE SET-UP

10 seeds per parent

16 parents

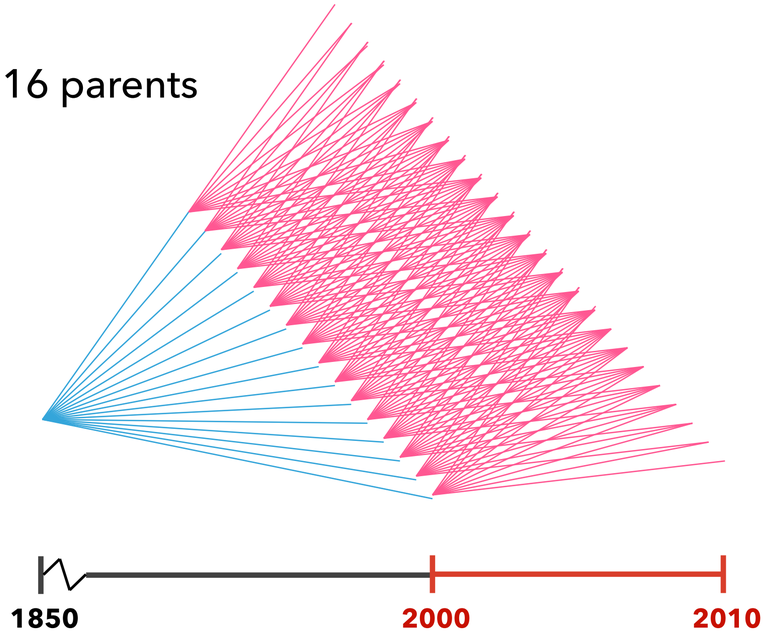


100 years PD

TIME SLICE LARGE ENSEMBLE SET-UP

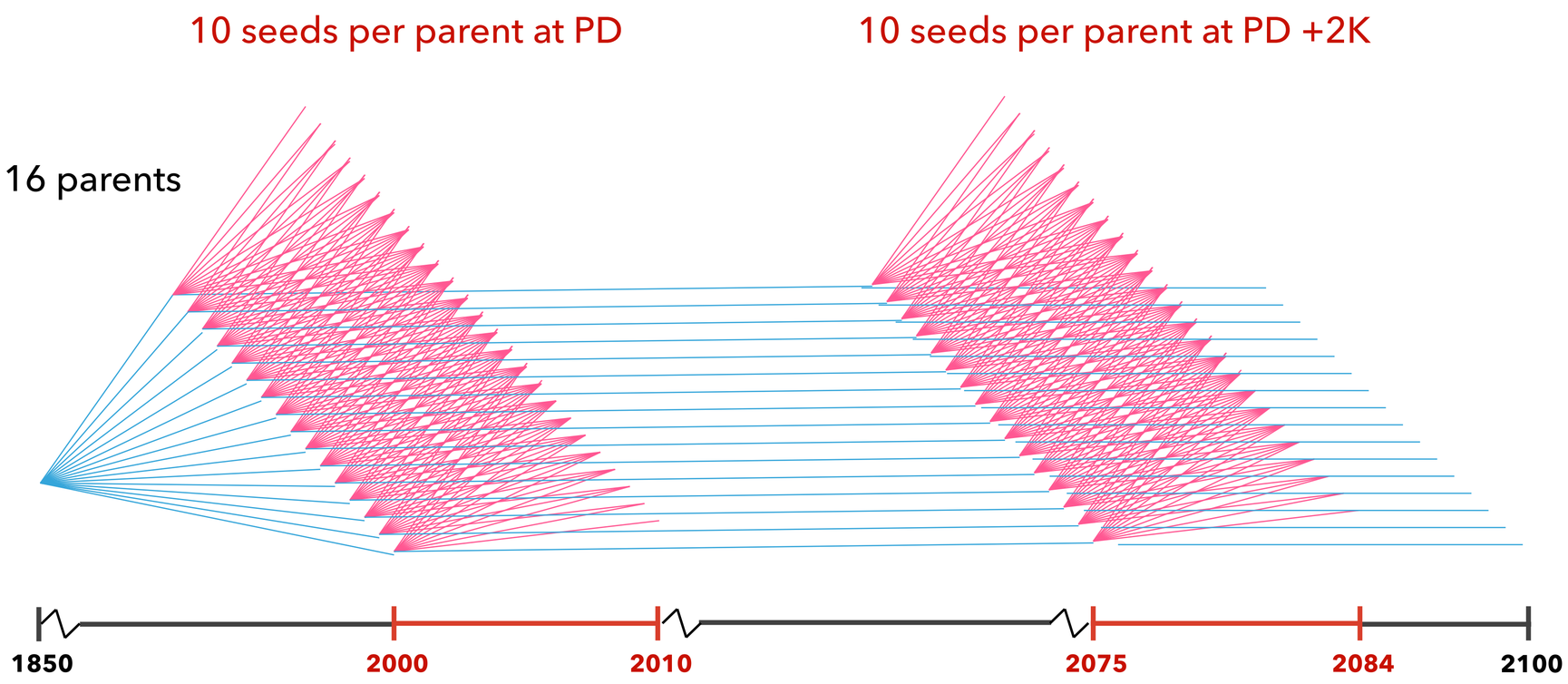
10 seeds per parent

16 parents



1600 years PD

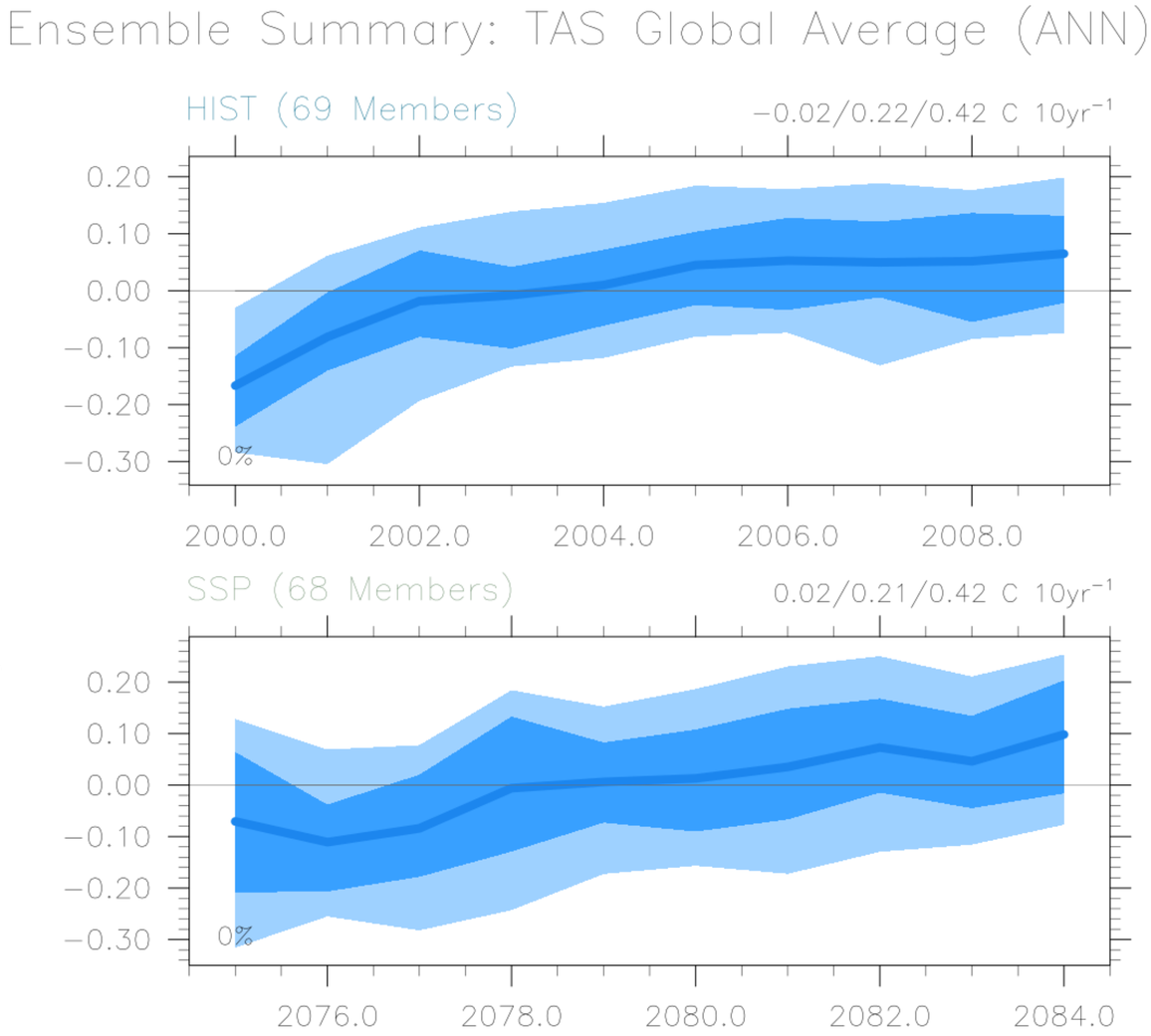
TIME SLICE LARGE ENSEMBLE SET-UP



1600 years PD + 1600 years +2K

CURRENT STATUS OF KNMI – LENTIS

- Production is halfway
- Estimated time of finishing: June '22
- Planned for later in 2022:
  - Datapaper to describe the dataset
  - Publish (part of) the data on ESGF/onlin



PLEASE FEEL FREE TO CONTACT ME FOR QUESTIONS OR IF YOU LIKE TO WORK WITH THIS DATA SET

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THANK YOU