

CANARI Large Ensemble

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CANARI Large Ensemble: Design

Model

- HadGEM3-GC3.1 (the UK Met Office CMIP6 model)
- N216-ORCA0.25 (~60 km atmosphere, $\frac{1}{4}^\circ$ ocean)

Experiments

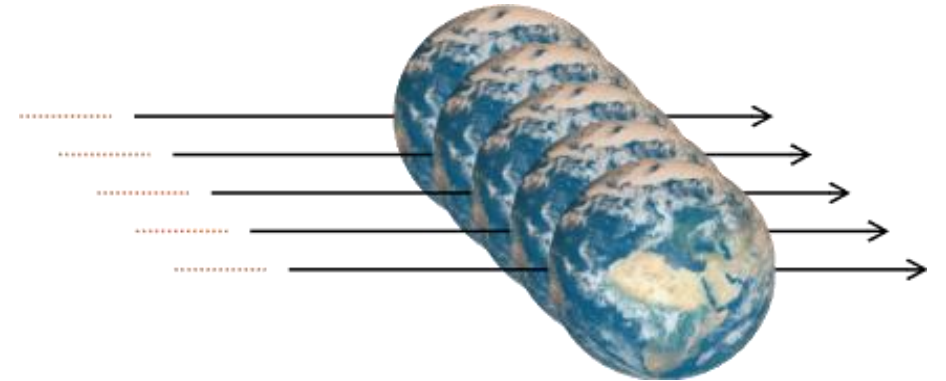
- CMIP6 historical (1950 – 2014)
- CMIP6 SSP3-7.0 (2015 – 2099)

40 members

- Hybrid initialisation
- 8 macro ICs x 5 micro perturbations

Output

- 6000 years – “CMIP6-like”
- RCM boundary conditions for a wide range of CORDEX-like domains



Reinhard
Schiemann



Grenville
Lister



Rosalyn
Hatcher



Bryan
Lawrence

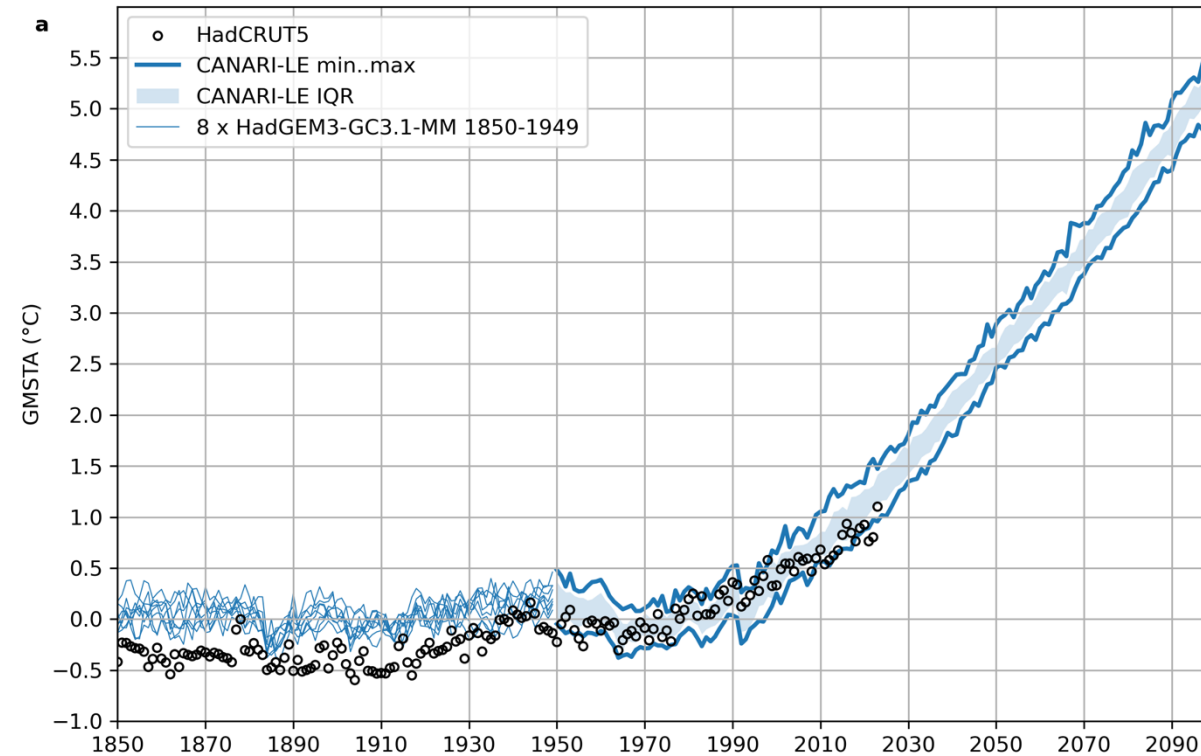


Dan Hodson

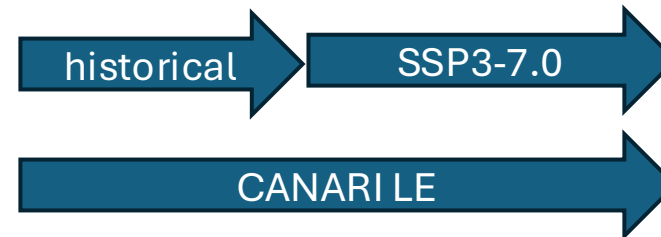
and many others!

Global mean surface temperature

- too strong cooling 1950-75, potentially due to too strong aerosol forcing (M. Andrews et al. 2020)
- climate sensitivity (and warming) too high 1980-2014 due to several forcings and feedbacks (T. Andrews et al. 2019)
- variability ~OK



(anomalies from
1961-1990)
(no detrending / drift
correction)



CANARI Large Ensemble: Output and access

- Full output stored on Elastic Tape at JASMIN
- Subset of priority variables stored on the JASMIN CANARI GWS
 - `/gws/ssde/j25b/canari/shared/large-ensemble/priority`
 - `.../HIST2` (CMIP6 historical, 1950-2014)
 - `.../SSP370` (2015-2099)
 - `.../ATM`
 - `.../OCN`
 - `.../CICE`
- Documentation of the simulations and data
 - https://promote-project.github.io/promote_analysis_sprint_2026/datasets

Data

Volumes (compressed): ~5.5 PB

- 2 PB atmos fields
- 0.4 PB ocean fields
- 0.1PB ice fields
- 2.1 PB of frames etc

4.5 Million Files!

CANARI Large Ensemble

- provisionally citable as:
- Schiemann, R. K. H., Lister, G., Hatcher, R., Hodson, D., Lawrence, B., Shaffrey, L., Cole, J., Dittus, A., Mecking, J., Robson, J., Wilson, S., Aksenov, Y., Blaker, A. T., Harvey, B., Martínez-Alvarado, O., Osprey, A., Rynders, S., Ahmadi, S., Aylmer, J., Baker, L., Case, D., Gentile, E. S., George, S., Hodges, K., Karlowska, E., Lang, C., Lu, H., O’Callaghan, N., Osmolska, W., Osprey, S., Phillips, T., Schröder, D., Smith, R., Turner, A. G., Woolnough, S., Andrews, M., Coward, A., Hardiman, S., Harle, J., Rostron, J. W., Sexton, D. M. H., Sinha, B., Williams, J., and Wilson, C.: The CANARI HadGEM3 Large Ensemble: Design, and evaluation of historical experiments, *submitted to Geoscientific Model Development*.
- (draft circulated on sprint slack)