

GloSAT Outreach

Science input to Norwich Climate Mural

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in collaboration with local artist **Gennadiy Ivanov**

Our Brief

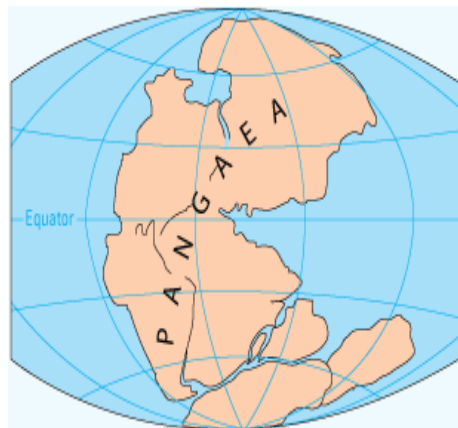
To contribute to an artwork commissioned by Norwich City Council by providing a climate timeline relevant to Norwich or the world that would put past events into a climate context and reflect the scale of changes now underway.

We chose GMST as our variable and the Cenozoic epoch combined with future projections from reduced complexity climate models to encompass climate states relevant to our past, present and future.

* GMST = Global Mean Surface Temperature

Cenozoic Epoch

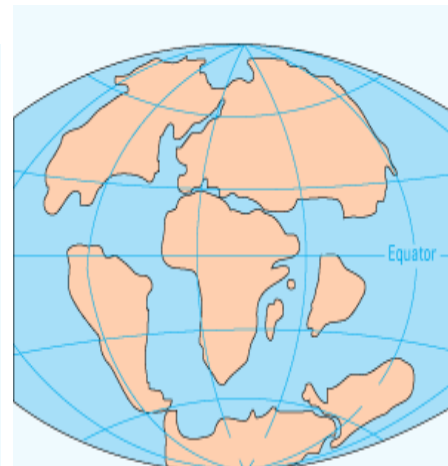
Cenozoic (*καίνος* 'new' + *ζωή* 'life') is our geological era (the last 66 million years) and the current configuration of the continents. It began with the Cretaceous–Paleogene extinction event (attributable to the Chicxulub impactor) when plants, birds and mammals could diversify and dominate → “**Age of Mammals**”



PERMIAN
225 million years ago



TRIASSIC
200 million years ago



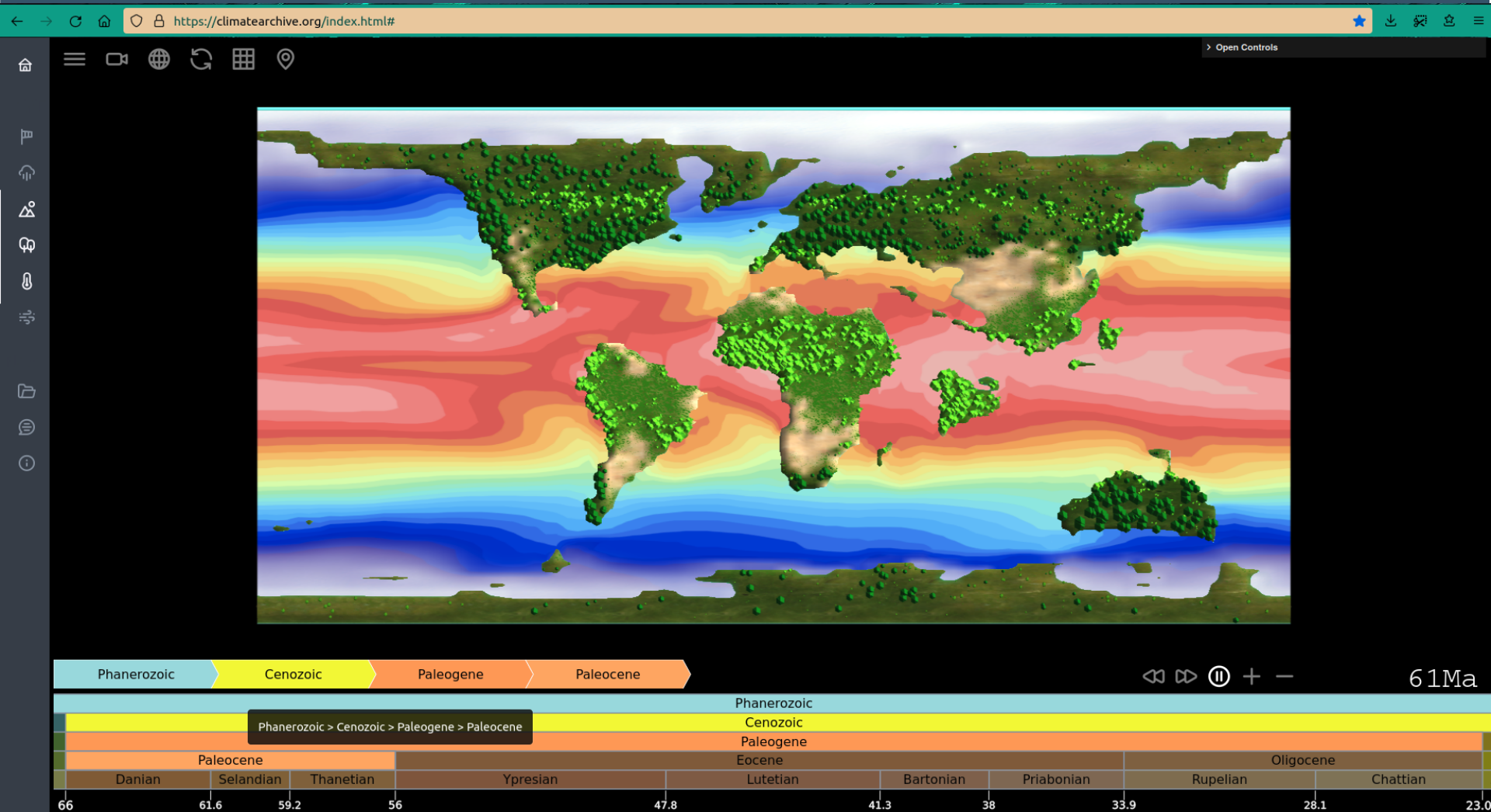
CRETACEOUS
65 million years ago



PRESENT DAY

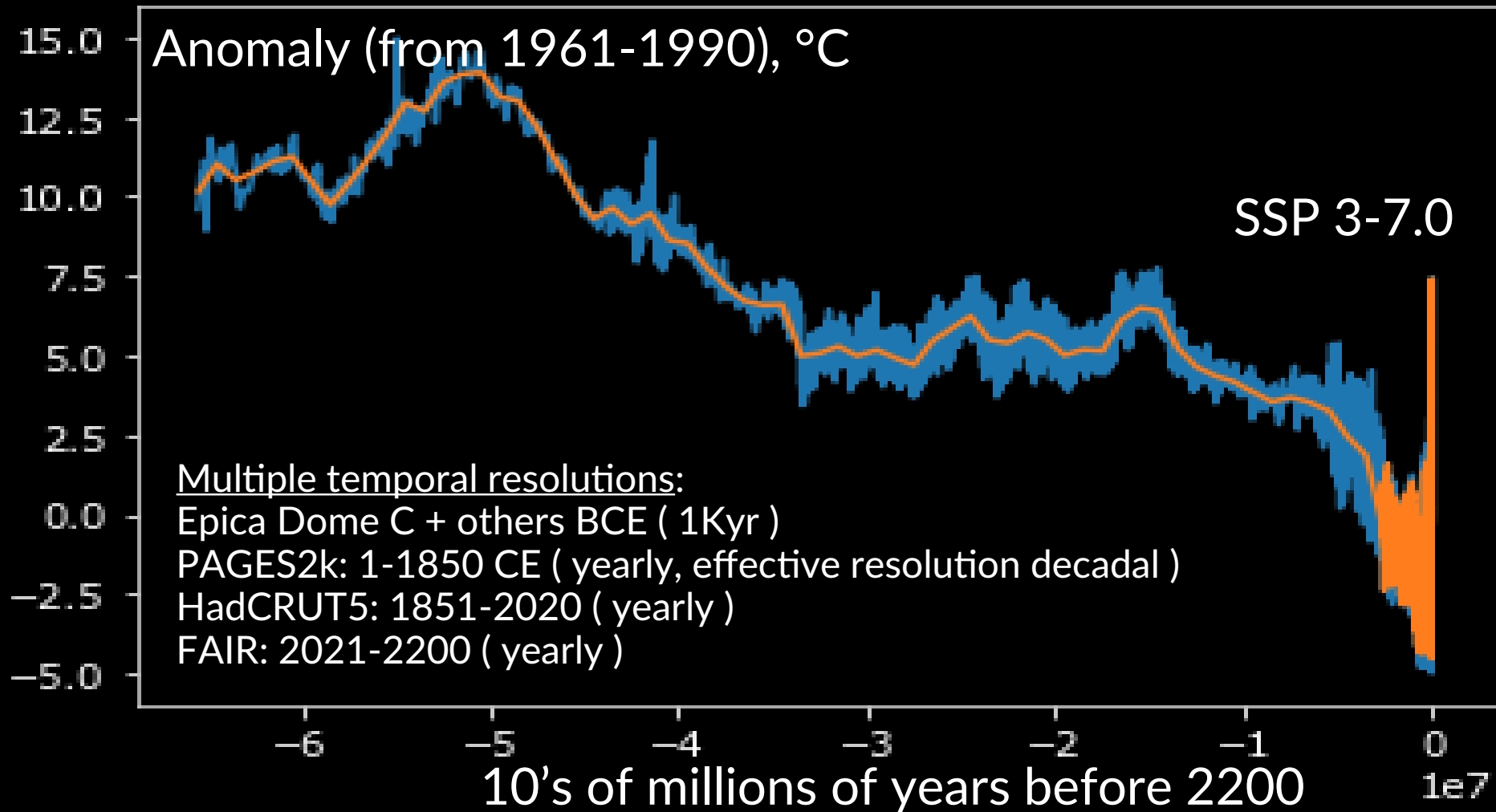


Climate Archive 66 Ma BCE

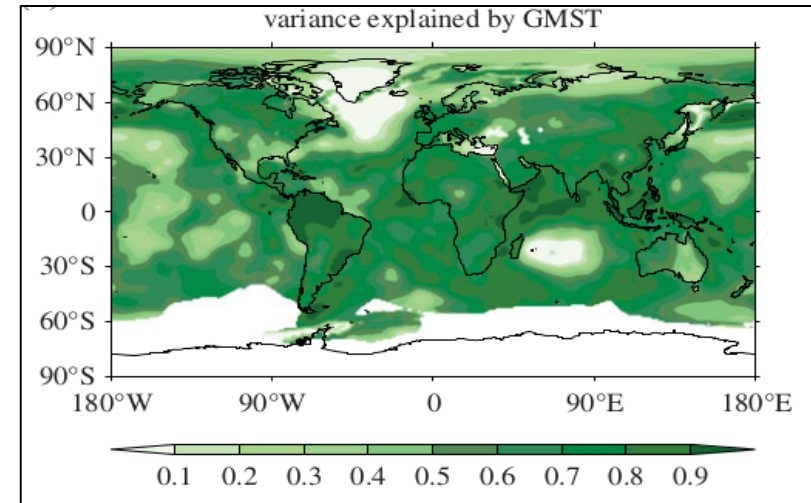
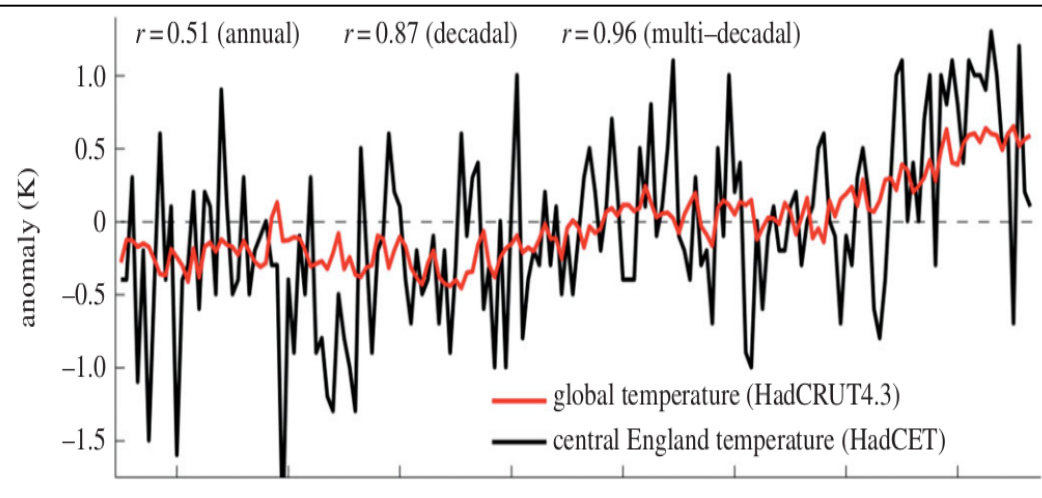


SST (+sea-ice), vegetation and elevation – note the ice-free Antarctica

Rebinning the GMST record

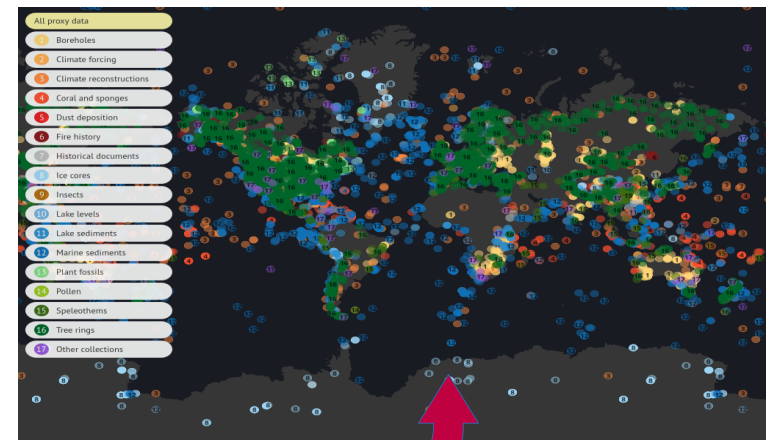


What about regional variability ?

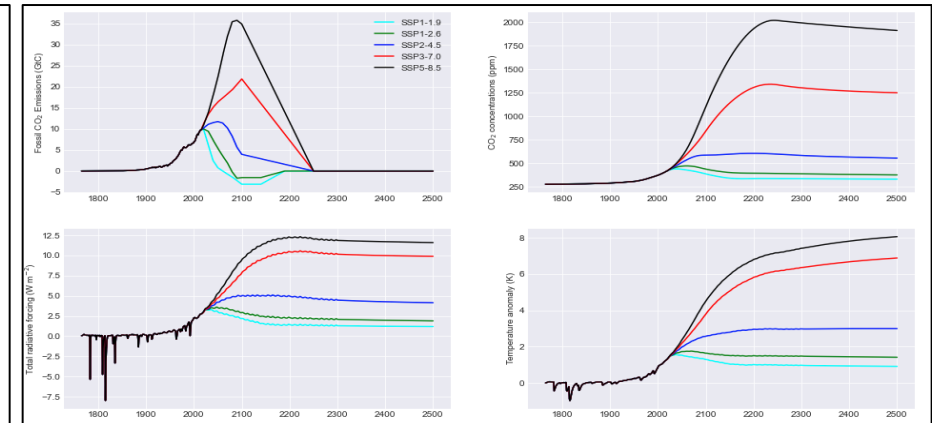
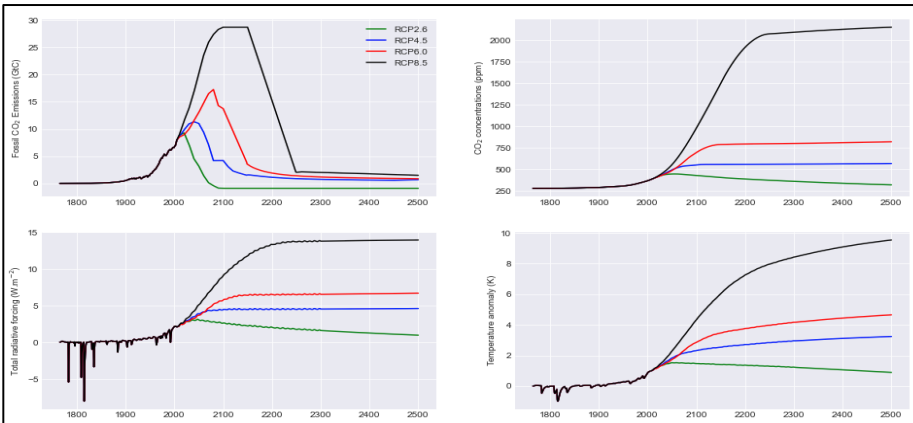
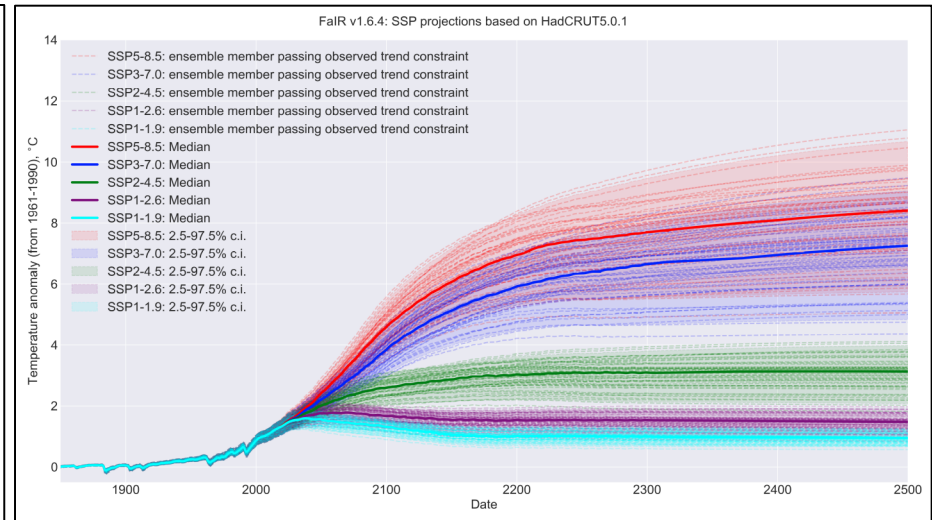
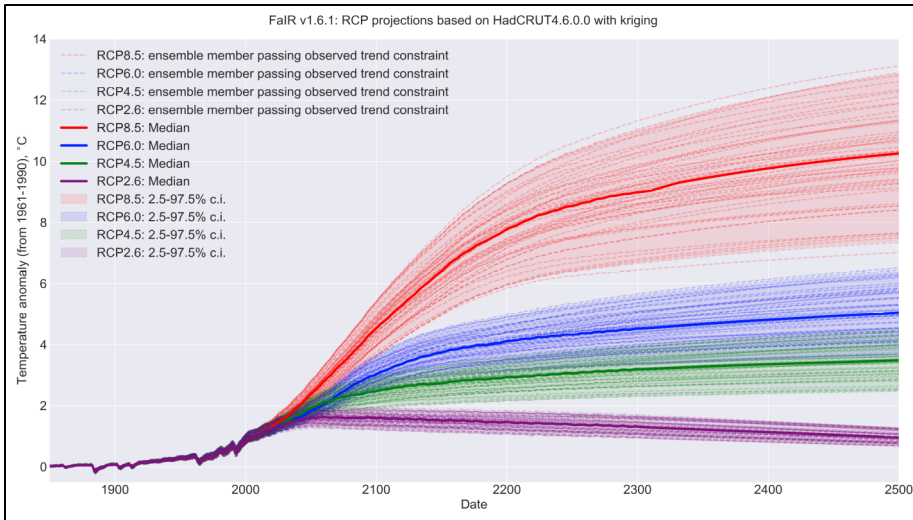


Sutton, Suckling, Hawkins 2015, What does global mean temperature tell us about local climate? Phil. Trans. R. Soc. A 373: 20140426. <http://dx.doi.org/10.1098/rsta.2014.0426>

- There are ~ 40 spatial degrees of freedom in GMST
→ Some locations correlate well
- Paleoproxy temp reconstructions provide decent spatial coverage



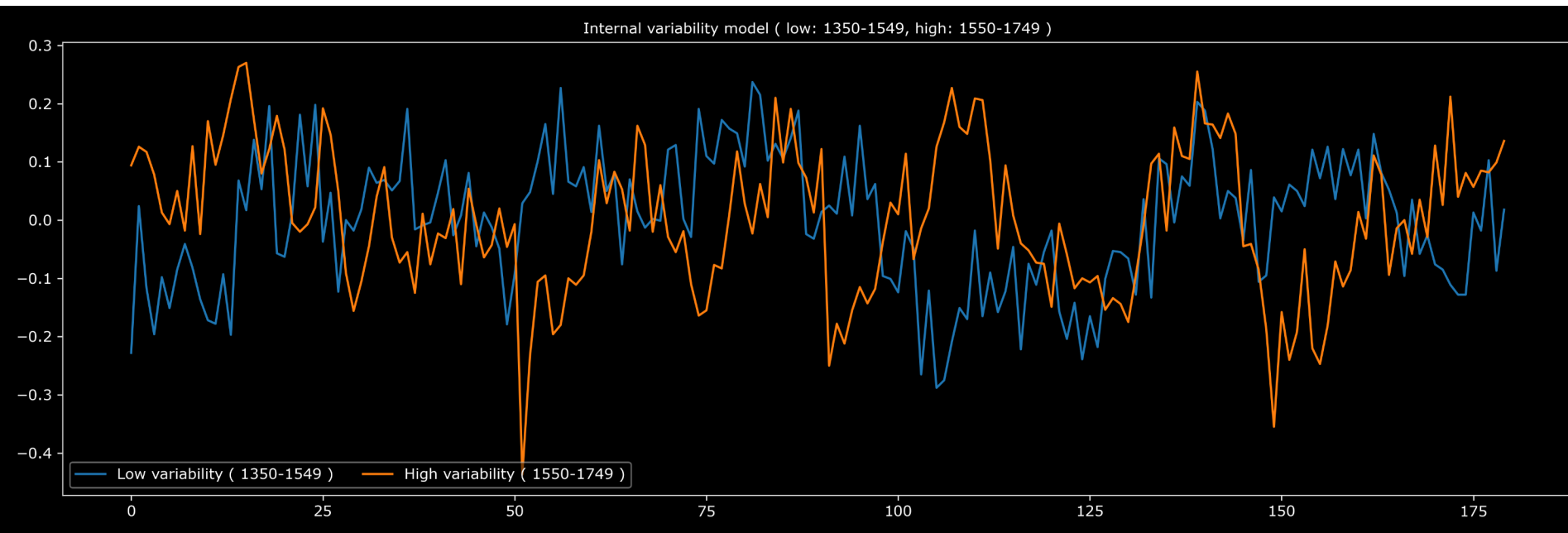
Adding Projections 2021-2200 CE



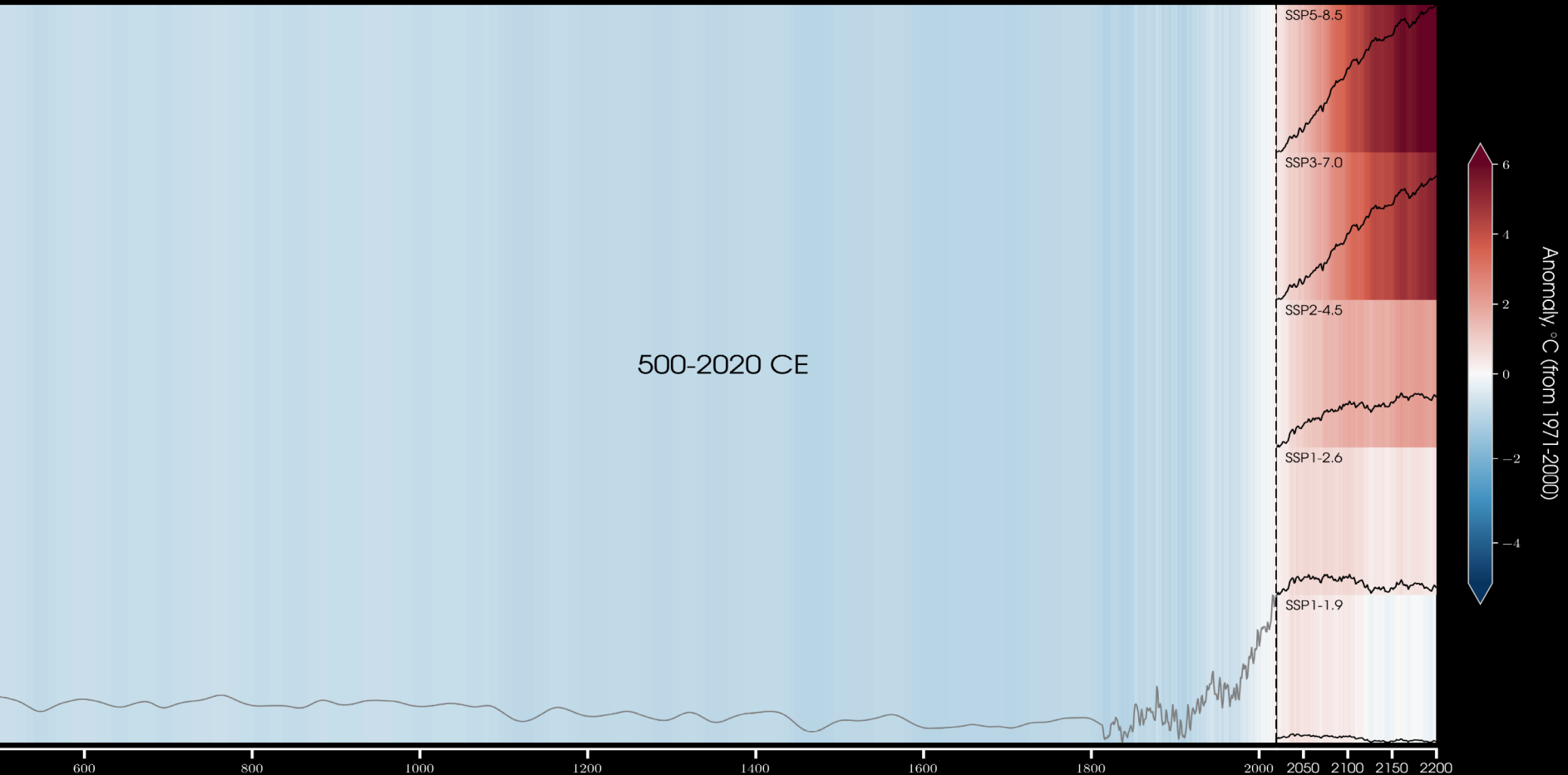
We use the reduced complexity FaIR climate model: <https://pypi.org/project/fair/>

What about climate variability in future projections ?

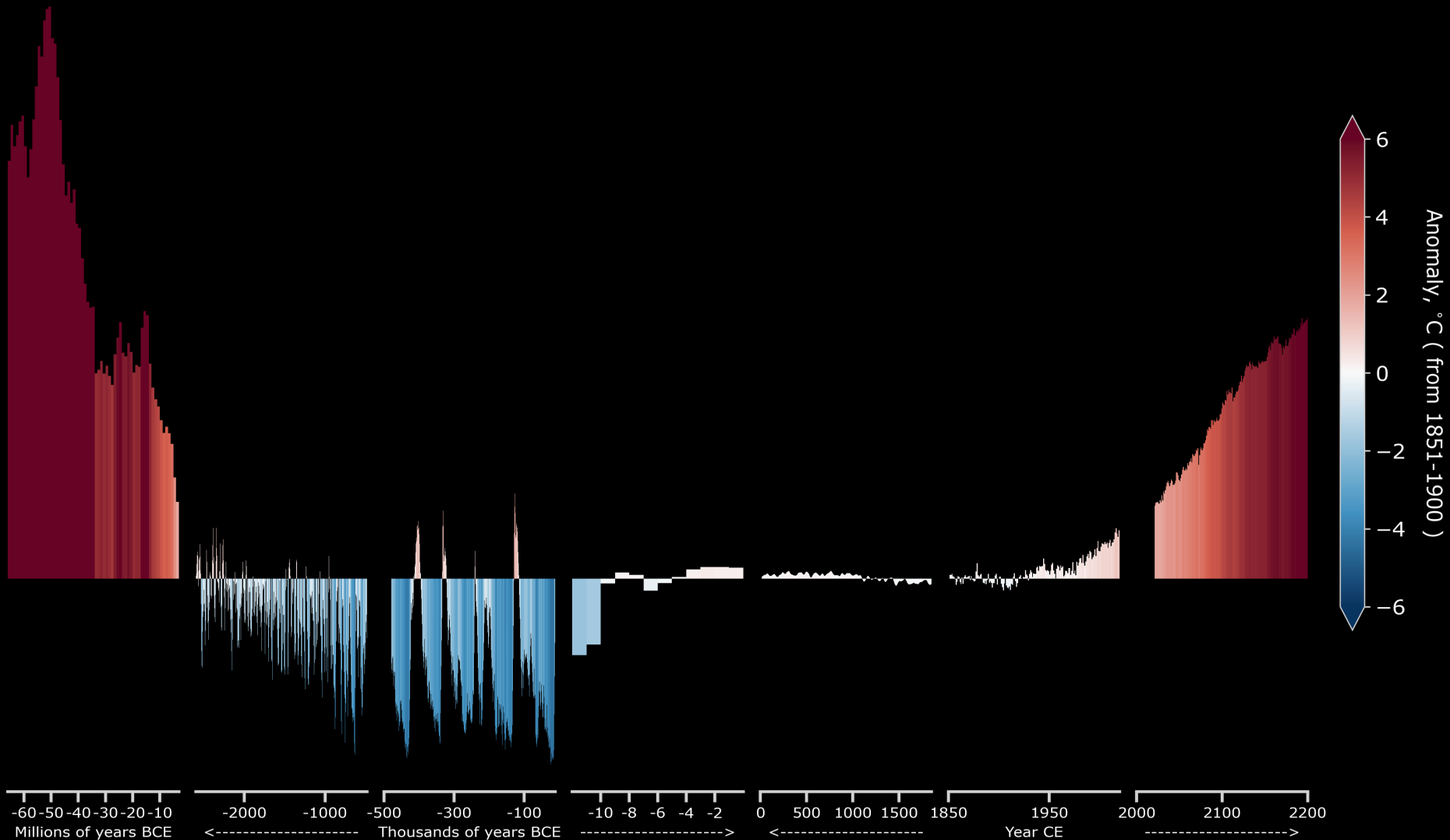
- For low climate forcing projections like SSP 1-2.6 we use a low variability analog from the past (1350-1549 CE)
- For high climate forcing projections like SSP 3-7.0 we use a high variability analog from the past (1550-1749 CE)
- We add these to the FAIR climate model projections



Age of Norwich + FAIR Projections (with variability)



Age of Mammals: 66 Myr BCE – 2200 CE: SSP 3-7.0

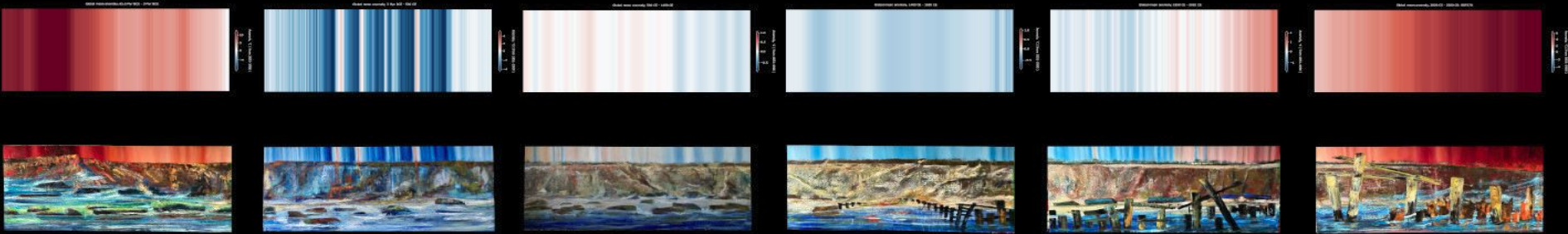


Art & Science

C.P. Snow talked about “The Two Cultures” (SCI & HUM) and Plato in *Symposium* talked about the content union of two halves. We’re happily working with a local artist Gennadiy Ivanov to produce a 10m x 2m mural for the council chamber in the Norwich City Hall that incorporates warming stripes and depicts climate impacts on Norwich during the Age of Mammals.



SCIENCE



Artist Gennadiy Ivanov

ART

Work in Progress



Integration of local elements (e.g. 1400-1850 CE)



Launch Date: 26 November 2022

WATCH
THIS SPACE!

26 NOV