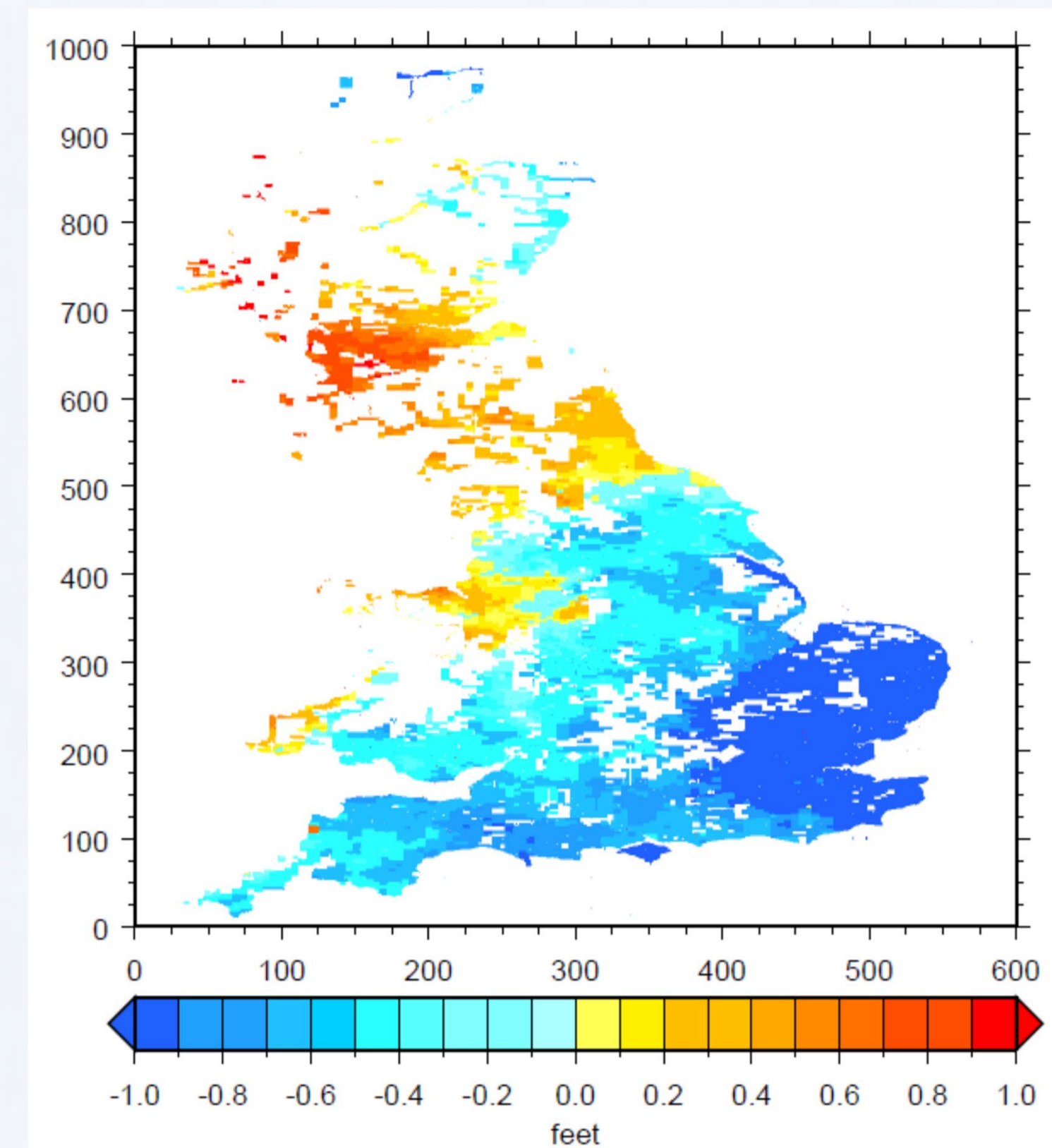
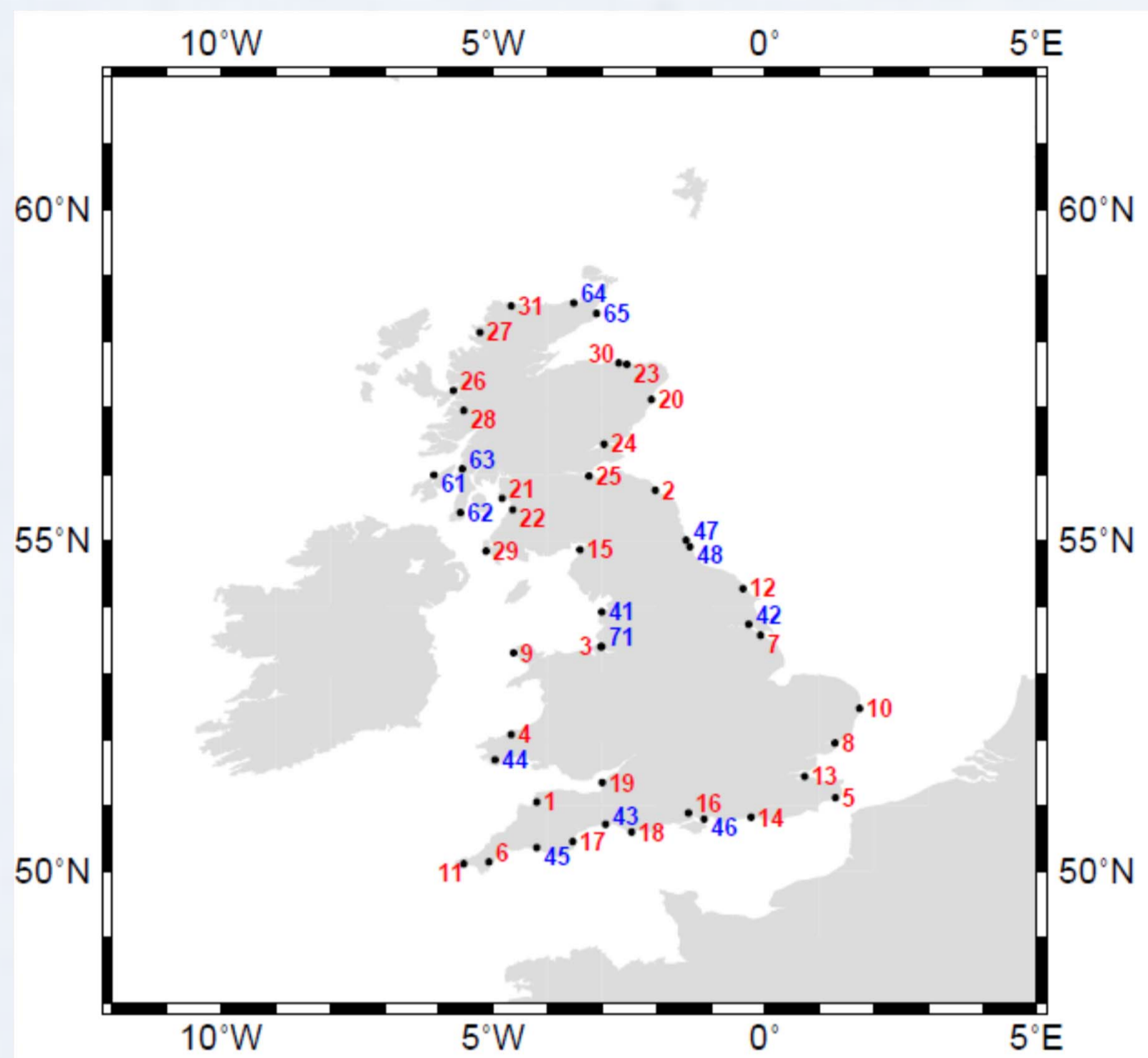


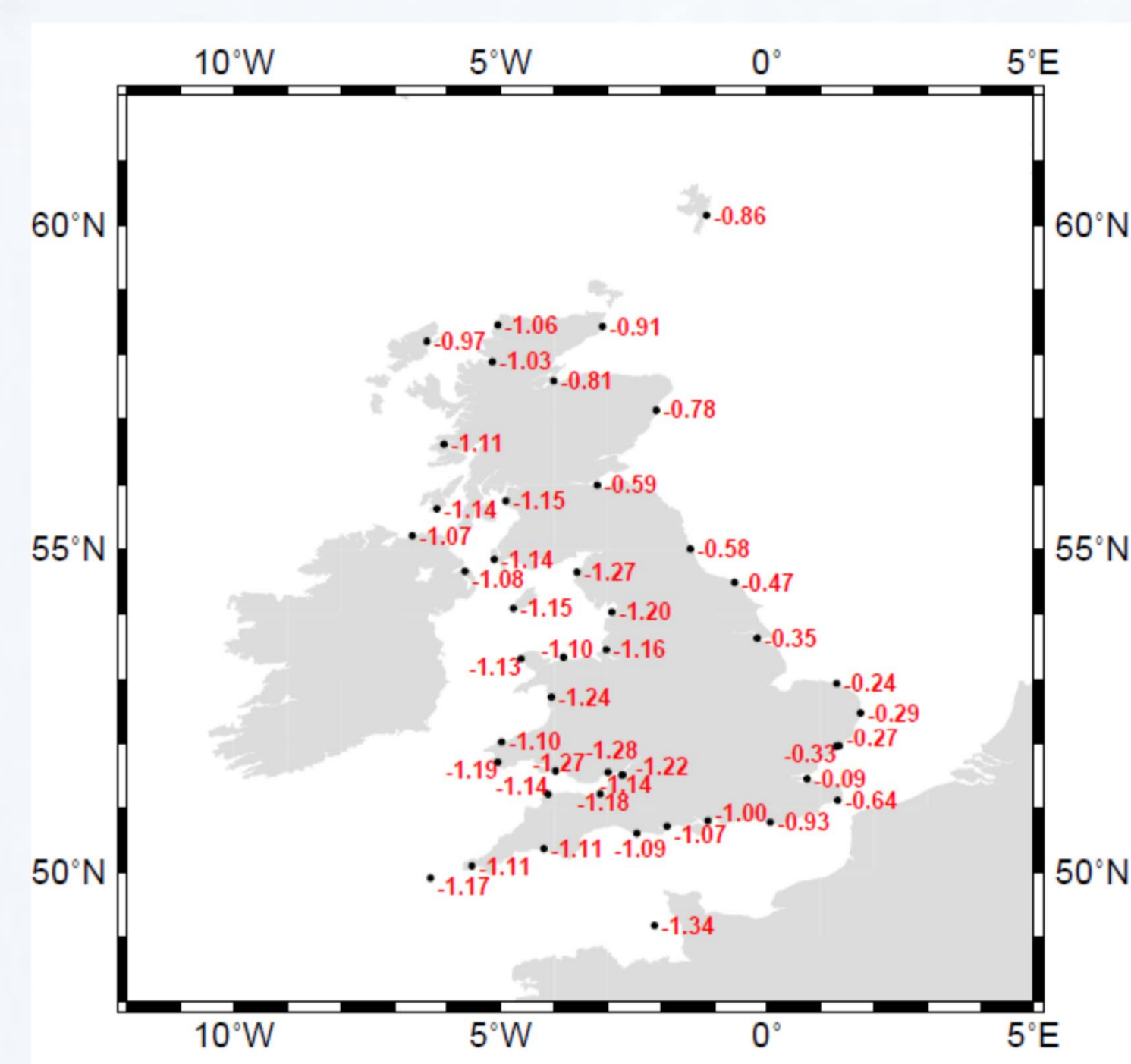
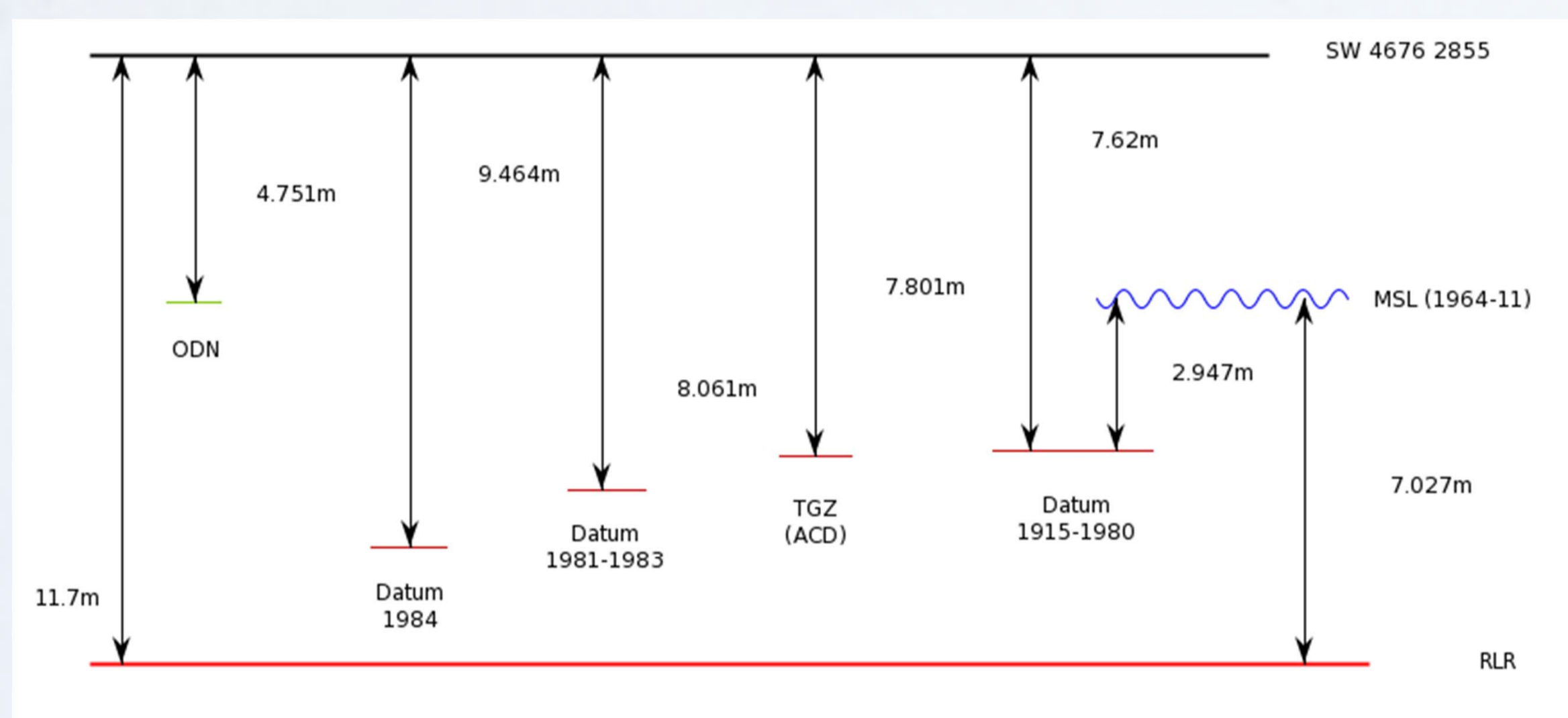
Sea Level Change in Great Britain between 1859 and Present

Philip Woodworth (NOC)



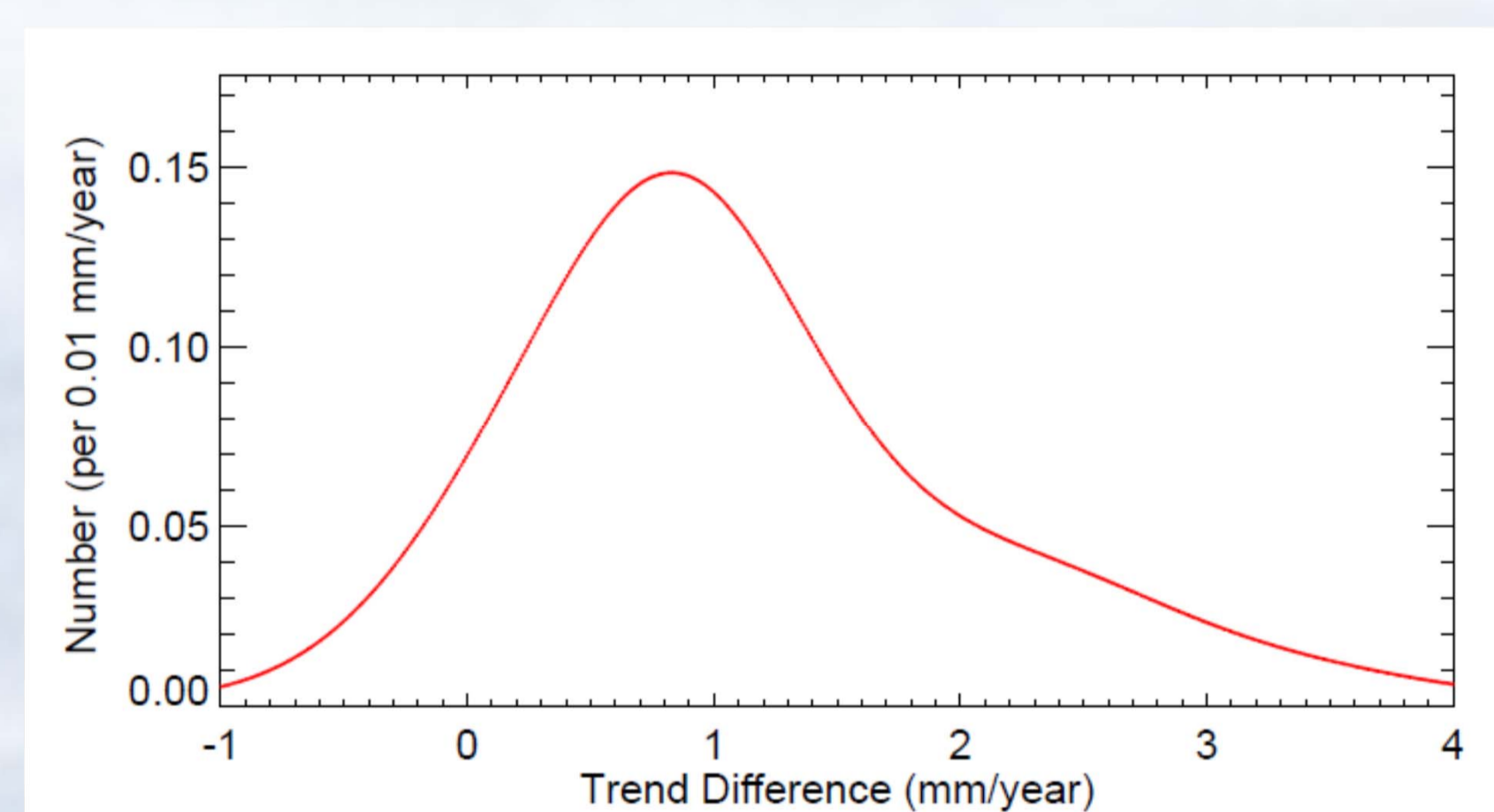
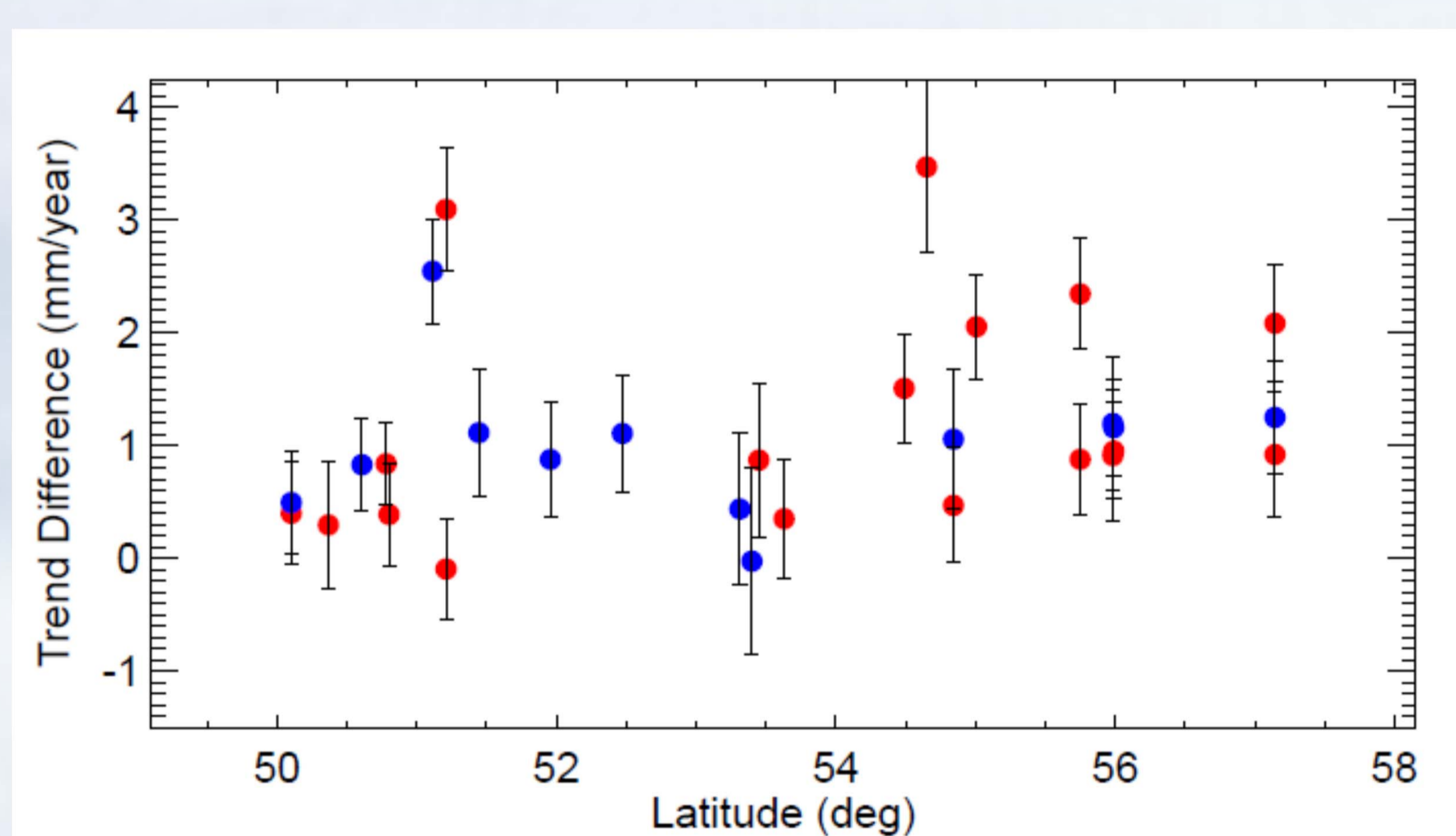
In 1859-60 the Ordnance Survey made sea level measurements for a fortnight at 31 locations shown in red (other stations of interest with data at about the same time are in blue). MSL was measured to Ordnance Datum Liverpool (ODL) at this time.

ODL datum across the country can be related to the more recent Ordnance Datum Newlyn (ODN) datum using information from repeated national levelling (estimated offsets between ODL and ODN shown above)



The benchmarks at tide gauges can be expressed as ODN heights (e.g. the above 'RLR diagram' for Newlyn). Therefore, sea level in 1859 can be related to that at present.

It is important to make a set of corrections to the short historical records e.g. for air pressure during the 1859 fortnight. To do this we need regression coefficients at 15-day timescales between sea level and air pressure, derived above from recent data. Also some of the historical data is in the form of Mean Tide Level, rather than true MSL. These corrections are straightforward if one has the historical meteorological data etc.



Trends between 1859 and present from the historical OS data and recent data from the PSM SL, minus trends for land movements using the model of Bradley et al. (2011). Plotted as a function of latitude. Trends are much the same at each latitude (~1 mm/year apart from 3 outliers).

A weighted average of the trend values in the opposite plot. In other words there is an 'extra' 1 mm/year not explained by land movements. More probably by climate change.

For more details see [P.L. Woodworth \(Geophys. J. Int., 2018\)](#)

This is an example of ongoing 'data archaeology' of UK sea level data – see also the poster of Peter Hogarth.