

1 Supplementary Information for: Climate speeds
2 help frame relative ecological risk in future
3 climate change and stratospheric aerosol injection
4 scenarios

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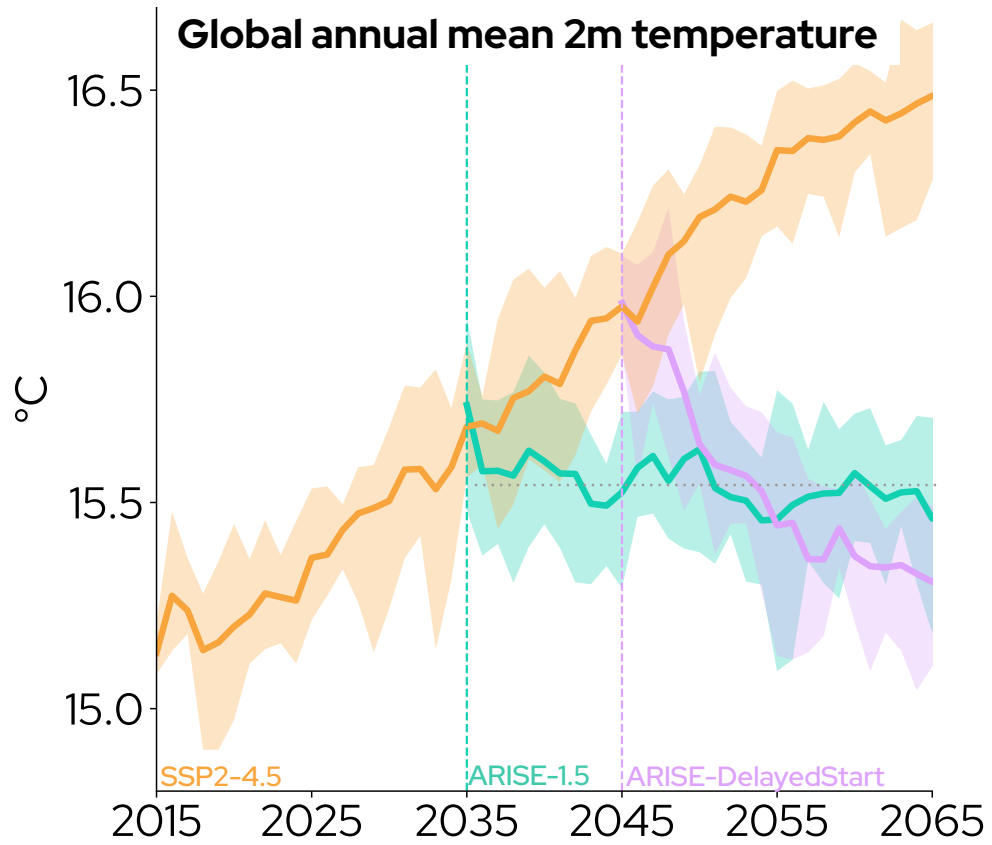


Fig. 1 Timeseries of global annual mean 2m temperature in the SSP2-4.5, ARISE-1.5, and ARISE-DelayedStart experiments. Thick lines portray the ensemble mean; shading shows variability spanning the maximum to minimum ensemble member at each year. Vertical dashed lines denote the deployment of SAI in 2035 (ARISE-1.5) and 2045 (ARISE-DelayedStart), while the horizontal dotted line displays an approximate temperature threshold of 1.5 °C above preindustrial.

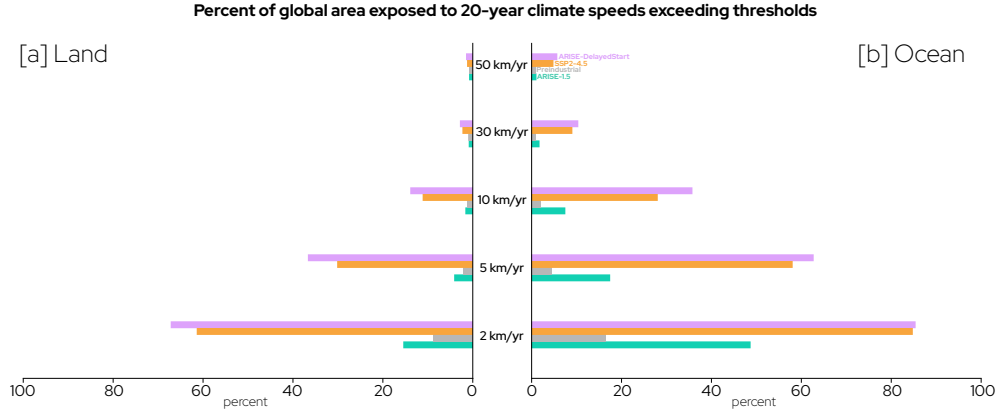


Fig. 2 Percent of global land [a] and ocean [b] area exposed to 20-year ensemble mean climate speeds beyond selected threshold values. Climate speeds calculated over the ensemble mean of 2035-2054 (ARISE-1.5), 2045-2064 (ARISE-DelayedStart and SSP2-4.5), and the mean of ten randomly-selected 20-year periods (Preindustrial).

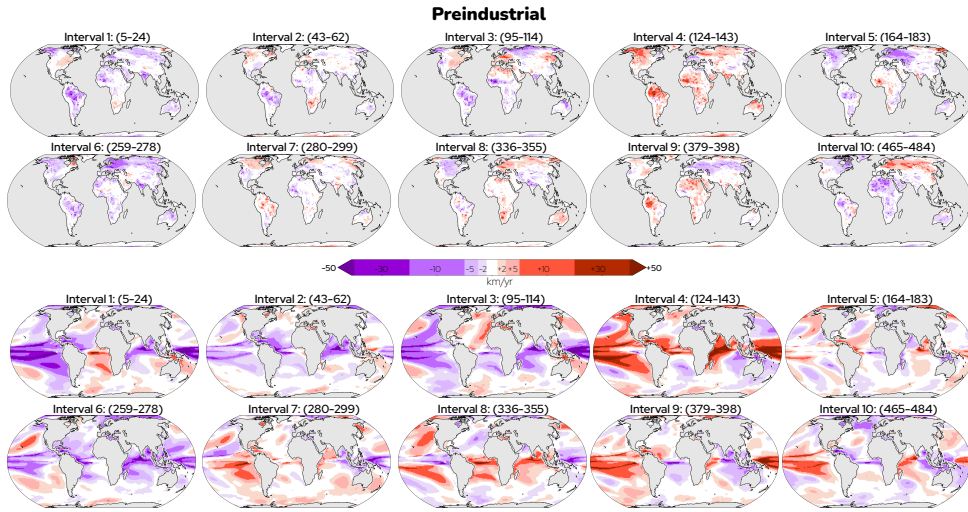


Fig. 3 20-year climate speeds for land (top half) and ocean (bottom half) in each of the ten intervals treated as different “ensemble members” in the Preindustrial simulation for Fig. 1-3.

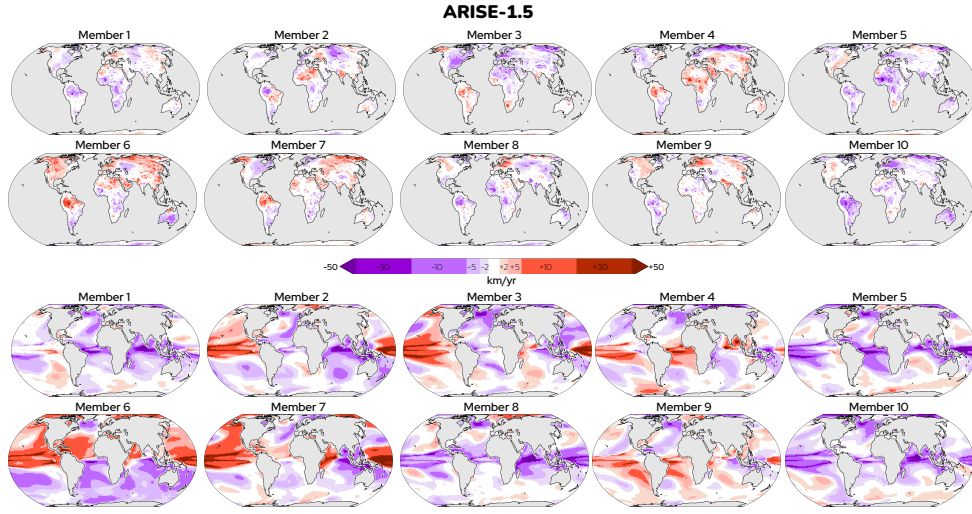


Fig. 4 20-year climate speeds (2035-2054) for land (top half) and ocean (bottom half) in each of the ten ensemble members of ARISE-1.5.

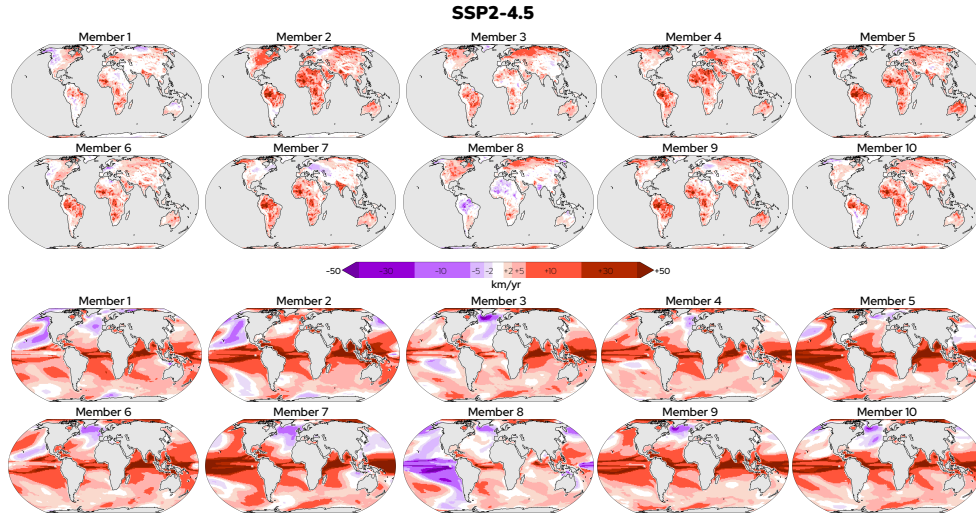


Fig. 5 20-year climate speeds (2045-2064) for land (top half) and ocean (bottom half) in each of the ten ensemble members of SSP2-4.5.

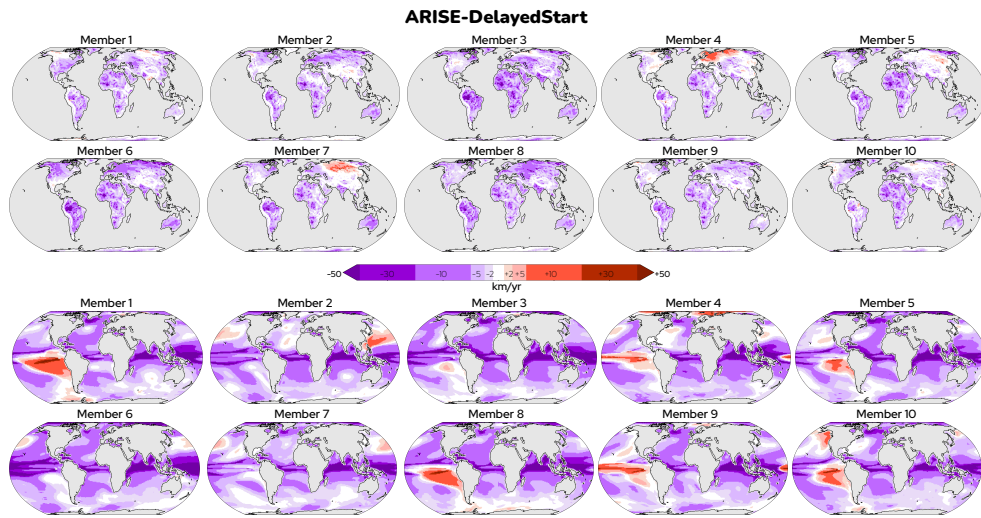


Fig. 6 20-year climate speeds (2045-2064) for land (top half) and ocean (bottom half) in each of the ten ensemble members of ARISE-DelayedStart.

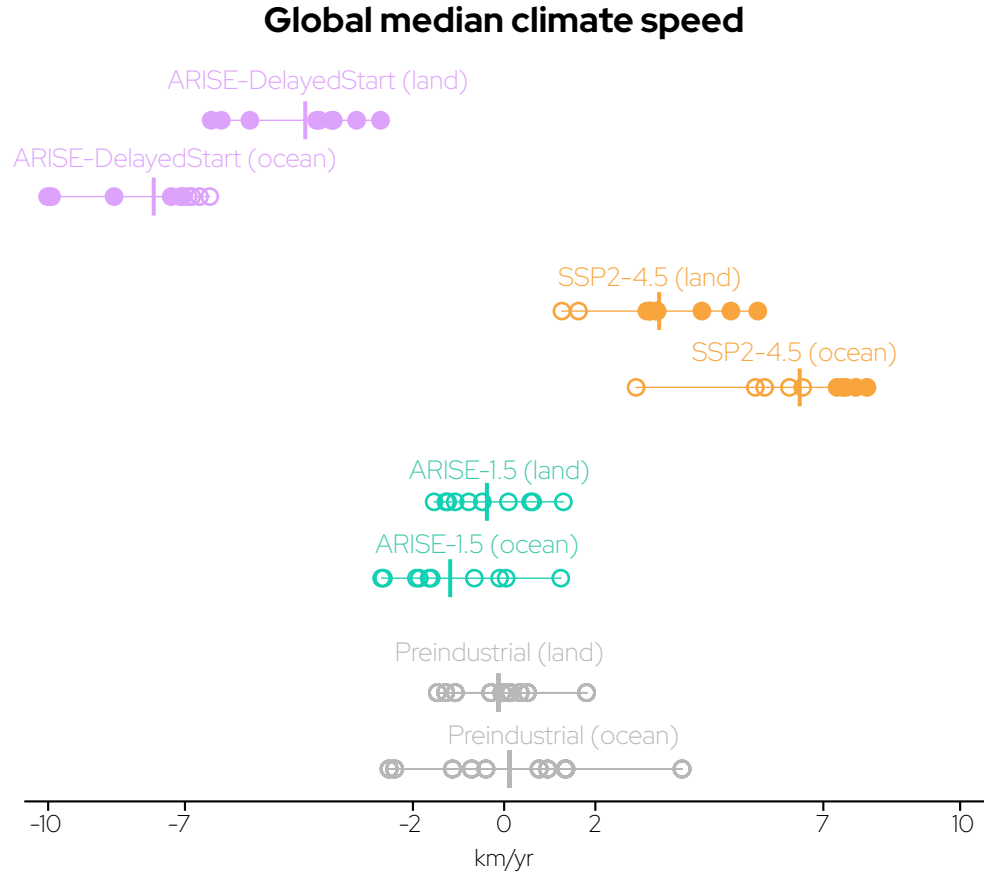


Fig. 7 Global median climate speeds of 2m temperature over land and ocean. Open circles denote climate speeds with magnitudes within the mean dispersal speed of terrestrial or ocean species, while closed circles signify climate speeds with magnitude exceeding mean dispersal speeds. Climate speeds are calculated over 2035-2054 (ARISE-1.5), 2045-2064 (ARISE-DelayedStart and SSP2-4.5), and ten randomly-selected 20-year periods (Preindustrial).

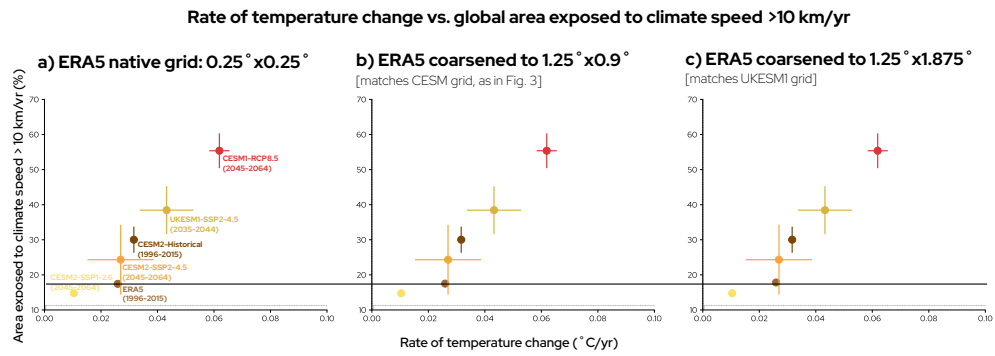


Fig. 8 20-year rate of temperature change per year vs. percent of area exposed to a climate speed with magnitude greater than 10 km/yr, demonstrating the influence of grid resolution on the calculated climate speed in ERA5. Horizontal black bar provides reference line of constant area exposed to provide greater clarity of the subtle difference between the three figures. See Online Methods for detailed descriptions of each dataset.