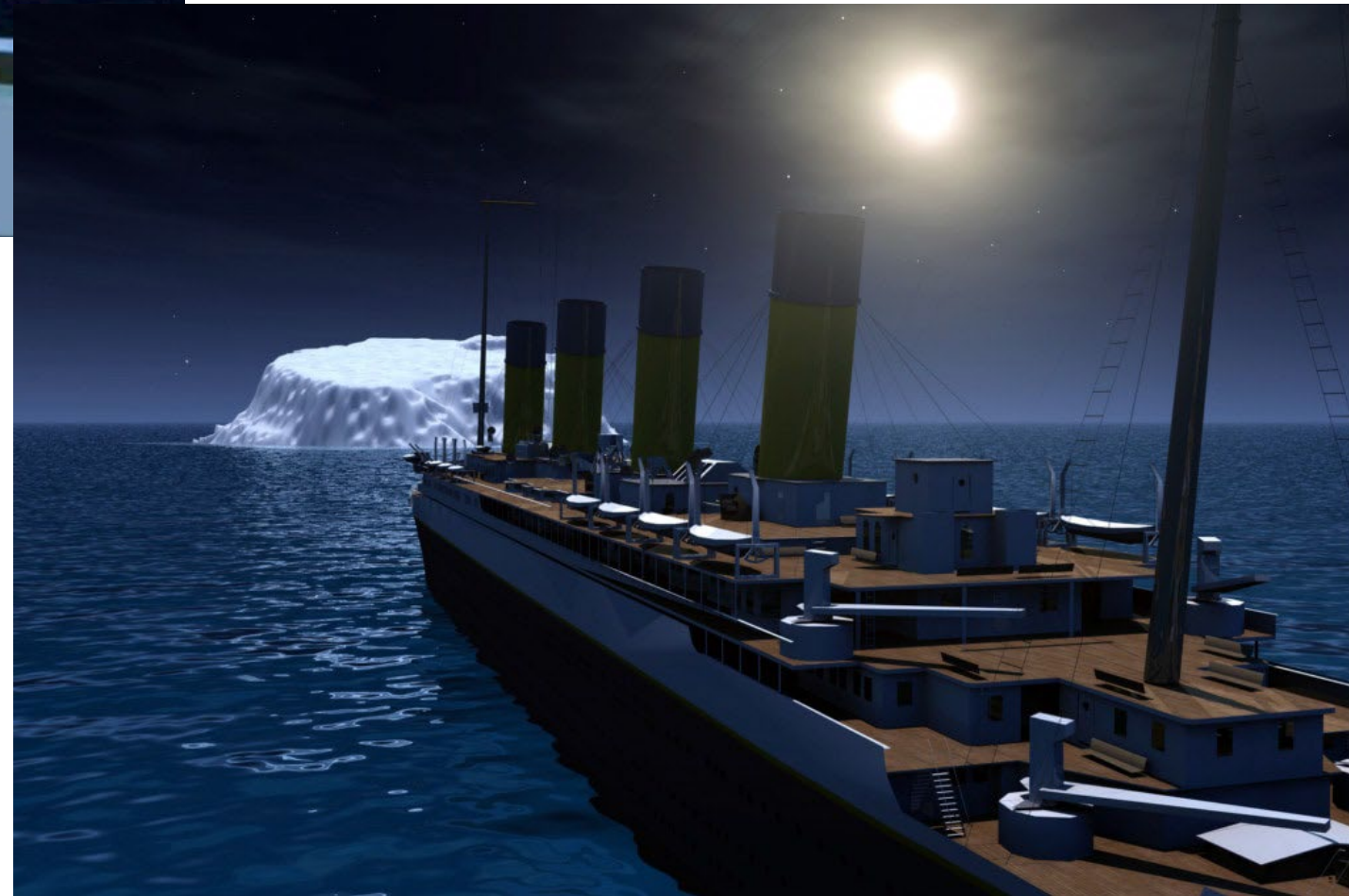
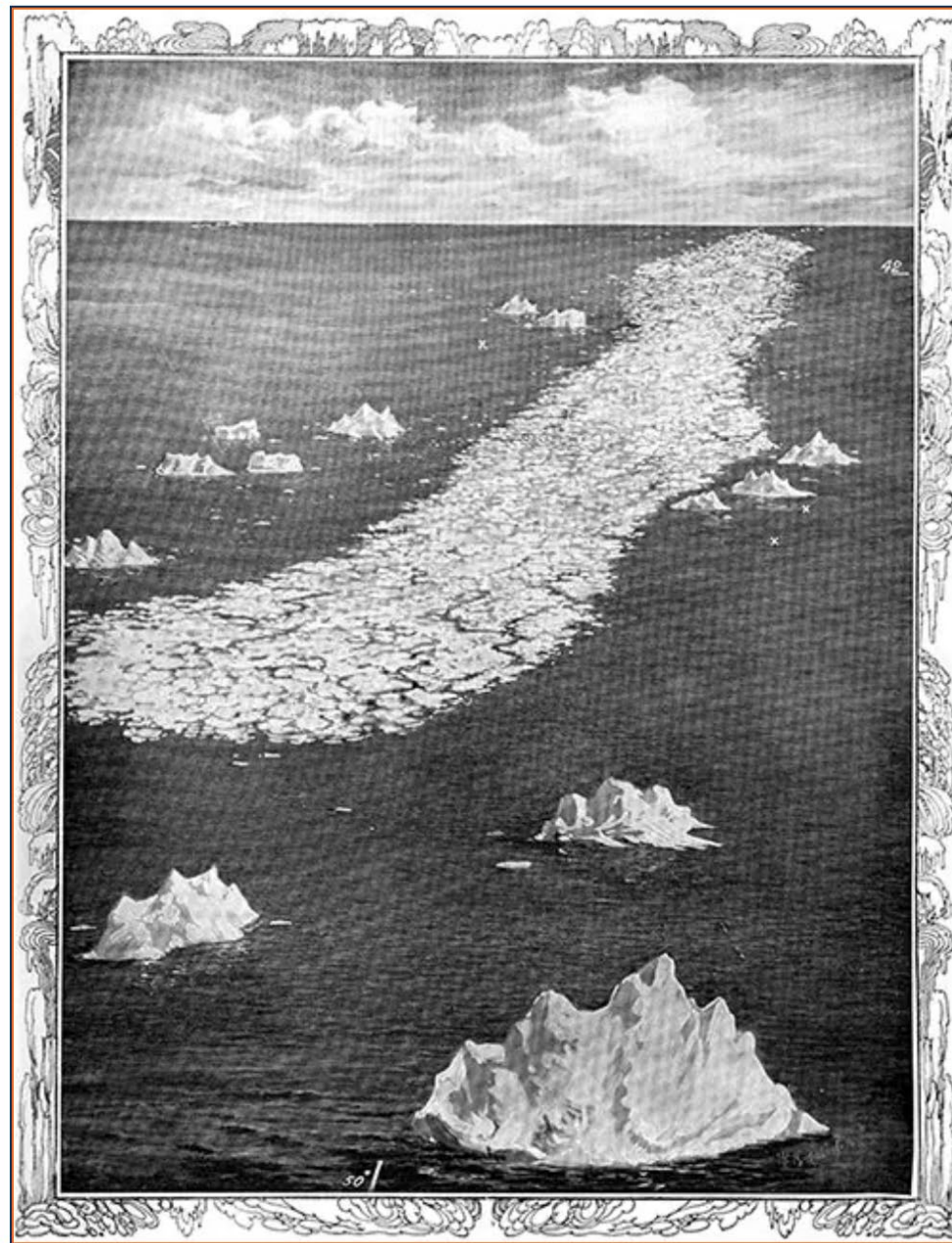


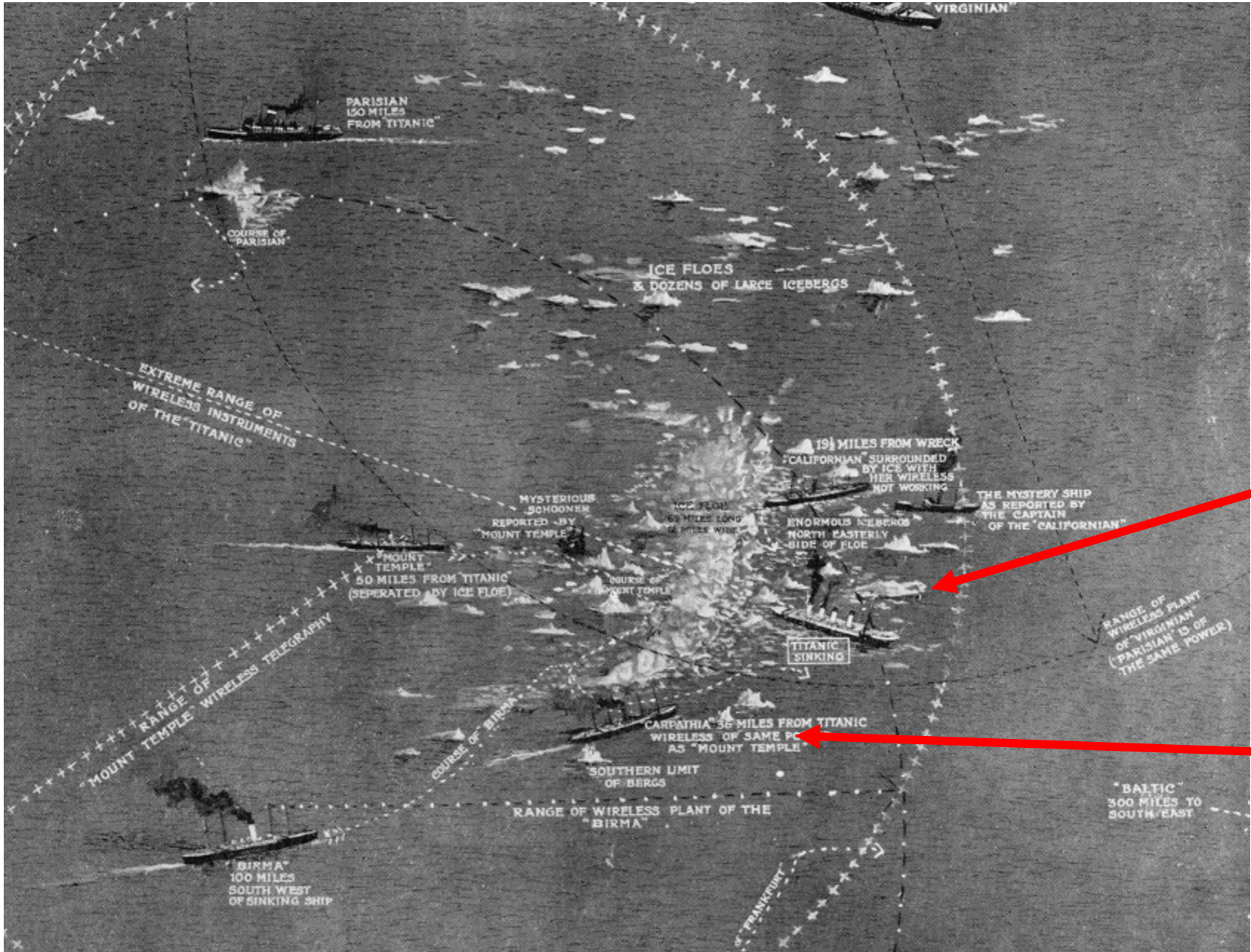
A New Perspective on Climate Change

Andy Bowman





Giver of the Titanic's Death Blow: The Ice Which Sank Her. Sixty-Nine Miles Long and from Three to Twelve Miles Wide: The Great Ice-Floe Encountered by the Ill-Fated Titanic. The Illustrated London News (18 May 1912) p. 741. Drawn by W. R.

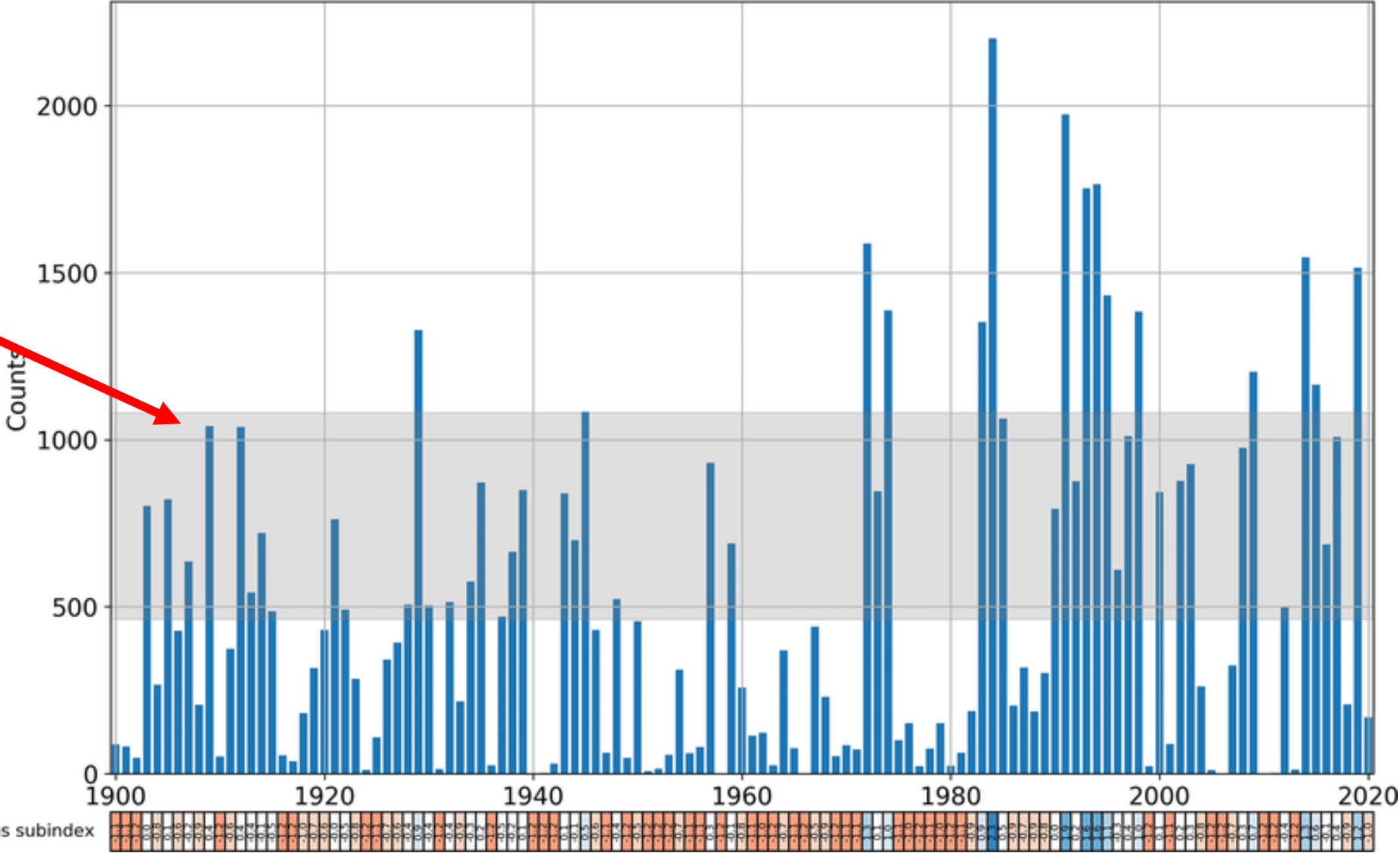
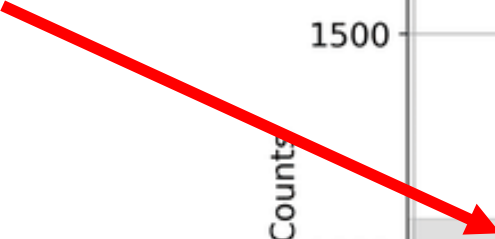


Titanic

Carpathia

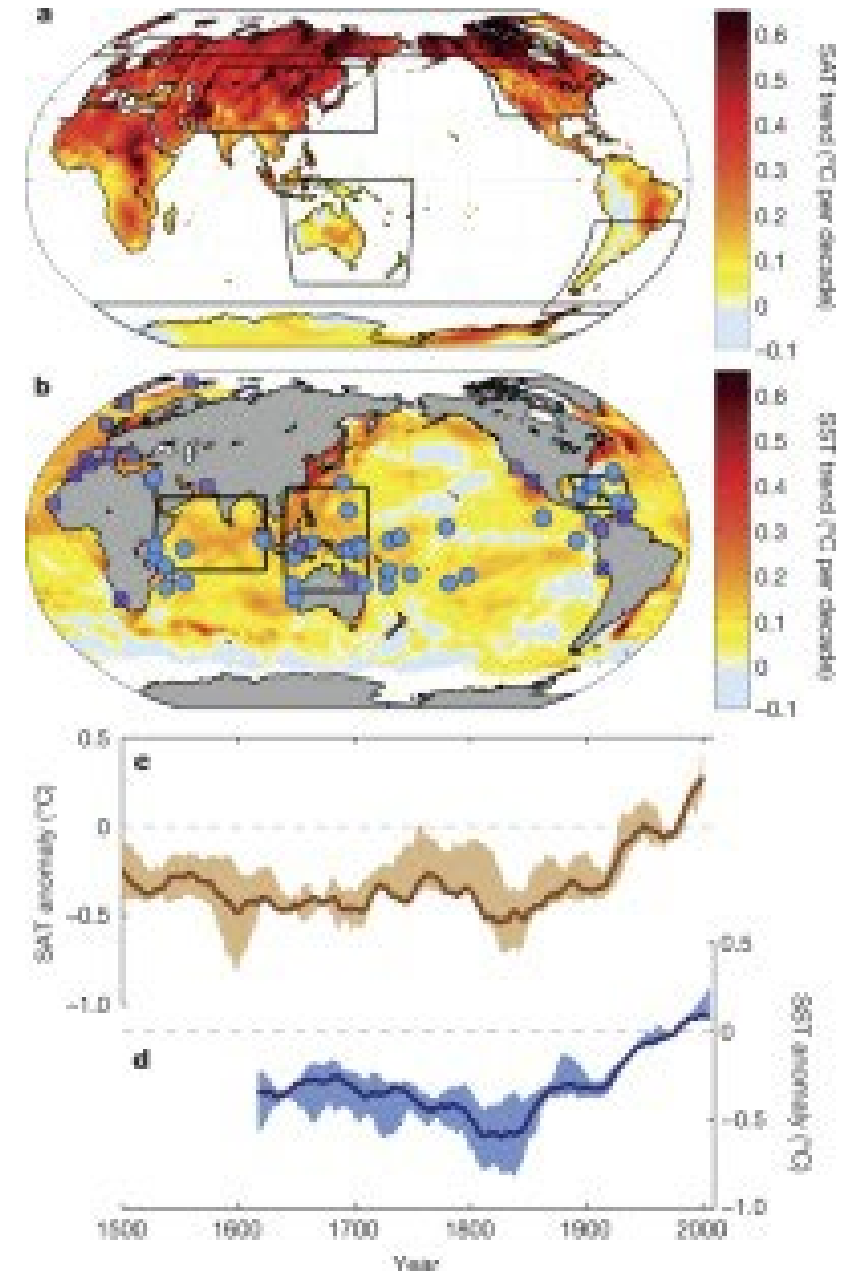
Annual icebergs count

1912
Iceberg
Count

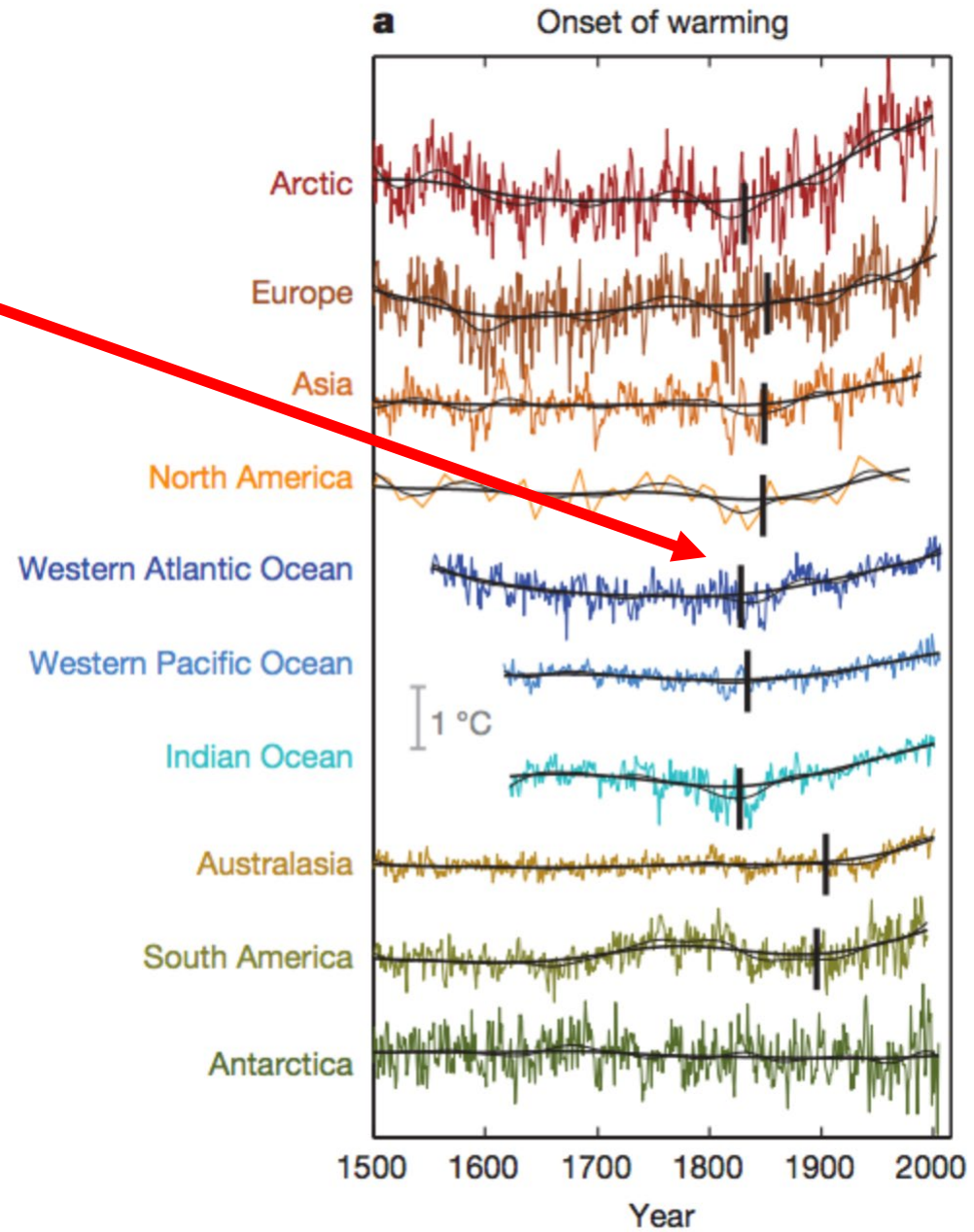


The evolution of industrial-era warming across the continents and oceans provides a context for future climate change and is important for determining climate sensitivity and the processes that control regional warming. Here we use post-AD 1500 palaeoclimate records to show that sustained industrial-era warming of the tropical oceans first developed during the mid-nineteenth century and was nearly synchronous with Northern Hemisphere continental warming. The early onset of sustained, significant warming in palaeoclimate records and model simulations suggests that greenhouse forcing of industrial-era warming commenced as early as the mid-nineteenth century and included an enhanced equatorial ocean response mechanism. The development of Southern Hemisphere warming is delayed in reconstructions, but this apparent delay is not reproduced in climate simulations. Our findings imply that instrumental records are too short to comprehensively assess anthropogenic climate change and that, in some regions, about 180 years of industrial-era warming has already caused surface temperatures to emerge above pre-industrial values, even when taking natural variability into account.

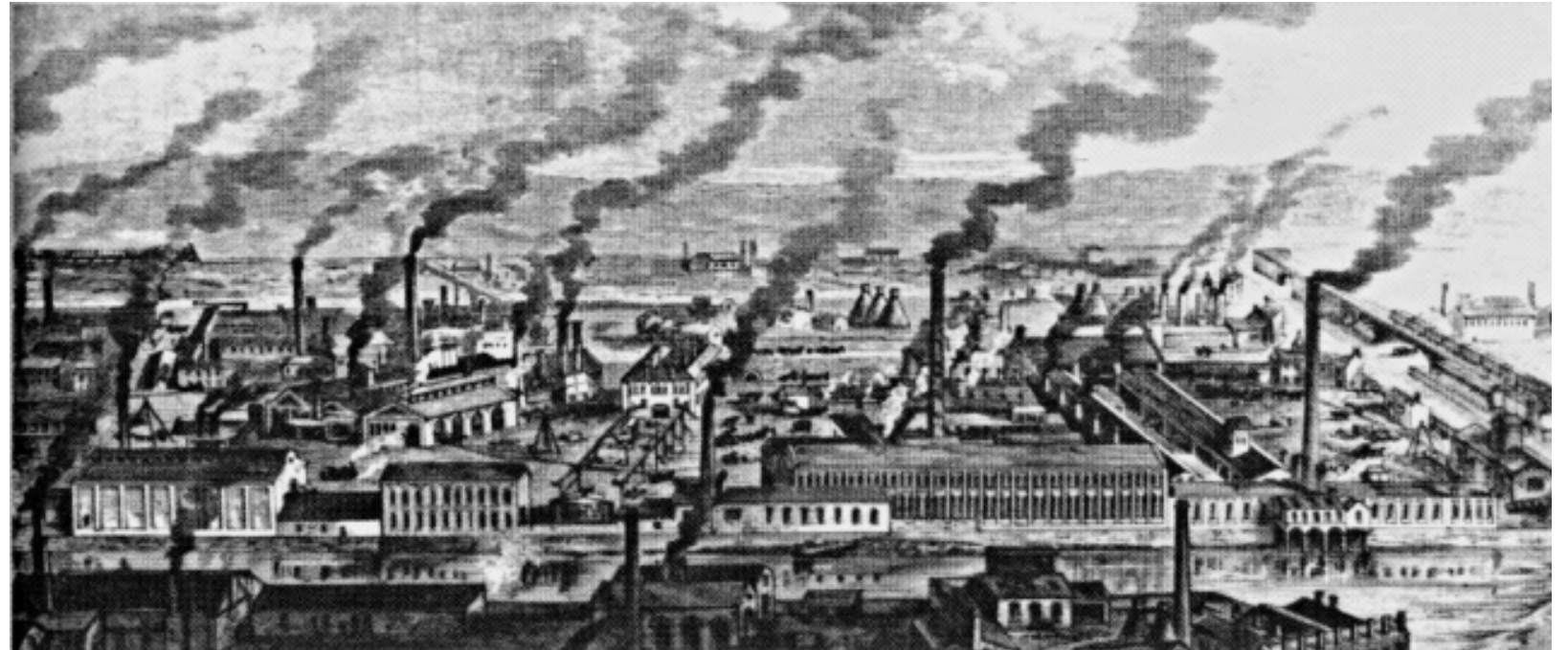
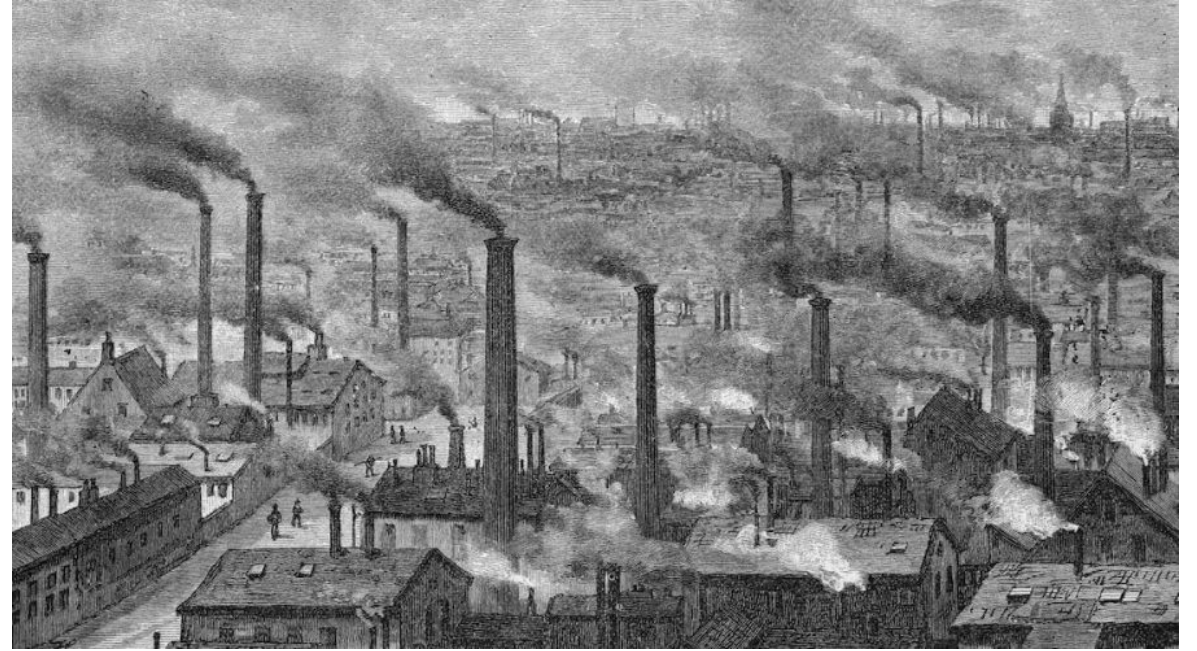
Abram, N., McGregor, H., Tierney, J. *et al.* Early onset of industrial-era warming across the oceans and continents. *Nature* **536**, 411–418 (2016). <https://doi.org/10.1038/nature19082>



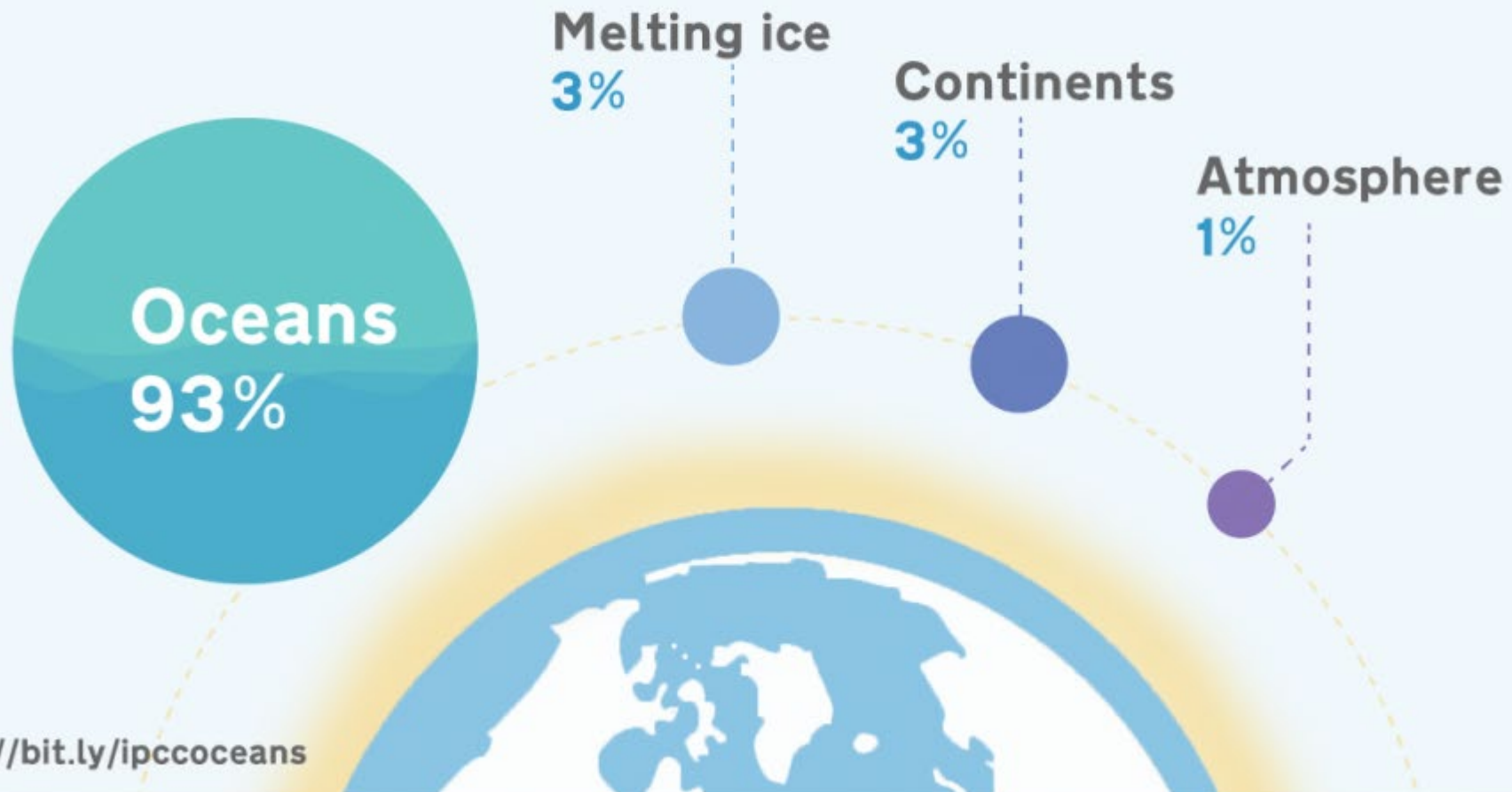
Western Atlantic Onset of Warming



London 19th Century



Where is the heat from global warming going?



WEATHER AUTHORITY



HURRICANE OTIS RAPID INTENSIFICATION

FROM 12 PM TUESDAY TO 12 AM WEDNESDAY

