Global Land–Ocean Temperature Index

Temperature Anomaly (°C)

-0.4 -0.2 0 0.2 0.4 0.6 0.8

1880 1900 1920 1940 1960 1980 2000 2020

- Annual Mean
- 5-year Running Mean
Surface and Satellite Temperatures

- Direct Surface Measurements
- Satellite Measurements
- UAH / RSS

Temperature Anomaly (°C)

Year:
- 1975
- 1980
- 1985
- 1990
- 1995
- 2000
- 2005
- 2010

Global temperature, atmospheric CO2 and sunspots

Sunspot activity→

Year

Average global temperature

CO2 (ppm)
Where is global warming going?

Ocean 93.4%

Atmosphere 2.3%
Continents 2.1%
Glaciers & ice caps 0.9%
Arctic sea ice 0.8%
Greenland Ice Sheet 0.2%
Antarctic Ice Sheet 0.2%

“Natural variability” and greenhouse warming. La Nina years tend to be cooler, El Nino years tend to be warmer. Years with a lot of volcanic activity tend to be cooler, and so on. When we put the variability together with the global temperature records, you can see the entire picture.
Fighting the big chill

Environmental data show that Greenland’s climate worsened during the Norse colonization. In response, the Norse turned from their struggling farms to the sea for food before finally abandoning their settlements.

Temperature

Winter temperatures dropped below the long-term average by more than a degree halfway through the 5-century occupation, according to oxygen isotope data in cores taken from the Greenland Ice Sheet.

Storminess

Measurements of salt particles in ice cores suggest that storminess rose toward the end of the occupation, perhaps making voyages to hunt and trade walrus ivory even more dangerous.

Proportion of marine food in diet

As conditions for farming worsened, the Norse shifted to a more marine diet, as shown by carbon isotopes in bones found in archaeological sites in the Eastern and Western settlements.