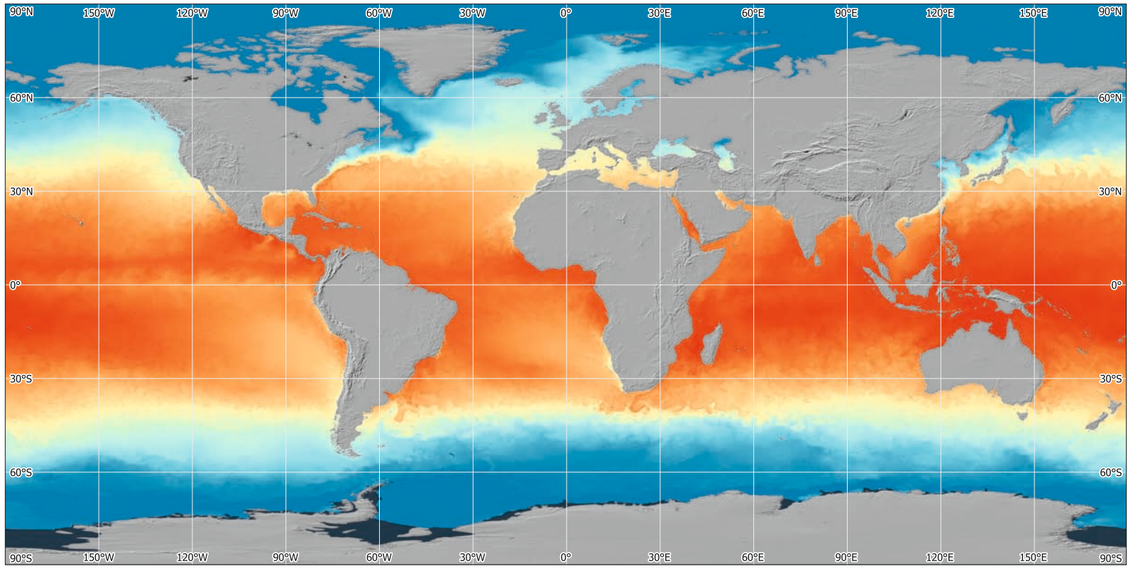
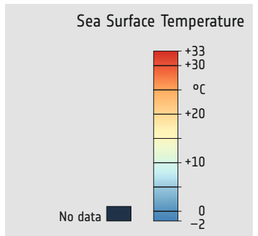


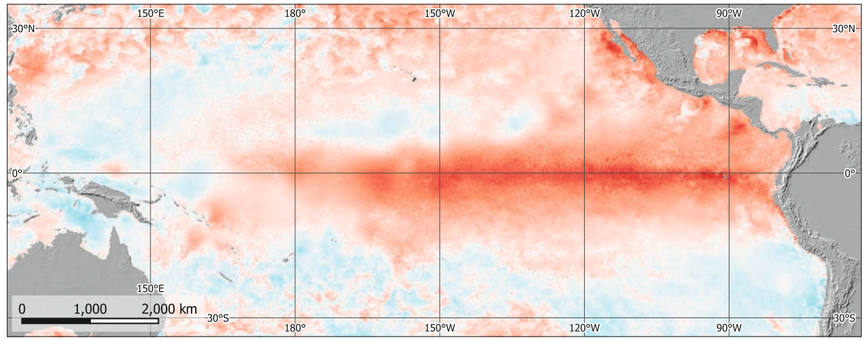


1. Global Sea Surface Temperatures, 2023-01-01.

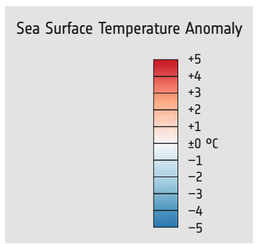
Sea Surface Temperature (SST)

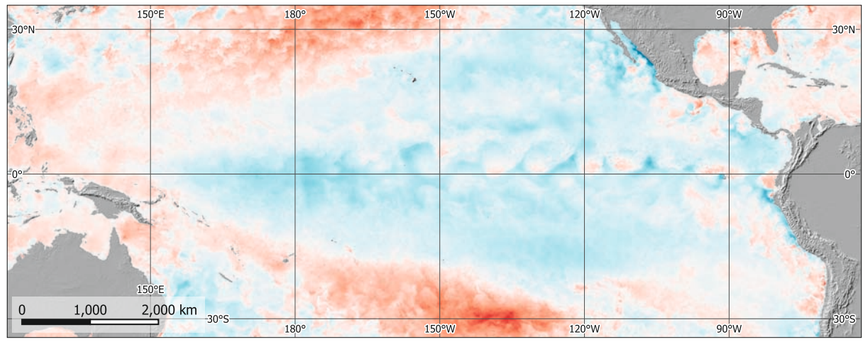
Global sea surface temperatures (SST) are a critical component of Earth's climate system, influencing weather patterns, ocean circulation, and ecosystem dynamics. The SST shows a zonal pattern, with warmer temperatures near the equator and cooler temperatures toward the poles. In a seasonal change these zones are shifted towards north or south. The temperature differences drives atmospheric and oceanic circulation and shapes climate patterns.

Compared to the atmosphere, water bodies can store large amounts of thermal energy and act as an important energy buffer in the context of climate change. Although at a smaller rate, the water temperatures of the oceans have risen by about 0.8 °C between 1950 and 2020. Increasing temperatures cause a thermal expansion of the water, which is one of the most important drivers of the global sea level rise.



3. Sea Surface Temperature Anomaly of the equatorial Pacific Ocean during an El Niño event, 2015-12-25.





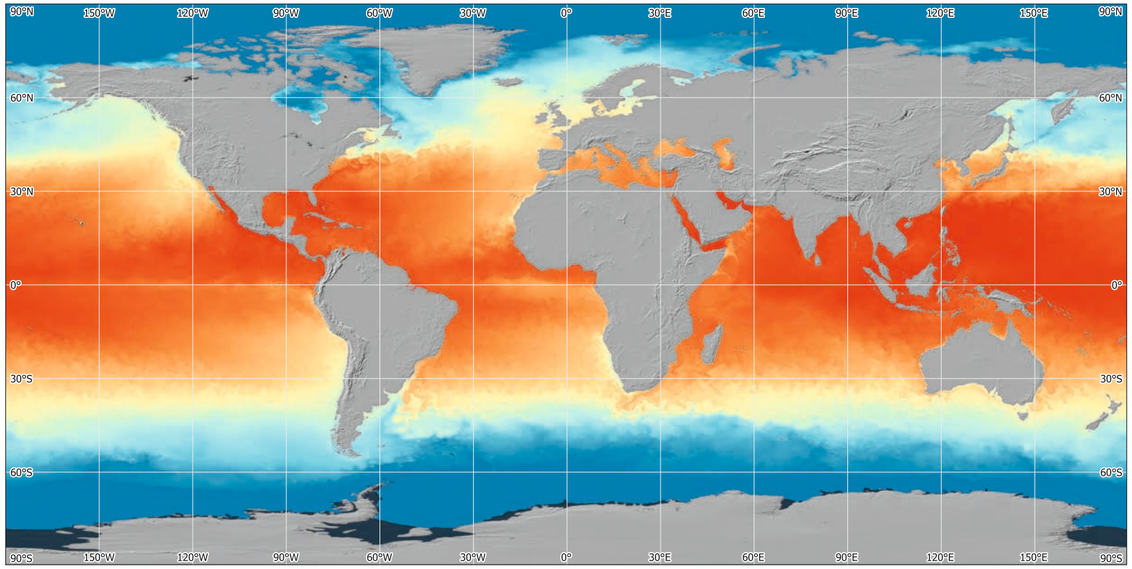
4. Sea Surface Temperature Anomaly of the equatorial Pacific Ocean during a La Niña event, 2011-12-25.

El Niño and La Niña

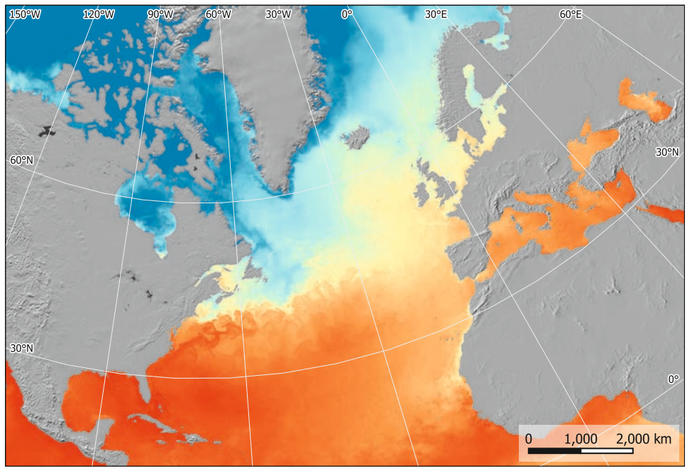
A significant phenomenon related to the SST is the El Niño-Southern Oscillation (ENSO). ENSO is a natural climate cycle characterized by the periodic warming (El Niño) and cooling (La Niña) of sea surface temperatures in the equatorial Pacific Ocean. During El Niño events, warmer-than-average SSTs develop in the central and eastern Pacific, altering atmospheric circulation patterns and influencing weather across the globe. Conversely, La Niña events feature cooler-than-average SSTs in the same region, leading to contrasting climate impacts, such as increased rainfall in some regions and drought in others.

Gulf Stream and North Atlantic Current

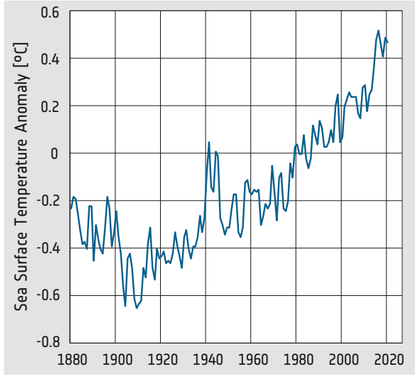
The Gulf Stream is a powerful ocean current in the North Atlantic Ocean, transporting warm water from the Gulf of Mexico toward the northeastern United States and western Europe. This warm current significantly influences SSTs along its path, contributing to the relatively mild climates of coastal regions in these areas. The Gulf Stream also plays a crucial role in regulating global climate by redistributing heat from the tropics to higher latitudes, affecting weather patterns and ocean circulation far beyond its immediate vicinity.



2. Global Sea Surface Temperatures, 2023-07-01.



5. The Gulf Stream and the North Atlantic reaching from Florida in North America to Scandinavia in northern Europe are visible in the Sea Surface Temperature (2014-01-01).



6. The global average Sea Surface Temperature shows a clear rise. During the last 50 years the increase was about 0.8 degree Celsius.