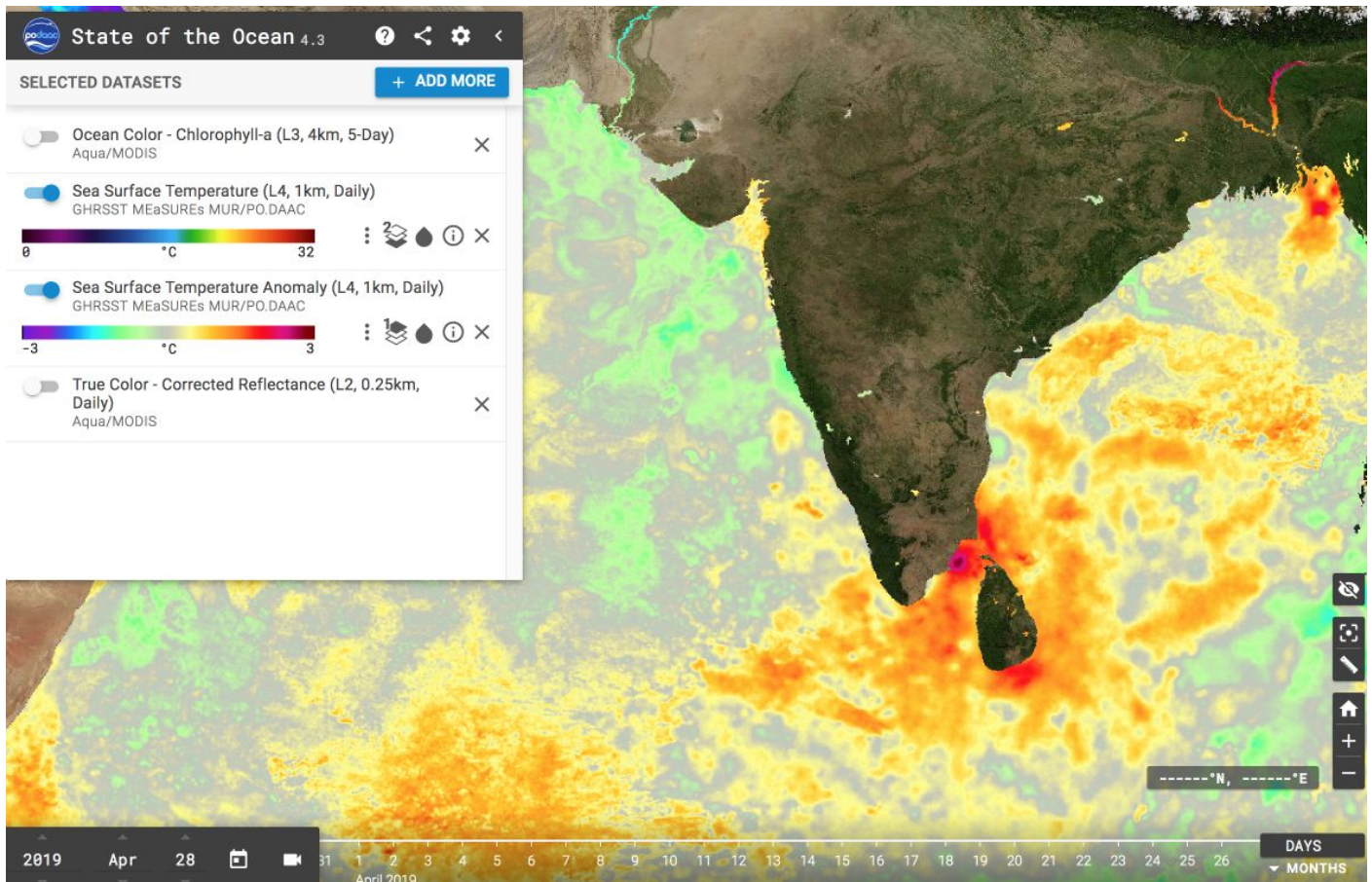


Cyclone Fani and climate change

Climate change affects hurricane activity and amplifies the damages in several ways including:

- (1) increasing the rainfall that drops during the storm,
- (2) increasing sea surface temperatures which in turn raises the maximum potential energy that a storm can reach
- (3) elevating storm surge, via sea level rise, which extends the storm's reach along low-lying areas.

Water in the Bay of Bengal was unusually warm as Cyclone Fani was forming, by more than 1°C above the long-term average. These higher sea-surface temperatures increased the energy available to the storm. Globally, ocean temperatures have increased dramatically as a result of climate change.



Source: [NASA](https://www.nasa.gov)

Climate science at a glance

- Increasing sea surface temperatures are increasing the potential energy available to passing storms.¹
- Sea level rise, combined with coastal storms, has increased the risk of erosion, storm-surge damage, and flooding for coastal communities.
- Global warming is increasing water vapor in the air, which in turn is fueling extreme rainfall, increasing the threat of flooding driven by hurricanes.²

¹ <https://www.climatesignals.org/node/2964>

² <https://www.climatesignals.org/node/2219>

Increase in the frequency of intense hurricanes

Tropical cyclones are fueled by available heat. Warming seas have increased the potential energy available to passing storms, effectively increasing the power ceiling or speed limit for these cyclones.^{[15][24]} In parallel, there has been a global increase in the observed intensity of the strongest storms over recent decades.^{[25][26]}

Cyclone Fani has been fueled by unusually warm seas (more than 1°C warmer than the historical average).

³

Extreme precipitation increase⁴

Unusually warm seas and a warmer atmosphere are helping supercharge the rains delivered by cyclones like Fani and amplify local flash flooding.

As the global average temperature increases, so too does the ability of the atmosphere to hold and dump more water when it rains.^[1] Atmospheric water vapor has been increasing,^{[10][11]} and the observed increases have been studied and formally attributed to global warming.^{[12][13][14]} An increase in rainfall rates is one of the more confident predictions of the effects of climate change on tropical cyclones.^{[11][15]}

Five attribution studies found that global warming added to the deluge of rainfall dumped by Hurricane Harvey, which hit the southern US in 2017.⁵

Storm surge increase⁶

The most important impact of tropical cyclones in coastal regions is storm surge, which accounted for 49 percent of storm-related fatalities between 1963 and 2012.^{[8][9][15]} Increases in storm surge related to climate change can be due to rising seas, increasing size, and increasing storm wind speeds.^{[15][18]}

Climate change has already contributed about 19cm to global sea level rise,^[12] and this has dramatically amplified the impact of cyclones by increasing baseline elevations for waves and storm surge.^{[12][19][20][21]}

A small vertical increase in sea level can translate into a very large increase in horizontal reach by storm surge depending upon local topography.

³ [Nasa data](#)

⁴ <https://www.climatesignals.org/climate-signals/extreme-precipitation-increase>

⁵ <https://www.climatesignals.org/node/7678> <https://www.climatesignals.org/node/8089>
<https://www.climatesignals.org/node/8258> <https://www.climatesignals.org/node/8474>
<https://www.climatesignals.org/node/7868>

⁶ <https://www.climatesignals.org/climate-signals/storm-surge-increase>