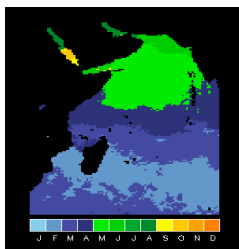


WESTERN INDIAN OCEAN

Regional bleaching warning network

DATE OF THIS ALERT: 15 January 2009



Bleaching alert – Western Indian Ocean

The maximum sea surface temperatures, that cause coral bleaching, occur in January in southern Madagascar/central Mozambique, and progressing through to May in the northern IO as the sun moves north (Maximum Mean Monthly temperature, source: NOAA/xxx)

This bleaching alert runs from January to May each year, compiling publicly available information and observations from the field into an accessible document. See listed sources for original information.

Bleaching interpretation/alert

High moderate low none expected

Ordered by date

Date	Level	Observation	Alert
15 Jan 09	low	Global indicators are for low bleaching. SST charts indicate hotspot in the southern Western Indian Ocean, off E Madagascar and Reunion. No bleaching observations to date.	Madagascar/Reunion - Moderate

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Bleaching observations, *in situ*

High moderate low normal seasonal bleaching

Ordered by latitude

Lat.	Date	Location	Sites	Observation	Source
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Sea Surface Temperatures

Explanation

The surface of the sea heats up by direct insolation, causing stress to corals and other shallow water organisms. Satellites directly measure the skin-temperature of the sea, providing the following maps and coral bleaching products for early warning.

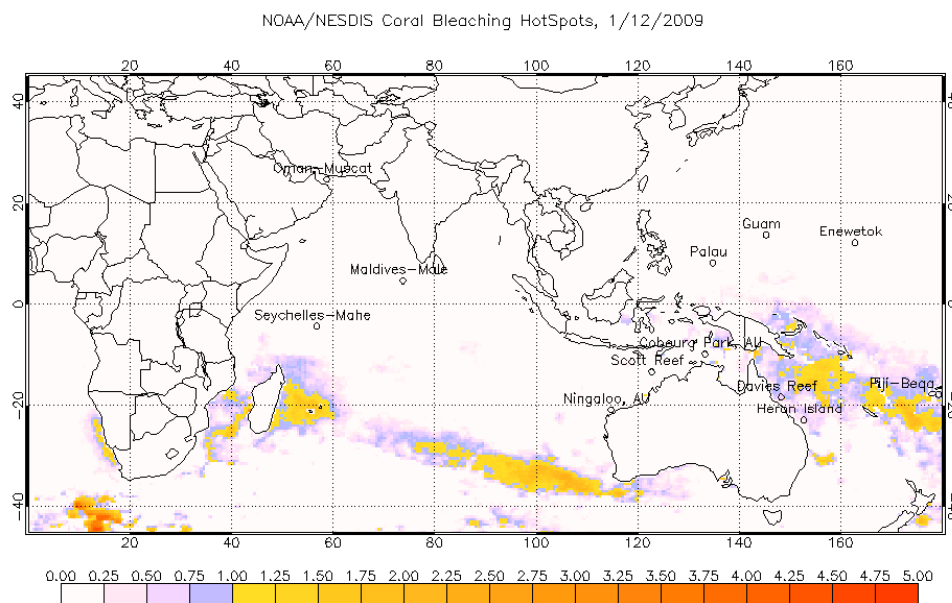
Sources:

http://coralreefwatch.noaa.gov/satellite/virtual_stations/indian_ocean_virtualstations.html

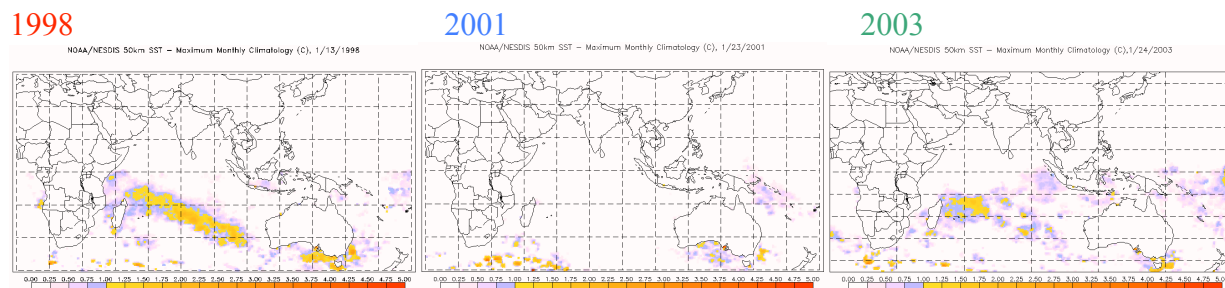
Station	Name	Status
5:	Kiunga, Kenya	nil
6:	Mombasa, Kenya	nil
7:	Zanzibar, Tanzania	nil

8:	Maluane, Mozambique	Bleach Watch
9:	Comoros	Bleach Watch
10:	Aldabra, Seychelles	Bleach Watch
11:	Glorieuse Island, France	Bleach Watch
12:	Andavadoaka, Madagascar	Bleach Watch
13:	Reunion, France	Bleach Warning
14:	Rodrigues, Mauritius	Bleach Watch
15:	Mahe, Seychelles **	nil
16:	Chagos Archipelago, UK	nil

SST maps



Comparison with previous years with **high** bleaching, **mild** bleaching and **no** bleaching



The small concentrated hotspot off NE Madagascar is most similar to conditions in 2003, but with a larger anomaly in the far south of the Indian Ocean.

Wind-driven mixing

Explanation

Wind is an important physical factor influencing conditions conducive to coral bleaching. Wind-driven mixing reduces temperature stress and wind generated waves can scatter harmful levels of incoming solar radiation.

- Cyclones - cause strong mixing, reducing temperature at the surface.
- Doldrums - periods of sustained low wind may therefore promote environmental conditions adverse to corals experiencing thermal and/or light stress.

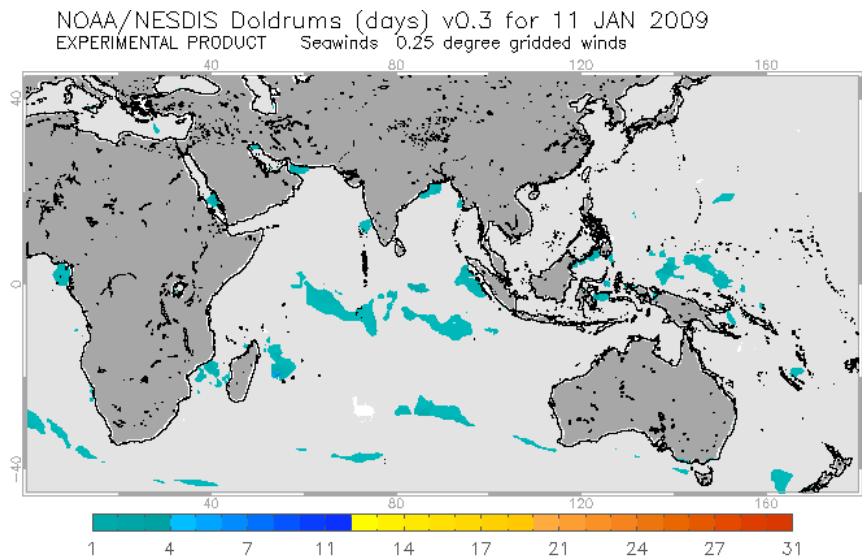
Source:

<http://coralreefwatch.noaa.gov/satellite/doldrums/>.

Cyclones

None to date

Doldrums



The chart shows regions exhibiting mean wind speeds of less than 3 m/s for the number of days in the colour-bar.

Other

Global indicators, January 2009

Explanation

Local temperatures are affected by global and regional trends. With global warming, temperatures are expected to rise from year to year, but significant variation can occur between years, and under the influence of regional factors such as ocean-atmosphere interactions across the Pacific and Indian Ocean. Major influences at the beginning of 2009 are summarized here.

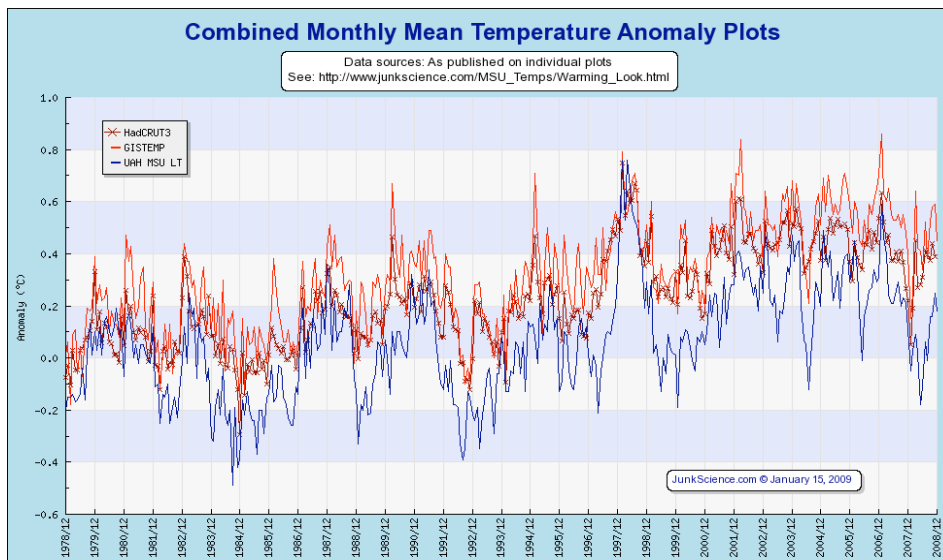
Sources:

http://www.junkscience.com/MSU_Temps/Warming_Look.html

2009 is not expected to be a severely warm year, compared to the previous decade, and the Southern Oscillation Index and Indian Ocean Dipole are predicted either to be neutral, or with different predictions from data provides.

Overall, this may mean that the Indian Ocean will not experience strong bleaching in the bleaching season of February-May, though there may be variation between areas.

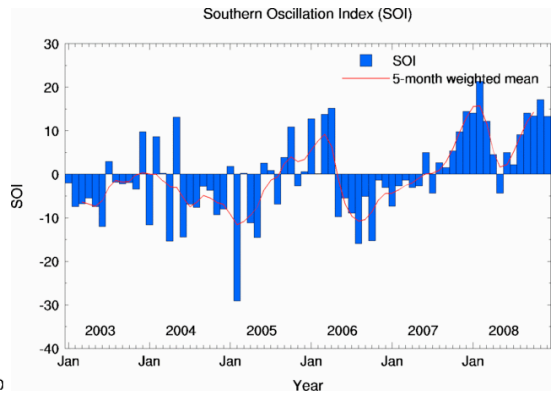
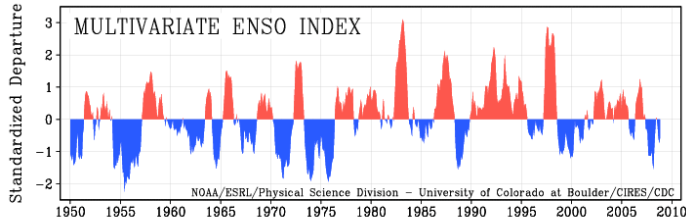
Global Temperatures



The plot shows 3 sets of atmosphere measurements and calculations from 1978 to 2008, showing increasing temperatures to approx. 1998 to 2005, and slightly lower temperatures since then.

Southern Oscillation and Indian Ocean Dipole indices.

The long term multivariate Southern Oscillation Index (below) shows negative values leading into 2008 indicate La Niña conditions, but a shorter term index (right) shows positive values in 2007 and 2008



Seasonal anomaly maps for the SOI (left) and IOD (right) show neutral conditions for the IOD in the Indian Ocean, but a positive SOI (hotter temperatures off New Zealand, cooler off South America).

