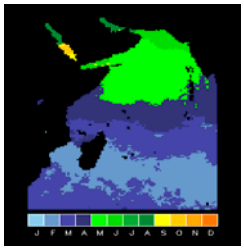
Western Indian Ocean Regional Bleaching Warning Network; 31 March 2009

Contact: Majambo Jarumani info@cordioea.org; David Obura dobura@cordioea.org



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

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
31 Mar 09	Moderate	SST charts shows development of hotspots with possible effect in Tanzania, Comoros and Madagascar	Tanzania, Comoros, Madagascar - Moderate
27 Feb 09	moderate	SST chart shows development of hotspots with possible effect in Mozambique and SE Madagascar.	Mozambique, Madagascar - Moderate
10 Feb 09	moderate	An extensive hotspot has built up at 20°S, possibly affecting the Mascarene islands (Reunion, Mauritius) and SW Madagascar, but cyclone Gael may have prevented spread of the hotspot northwards and to eastern Madagascar.	Mauritius, Reunion - - Moderate Other areas - low
15 Jan 09	low	Global indicators are for low bleaching. SST charts indicate a large low-intensity hotspot in the southern Western Indian Ocean, off E Madagascar and Reunion, and in the Mozambique channel. No bleaching observations to date.	Madagascar/Reunion - Moderate

Bleaching observations, *in situ*

High moderate low normal seasonal bleaching

Ordered by latitude

Lat.	Date	Location	Sites	Observation	Source

NO REPORTS TO DATE

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Please return any comments and observations, particularly of coral bleaching, to the contacts above.

Contact: Majambo Jarumani info@cordioea.org; David Obura dobura@cordioea.org

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 ealy warning.

Sources:

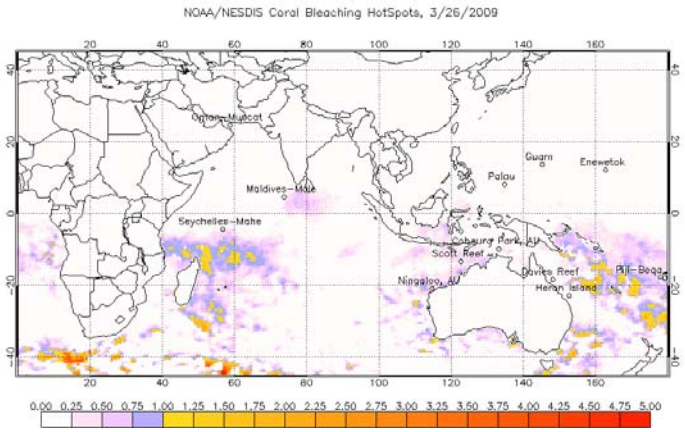
http://coralreefwatch.noaa.gov/satellite/virtual_stations/indian_ocean_virtualstations.html

NOAA Virtual Stations summary

Station	Name	Status
5:	Kiunga, Kenya	nil
6:	Mombasa, Kenya	nil
7:	Zanzibar, Tanzania	Bleach Watch
8:	Maluane, Mozambique	Bleach Watch
9:	Comoros	Bleach Watch
10:	Aldabra, Seychelles	Bleach Watch
11:	Glorieuse Island, France	Bleaching Warning
12:	Andavadoaka, Madagascar	Bleach Watch
13:	Reunion, France	Bleach Watch
14:	Rodrigues, Mauritius	nil
15:	Mahe, Seychelles **	Bleach Watch
16:	Chagos Archipelago, UK	Bleach Watch

SST maps

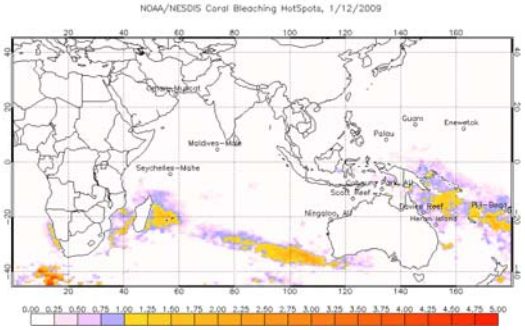
March 26, 2009



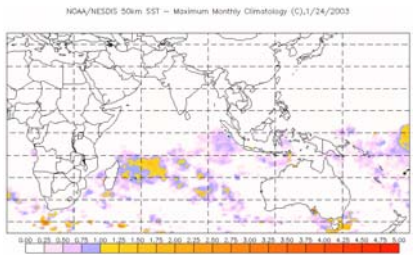
The hotspot has developed north of Madagascar and around the Tanzanian coast but it has cleared out the Mozambique channel.

Tropical cyclone Izilda appears to have limited the southward spread of the hotspot and also in the Mozambique channel.

January 15, 2009



2003



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

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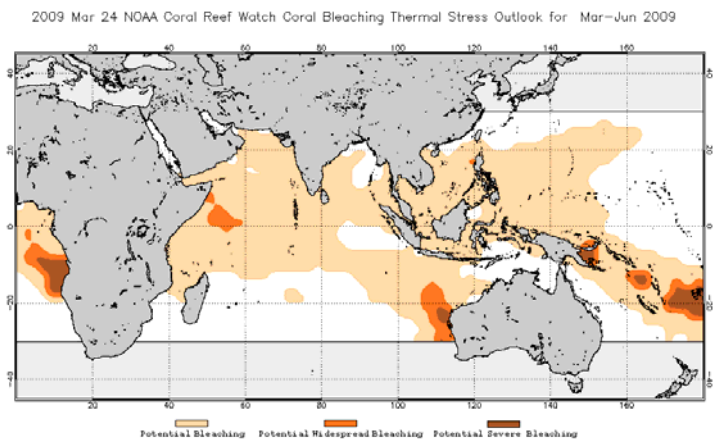
Coral bleaching thermal stress outlook

Explanation

The Bleaching Thermal Stress Outlook is based on sea surface temperature (SST) forecasts generated by the Linear Inverse Model from the NOAA Earth System Research Laboratory. In a normal year, the Outlook forecasts no potential for bleaching. When forecast SST exceeds bleaching thresholds over a long enough period to cause bleaching, the outlook maps display the bleaching potential.

Some mild stress may be seen around the Indian Ocean.	

Source:
http://coralreefwatch.noaa.gov/satellite/bleachingoutlook/outlook_messages/bleachingoutlook_current.html

Wind-driven mixing

Explanation

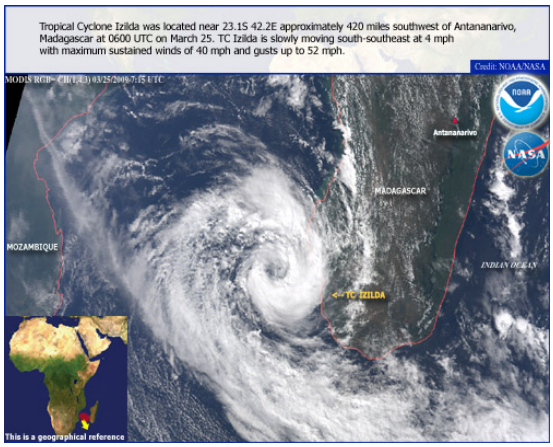
Wind is an important physical factor influencing conditions conducive to coral bleaching. Wind-driven mixing reduces temperature stress and wind generated waves can scatter harmful levels of incoming solar radiation.

- *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

Tropical Cyclone Izilda was reported on 25 March near 23.1S 2.2E SW of Antananarivo (Madagascar) with winds up to 60-78 kmh which has prevented the spread of hotspot in the Mozambique channel and south of the channel, and pushed the hotspot in the north coast of Madagascar.
Source: http://indianocean.free.fr/cyclones.htm



Doldrums

No doldrum conditions.

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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.

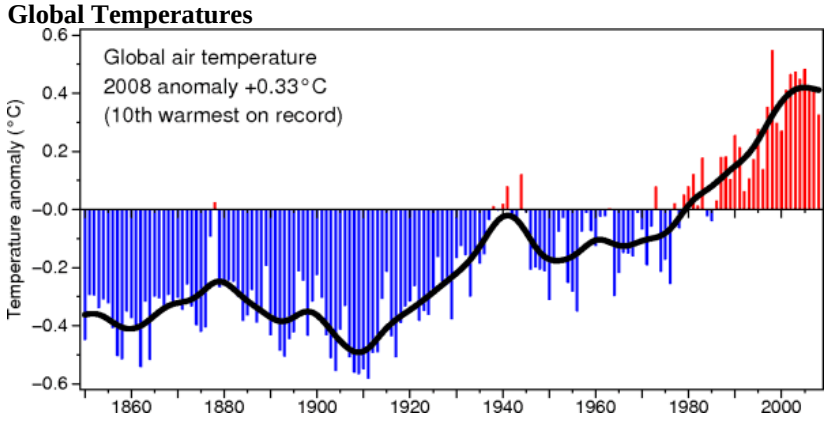
Sources:

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 providers.

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

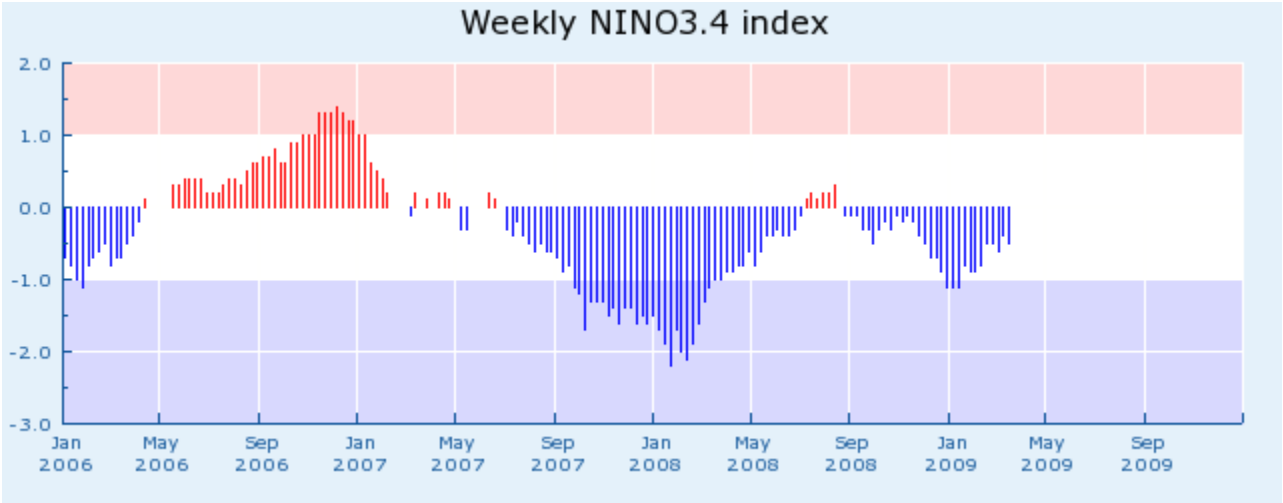


The time series shows the combined global land and marine surface temperature record from 1850 to 2009. The year 2007 was eighth warmest on record, exceeded by 1998, 2005, 2003, 2002, 2004, 2006 and 2001. This time series is being compiled jointly by the Climatic Research Unit and the UK Met. Office Hadley Centre. http://www.cru.uea.ac.uk/cru/info/warming/

Southern Oscillation and Indian Ocean Dipole indices.

NINO 3.4 Index

The NINO3.4 index is one of several El Niño/Southern Oscillation (ENSO) indicators based on sea surface temperatures. NINO3.4 is the average sea surface temperature anomaly in the region bounded by 5°N to 5°S, from 170°W to 120°W. This region has large variability on El Niño time scales, and is close to the region where changes in local sea-surface temperature are important for shifting the large region of rainfall typically located in the far western Pacific.



An El Niño or La Niña event is identified if the 5-month running-average of the NINO3.4 index exceeds +0.4°C for El Niño or -0.4°C for La Niña for at least 6 consecutive months. Source: http://www.weatherzone.com.au/climate/stationdrill.jsp