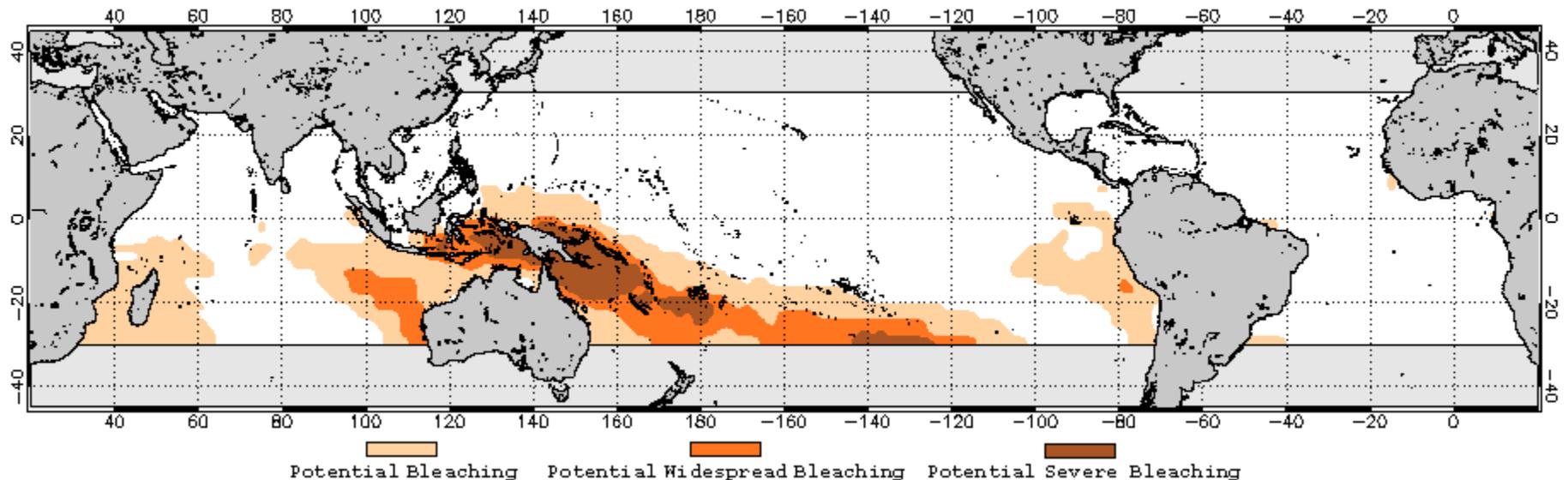


NOAA Coral Reef Watch
Seasonal Coral Bleaching Thermal Stress Outlook
(Experimental product, 2x2 degree spatial resolution)

December 2008 NOAA Coral Reef Watch Bleaching Thermal Stress Outlook Through March 2009

The NOAA Coral Reef Watch Bleaching Thermal Stress Outlook indicates that the greatest chance of bleaching during the upcoming austral summer will be in the region bounded by Papua New Guinea, the Solomon Islands, and the northern Great Barrier Reef (GBR). Currently, the forecast system suggests that thermal stress with a high potential for bleaching possible in that region with milder thermal stress in a band stretching from the Coral Triangle region southeast to Fiji and perhaps French Polynesia. The following figure shows the most recent global 17-week Coral Bleaching Thermal Stress Outlook from the 09 December 2008 model run.

2008 Dec 09 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Dec 08–Mar 09



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. Actual conditions may vary due to subsequent changes in climatic conditions, extreme localized variability, or weather patterns.

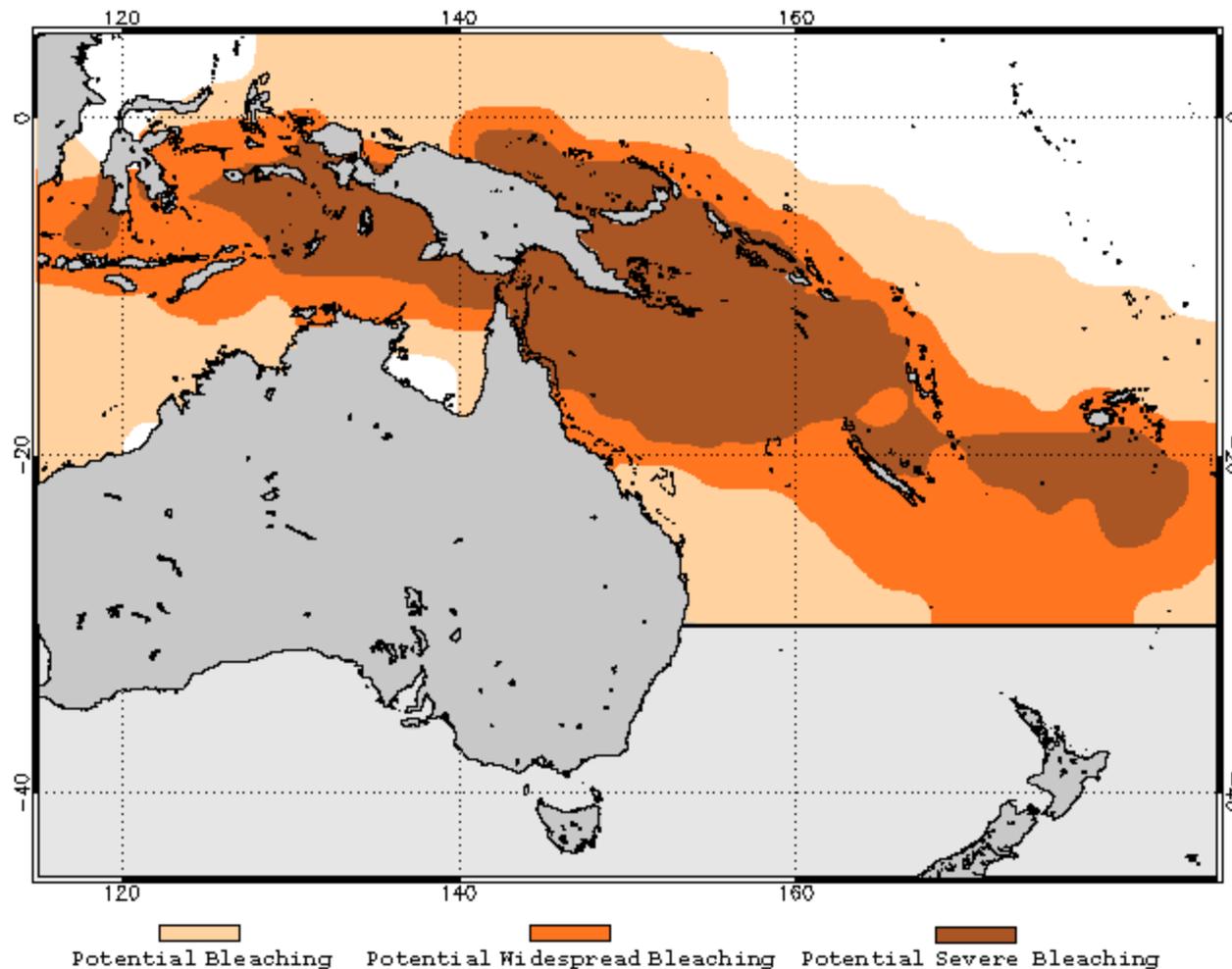
Indo-Pacific Bleaching Thermal Stress Outlook:

The area likely to experience the highest temperature anomalies and greatest potential for widespread bleaching during the next 12 weeks is a region extending southeast from Papua New Guinea to the Solomon Islands and the Far Northern section of the GBR.

To the west, the model currently predicts a threat of moderate to high levels of thermal stress in eastern Indonesia from southern Borneo across through Timor-Leste to southern Papua and the Torres Strait. While this appears to indicate a strong potential for bleaching in parts of Indonesia east of Borneo, some of this is likely the result of short-term model bias toward higher bleaching levels similar to that seen late in the 2008 Caribbean bleaching season (see Caribbean Retrospective below). The potential of high thermal stress in the next month around Sulawesi and the Banda Sea is not consistent with current satellite observations. However, low to moderate thermal stress is forecast to continue through January, giving rise to the potential for bleaching in eastern Indonesia, especially along the southern coast of Papua. This can be seen best by viewing the weekly images, the animation, or the animated outlook on Google Earth.

Bleaching stress is likely to vary along the GBR with higher and longer-lasting anomalies to the north and mild stress to the south. The model indicates a strong potential for bleaching in the Far Northern Section, moderate potential in the Cairns and Central sections, and a mild potential in the Mackay/Capricorn section. This is consistent with results of the POAMA model from the Australian Bureau of Meteorology that is predicting higher than normal temperatures.

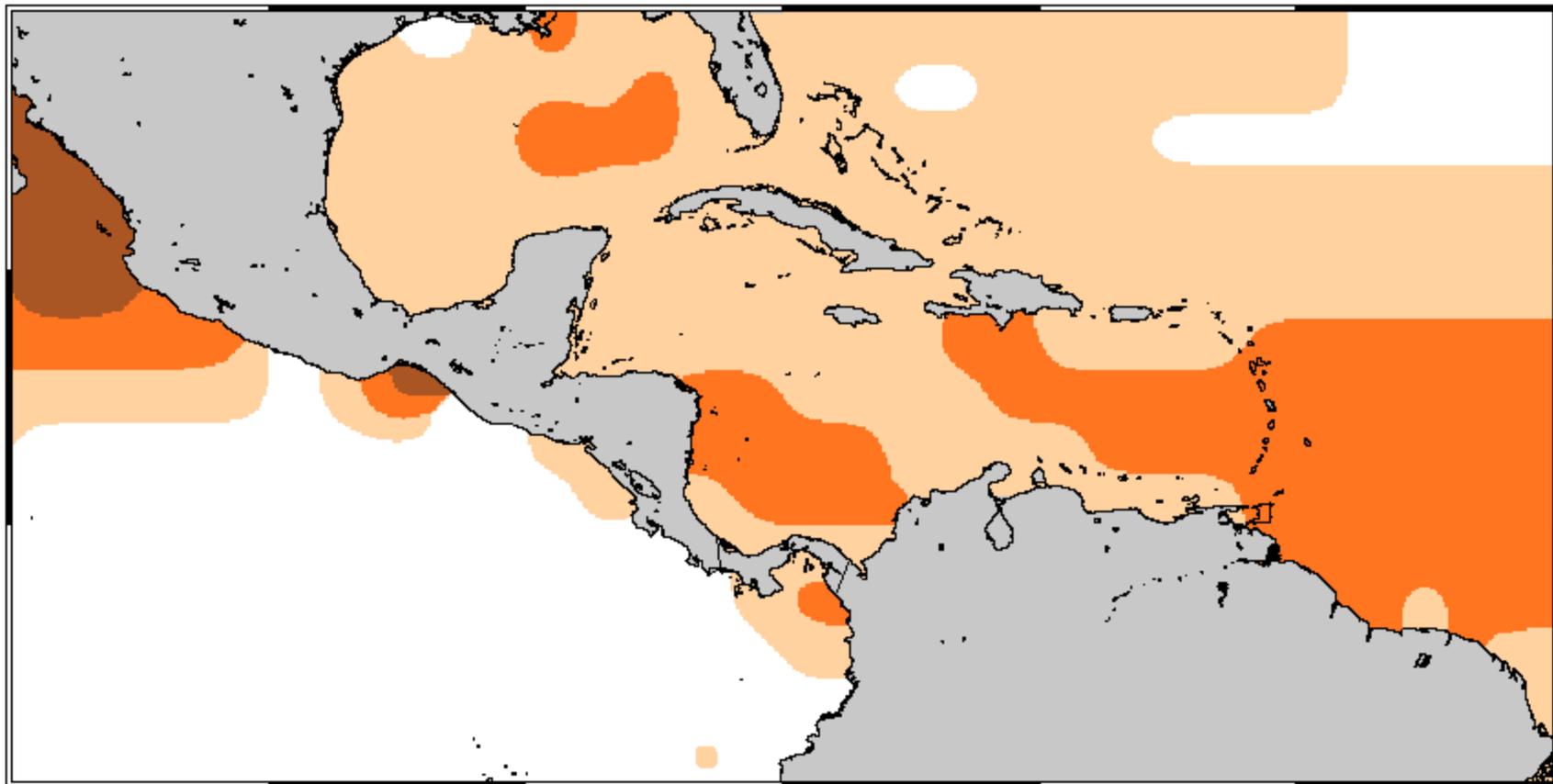
Low to moderate thermal stress is likely in a region extending across the entire GBR east across Vanuatu and New Caledonia, past Fiji, possibly to parts of French Polynesia. Some mild stress may be seen in the Indian Ocean including a region stretching from Western Australia to Pulu Keeling, with chance of mild stress extending on past the Chagos archipelago, Seychelles, and Madagascar to the eastern African coast, centered on Mozambique. The greatest warming is expected to occur from February through March.



Caribbean / Americas 2008 Bleaching Season Retrospective:

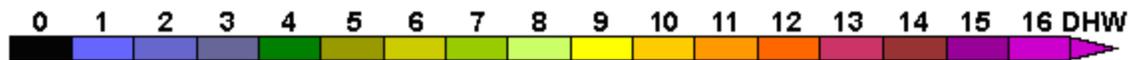
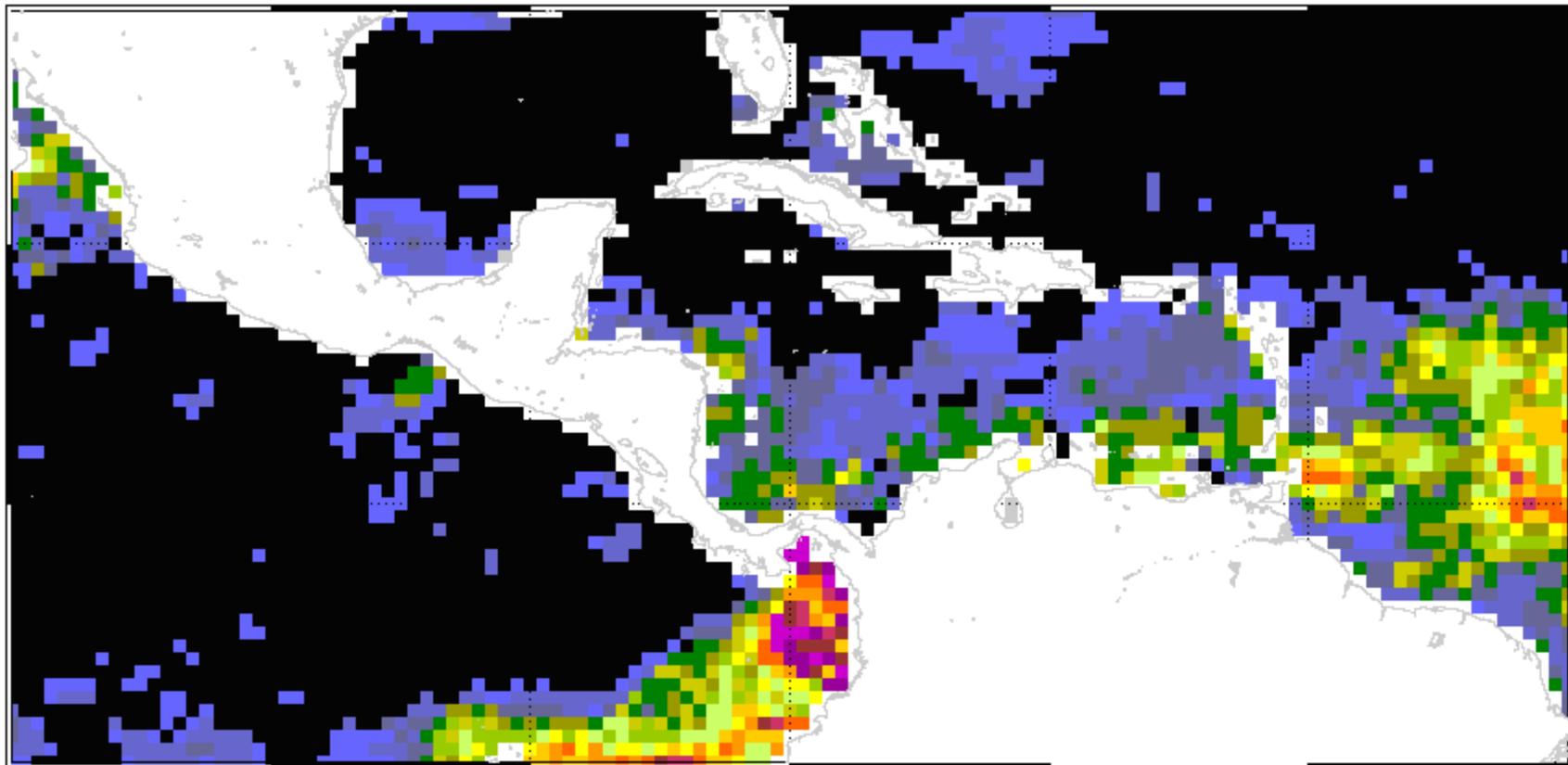
In its inaugural year the forecast system did well in predicting the general patterns of thermal stress in the Caribbean in 2008, especially earlier in the season providing confidence in the ability of the system to provide valuable guidance on the potential for bleaching 2-4 months in advance. The figures below compare the outlook issued in August with the maximum thermal stress experienced in the Caribbean during the 2008 bleaching season. The forecast of sudden warming around Baja California was captured particularly well by the model. Late in the season the forecast system over-predicted thermal stress in the first few weeks after the model was initiated, but performed well in weeks 8-16. We are working to diagnose what may have caused this bias in the model and may need to tune the model to reduce the intensity of thermal stress generated in the early weeks.

2008 Aug 12 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Aug–Nov 2008



 Potential Bleaching  Potential Widespread Bleaching  Potential Severe Bleaching

NOAA Coral Reef Watch Satellite Maximum Coral Bleaching Degree Heating Weeks
2008 Jan 01–2008 Nov 14



NOAA Coral Reef Watch Satellite Maximum Coral Bleaching HotSpots
2008 Jan 01–2008 Nov 14

