

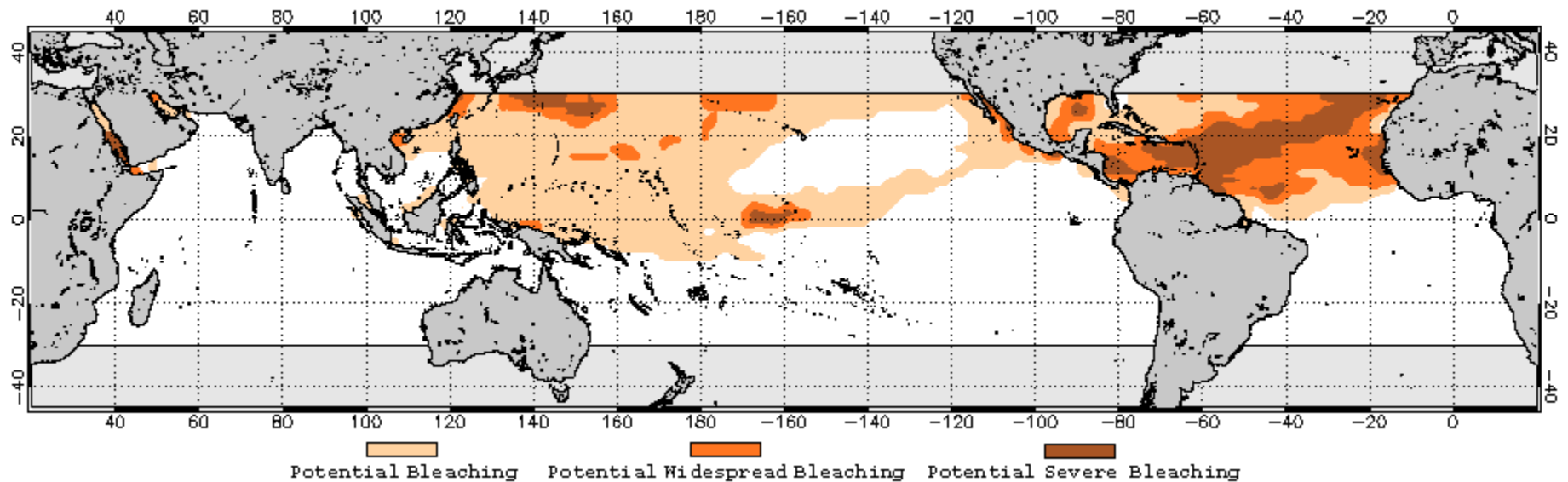
NOAA Coral Reef Watch
Seasonal Coral Bleaching Thermal Stress Outlook
(Experimental product, 2x2 degree spatial resolution)

July NOAA Coral Reef Watch Thermal Stress Guidance Through October 2009

The NOAA Coral Reef Watch (CRW) [Coral Bleaching Thermal Stress Outlook](#) indicates there is a significant potential for coral bleaching in the Caribbean in 2009, especially in the Lesser Antilles. Based on our current model, there is a potential for higher thermal stress than normal.

Other areas of concern in 2009 are central Pacific including the equatorial Line Islands and Kiribati. Some thermal stress may also develop between the Northern Marianas Islands and Japan. An important caveat is that the model used for this outlook is not yet calling for El Niño development, whereas NOAA's operational Climate Forecast System is now calling for [development of an El Niño during 2009-10](#). If El Niño conditions continue to strengthen, this could increase the bleaching risk in the central to eastern Pacific and Caribbean. Remember that this guidance should be used as indicators potential general patterns rather than precise predictors of thermal stress.

2009 Jul 14 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Jul–Oct 2009

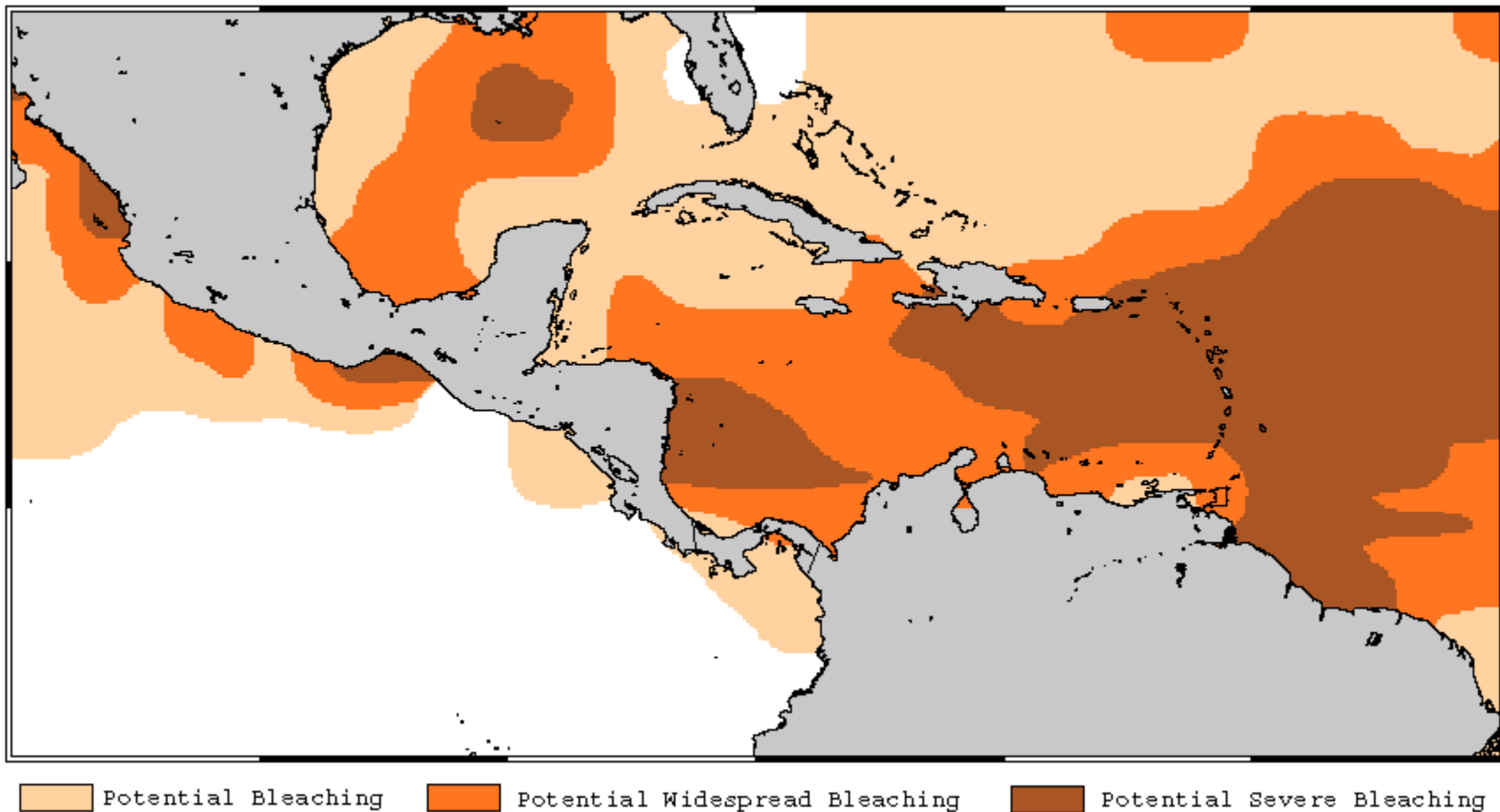


Caribbean Bleaching Outlook:

The forecast system indicates that there is a potential for bleaching across the Caribbean basin in 2009. At this time, the model indicates that there is potential for high thermal stress in 2009 through October. Our concern at this time is that thermal stress potential based on the LIM model is reminiscent of that seen in July 2005 hindcasts of the record-setting 2005 event. Currently there appears to be some potential for

high stress in the central Gulf of Mexico and a region stretching from the Lesser Antilles across to the southern coast of Hispaniola and the Caribbean coast of Nicaragua. NOAA's operational Climate Forecast System is now calling for [development of an El Niño during 2009-10](#). Typically this has the strongest impact in the Caribbean during the second year of the El Niño (2010). Finally, in light of predictions for a potential of lower than normal precipitation in much of the Caribbean this year (see [International Research Institute for Climate and Society](#) and [Caribbean Institute for Meteorology and Hydrology](#) outlooks), we do not expect cloud cover to provide relief from the predicted warming as was seen earlier this year in Australia. We are still 2-3 months away from the peak of this year's warmest months and we recommend that you monitor these updates as we get closer to the event. The following figure shows the current Caribbean 4-month Coral Bleaching Outlook through October 2009.

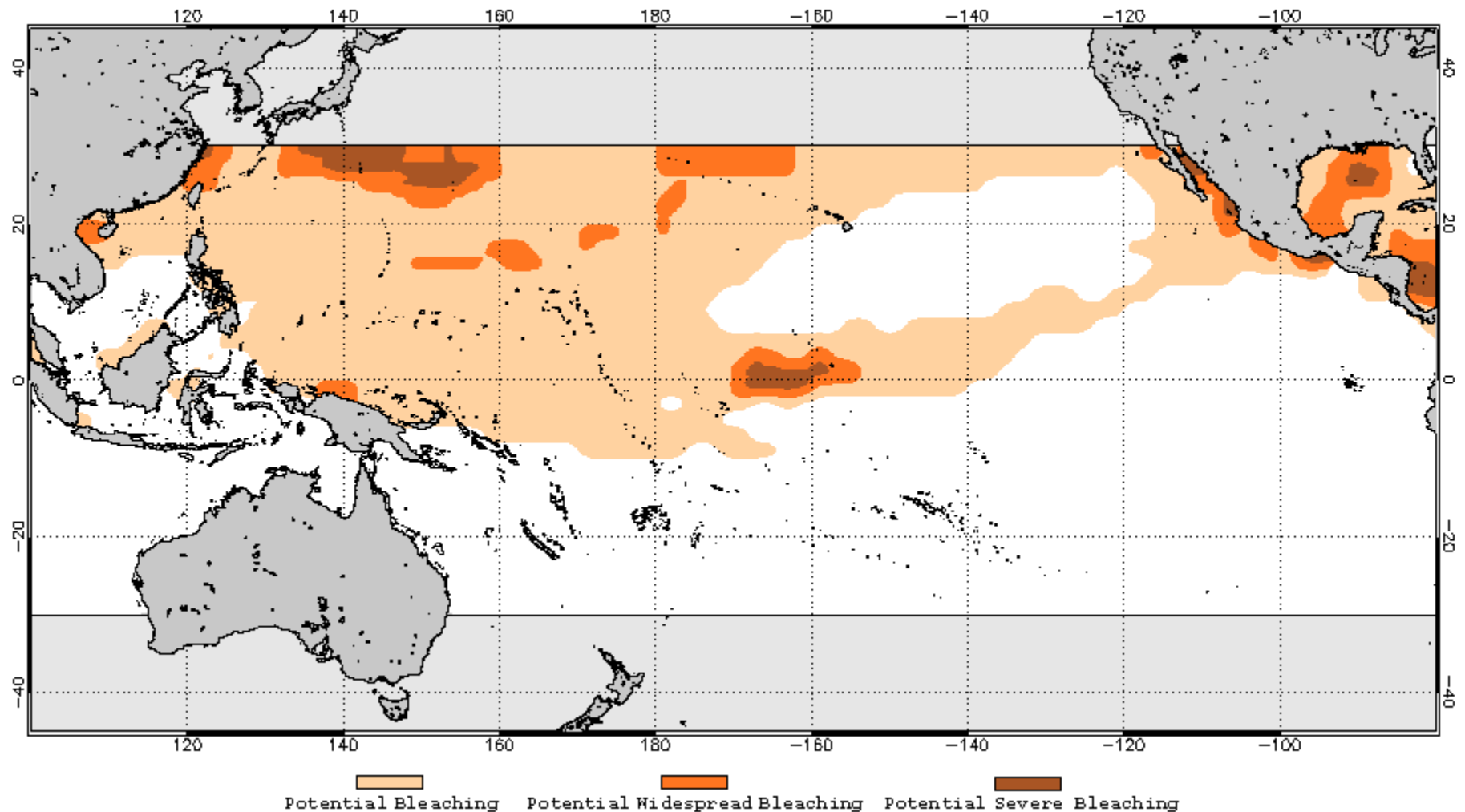
2009 Jul 14 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Jul–Oct 2009



Pacific Bleaching Outlook:

Another area of concern in 2009 is the central Pacific including the equatorial Line Islands and Kiribati. This area is especially subject to stress if El Niño development continues. NOAA's operational Climate Forecast System is now calling for [development of an El Niño during 2009-10](#). There also is a potential for some thermal stress to develop between the Northern Marianas Islands and Japan. There is also some indication of thermal stress along the Pacific coast of Mexico. However, the model is only generating small areas in the Pacific with a potential for abnormally high temperatures. Care should be taken that these are likely to move from their current locations. This region is also subject to intensification during El Niño conditions. The following figure shows the current Pacific 4-month Coral Bleaching Outlook through October 2009.

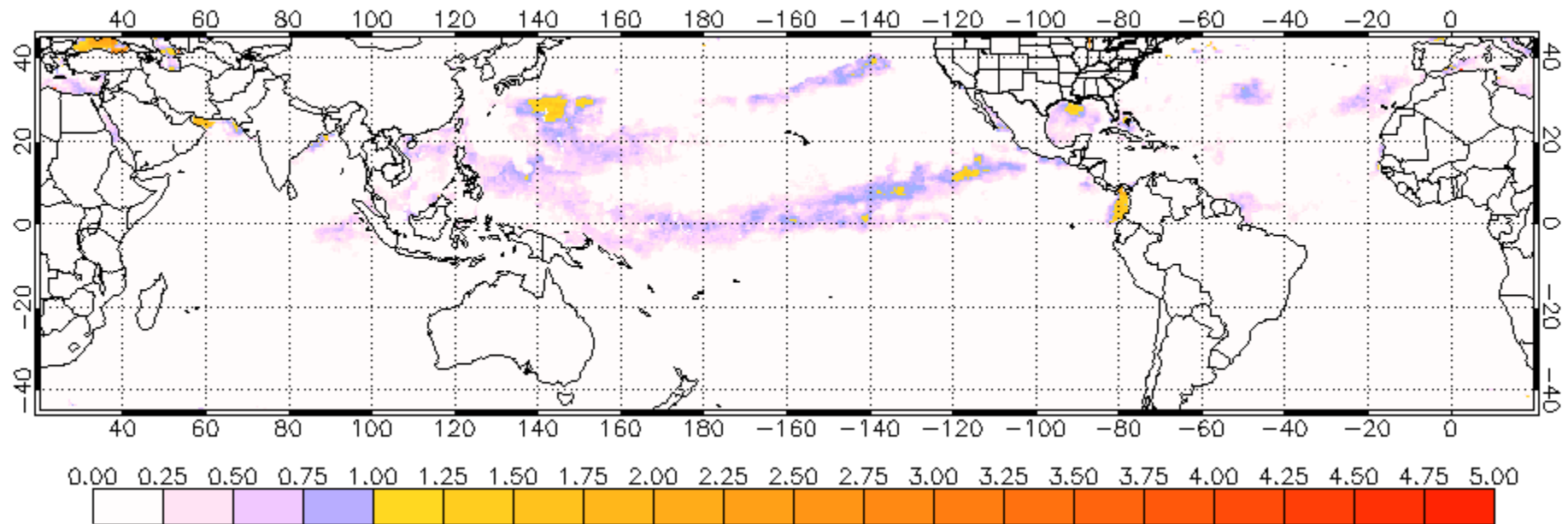
2009 Jul 14 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Jul–Oct 2009



Current Bleaching Conditions:

Thermal stress is still low in the Caribbean. However, early intensification of heating has occurred in the Gulf of Mexico and around the Florida Keys. In fact, the issuance of a Bleaching Watch for Sombrero Reef on 22 June 2009 was the earliest such alert since our bleaching alert system began in 2003. Two broad bands of warming have begun to develop across the Pacific that are consistent with El Niño development. This currently has warmed waters above the maximum monthly mean (Bleaching Watch) in the Marianas Islands, parts of Micronesia, and the outermost Northwestern Hawaiian Islands in one band, and Nauru, Howland-Baker, Kiribati, the equatorial Line Islands to Clipperton and Mexico along the other band.

NOAA/NESDIS Coral Bleaching HotSpots, 7/16/2009

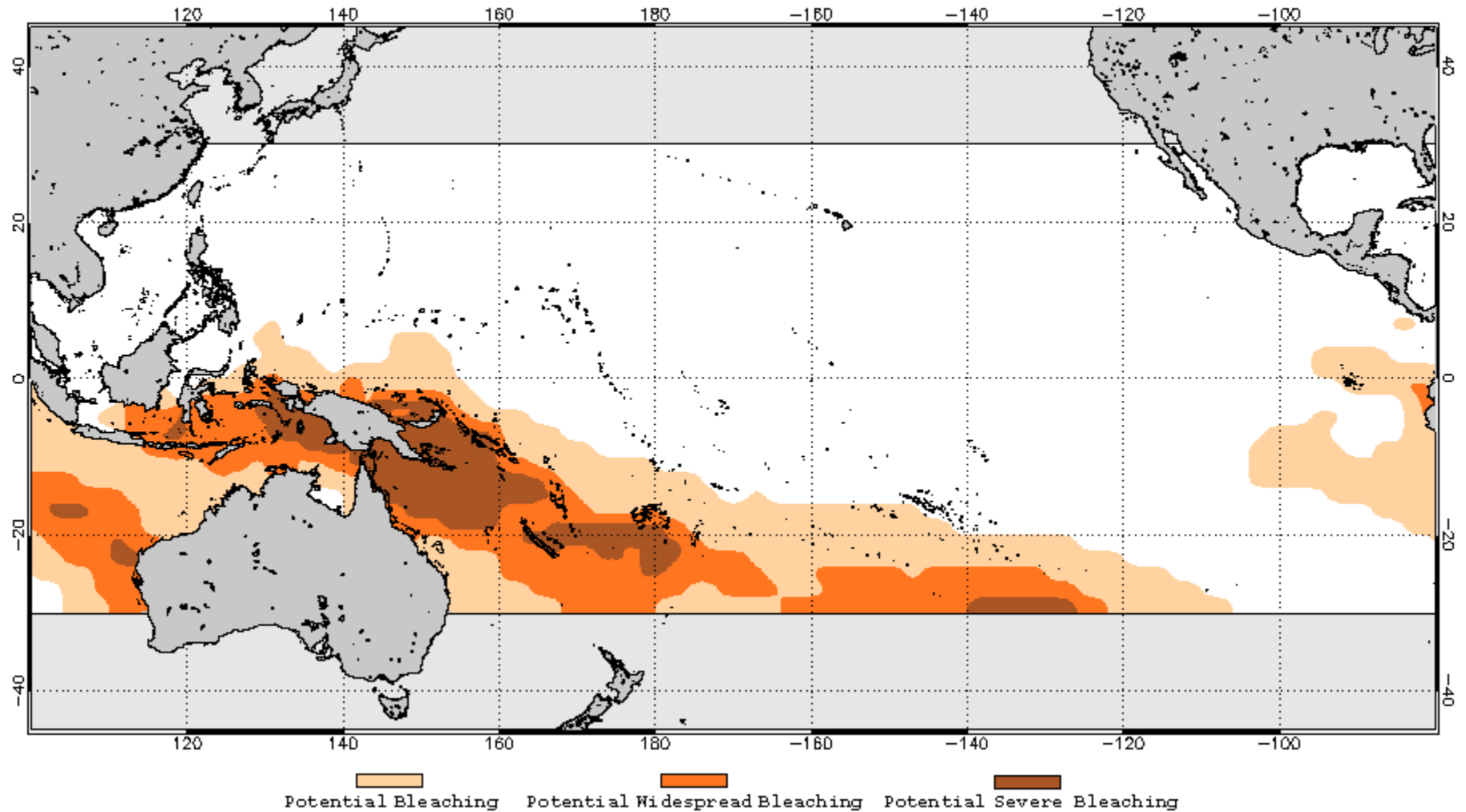


South Pacific 2008-2009 Bleaching Season Retrospective:

In its inaugural year the forecast system did well in predicting the general patterns of thermal stress in the western Pacific in 2008-9, especially earlier in the season. The guidance issued in early December shown below provided valuable guidance on the potential for bleaching 2-4 months in advance. The figures below compare the outlook issued at the start of December with the maximum thermal stress experienced in the Pacific as of the end of March 2009. The general pattern of warming in the outlook corresponded quite well with large-scale patterns of actual thermal stress. However, strong monsoonal activity along northeastern Australia cooled waters on the Great Barrier Reef (GBR) reducing thermal stress there. This was a fortunate difference between the forecast and actual conditions that protected these valuable reef resources. It is important to note that an SST forecast model such as the one used in our seasonal outlook would not capture weather patterns such as these so differences between the seasonal outlook and observations are more likely for areas close to large land areas - such

as the GBR and other continental reefs. The purpose of these outlooks is to provide general guidance on the potential of conditions that may lead to bleaching-levels of thermal stress.

2008 Dec 02 NOAA Coral Reef Watch Coral Bleaching Thermal Stress Outlook for Dec 08–Mar 09



NOAA/NESDIS Degree Heating Weeks for last 12 Weeks - 3/30/2009

