

Southwest Monsoon in the Arabian Sea 2008 and 2009 (to present)

The Southwest Monsoon is characterized by southwesterly winds that blow across the Arabian Sea, Bay of Bengal and South China Seas in response to a temperature gradient that develops as the central portions of the Asian continent warm with the summer months.

Typically, the monsoon in the Arabian Sea begins in early June, with the peak occurring in mid July and then waning by the end of August/early September. The area of strongest winds develops in association with the Somali Low-Level Jet, which develops off the Somalia coast. During the height of the monsoon, persistent gale conditions develop north of 7N off the Somalia coast, with 6-8m seas and swells in the area of highest winds/seas. Near gale to gale southwesterly conditions persist across the Arabian Sea to near 20N and 70E. Figure 1 shows the climatological mean of wind distribution across the Arabian Sea.

The 2008 Southwest Monsoon was characterized by an early onset – the onset of the monsoon across the Arabian Sea occurred about a week earlier than normal. As a result, heavy conditions associated with the monsoon developed sooner than normal across the Arabian Sea. However, on the whole, the 2008 Monsoon was near-average in terms of strength over the course of the June-August time period (Figure 2).

The major feature of the Monsoon of 2008 was the extent of the conditions across the basin: the core of heaviest conditions was displaced slightly further north than average, but more notably, did not extend as far east through the basin. An easterly anomaly developed east of 65E, south of 15N, along the southwestern Indian Coast, which was present throughout the season (Figure 3). So although conditions were near average in strength, the duration that vessels spent in the conditions was shorter than average as they transited the Arabian Sea either eastbound or westbound (although conditions on average were heavier for vessels sailing into and out of the Persian Gulf).

The affect of the early onset of the monsoon can be seen in the mean vector wind distribution for the month of May (Figure 4). Compared to climatology for the same period (Figure 5), the winds across the Northern Arabian Sea and Somali Jet Region were stronger than normal by 1-3 m/s on average for the month. As a result, heavy

conditions associated with the monsoon developed sooner than normal across the Arabian Sea.

The month of June saw more fully developed conditions sooner than average, due to the early onset of the monsoon. In June, the core of monsoon winds was stronger than climatology and extended farther north into the western Arabian Sea – Figure 6 shows that on average the core extended north of 15N in 2008, whereas the climatological placement of the core remains south of 13N during the month of June (Figure 7). Figure 8 shows that the easterly anomaly was present in June, and as a result the conditions associated with the monsoon did not propagate as far east through the Arabian Sea.

The month of July also saw conditions that were stronger than average; however the area of heavy conditions was confined to a smaller area of the Arabian Sea than normal. Climatologically, the core of near gale force and higher conditions stretch from 06N to 17N and east to 65E (Figure 9). In July 2008, the core of near gale force or higher conditions stretched from about 07N to 16N and east to about 63E (Figure 10). However, the area of gale force conditions was larger than average and extended further east compared to climatology. As a result, when transiting east or westbound, vessels were exposed to longer periods of heavy conditions than average during the month of July, though the conditions developed and diminished more quickly.

The northeasterly anomaly in the southeastern Arabian Sea was more pronounced in the month of August (Figure 11) than in either June or July, and as a result the conditions for the month of August were on average weaker, and did not extend as far north or east through the basin compared to climatology (Figures 12, 13). Average wind speeds were generally near gale force or lower.

To present, data from June and July 2009 (Figure 14) indicate that the monsoon of 2009 has been below average in intensity compared to climatology (Figure 15). However, in looking more closely at each month, one will note that the cumulative average of the two months is based on the fact that the month of June was below average in strength of conditions – Figure 16 shows that on average, the heaviest conditions in June were in the strong breeze range. July, on the other hand, was stronger than average – with gale force conditions stretching farther north and east into the central portions of the Arabian Sea than average (Figure 17). As a result, vessels transiting the Arabian Sea in July 2009 were subject to stronger conditions, for longer durations, compared to both climatology and for July 2008.

Final analysis on the Southwest Monsoon of 2009 will be possible once data collection for the month of August is completed.

In conclusion, the Southwest Monsoon of 2008 was near normal in strength; however conditions were not as extensive across the Arabian Sea, thereby minimizing their overall impact on shipping interests passing east or westbound through the basin. Preliminary data for June and July indicate that the Southwest Monsoon for 2009 is overall weaker than average, however for the month of July, monsoonal conditions were stronger than average, which had greater impact on shipping interests across the basin in 2009 compared to 2008.

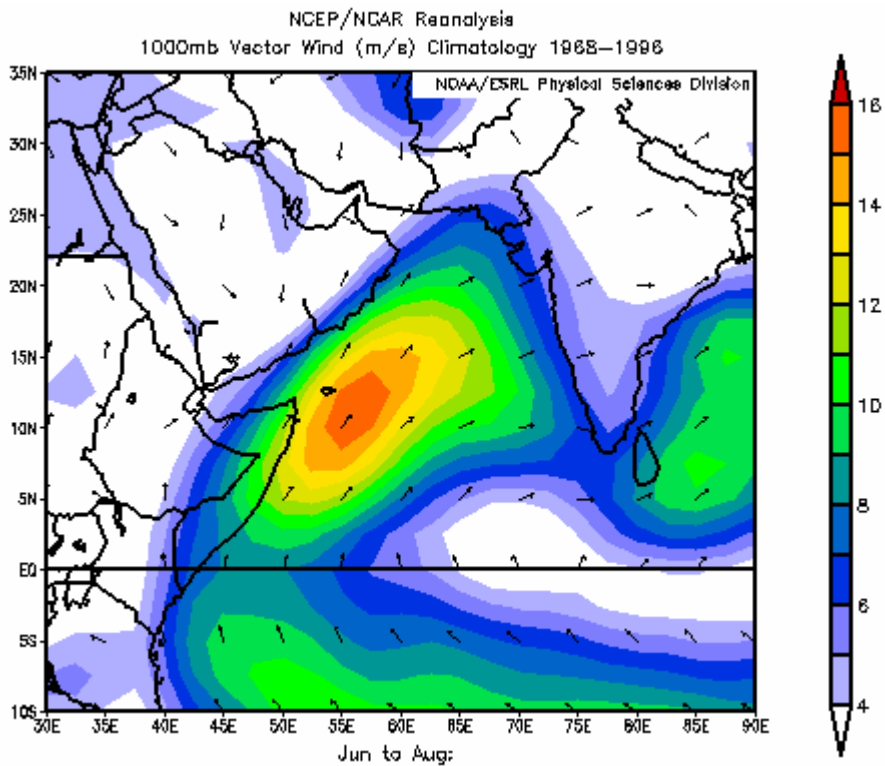


Figure 1. Vector wind composite mean (1000mb) for June-August 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

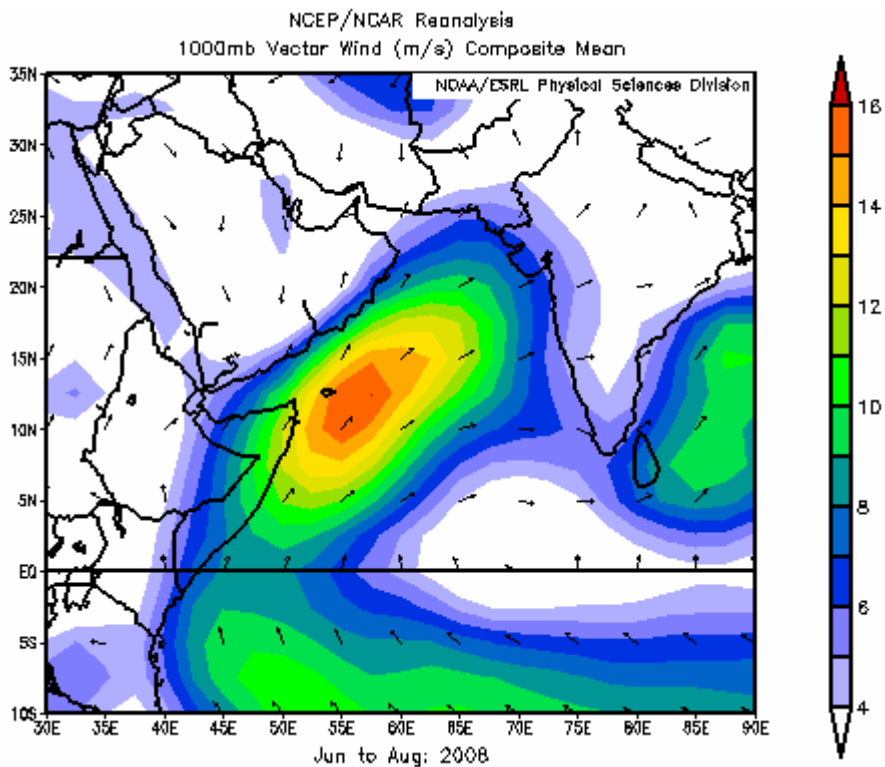


Figure 2. Vector wind composite mean (1000mb) for June-August 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

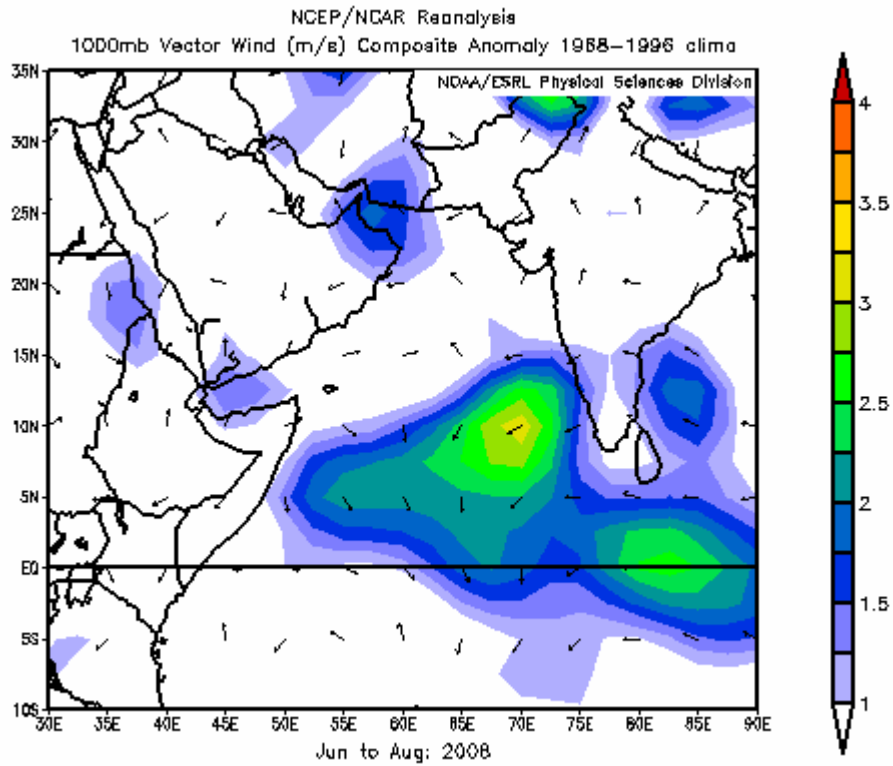


Figure 3. Vector wind composite anomaly (1000mb) for June-August 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

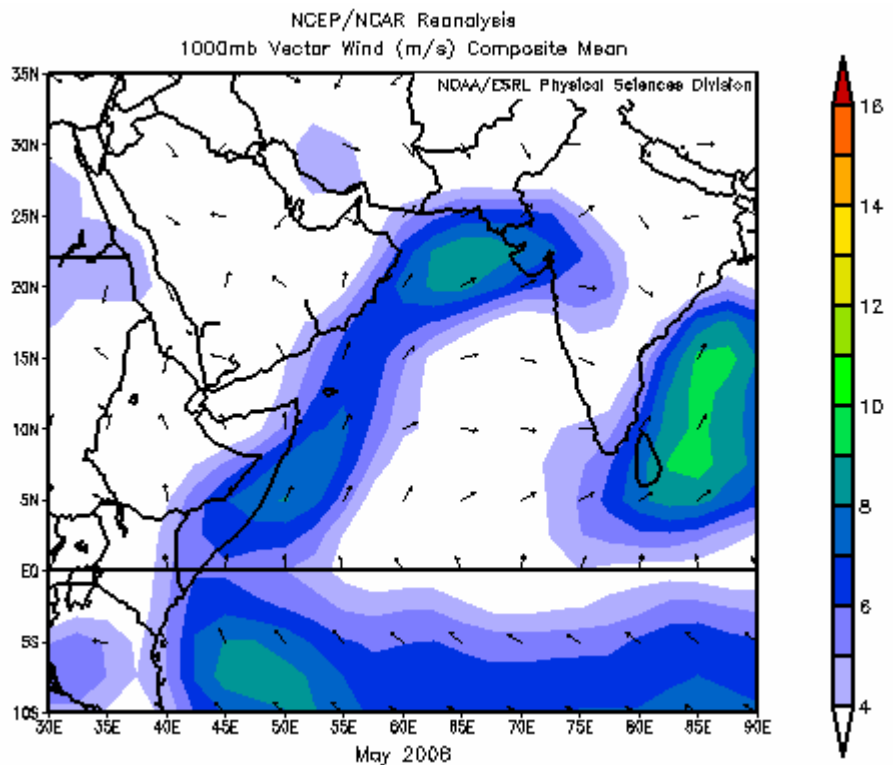


Figure 4. Vector wind composite mean (1000mb) for May 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

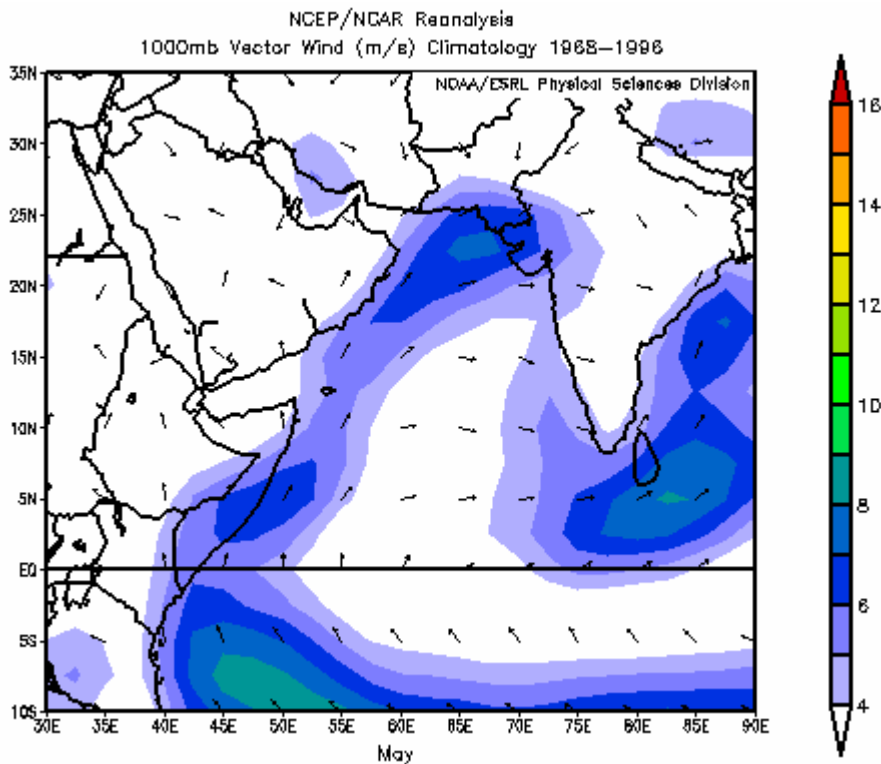


Figure 5. Vector wind composite mean (1000mb) for May 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

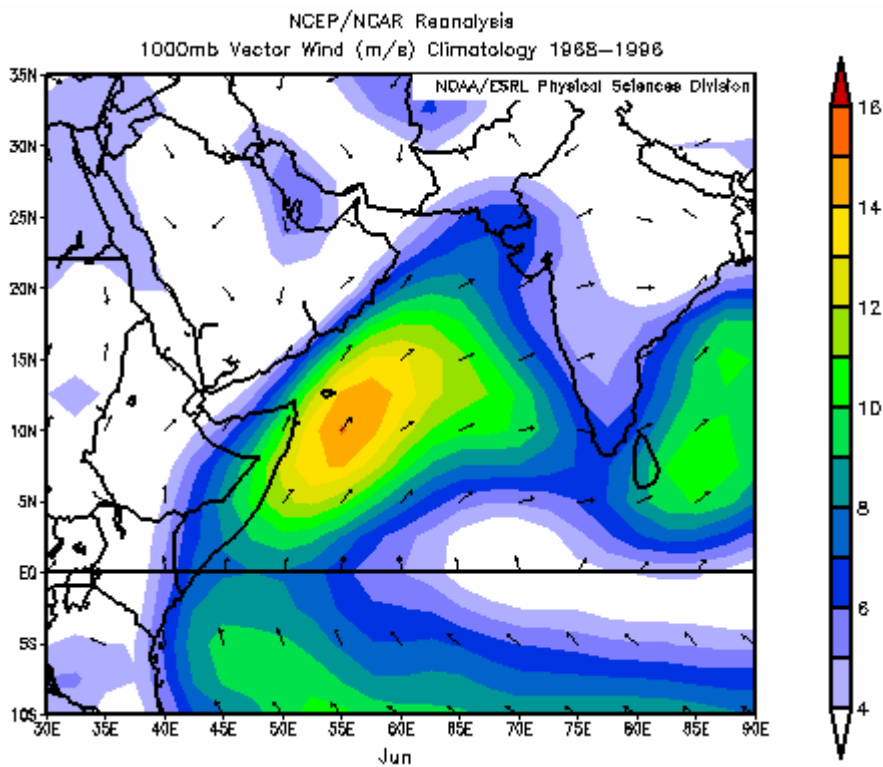


Figure 6. Vector wind composite mean (1000mb) for June 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

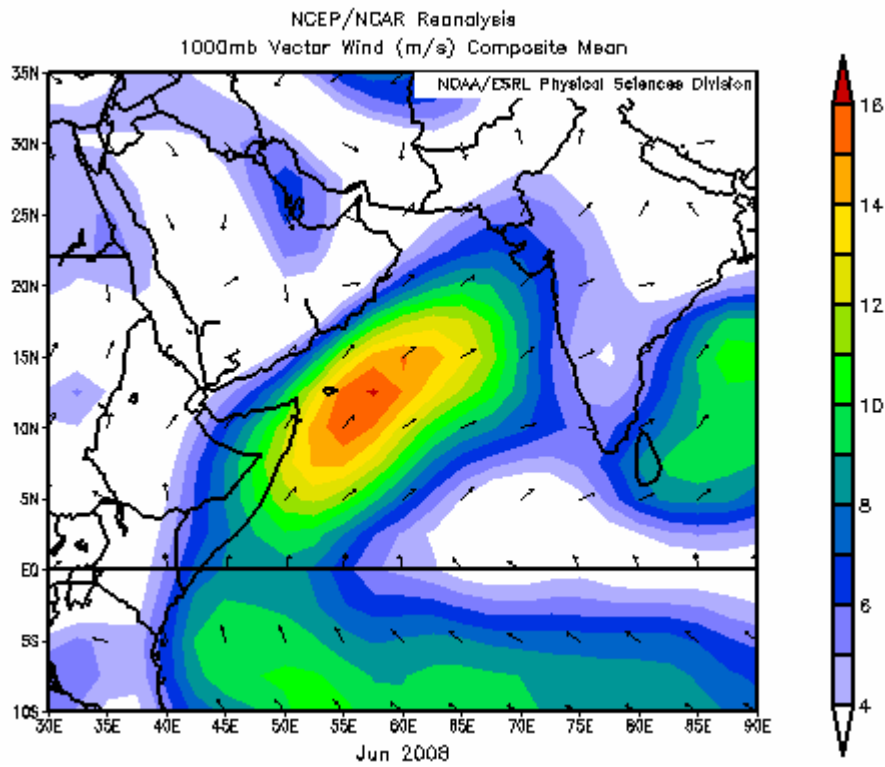


Figure 7. Vector wind composite mean (1000mb) for June 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

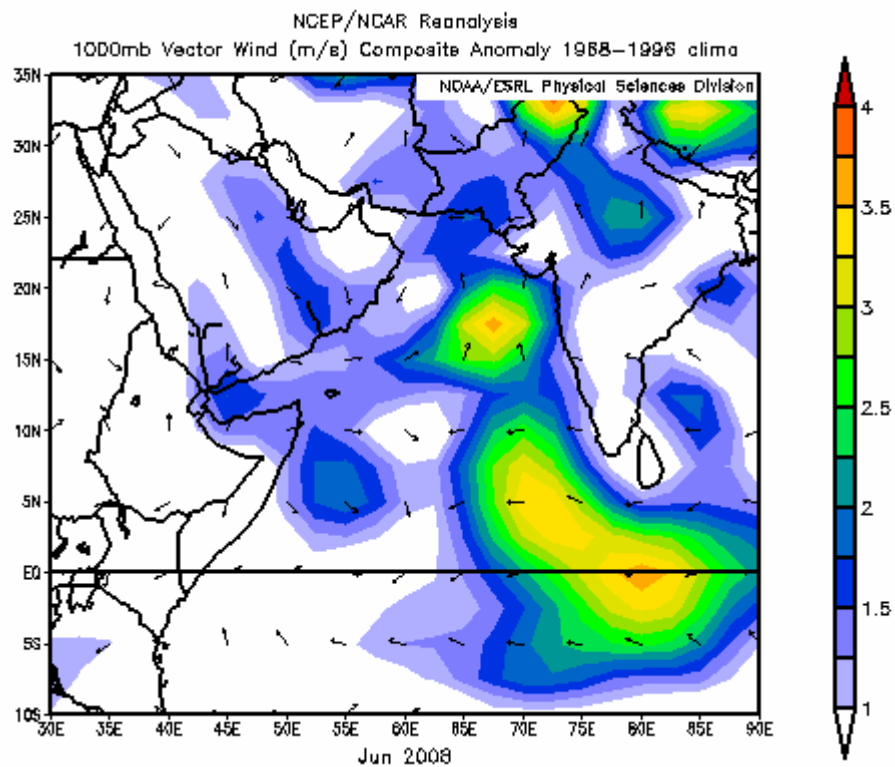


Figure 8. Vector wind composite anomaly (1000mb) for June 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

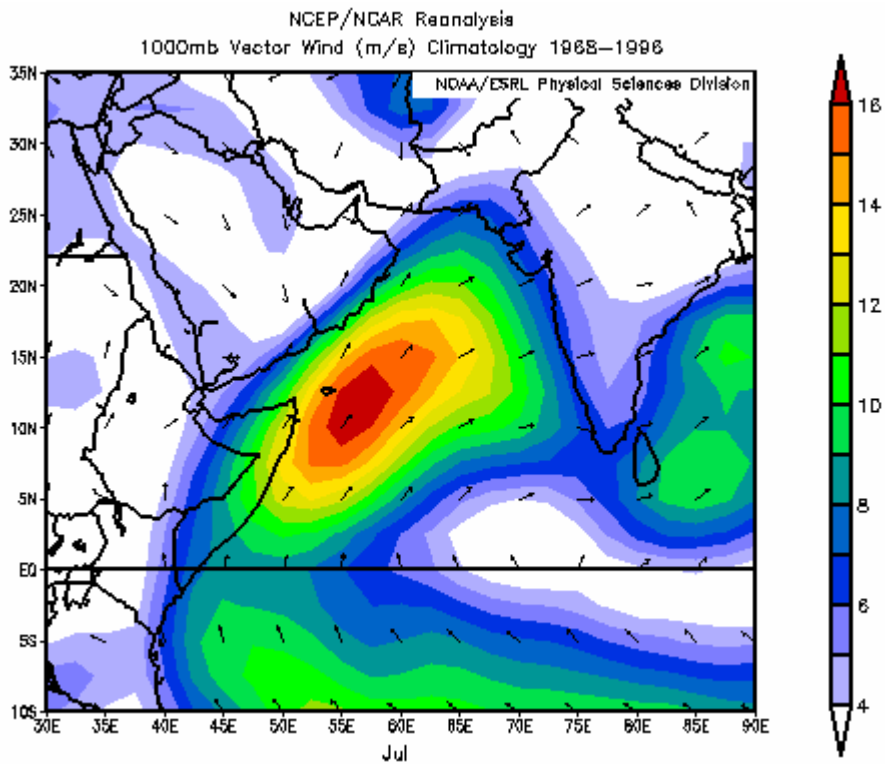


Figure 9. Vector wind composite mean (1000mb) for July 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

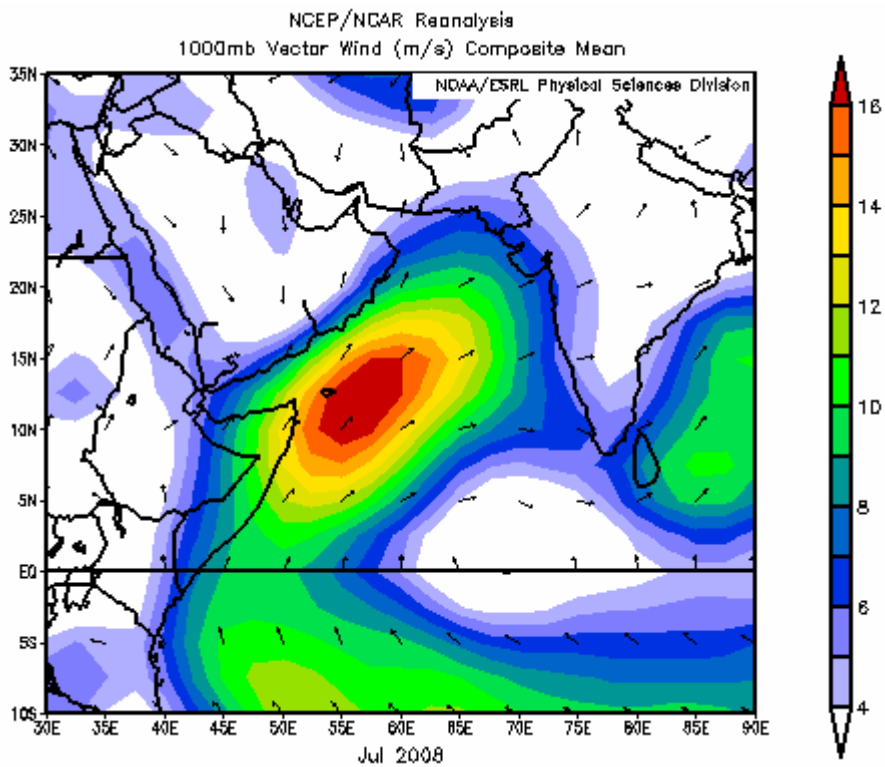


Figure 10. Vector wind composite mean (1000mb) for July 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

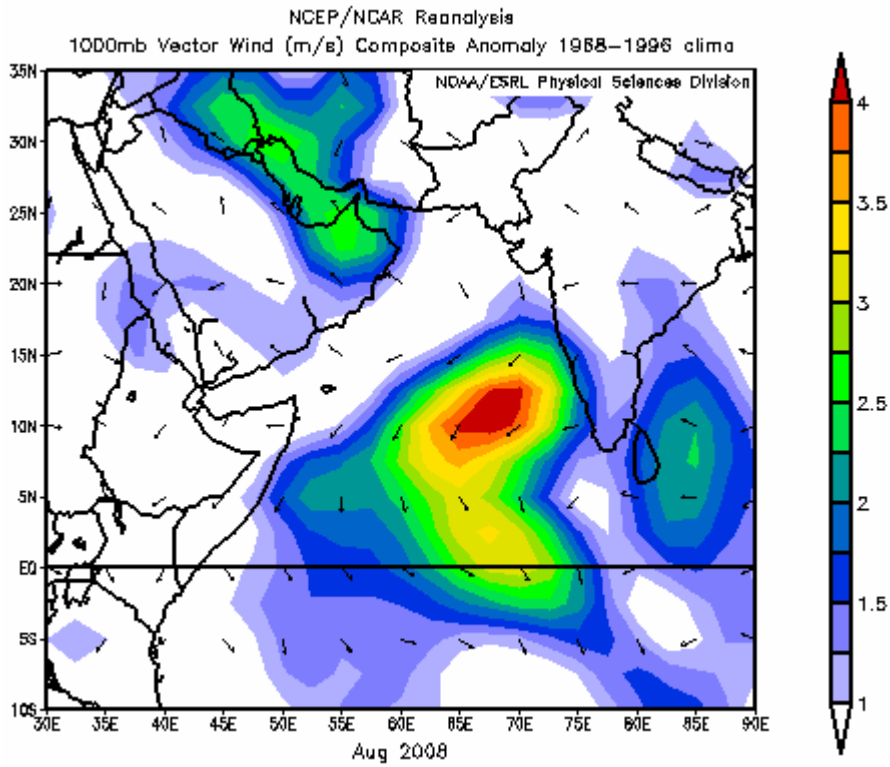


Figure 11. Vector wind composite anomaly (1000mb) for August 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

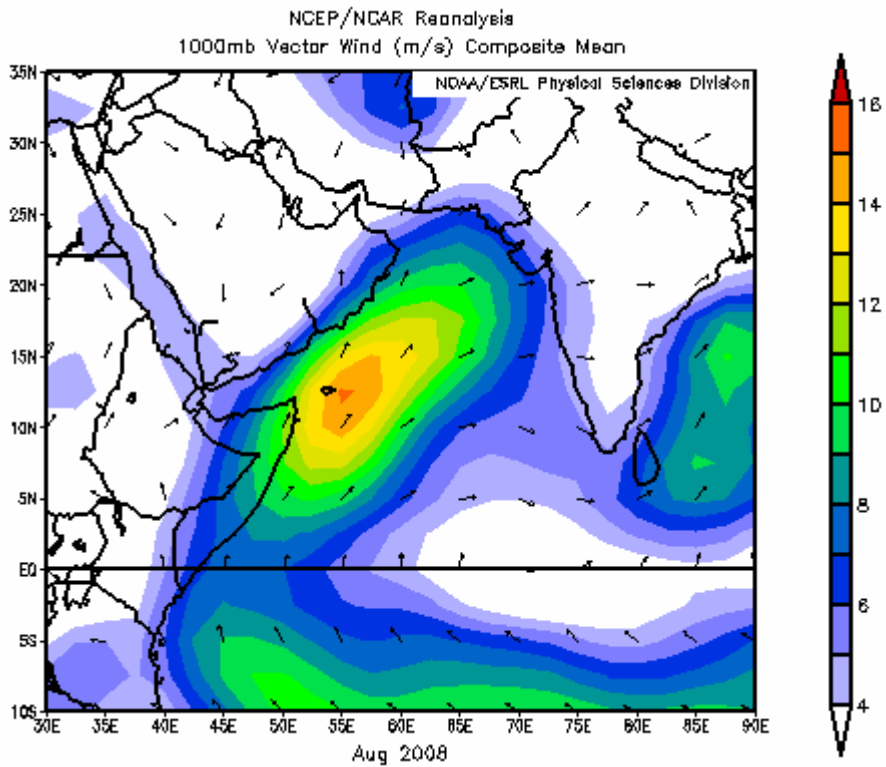


Figure 12. Vector wind composite mean (1000mb) for August 2008. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

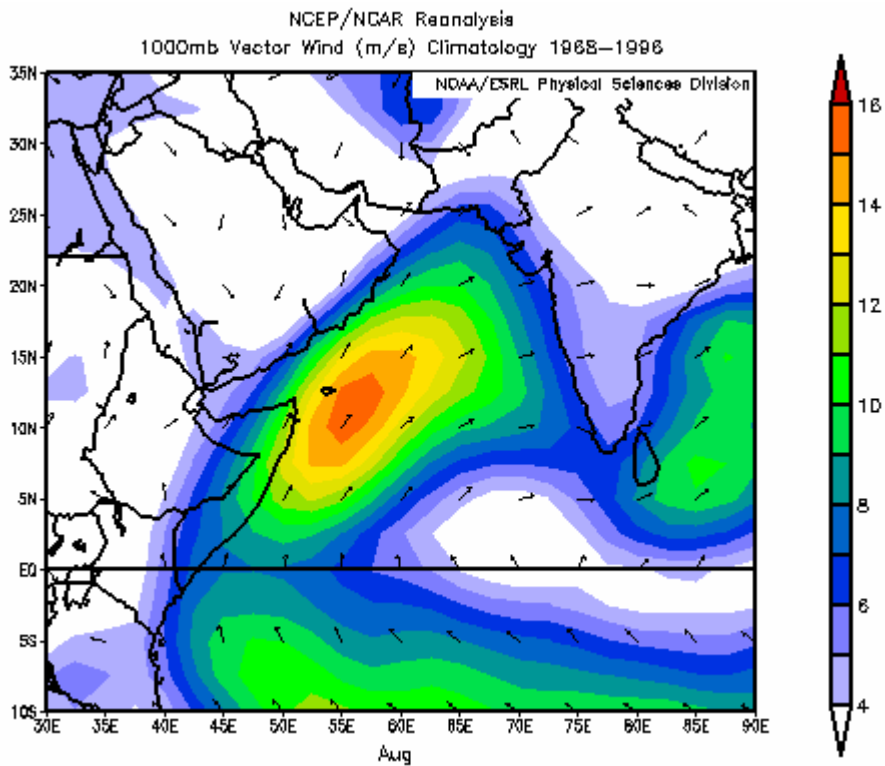


Figure 13. Vector wind composite mean (1000mb) for August 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

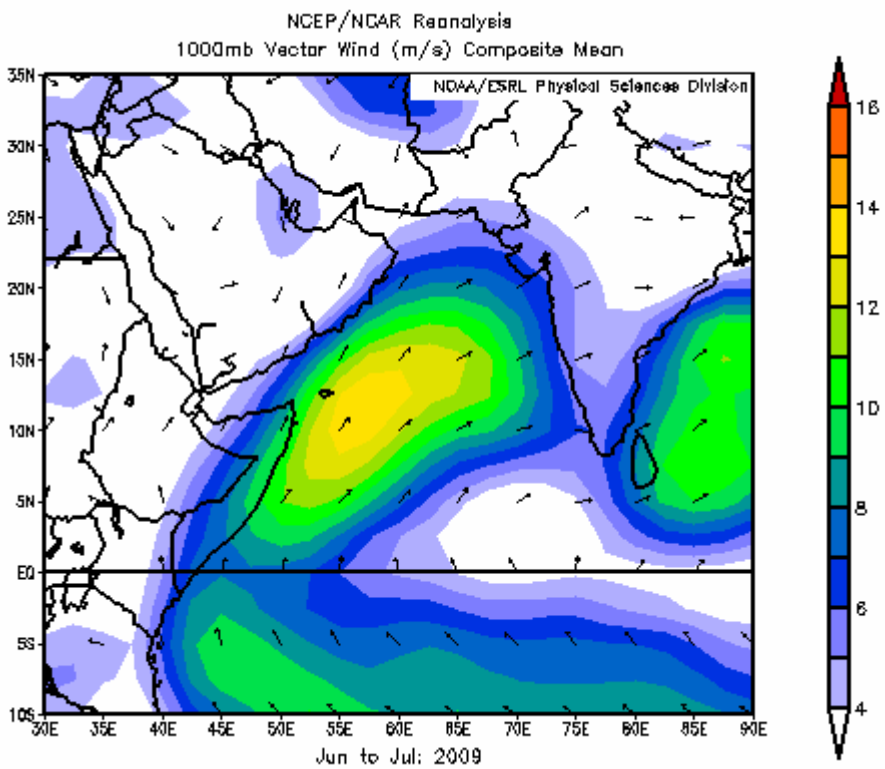


Figure 14. Vector wind composite mean (1000mb) for June-July 2009. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

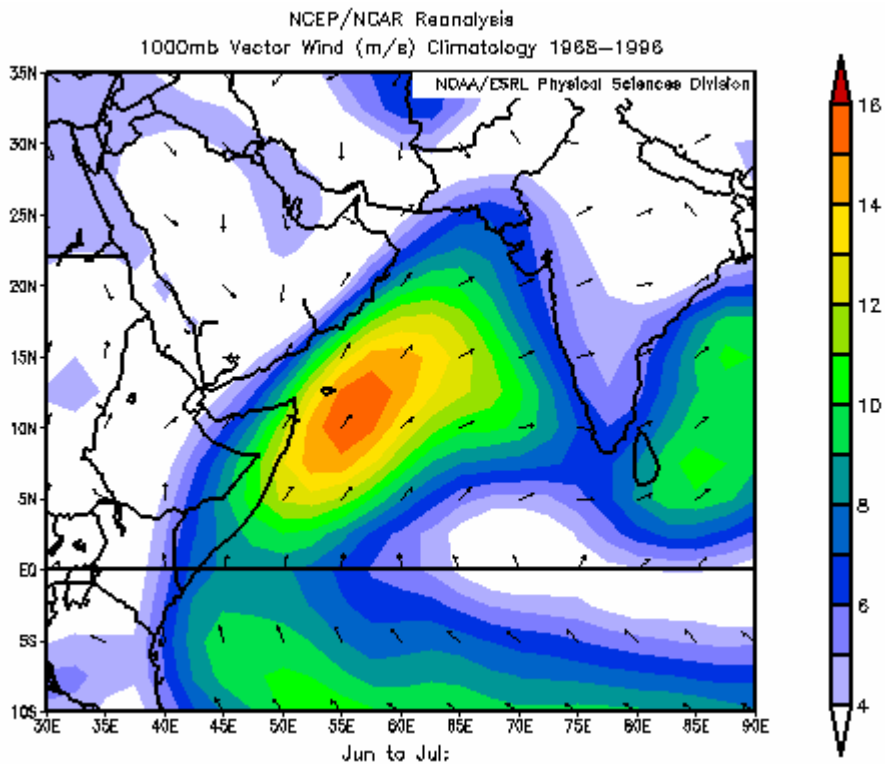


Figure 15. Vector wind composite mean (1000mb) for June-July 1968-1996. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

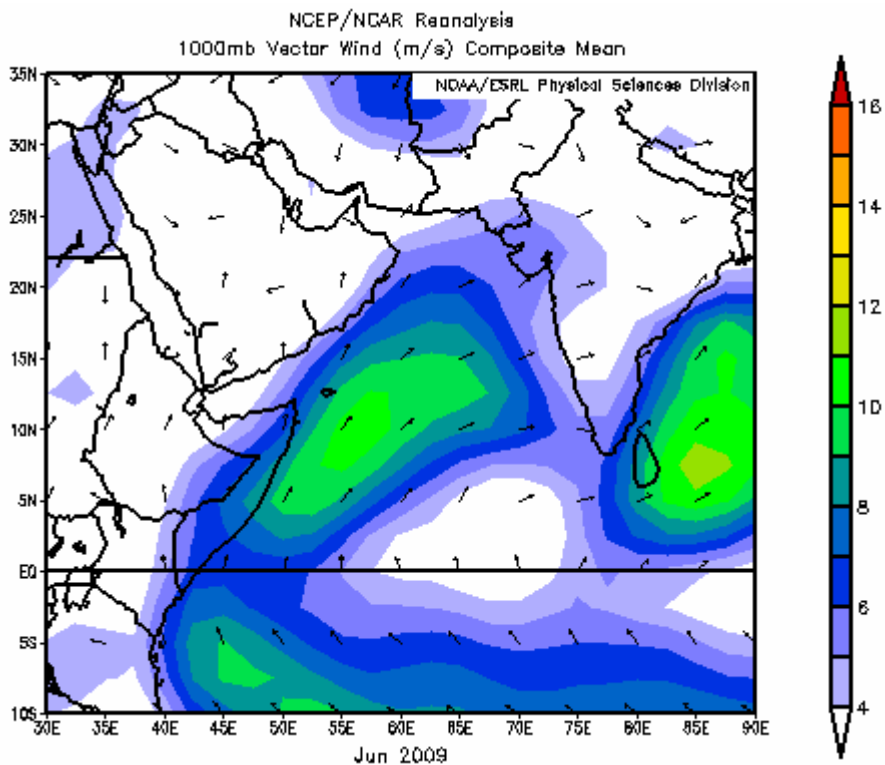


Figure 16. Vector wind composite mean (1000mb) for June 2009. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

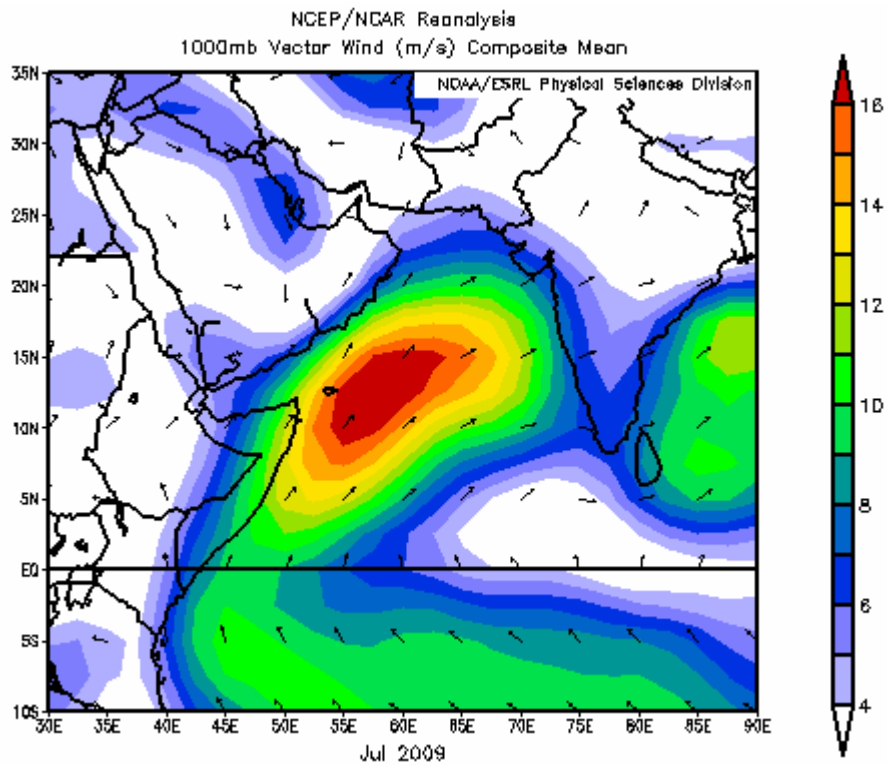


Figure 17. Vector wind composite mean (1000mb) for July 2009. From NCAR/NCEP global Reanalysis data provided by Earth Systems Research Laboratory.

Addendum

One major, non-weather-related issue that affected the shipping lanes of the Arabian Sea of 2009, which was not as serious an issue in 2008, was piracy.

This year, the threat of piracy in the North Indian has been much worse than in years past, and the IMO is now suggesting that vessels remain at least 600nm from the Somalia Coast through the North Indian Ocean.

Due to the piracy issue, Weathernews was no longer able to recommend routes south of monsoon core, as had been the routeing strategy in years past (reducing speed down by minimizing exposure to head conditions), and instead had to evaluate routes that were more north of the monsoon core as alternatives.

Analyses indicated that there is no way to minimize the conditions of the monsoon by sailing farther north without adding significant time and distance to the route. Therefore, it was determined that the routeing strategy for 2009 would be to recommend the shortest route, on the basis that although a vessel would be subject to periods of heavy conditions, they would at least be able to minimize the time spent in them.

For ship types and cargoes that are sensitive to rolling, a route passing north of the heaviest conditions associated with the monsoon core was developed, on the basis that passing further north through the Arabian Sea the vessel would pass north of the core of heaviest conditions, and place those conditions more forward of the beam to minimize rolling.

Therefore, due to the issues associated with Piracy in the North Indian Ocean, vessels sailing across the Arabian Sea in 2009 were not able to benefit from time-saving routeing strategies used in years past.