



## **Climatology of the Nortes of the Gulf of Mexico**

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In the Gulf of Mexico, the Nortes are stream winds events extremes. They are also named could surges, which propagates as waves from the North to the Tropics. Those kinds of events are generated in the Rocky Mountains between the months of September to May. They are meteorological hazardous events that have a strong impact in the ocean and in the coral reef communities extended along of the Gulf area, and could be dangerous for navigation and urban zones located along of their littoral due to the strong gust of winds which can reach velocities higher than 12 m/s. Although some studies have developed the statistics of the cold surges (DiMego et al., 1976), the Nortes characterization, classification and climatology have not been analyzed in deep. This fact is important to know how the climatic change could affect them and their impact in society and coral reefs. This contribution starts in the deep analysis of a Norte event of developed in early February of 2005 (Salas and Arenas 2010) and tries to analyze the climatic variability of Nortes. With this objective the climatic series of Veracruz (30 years long) and Tuxpan (10 years long) ports have been analyzed. This information has been combined with the NARR-NCEP reanalysis model outputs to characterize the main events. The interannual and intrannual variability of wind speed, pressure, air temperature and relative humidity, have analyzed. Specific attention to abnormal years (El Niño and La Niña events) has been paid. In general 425 Nortes have been identified from January of 1980 to December of 2009. The minimum and maximum events generated in the Gulf of Mexico, was 4 and 27 events, respectively. The months of maximum occurrence of the Nortes events in the Gulf of Mexico were in winter. The Nortes produced in the coastal zone induced drastic thermal shifts in the coastal water, which can result in reduced coral vitality (e.g. bleaching and reproductive inhibition) or, in extreme instances, total destruction of entire reef systems.