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Coastal circulation and dispersion in the port zone of Fortaleza, Ceará (Brazil)

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The area proposed for the study is the Mucuripe port zone located in the city of Fortaleza (Ceará-Brazil), in South Atlantic Ocean, with geographical coordinates that are 3° 41 ’ 28 ” of South Latitude and 38° 33 ’ 29 ” of WGr. Longitude. The interests of the work it is to observe the Lagrangian dispersion of sets of buoys and to analyze if it’s trajectory behavior receives influences of the winds or of the superficial currents in the semi -diurnal tide.These results represent an important tool to help decisions about the way of actions in the cases of accidents with oil spill. The sea data were collected in May 2005, in the final of the rainy period, with predominance of the southeast and east winds, and with average of expected spring tide (syzygy) for 2.80m of amplitude, the waves type are sea , waves of short period (6 to 8 s) .The datas of direction and horizontal speed of the superficial current were obtained during a complete cycle of tide (12,42 hours) for high water, ebb, low water and flood tidal stages, in each stage were obtained instantaneous measures with the Sensordata Current Meter model SD30. The vertical profile of the wind was obtained in three different heights with the TEST-TERM 440 anemometer. The initial and final positions of the buoys were acquired with Garmin GPS. There were simultaneous acquisitions of datas for the winds, currents and of the dispersion of the buoys. The results obtained for the superficial currents presented speed between 14,2 and 5,8 cm/s, the highest speeds for low water and ebb and the lowest speeds for the high tide and flood. The direction of the currents varied 84° with preferential direction for E - SSE. The winds presented preferential direction of E and ESSE with speeds varying between 7,7 and 2,6 m/s. The direction

of the buoys between N - ONO. Through the space and time circulation patterns of the Mucuripe port zone the results allowed to determine that the dispersions of the buoys are strongly influenced by the winds, this condition allowed to deduce that probably in case of accident with oil spill the dispersion is offshore directed to a typical May period. This knowledge is an important instrument to aid in the port environmental management and consequently in the preservation of the coastal ecosystem resources.
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