

## **Tidal analysis for the port of Nacala**

Humberto F Meque \* ([humbertomeque.hm@gmail.com](mailto:humbertomeque.hm@gmail.com)), Fialho PJ

Nehama\* ([fialho.nehama@gmail.com](mailto:fialho.nehama@gmail.com)), Angela Hibbert\*\* ([anhi@noc.ac.uk](mailto:anhi@noc.ac.uk)), Amani Becker\*\*\*,\*\*\*\*  
([abeck@noc.ac.uk](mailto:abeck@noc.ac.uk))

\*Escola Superior de Ciências Marinhas e Costeiras, UEM, 1º de Julho ave., Quelimane, Mozambique

\*\*Satellite Oceanographic Consultants Ltd, 49 Seal Road, Stockport, SK7 2JS, United Kingdom

\*\*\*National Oceanography Centre, 6 Brownlow Street, Liverpool L3 5DA, United Kingdom

\*\*\*\*University of Liverpool, Dept of Geography and Planning, Liverpool L69 7ZT, United Kingdom

### **Background**

In coastal areas the action of sea agitation is always associated with and in overlapping the different levels of tides. In the case of the Mozambican coast, the tides have amplitudes that can reach 5.0 m, being the semi-diurnal tide, that is, during the day there are two low tides and two high tides.

### **Methods**

Our approach was to analyze the tides at the Port of Nacala. The data were extracted for the years 2003 and 2004 using specific software made available through the C-RISe project (<http://www.satoc.eu/projects/c-rise>) comprising time series of tide height for the delimited area by the latitude of 14°32'23.24 "S and longitude of 40°40'04.78" E covering all part of the Port of Nacala. Data processing and tidal analysis were conducted in TASK - Windows Edition.

## **Results**

In the living tide (MV) the elevation reaches about 4.83 meters while at tide (MM) the maximum elevation is about 2.7 meters. Note the time of almost 15 days between two living or dead tides and the time of 7 days between a living tide and the consecutive dead tide. The tides in the Port of Nacala are semi-diurnal and this characteristic can be seen in graph 1, where the time between two high tides or consecutive low seas is approximately 12 hours.

For the values of elevation it was noticed that the maximum of all the period in analysis was of 4.83 meters and was registered during the living tide. while the minimum value was 0.20 meters and was recorded at low tide of the living tide.

## **Conclusions**

The results of the harmonic analysis indicate that for the predicted / modeled tides the most important tidal components for this region of the Port of Nacala are the semi-diurnal ones of which the main mole (M2) and the main solar (S2) having the largest amplitudes and differing from those observed with a mean of 0.202 meters in height. And we conclude that the analysis method presented here is more feasible because it presented values of the elevations closer to the observed elevations. In the Port of Nacala semi-diurnal tides with a factor of form equal to 0.115 are observed.