



SOUTH AFRICAN NAVY HYDROGRAPHIC OFFICE

National Report for South Africa

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1. **Introduction**

The South African coastline is approximately 3000km in length and for aesthetic, recreational and economic reasons; it is an enormous national asset.

The South African Navy Hydrographic Office (SANHO) is the responsible authority for the installation and maintenance of the tide gauge network around the South African Coastline. The SANHO is also responsible for the acquisition, processing, archiving and dissemination of sea level data for South Africa. The data is retrieved and processed in accordance with the International Hydrographic Organisation's (IHO) guidelines and standards.

This report describes the current status of the SANHO tide gauge network, as well as future plans for the network.

2. **History**

The SANHO was formed in 1954. Installation of the first of its own KENT float-type gauges followed in 1957 and the operation of certain SA Railways and Harbours gauges seems to have been taken over at about the same time. Occasional additions were made to the original network of KENT gauges using LEA, OTT and SIAP float-type gauges. Twelve tidal stations were in operation by 1989 but it was considered that most of the gauges were getting too old (Note that two of the original mechanical gauges continue in service in tandem with their modern replacements).

At this stage, the EMATEK Division of the Council for Scientific Industrial Research (CSIR) was commissioned to design and construct acoustic Automatic Water Level recorders (AWLRs) incorporating barometers and temperature sensors. A total of eight were acquired but they never proved to be a success and after several years of perseverance, they were abandoned in 1996/97. The exception was the AWLR at Walvis Bay, which actually operated successfully and produced good, accurate datasets for 1997/98 only.

The AWLRs, in South Africa, were replaced with ten SRD acoustic gauges, which were installed in 1996/97. These produced continuous datasets but their accuracy was, in many cases, unacceptably variable.

Towards the end of 2002 a Radar tide gauge was put on trial in Simon's Town and the results indicated that the Radar gauge performed with a higher degree of accuracy and stability that had been previously encountered. The Institute of Maritime Technology (IMT), after independent study, reaffirmed the results obtained by the SANHO trials. At present 7 of the 10 South African tide stations are Radar gauges, with the remaining three stations to be upgraded in the next two years.

3. Status of the SANHO Tide Gauge Network

The South African tide gauge network consists of 10 tide gauge stations along the South African coastline. The SANHO tide gauge network is presented in Figure 1

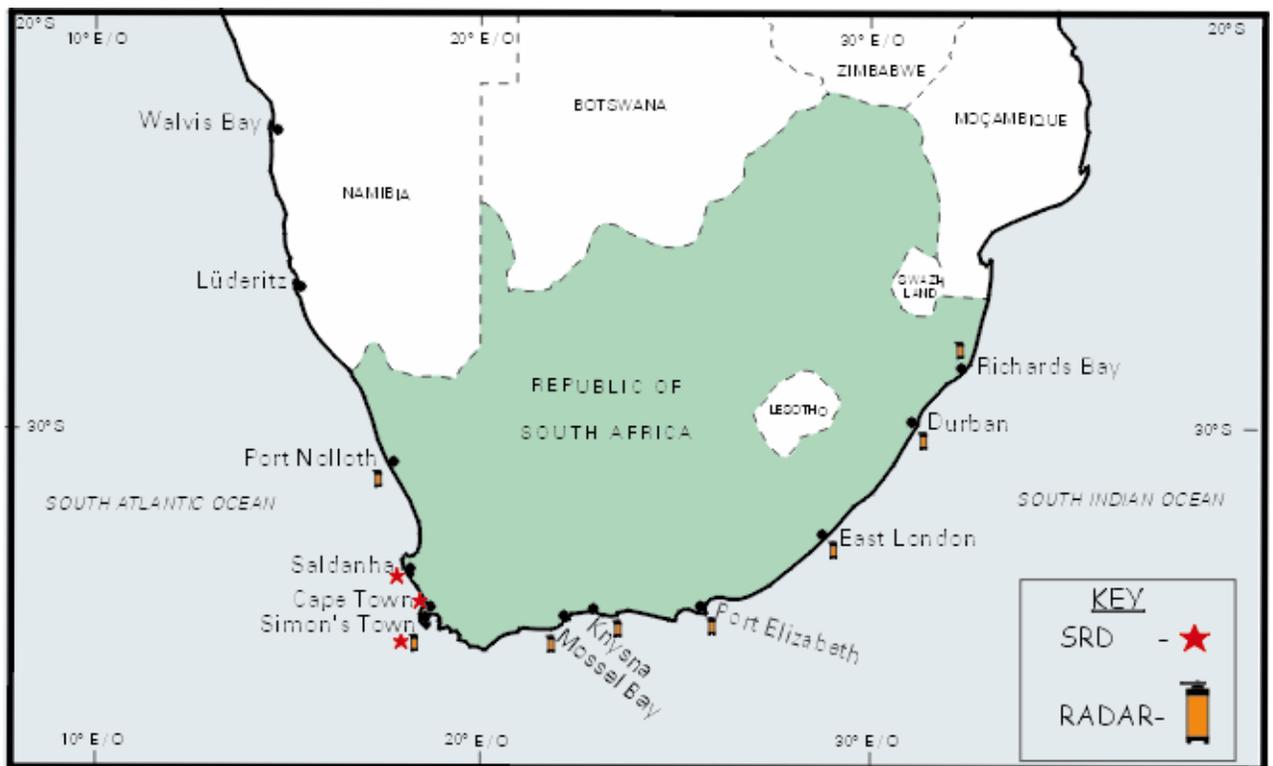


Figure 1: South African Tide Gauge Network

3.1 Gloss Stations

Table 1- South African Gloss Stations

| GLOSS Number | Station Name | Latitude | Longitude | Time Zone | Type of Gauge | Responsibility |
|---------------------|---------------------|-----------------|------------------|------------------|---|-----------------------|
| 13 | Durban | 29°52'S; | 31°03'E | GMT + 2 | Radar fitted with satellite transmitter | SANHO |
| 76 | Port Elizabeth | 33°57's | 25°37'E | GMT + 2 | Radar fitted with satellite transmitter | SANHO |

Both GLOSS stations are operational.

The DCP satellite transmitter for Durban was installed in April 2006, however, due to technical errors it is not yet transmitting data. It is intended to have these errors eradicated by mid 2007.

The DCP satellite transmitter for Port Elizabeth was installed on 17 May 2007.

3.2 Other Main Stations

Table 2- South African Tide Gauges excluding GLOSS Stations

| Station Name | Latitude | Longitude | Time Zone | Type of Gauge | Responsibility |
|---------------------|-----------------|------------------|------------------|---|-----------------------|
| Port Nolloth | 29°15'S | 16°52'E | GMT + 2 | Radar | SANHO |
| Saldanha Bay | 33°01'S | 17°57'E | GMT + 2 | Acoustic | SANHO |
| Cape Town | 33°54'S | 18°26'E | GMT + 2 | Acoustic | SANHO |
| Simon's Town | 34°11'S | 18°26'E | GMT + 2 | Acoustic Radar fitted with satellite transmitter | SANHO |
| Mossel Bay | 34°11'S | 22°08'E | GMT + 2 | Radar | SANHO |
| Knysna | 32°02'S | 23°02'E | GMT + 2 | Radar | SANHO |
| East London | 33°01'S | 27°55'E | GMT + 2 | Radar | SANHO |
| Richards Bay | 28°48'S | 32°05'E | GMT + 2 | Radar | SANHO |

3.3 **Future Work**

It is the intention of the SANHO to re-evaluate and standardise all the benchmarks surrounding the tide stations and to confirm their accuracy in relation to the existing national benchmark network. This has been done in Mossel Bay (February 2007) with new benchmarks to be installed in the coming months.

The jetty at Port Nolloth has recently been resurfaced and all, but one, benchmarks have been lost. The SANHO intends to install new benchmarks along the jetty in 2007.

The tide gauges at Cape Town and Saldanha are to be upgraded to Radar Gauges in 2007/08. The entire SANHO tidal network will then be Radar gauges.

It is planned to install a new site on the West Coast at Lamberts Bay, however this is still in the planning stage.

4 **International Work**

The success of the Radar gauges in South Africa and the United Kingdom has led to the Intergovernmental Oceanographic Commission (IOC-UNESCO) to sponsor the installation of these gauges in various countries through out Africa. Mozambique was the first country to benefit from this. The SANHO assisted, at the IOC's request, the Mozambique Hydrographic Office (INAHINA) with the installation of two tide gauges at Pemba and Inhambane in April 2005.

Both of these gauges have since been fitted with satellite transmitters to transmit real time one minute values to the Indian Ocean Tsunami Early Warning System

5. **Conclusion**

Although a lack of human resources has lead to slower progress, progress- non the less- is being made in the SANHO tidal network.

Tidal Data from the SANHO network is used to create the South African Tide Tables and the predictions are displayed on our website (<http://www.sanho.co.za>). Currently data from all radar tide gauge stations is being sent, via email, twice weekly to the PSMSL, as well as the University of Hawaii. Real time data from the Simon's Town tide gauge can be viewed on the IODE website (<http://www.vliz.be/vmdcdata/iode/blist.php>).