

UK Tide Gauge Status Report – National contribution to GLOSS

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The National Tidal & Sea Level facility (NTSLF) comprises the UK National Tide Gauge Network, geodetic networks for monitoring vertical land movements, and gauges in the British Dependent Territories of the South Atlantic and Gibraltar.

The UK National Tide Gauge Network is owned and funded by the Environment Agency. Associated scientific research is funded by the National Environment Research Council (NERC) and the Department for Environment, Food & Rural Affairs (Defra).

Additional partners include the National Oceanography Centre (NOC), British Oceanographic Data Centre (BODC) and British Isles GPS archive Facility (BIGF).

UK

The UK National Tide Gauge Network was established after violent storms in the North Sea in 1953 resulted in serious flooding in the Thames Estuary and consists of 43 gauges around the coast of the UK. Three of the gauges are committed to GLOSS.

Lerwick

The installation at Lerwick consists of two full tide and a mid-tide bubbler gauge. There were visits to site in 2010. As part of a project to recover historical data, charts for 1957-1958 were digitised for Lerwick to fill in gaps in the record.

Newlyn

The installation at Newlyn consists of a full tide and a mid-tide bubbler gauge and a back-up potentiometer attached to a Munro float gauge. There were visits to site in 2009, 2010 and 2011 and the measuring point of the bubbler gauge was relocated to the inner harbour wall in 2010.

Stornoway

The installation at Stornoway consists of two full tide and a mid-tide bubbler gauge. There were visits to site in 2010 and 2011. As part of the historical data recovery project, charts for 1956-1966 were digitised in 2009/2010, in order to fill in gaps in the record.

The dataloggers and telemetry of the UK National Tide Gauge Network are currently being upgraded, and when complete in 2012, the stations at Holyhead, Lerwick, Newlyn and Stornoway will be equipped with broadband access. This will enable them to become tsunami monitoring stations, and deliver 10 second data.

Real time data are displayed on the Sea Level Station Monitoring Facility website (SLSMF - hosted by Flanders Marine Institute, VLIZ), the Sea Levels along the European Atlantic Coastline (SLEAC) website and the NOC website.

Vertical land movement at UK National Tide Gauge Network sites

10 sites are co-located with GPS. These include the three GLOSS sites, Lerwick, Newlyn and Stornoway. The data are archived at the British Isles GPS archive Facility (BIGF). GPS data from four sites are sent to the International GNSS Service (IGS) Tide Gauge Pilot Project (TIGA) and data from Newlyn are sent to the EUREF Permanent Network (EPN). Absolute gravity measurements are also made each year at Newlyn.

Gibraltar

The site at Gibraltar has several gauges installed for different purposes. The installation includes a Kalesto radar gauge plus 2 KPSI differential sensors which report via Meteosat, as well as a Vega radar and a high rate tsunami sensor which use broadband. There is also the old float gauge in the harbour and co-located GPS.

South Atlantic and Antarctica

NOC maintain eight gauges in the South Atlantic and Antarctica, as part of the laboratory's contribution to several international programmes, including the World Ocean Circulation Experiment (WOCE) and now the Climate Variability and Predictability Programme (CLIVAR) as well as GLOSS. Data and metadata from the stations can be found at <http://www.psmsl.org/links/programmes/acclaim.info.php>.

Ascension Island (GLOSS No.264)

OTT DCP tide gauge, status – operational on all channels, solar charger and battery voltage good, one minute data values every 15 minutes.

Vegapuls radar, PS1(Full)=KPSI 500, PS2(half)=KPSI 500.

POL Tidata (original logger with Quartztronic sensors), status – unknown, data modem not operational. Replacement of stilling well tube will be required in next couple of years. There is extensive corrosion of the tube.

Maintenance visit planned early 2012, to fit a WaterLog DCP system.

St Helena (GLOSS No.264)

Waterlog DCP system fitted Jan/Feb 2011, status – operational on radar channel, solar charger and battery voltage good, one minute data values every 15 minutes. New stilling well tube with KPSI 500 sensors left for fitting later in 2011 by local engineer. POL Tidata (original logger with Digiquartz sensors) removed during visit.

Tristan da Cunha (GLOSS No.266)

Waterlog DCP system fitted Jan/Feb 2011, status - operational on radar channel, solar charger and battery voltage good, one minute data values every 15 minutes.

Port Stanley (GLOSS No.305)

OTT DCP tide gauge, status – operational on all channels, solar charger and battery voltage good, one minute data values every 15 minutes. OTT Kalesto radar fitted.

POL Tidata (original logger with Digiquartz sensors) status – operational on all channels, data transmitted via email over broadband, data values every 15 minutes (Linux box uptime 696 days).

Maintenance visit planned - early 2012, to fit a WaterLog DCP system.

Vernadsky (GLOSS No.188)

OTT DCP tide gauge, status – operational on sea pressure channels, solar charger and battery voltage good. PS1(Full)=KPSI 500, PS2(half)=KPSI 500. Three minute data values every hour.

POL Tidata (original logger with single Digiquartz sensor) status – operational on barometer channel only, pressure sensor working but port probably blocked, data logged locally.

Maintenance visit planned - Nov/Dec 2011, to update DCP reporting from hourly to every 15 min. New barometer to be fitted. Position of half-tide sensor to be reviewed and changed. Chart data from float gauge to be recovered and new chart paper and pens supplied.

Rothera (GLOSS No.342)

POL Tidata (original logger with Digiquartz sensors), status – operational on all channels, data transmitted via email over broadband, data values every 15 minutes.

Maintenance visit planned - Nov/Dec 2011, inspection and manual data download only.

Signy (GLOSS No.306)

POL Tidata (original logger with single Digiquartz sensor), status – operational on barometer channel and single sea pressure sensor, data logged locally.

Maintenance visit planned - Nov/Dec 2011, battery replacement, inspection and manual data download only. Installation of multi-way connector for the sensor cable to allow easy removal and replacement of future portable system.

Vertical land movement at South Atlantic and Antarctic sites

Ascension: DORIS beacon 6.5km away (ARIANE Tracking Station), GPS about 5 km away

St Helena: DORIS 5.9 km away (Meteorological station), no GPS

Tristan da Cunha: DORIS beacon 123 m away (Radio station), no GPS

Falklands: No DORIS, two GPS sites about 2 and 4 km away (the one, ~4 km away, is an IGS site so the data is readily available)

Rothera: DORIS beacon less than 100m away (British Antarctic Survey)

Africa and Western Indian Ocean

PSMSL and BODC work with IOC to provide access to delayed-mode quality-controlled data from gauges that form part of the ODINAFRICA and Indian Ocean Tsunami Warning System. The data are available at http://www.gloss-sealevel.org/data/africa_and_west_indian_ocean/

Aden (Yemen)

The primary channel on site is an OTT Kalesto Radar Sensor, with two OTT ODS4-K Pressure Sensors as backup.

The bracket holding the pressure gauges collapsed in September 2009, terminating operation of main pressure gauge and leading to bad data from half tide gauge. Radar transmission began to deteriorate mid 2010. Fixed November 2010, and has operated well since.

Alexandria (Egypt)

The primary channel on site is an OTT Kalesto Radar Sensor and the secondary channel is an OTT ODS4-K Pressure Sensor.

Radar and Pressure gauges were installed in November 2009. Break in transmissions during revolution of January / February 2011. Transmissions became intermittent in July 2011, and ceased entirely in October 2011.

Chabahar (Iran)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

The site continues to operate successfully.

Djibouti (Djibouti)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

The site continues to operate successfully.

Inhambane (Mozambique)

The primary channel on site is an OTT Kalesto Radar Sensor and the secondary channel is an OTT ODS4-K Pressure Sensor.

The gauge was reinstalled in August 2009 following redevelopment of the harbour. Successful transmission rates remain poor, and pressure sensor has functioned erratically since May 2011.

Karachi (Pakistan)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

The site continues to operate successfully.

Lagos (Nigeria)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

The radar gauge stopped working in April 2009. Two pressure gauges were installed in October 2010. Transmission rates are poor, and ceased entirely in September 2011.

Nouakchott (Mauritania)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

There were major transmission problems between November 2010 and July 2011, although radar data was downloaded off logger by the local operator and sent to PSMSL via email. Pressure gauges lagged behind radar due to blocked stilling well. This was cleared in August 2011, but the procedure appears to have damaged the full tide pressure sensor.

Pemba (Mozambique)

The primary channel on site is an OTT Kalesto Radar Sensor

The radar gauge stopped operating in September 2009. A pressure gauge was fitted in April 2010, and the radar gauge repaired in July 2010. Since then, problems with the GPS antenna have resulted in transmissions being intermittent, and they stopped entirely in August 2011.

Pointe Noire (Republic of Congo)

The primary channel on site is an OTT Kalesto Radar Sensor and the secondary channel is an OTT ODS4-K Pressure Sensor.

The radar sensor is operating well. The pressure sensor ceased working November 2010.

Port Sonara (Cameroon)

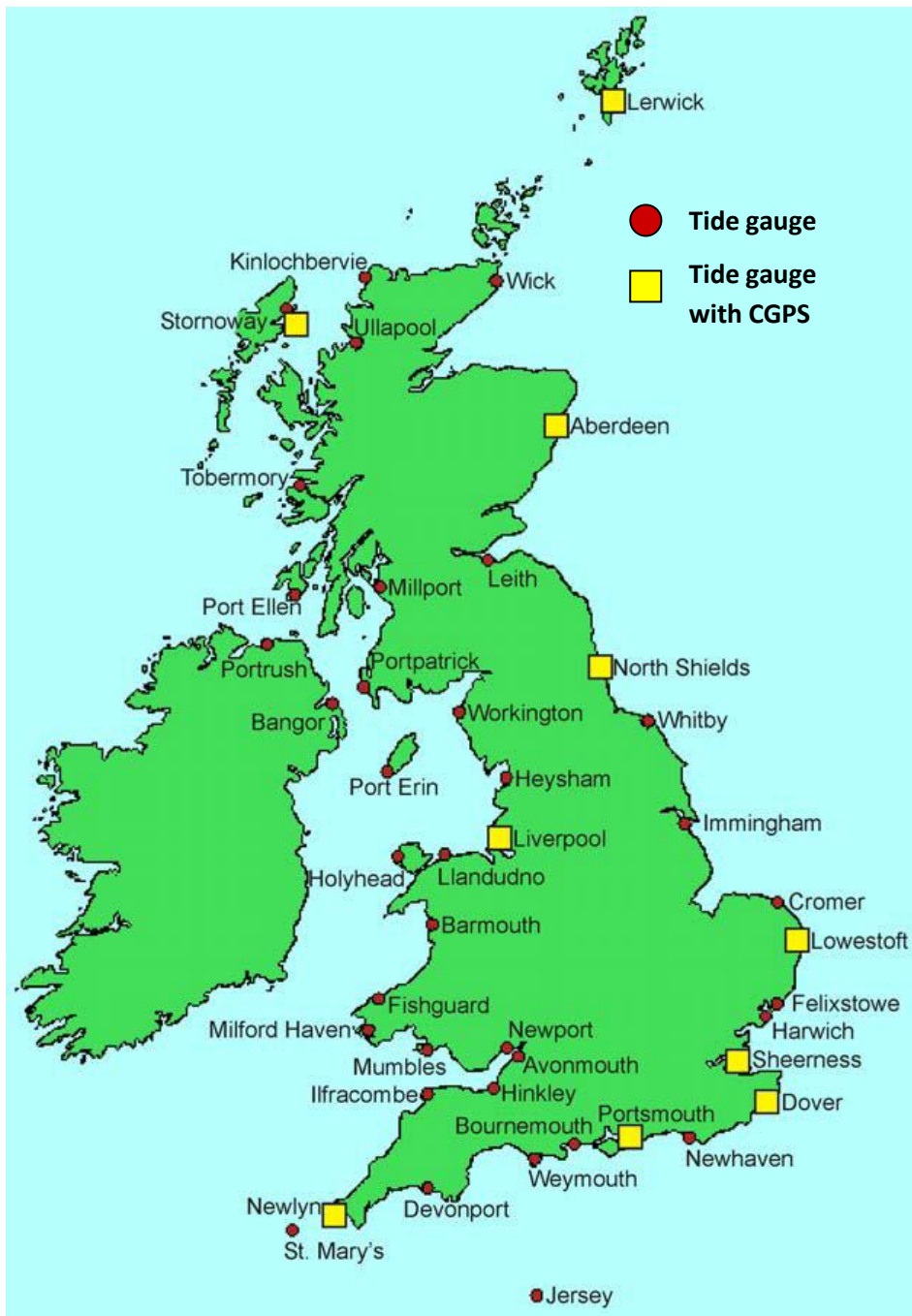
The primary channel on site is an OTT Kalesto Radar Sensor and the secondary channel is an OTT ODS4-K Pressure Sensor.

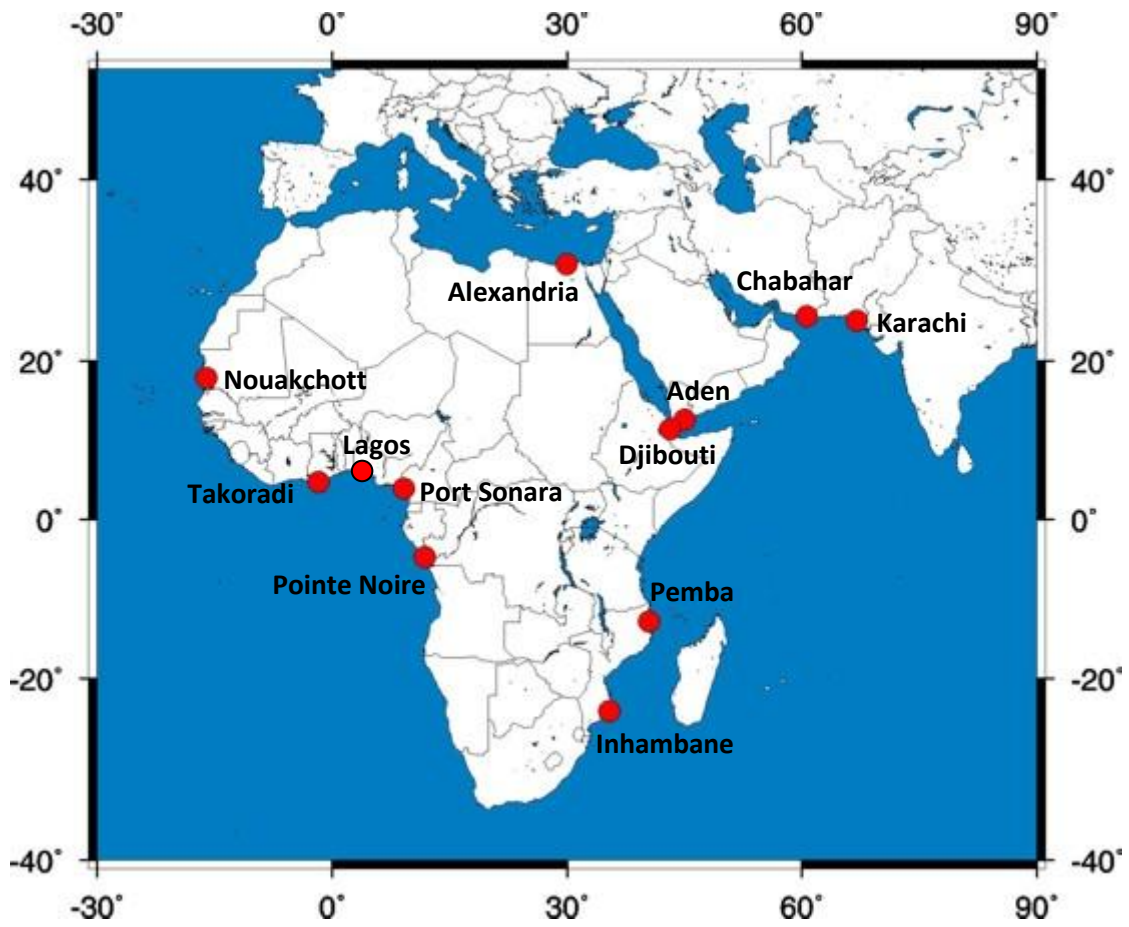
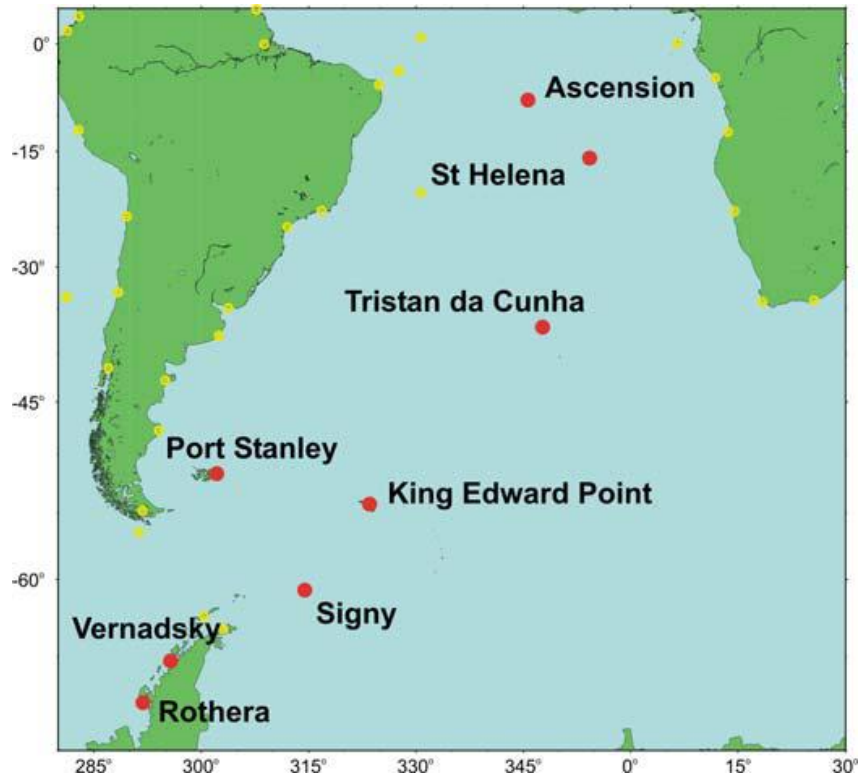
The site was operating well until transmissions ceased in June 2011.

Takoradi (Ghana)

The primary channel is an OTT Kalesto Radar Sensor and there are two OTT ODS4-K Pressure Sensors acting as secondary channels.

There were major problems with the data logger and sensors in 2009 and 2010. Repaired March 2011, and has generally operated well since.





Summary

| GLOSS NO. | Site Name | Responsible country | Latitude | Longitude | Sensors |
|-----------|------------------|---------------------|----------|-----------|---|
| 236 | Lerwick | UK | 60.15 | -1.1333 | Two full tide and a mid-tide bubbler gauge |
| 241 | Newlyn | UK | 50.1 | -5.55 | Full tide and a mid-tide bubbler gauge and a back-up potentiometer attached to a Munro float gauge |
| 238 | Stornoway | UK | 58.2 | -6.3833 | Two full tide and a mid-tide bubbler gauge |
| 248 | Gibraltar | UK | 36.1482 | -5.3649 | Kalesto radar gauge plus 2 KPSI differential sensors which report via Meteosat, as well as a Vega radar and a high rate tsunami sensor which use broadband. There is also the old float gauge |
| 349 | Ascension | UK | -7.9167 | -7.9167 | OTT DCP, Vegapuls radar, PS1(Full)=KPSI 500, PS2(half)=KPSI 500, POL Tidata (original logger with Quartztronic sensors) |
| 264 | St. Helena | UK | 15.9667 | -5.7 | WaterLog DCP system |
| 266 | Tristan da Cunha | UK | -37.05 | -12.3 | Waterlog DCP system |
| 305 | Port Stanley | UK | -51.75 | -57.9333 | OTT DCP tide gauge, OTT Kalesto radar, POL Tidata (original logger with Digiquartz sensors) |
| 188 | Vernadsky | Ukraine | -65.25 | -64.2667 | OTT DCP tide gauge, PS1(Full)=KPSI 500, PS2(half)=KPSI 500, POL Tidata (original logger with single Digiquartz sensor), float gauge |
| 342 | Rothera | UK | 67.5717 | -68.1283 | POL Tidata (original logger with Digiquartz sensors) |
| 306 | Signy | UK | -60.7 | -45.6 | POL Tidata (original logger with single Digiquartz sensor) |
| 003 | Aden | Yemen | 12.7833 | 44.9833 | OTT Kalesto Radar Sensor, two OTT ODS4-K Pressure Sensors |
| 349 | Alexandria | Egypt | 31.2167 | 29.9167 | OTT Kalesto Radar Sensor and an OTT ODS4-K Pressure Sensor |
| 337 | Chabahar | Iran | 25.3 | 60.6 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |
| 002 | Djibouti | Djibouti | 11.6 | 43.15 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |
| 010 | Inhambane | Mozambique | 23.9167 | 35.5 | OTT Kalesto Radar Sensor and an OTT ODS4-K Pressure Sensor |

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|-----|--------------|-------------------|---------|---------|--|
| 030 | Karachi | Pakistan | 24.8 | 66.9667 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |
| 259 | Lagos | Nigeria | 6.4205 | 3.4073 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |
| n/a | Nouakchott | Mauritania | 17.9896 | 16.0370 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |
| 011 | Pemba | Mozambique | 12.9667 | 40.4833 | OTT Kalesto Radar Sensor |
| 261 | Pointe Noire | Republic of Congo | -4.7833 | 11.8333 | OTT Kalesto Radar Sensor and an OTT ODS4-K Pressure Sensor |
| 350 | Port Sonara | Cameroon | 4.005 | 9.125 | OTT Kalesto Radar and an OTT ODS4-K Pressure Sensor |
| 335 | Takoradi | Ghana | 4.8833 | -1.75 | OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors |