

UK Tide Gauge Status Report – National Contribution to GLOSS

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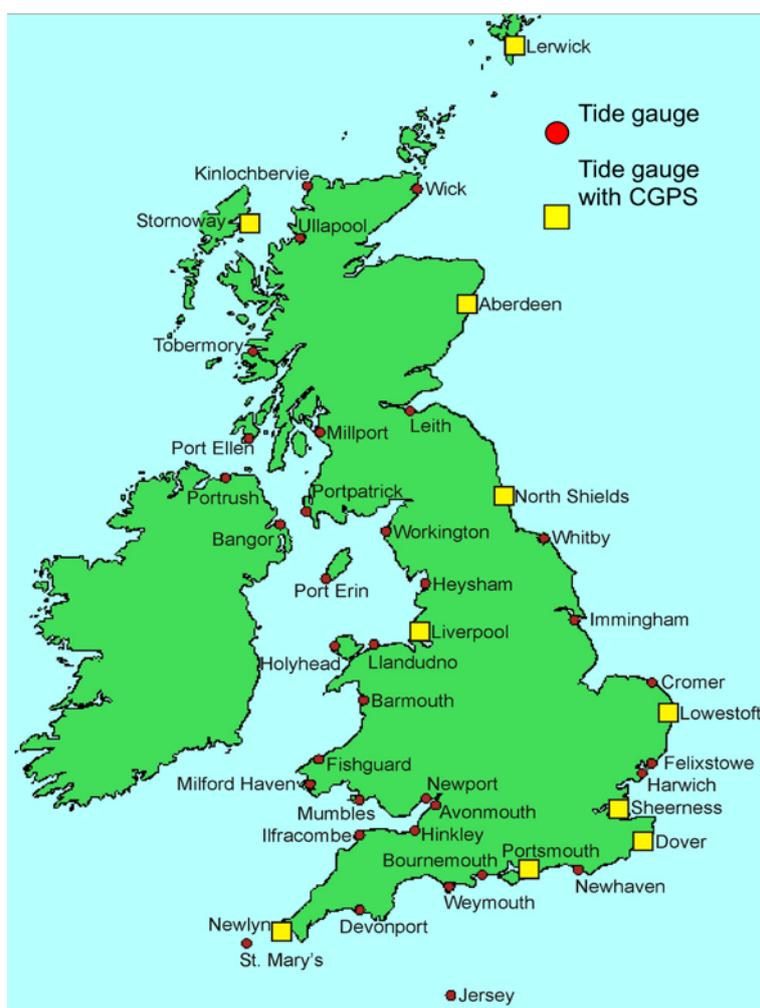
The UK tide gauges that contribute to GLOSS come from the UK National Tide Gauge Network, gauges in the British Dependent Territories of the South Atlantic and Gibraltar and gauges in Antarctica.

The UK National Tide Gauge Network is owned by the Environment Agency (EA) and maintained by the Tide Gauge Inspectorate at National Oceanography Centre (NOC).

The UK tide gauges in the South Atlantic and Antarctica are funded by the National Environment Research Council (NERC), through the NOC core-funded Climate and Sea Level activities.

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 currently consists of 40 gauges around the coast of the UK. Three of the gauges are committed to GLOSS.



Lerwick (GLOSS 236)

The site at Lerwick consists of a data acquisition system with two full-tide and a mid-tide bubbler gauge. There was a general maintenance visit to site on the 31st of March 2014 which included a compressor change and a general maintenance visit on the 18th March 2015.

Newlyn (GLOSS 241)

The Newlyn site consists of a data acquisition system with a full-tide and mid-tide bubbler gauge and a back-up potentiometer attached to a Munro float gauge.

On the 30th of September 2014 there was a report of a power failure at Newlyn and the float gauge then began recording a constant height of 5.5m. A fault on the main pier power cable caused earthing points to become live via standing water, the surge tracked down the float wire causing it to rupture at a weak point on the float. The gauge spun out of control causing damage to the mechanism. The gauge needed a complete refurbishment.

On the 21st of February 2015 the data at Newlyn was reported as being unrealistic. Channel 2 showed signs of blocking. The local operator purged and cleared the blockage. There was a visit to site on the 16th of March 2015 to change the compressor change and to collect equipment to refurbish the float gauge. The full tide bubbler was blocked. A Digiquartz was reconnected to the spare full tide bubbler channel. On the 11th of September 2015 the float gauge was refurbished. General maintenance was carried out and the site was levelled.

Stornoway (GLOSS 238)

The site at Stornoway is a data acquisition system with two full-tide and a mid-tide bubbler gauge. There was a site visit on 11th December 2013 to change the compressor.

On the 6th of November 2014 all three channels were lost at Stornoway. The Tide Gauge Inspectorate (TGI) contacted the harbour on the 7th of November and were informed that a pontoon came adrift in the storm and severed all 3 pneumatic lines. TGI made a site visit on the 2nd of December to investigate the damage and repaired and replaced all 3 pneumatic lines. The compressor autodrain was also found to be faulty and was disconnected.

Data delivery

Real time data are displayed on the Sea Level Station Monitoring Facility website (SLSMF – hosted by Flanders Marine Institute, VLIZ), the National Tidal and Sea Level Facility (NTSLF) website (<http://www.ntsfl.org/data/uk-network-real-time>), the Sea Levels along the European Atlantic Coastline (SLEAC) website, and the North West European Shelf Operational Oceanographic System (NOOS) website.

Vertical land movement at UK National Tide Gauge Network sites

The three GLOSS sites are co-located with GPS stations, but currently only Newlyn and Stornoway are functioning. Lerwick was operational at the beginning of 2015 but as of October 2015, is not reporting any data.

The data are archived at the British Isles GPS archive Facility (BIGF) and data are available via the Sonel website (<http://www.sonel.org>).

Gibraltar (GLOSS 248)

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 an old float gauge in the harbour and co-located GPS.

A visit to site was made in July 2015 to perform routine maintenance (changing pressure sensors), carry out levelling and to repair the GPS receiver. An upgrade is planned for 2016. The GPS data are archived at the British Isles GPS archive Facility (BIGF) and are also available via Sonel.

South Atlantic and Antarctica

NOC maintains a network of South Atlantic and Antarctic coastal tide gauges and bottom pressure recorders, which was established through the ACCLAIM (Antarctic Circumpolar Current Levels by Altimetry and Island Measurements) programme. Data from the gauges can be found at www.ntsif.org/networks/acclaim.



Ascension (GLOSS 263)

Maintenance visit February 2014 – nothing operational, all batteries failed, Tidata (QT logger) had fallen off the wall. OTT DCP tide gauge had stopped, together with the Trimble GPS receiver.

The OTT DCP was replaced by a DAA Waterlog logger transmitting one minute data values every 15 minutes. DAA H-3611i radar, PS1(Full)=OTT PLS, PS2(half)=OTT PLS.

POL Tidata (original logger with Quartztronic sensors), electronics transferred from old corroded cabinet to the OTT cabinet and made operational again, but there is a fault with the time base stopping it from being synchronised to the 15 minute interval, i.e. the start button doesn't work and the timebase is running to an arbitrary time every 15 minutes. Timebase time at Ascension noted and recorded in the Ascension visit report.

Replacement or removal of stilling well tube will be required in next couple of years.

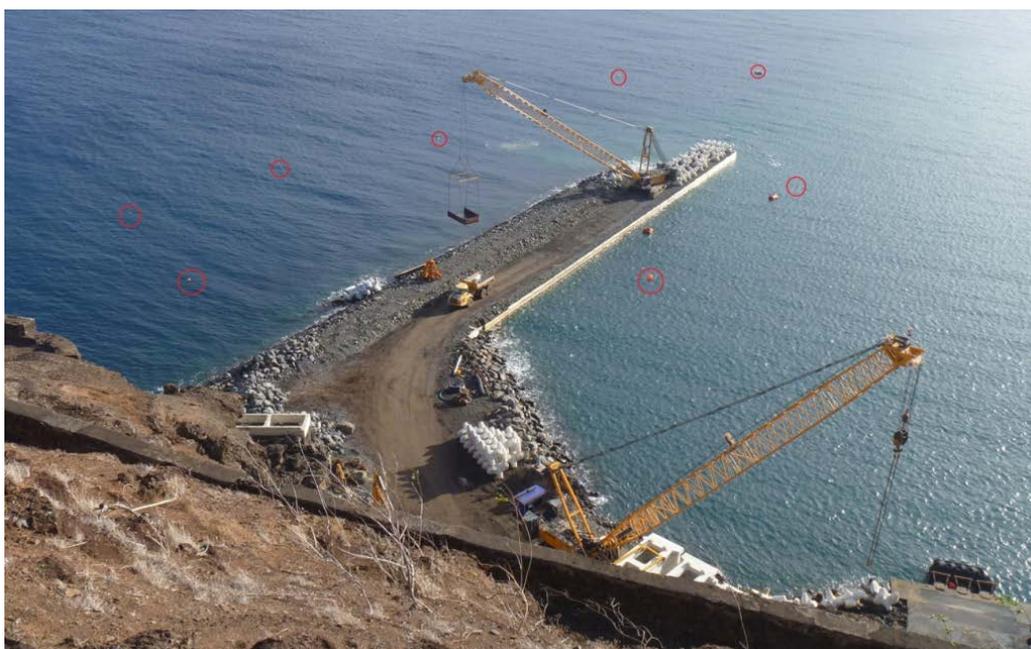
As reported in 2012, there is further extensive corrosion of the tube and replacement will be a major exercise involving H&S measures and costly. Funding has been obtained to replace this over the course of the next 3 years.

DORIS beacon 6.5km away (ARIANE Tracking Station), GPS about 5 km away. A GPS receiver is fitted at the tide gauge hut but is currently non-operational and is to be sited to a position with permanent mains power and broadband. However, we are currently encountering difficulties in obtaining permission to install instruments at the most suitable site.

St. Helena (GLOSS 264)

WaterLog DCP system fitted Jan/Feb 2011, status – Operational DCP transmissions but no sensors working, possibly storm damage. A replacement OTT radar gauge and larger battery were installed by our local contact and the instrument is now working well. However, the pressure sensors remain non-operational.

Engineers will attend during April 2016 to install a new gauge in a neighbouring cove (Rupert's Bay). This bay is being developed for bigger ships to dock alongside a new breakwater (see figure below), giving us the advantage of possible mains power and internet connections, whilst also benefiting from the protection of the breakwater from the prevailing conditions. Initially the gauge will be self-contained e.g. solar and Meteosat but will be upgraded in the future. A GPS will be co-located with the tide gauge in some way.



There is an active IGS site STHL collocated with the DORIS beacon 5.9km away.

Tristan da Cunha (GLOSS 266)

As previously reported, a Waterlog DCP system was fitted in Feb 2011, status – DCP transmissions operational but data are not being received as the radar has been damaged on numerous occasions by crane activities. Engineers will visit during April 2016 to upgrade the existing tide gauge so that it is more robust and hence more reliable. This may involve removal of the sensors to a different location.

There is a GPS receiver and antenna is mounted on the radio shack building, but a permanent installation will be made on the nearby DORIS monument in April 2016.

Port Stanley (GLOSS 305)

Waterlog DCP tide gauge, status – operational on all channels, solar charger and battery voltage good, one minute data values every 15 minutes. The sensors are: DAA H-3611i radar, PS1(Full)=OTT PLS, PS2(half)=OTT PLS.

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

The steel dolphins to which the sensors and radar are attached are to be cleaned and repainted between October and December 2015. A local contact is to supervise this to ensure that the gauge instrumentation are not damaged in the processes. A NOC engineer will attend site in December 2015 and January 2016 in order to check the installation and to download data from the Tidata logger.

Two GPS sites about 2 and 4 km away (the one, ~4 km away, is an IGS site so the data are readily available).

King Edward Point (GLOSS 187)

POL Linux box with KPSI 500 sensors, status - operational on all channels, data transmitted via email over broadband, one minute data values every 5 minutes. Suffers from the occasional power down during generator maintenance, but copes during the power interruption. Position of half-tide sensor was reviewed and changed in 2011. A GPS receiver was installed by colleagues at the University of Luxembourg.

Signy (GLOSS 306)

POL Tidata (original logger with single Digiquartz sensor), status – non-operational and scheduled to be decommissioned.

Vernadsky (GLOSS 188)

OTT DCP tide gauge, status – operational on sea pressure channels, and battery voltage good. PS1(Full)=KPSI 500, PS2(half)=KPSI 500. Reporting now one minute data values every fifteen minutes through GOES.

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

the pressure sensor is possible, due to in-accessible position of the sensor housing. Options are being considered for a future sensor.

Maintenance visit planned - January 2015, chart data from float gauge recovered and new chart paper and pens supplied. Survey possible new sensor installation.

Jan 2015 Site Visit: basic servicing carried out and data recovered.

Rothera (GLOSS 342)

POL Tidata (original logger with Digiquartz sensors), status – operational on all channels, data transmitted via email over broadband, data values every 15 minutes. Suffers from frequent power downs, but copes well. Maintenance visit planned - January 2016 to install a heated Guided Wave radar in the stilling well.

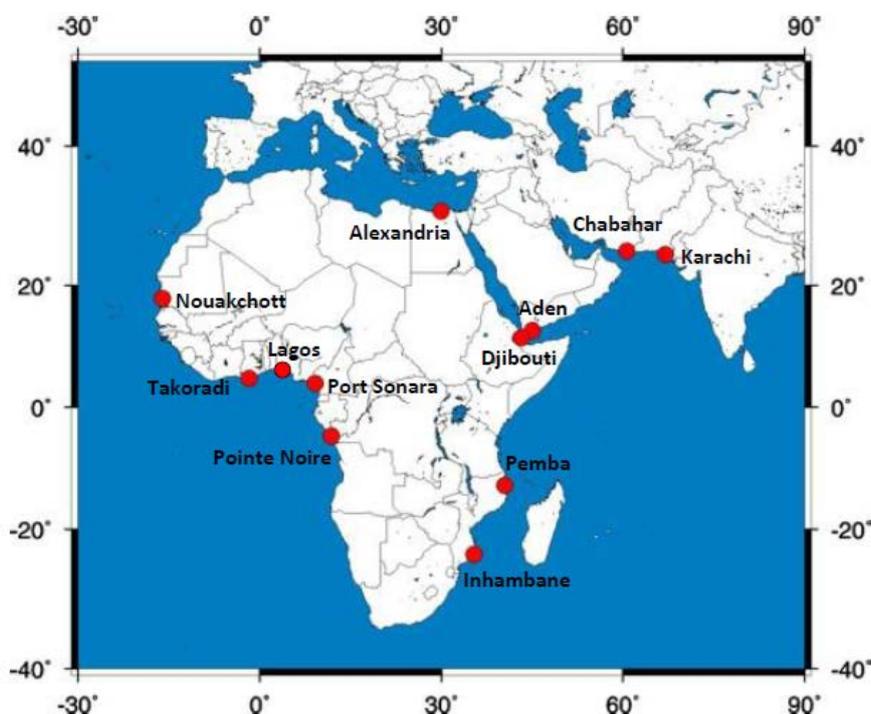
Jan 2015 Site Visit: basic servicing carried out and data recovered.

There is a DORIS beacon <100m away (British Antarctic Survey) and there is also an IGS GPS site there also < 100m from tide gauge.

Africa and Western Indian Ocean

NOC scientists and engineers have been involved in the Ocean Data and Information Network for Africa (ODINAFRICA) network, funded by the Intergovernmental Oceanographic Commission (IOC) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) to establish an African tide gauge network and improve sea-level monitoring in the 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.

Transmissions from Aden stopped abruptly in April 2015, but have recently resumed (September 2015).

The radar sensor at Aden has slowly fallen into disrepair, before completely stopping transmissions in April 2015. The raw (1 minute) data is very noisy. As a result there's not much left in our 15 minute data (which requires 12 values in any 15 minute period). It might be possible to use what's left to construct something useful, but I've not been able to do it.

The pressure sensors continue to operate well.

Alexandria, Egypt

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

The radar sensor at Alexandria continues to operate relatively well, with some brief pauses. The pressure sensor is still not working.

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 radar sensor at Chabahar continued to only operate during daylight hours until March 2015, when it was fixed. It is currently operating properly.

Neither pressure sensor is currently operational.

Djibouti, Djibouti

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

Djibouti generally has operated well over the past couple of years, although the half tide pressure sensor stopped working in June 2015.

Inhambane, Mozambique

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

The sensors at Inhambane have continued to be beset by problems. The radar sensor operated (with gaps) during 2013, and the pressure sensor was fixed in January 2014. Transmissions stopped in September 2014.

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 gauge at Karachi is operating well.

Lagos, Nigeria

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

There is still no gauge operating at Lagos.

Nouakchott, Mauritania

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

The radar and main pressure sensor at Nouakchott were operating well, with some small gaps, until both stopped working in February 2015. The half-tide pressure sensor stopped working in August 2013.

Pemba, Mozambique

The primary channel was an OTT Kalesto Radar Sensor and there was an OTT ODS4-K backup pressure channel.

There has been no data from Pemba since 2013.

Pointe Noire, Republic of Congo

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

Pointe Noire ceased operating in June 2014.

Port Sonara, Cameroon

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

There has been no data from Port Sonara since May 2011.

Takoradi, Ghana

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

There has been no data from Takoradi since September 2012.

Summary

GLOSS NO.	Site Name	Responsible country	Latitude	Longitude	Sensors (may not all be operational)
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.
349	Ascension	UK	-7.9167	-14.4167	OTT DCP, Waterlog 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 and radar system, plus 2 PLS pressure sensors
266	Tristan da Cunha	UK	-37.05	-12.3	Waterlog DCP and radar system
305	Port Stanley	UK	-51.75	-57.9333	OTT DCP tide gauge, Waterlog radar 2x PLS pressure sensors, 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 2 Digiquartz sensors)
3	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
2	Djibouti	Djibouti	11.6	43.15	OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors
10	Inhambane	Mozambique	-23.9167	35.5	OTT Kalesto Radar Sensor and an OTT ODS4-K Pressure Sensor
30	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	16.037	OTT Kalesto Radar Sensor and two OTT ODS4-K Pressure Sensors
11	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