

## UK Tide Gauge Status Report – National Contribution to GLOSS

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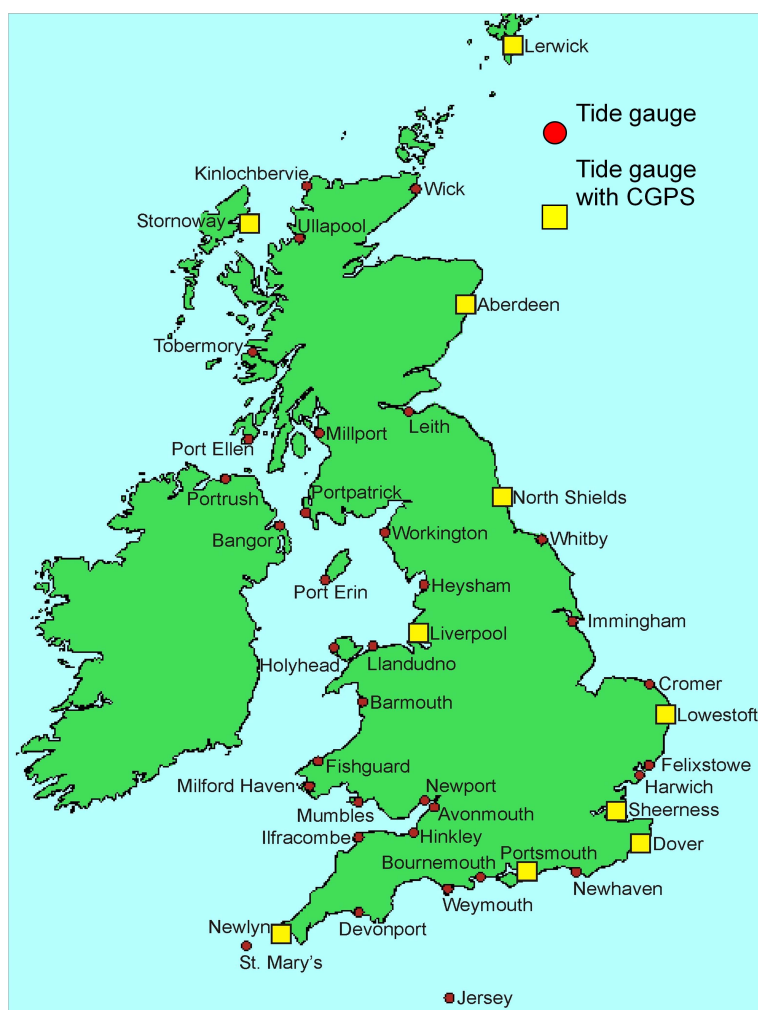
The UK tide gauges that contribute to GLOSS come from the UK National Tide Gauge Network, gauges in the British Dependent Territories of the South Atlantic and Gibraltar and gauges in Antarctica.

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 group.

### 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 42 gauges around the coast of the UK. Three of the gauges are committed to GLOSS.



In 2011 and 2012 there was a programme of upgrading the loggers and telemetry system for the UK National Tide Gauge Network, which led to a gap in data supply for all sites, whilst the migration took place. There was a period of running the two loggers in parallel, to ensure that the data were not affected. The older Dataring loggers were left in place at the three GLOSS sites and are still run in parallel.

#### **Lerwick (GLOSS 236)**

The site at Lerwick consists of a data acquisition system with two full-tide and a mid-tide bubbler gauge. There were two visits to site in 2012, and on 27/04/2012 the site was migrated to the new logger and telemetry system.

#### **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. There were two visits to site in 2011 and two in 2012, which included a levelling exercise. The site was migrated to the new telemetry system on 09/08/2012.

#### **Stornoway (GLOSS 238)**

The site at Stornoway is a data acquisition system with two full-tide and a mid-tide bubbler gauge. There was one visit to site in 2011, when the site was migrated onto the new logger and telemetry system, on 01/09/2011. There was one visit to site in 2012, which also included a levelling exercise. There have been two visits to site in 2013 so far.

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**

The three GLOSS sites are co-located with GPS stations, but currently only two are functioning. The GPS at Newlyn was upgraded on 21/05/2013 and Lerwick was upgraded 11/07/2013. The GPS at Stornoway is due to be upgraded in November 2013. The data are archived at the British Isles GPS archive Facility (BIGF) and data are sent to the International GNSS Service (IGS) Tide Gauge Pilot Project (TIGA).

#### **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.

#### **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](http://www.ntsif.org/networks/acclaim).



#### **Ascension (GLOSS 263)**

OTT DCP tide gauge

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

POL Tidata (original logger with Quartztronic sensors)

As of October 2013 there has been no Meteosat data since 19/06/2013 as the battery needs replacing. The site will be serviced in early 2014.

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

#### **St. Helena (GLOSS 264)**

Waterlog DCP system

Stilling well tube with KPSI 500 sensor

The radar sensor has been non-operational since 26/02/2013 due to storm damage. Pressure sensors remain operational up to date.

There is an active IGS site STHL collocated with the DORIS beacon 5.9km away. There has also been a GPS running next to the tide gauge but is only semi-permanent and will move to a new site being commissioned on the round tower in Half Tree Hollow above Jamestown < 1km away.

#### **Tristan da Cunha (GLOSS 266)**

Waterlog DCP system

There has been no data since 19/06/2013. Repairs to restore the operation are on-going. The radar sensor has been damaged by local harbour operations.

There is a NOC GPS site there now mounted on the old DORIS beacon monument.

### **Port Stanley (GLOSS 305)**

OTT DCP tide gauge

OTT Kalesto radar

POL Tidata (original logger with Digiquartz sensors)

WaterLog DCP system

Operational on radar but intermittent readings. This has been an on-going problem and will be corrected during a servicing visit in early 2014.

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

### **Signy (GLOSS 306)**

POL Tidata (original logger with single Digiquartz sensor) but no half-tide sensor.

No real-time data transmission.

### **Vernadsky (GLOSS 188)**

OTT DCP tide gauge, PS1(Full)=KPSI 500, PS2(half)=KPSI 500

POL Tidata (original logger with single Digiquartz sensor)

Float gauge

Operational on both pressure sensors.

### **Rothera (GLOSS 342)**

POL Tidata (original logger with Digiquartz sensors)

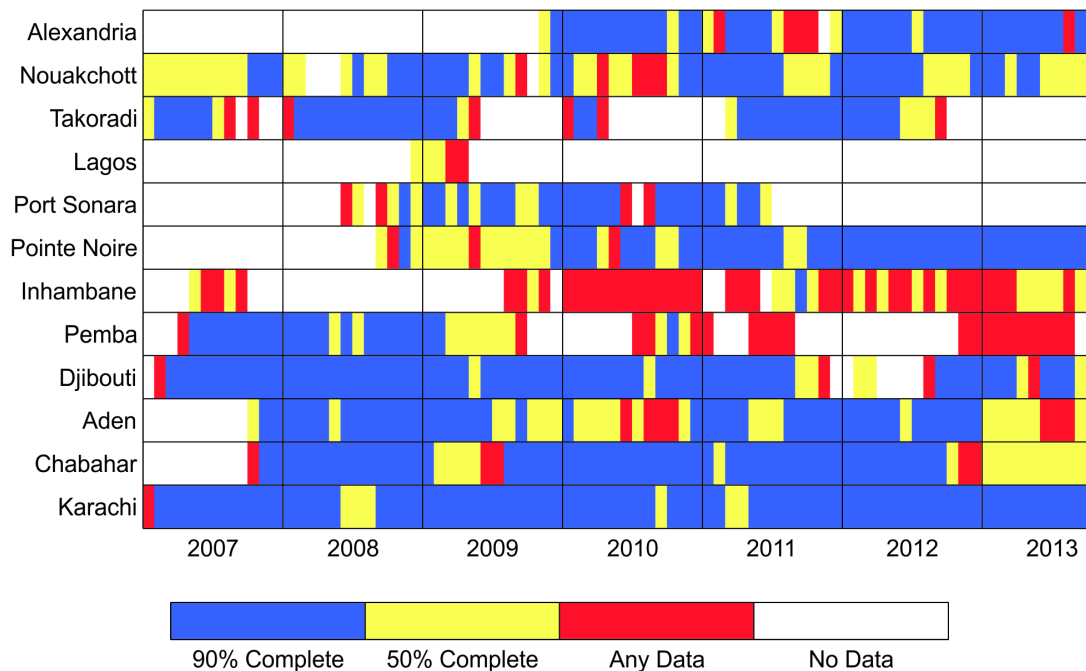
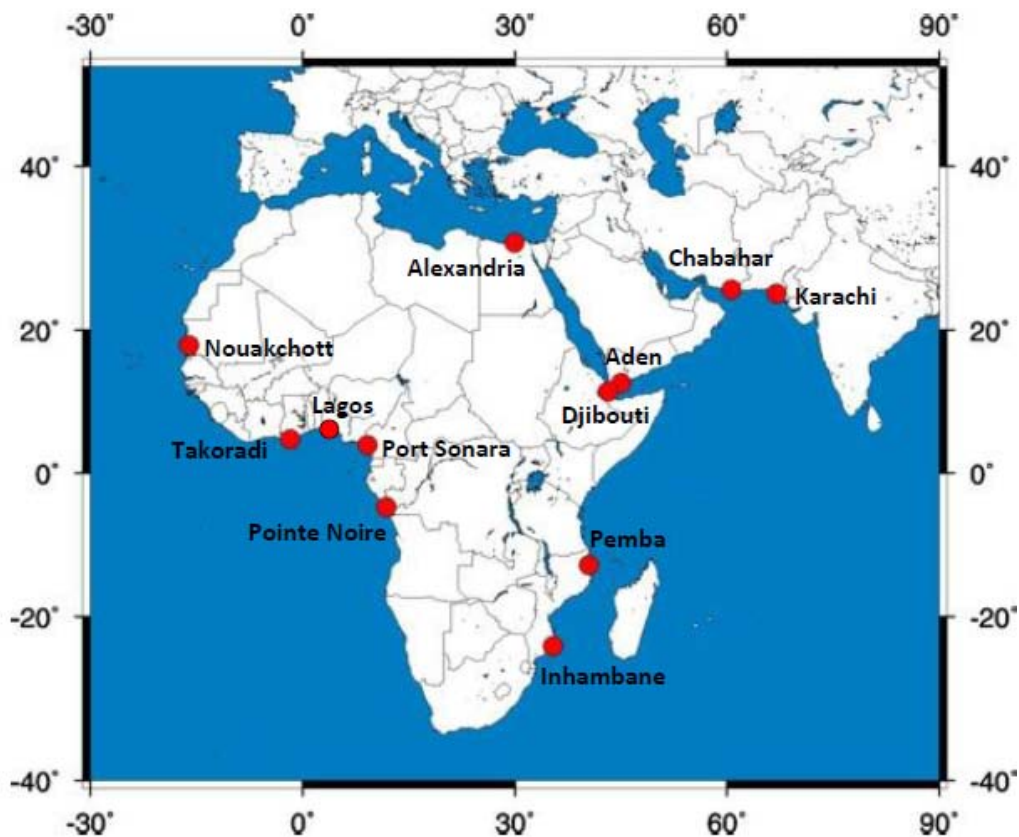
Operational on full tide sensor and half-tide sensor, but problems with temperature channel of half-tide sensor. No proper temperature corrections possible.

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/](http://www.gloss-sealevel.org/data/africa_and_west_indian_ocean/).



Percentage of 1 minute observations recorded by each of the radar sensors each month, up to the end of September 2013

**Aden (Yemen)**

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

From November 2010 to December 2012 the gauge operated well, but in 2013 the data transmission has only been 50% complete at best.

**Alexandria (Egypt)**

The primary channel on site is an OTT Kalesto Radar Sensor and the secondary channel was an OTT ODS4-K Pressure Sensor. Currently operational on radar only, no pressure sensor data.

DCP ID 2636F22C (97% Txs), Sensors – Kelsto radar, 1 x KPSI Pressure

The gauge at Alexandria has been operating well since the beginning of 2012.

**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 had been operating successfully up until the end of 2012 when there was a drop in transmission. In 2013 the data have only been 50% complete. It appears that the site is only operating in daylight and a new battery is needed.

**Djibouti (Djibouti)**

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

DCP ID 3601E29A (100% Txs), Sensors – Kalesto radar, 2 x KPSI Pressure

The site was operating well up until the end of 2011 when there was a drop and then complete break in transmission. The site started operating again towards the end of 2012.

**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. Not Operational for 783 days.

DCP ID 1654F3B4 (0% - no TxS), Sensors – Kalesto radar, 2 x KPSI Pressure

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. Operational on radar and PR1, PR1 is erratic.

DCP ID 366E2324 (84%, breaks in transmission), Sensors – Kalesto radar, 2 x KPSI Pressure

The stilling well was cleared in August 2011, but the procedure appears to have damaged the full tide pressure sensor. The gauge has only been transmitting approximately 50% of the time since early 2013.

#### **Pemba (Mozambique)**

The primary channel on site is an OTT Kalesto Radar Sensor

Pemba became operational again at the end of 2012, but the rate of transmission was low, and the site ceased operation again in the middle of 2013.

#### **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. Operational, radar only, no pressure sensor data.

DCP ID 26A63714 (97% TXs), Sensors – Kalesto radar, 2 x KPSI Pressure

The site is operating well.

#### **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. Not Operational for 165 days.

DCP ID 2654900C (0% - no TxS), Sensors – Kalesto radar, 2 x KPSI Pressure

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. Not Operational for 415 days.

DCP ID 26BF7DC (0% - no TXs), Sensors – Kalesto radar, 2 x KPSI Pressure

Takoradi ceased operating towards the end of 2013.

## 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. There is also the old float gauge
349	Ascension	UK	-7.9167	-14.4167	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)
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