



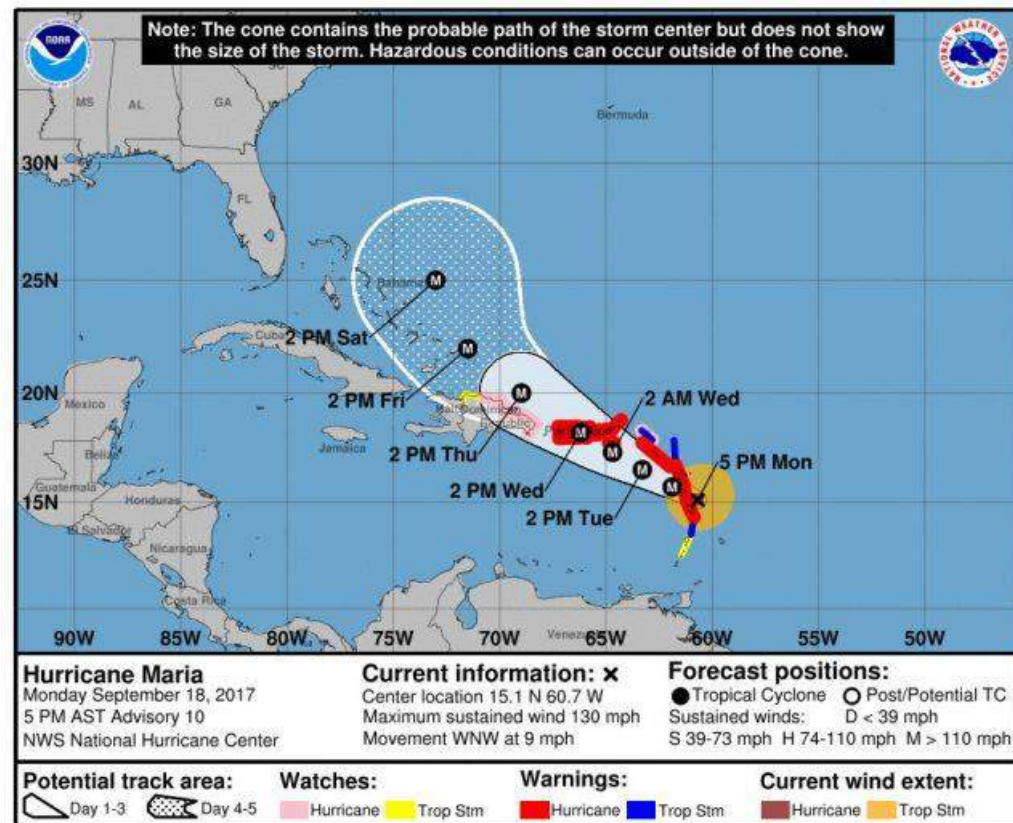
Developments in Environmental Monitoring

Robert Proctor

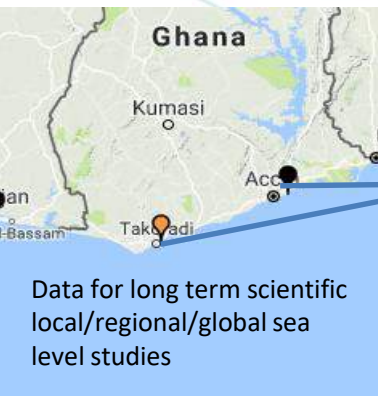
Agenda

- Overseas Collaboration – African Market
- Air Quality – Next Monitoring Challenge!
- Portable Tide Gauge + Port-Log Connect
- Swell Sensors – Improving Port Operations

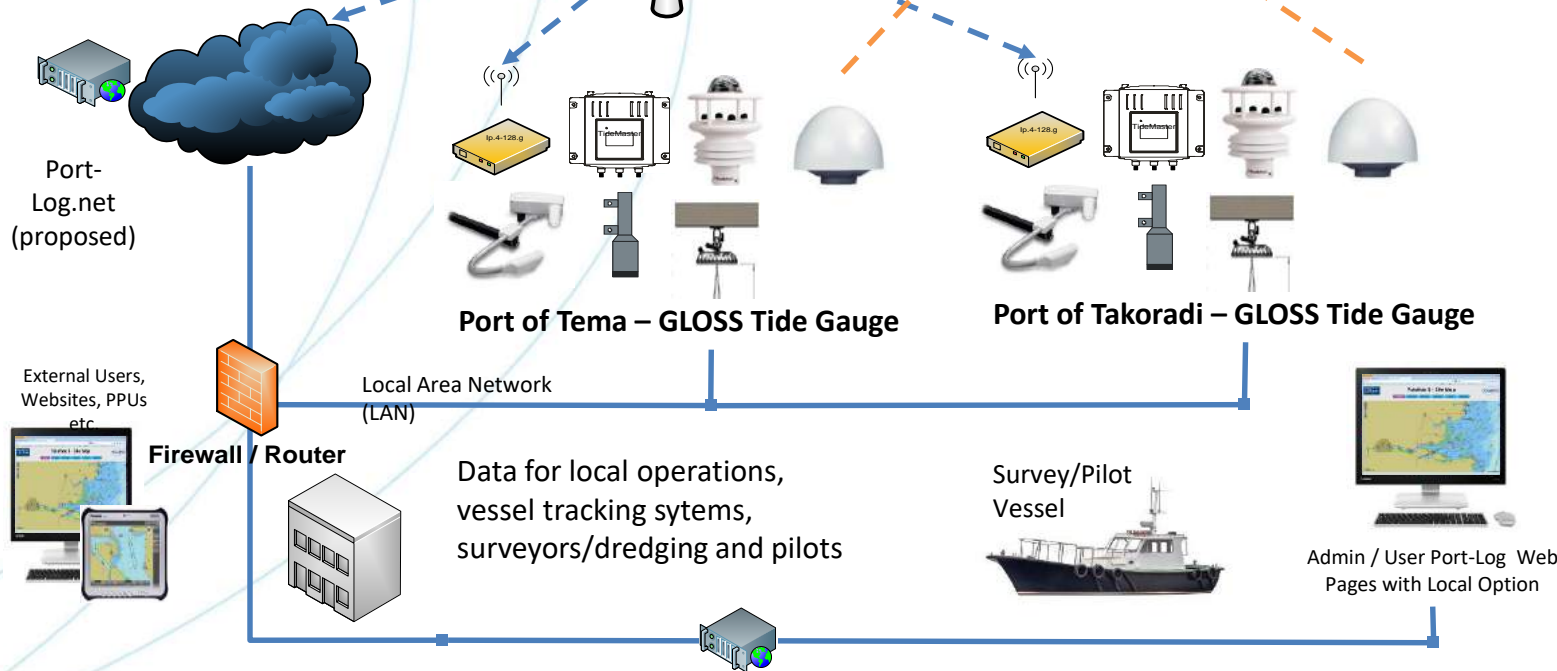
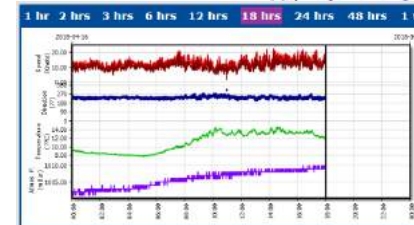
Collaboration



Ghana Ports and Harbours Authority



Permanent Service for Mean Sea Level



Key

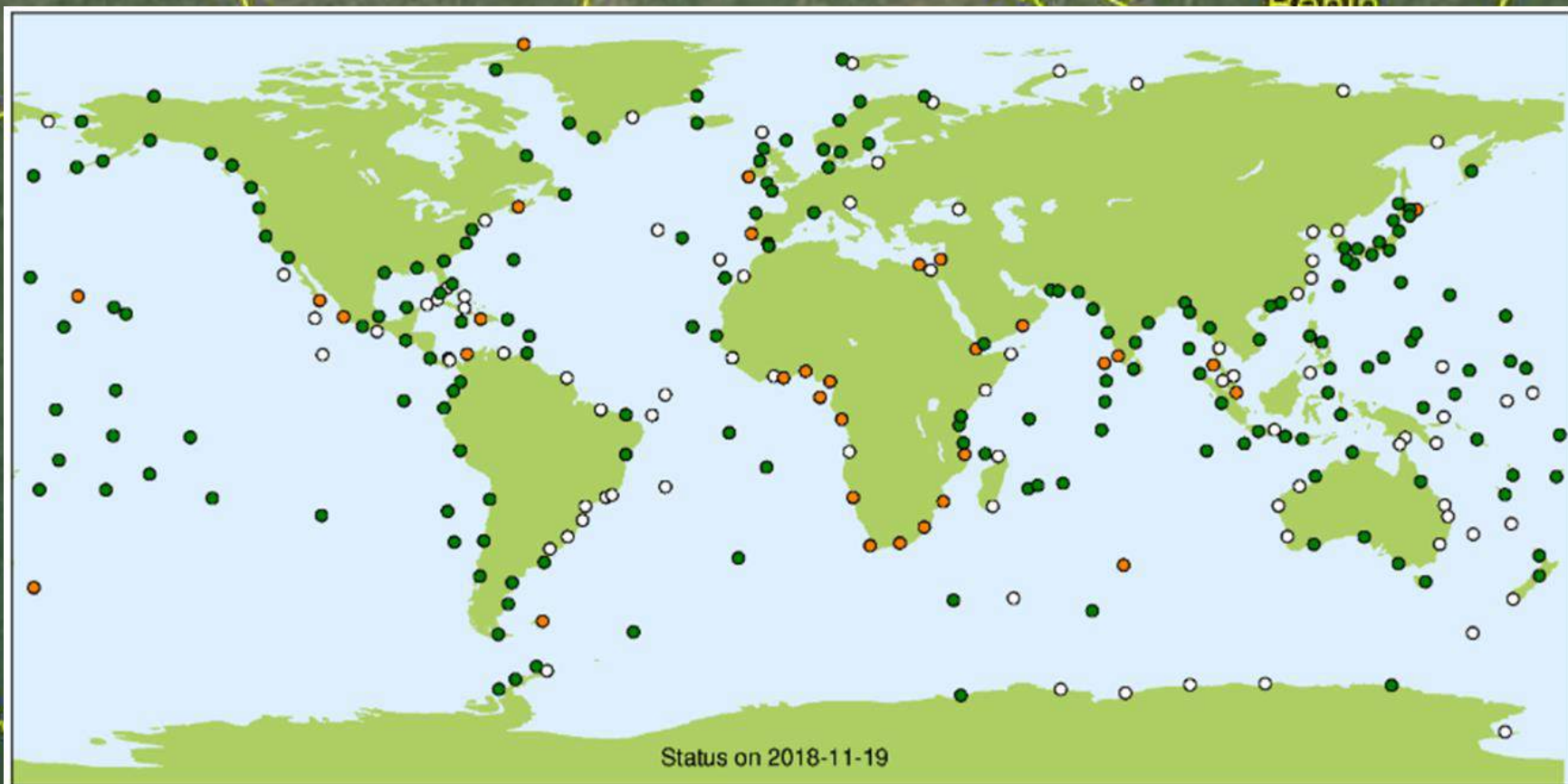
- Satellite Link
- Mobile Network
- Visibility Sensor
- Continuous Satellite Transmitter
- Gill GMX 500 (weather sensor)
- Valeport TideMaster
- Valeport Pressure Sensor (tide level)
- ip.buffer
- Valeport VRS-20 Radar

Bamako
2018 3:26:01 pm

Burkina Faso

Benin

lands



Status on 2018-11-19



Updated in past 31 days (177)



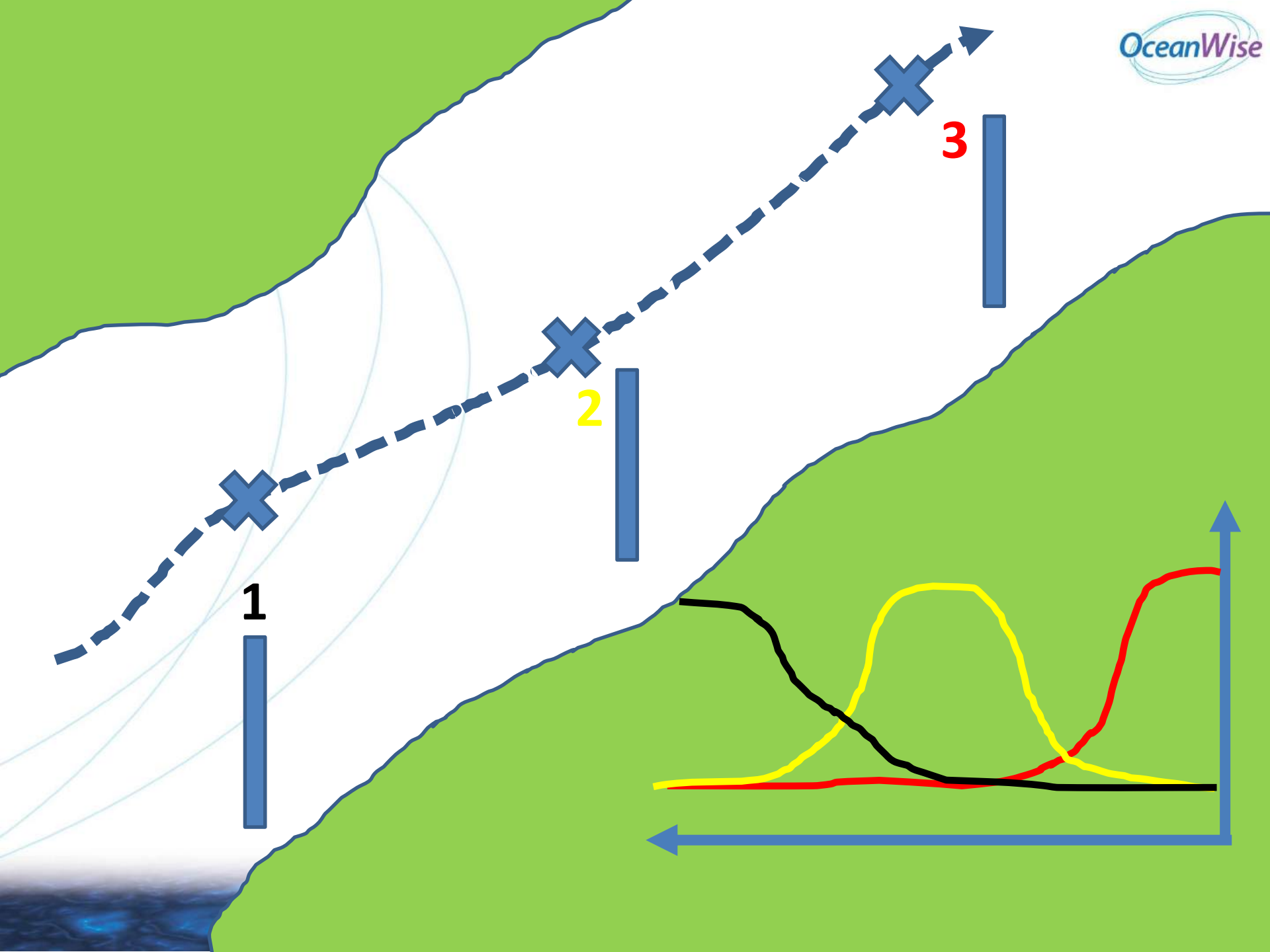
Has some data (32)



No data (81)

Air Quality - Hot Topic!

- DEFRA Clean Air Strategy - UK Clean Maritime Plan Spring 2018
- PM, NH₃, NO_x, SO₂, volatile organic compounds
- *By May 2019, all major English ports should produce Air Quality Strategies setting out their plans to reduce emissions across the port estate including ship and shore activities*
- *Shipping – worst offender!*
- *Can't set (SMART) objectives without good data!*



Environmental Monitoring

- *Environmental Shipping Index – discount on port charges where a vessel has an ESI score of 30 or above.*
- *ESI developed by the World Ports Climate Initiative*
- *Avoid fines*
- *ABP Southampton trial*



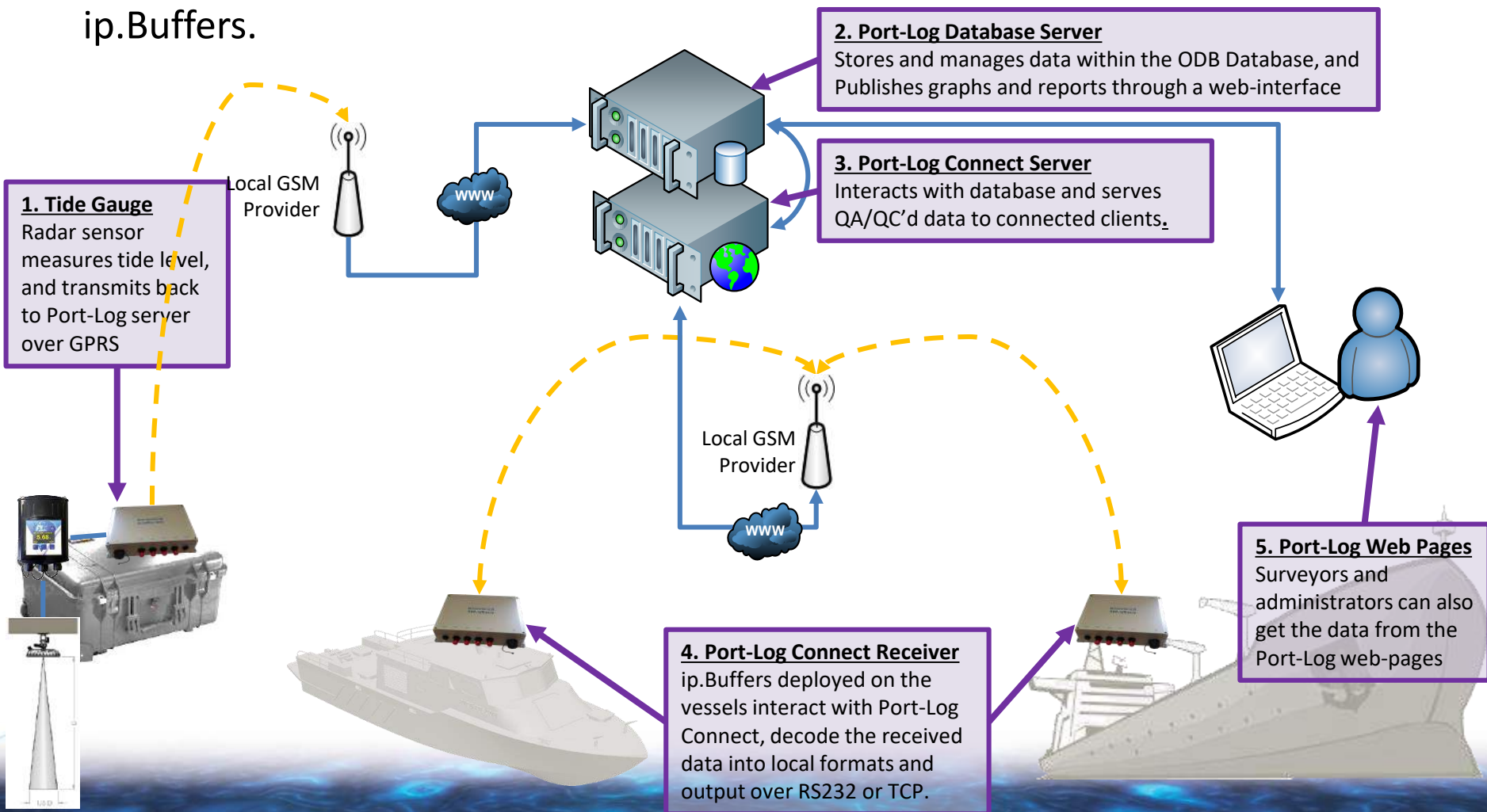
Portable Tide Gauge



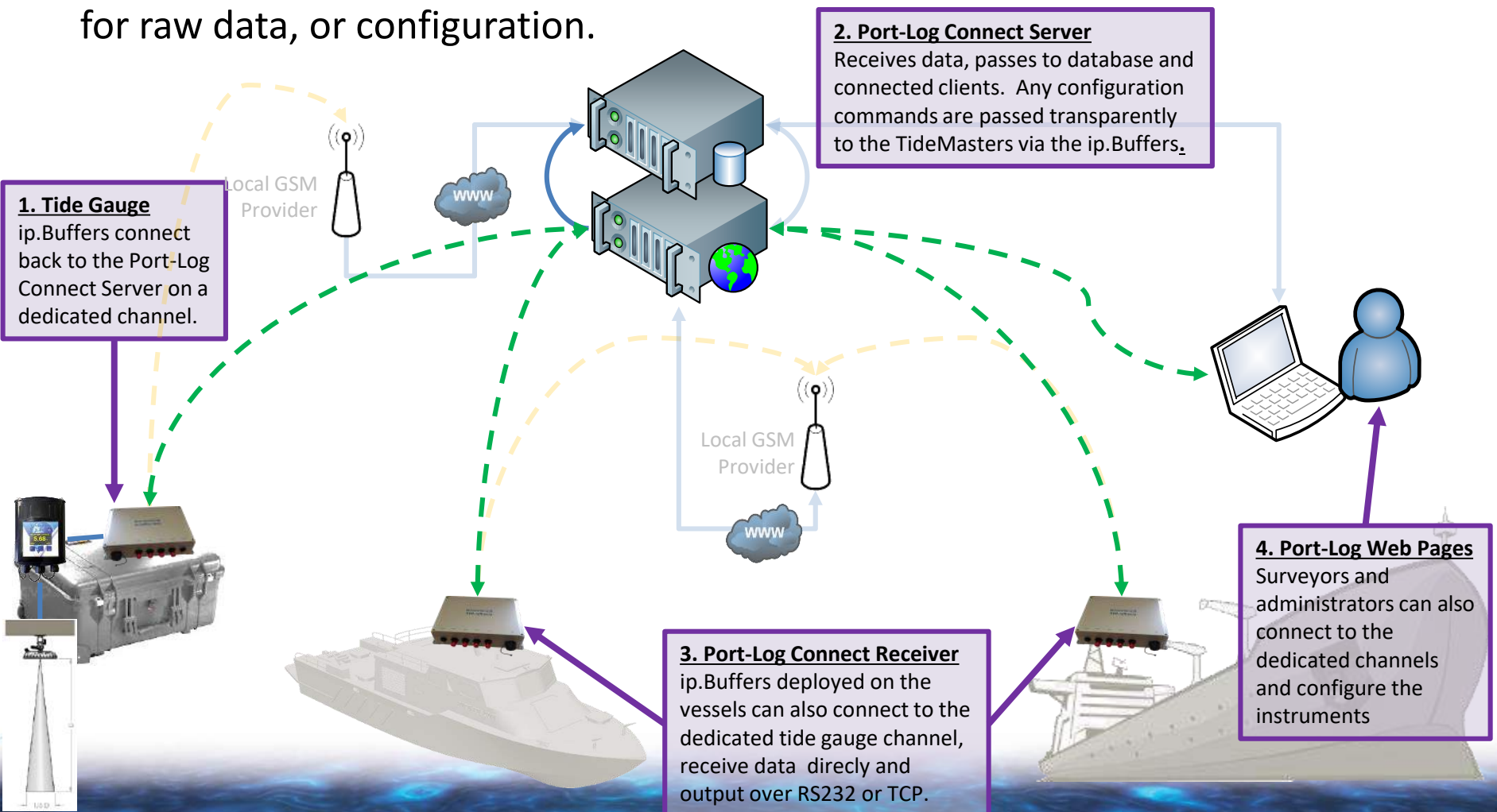
- No permanent tide gauge - Dredging
- Contingency Planning for Ports

Port-Log Connect

- Port-Log Connect enables remote stations (eg survey boats and dredging vessels) to receive QA/QC'd data from the Port-Log database.
- The tide gauges push readings to the Port-Log database over GPRS using ip.Buffers.



- for raw data, or configuration.
-
- The diagram illustrates the Port-Log system architecture. It features four main components in numbered boxes:
- 1. Tide Gauge**: A physical device on a boat. A text box states: "ip.Buffers connect back to the Port-Log Connect Server on a dedicated channel." It is connected via a dashed green line to the Connect Receiver.
 - 2. Port-Log Connect Server**: A central server unit. A text box states: "Receives data, passes to database and connected clients. Any configuration commands are passed transparently to the TideMasters via the ip.Buffers_". It is connected via solid blue lines to the Tide Gauge, the Connect Receiver, and the Web Pages.
 - 3. Port-Log Connect Receiver**: A device on a boat. A text box states: "ip.Buffers deployed on the vessels can also connect to the dedicated tide gauge channel, receive data directly and output over RS232 or TCP." It is connected via a dashed green line to the Tide Gauge and a dashed orange line to the Connect Server.
 - 4. Port-Log Web Pages**: Represented by a laptop and a person icon. A text box states: "Surveyors and administrators can also connect to the dedicated channels and configure the instruments". It is connected via a solid blue line to the Connect Server.
- Communication paths are shown with various line styles: solid blue for direct connections to the server, dashed green for data flow between gauges and receivers, and dashed orange for indirect paths. Two "Local GSM Provider" icons with "www" clouds indicate network connectivity for the tide gauges and receivers.





Wave Sensors

- Local wave data out of reach
 - cost and vulnerability
- Multiple ports have wave height operational thresholds
- Monitoring environmental conditions at critical infrastructure



Swell Sensors

- Suite of motion sensors
 - Hs, Hmax, Tp, Tz, Mdir



Golden Rules

- Size matters!
 - Power Requirements – sensor suite
 - Reduced wind sea heave accuracy

Valuable addition to monitoring operational environments!

Thank you for Listening!



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