

# Eighteenth Session of the Group of Experts for the Global Sea Level Observing System

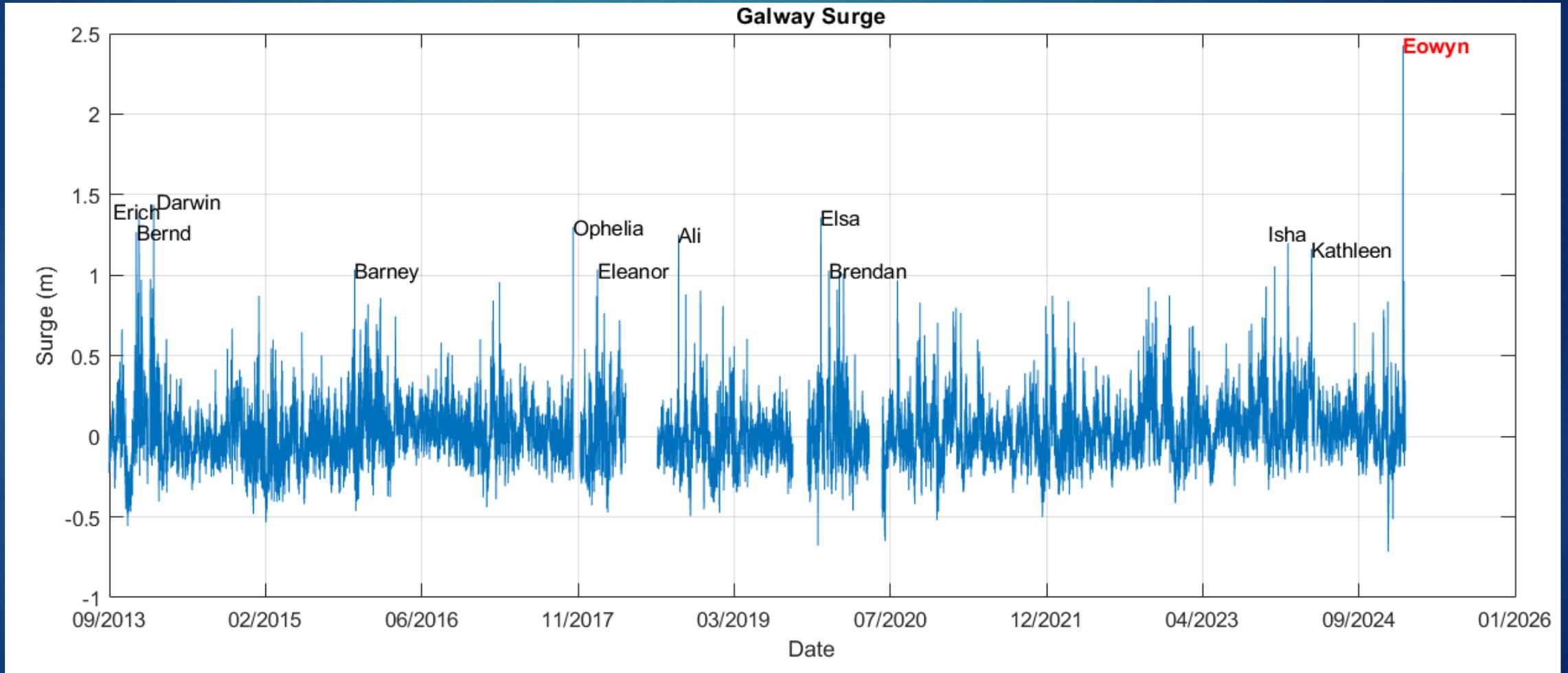
Glenn Nolan, Guy Westbrook, Kieran Lyons, Deirdre Fitzhenry, Donal Kennedy, Patrick Mc Loughlin, Patrick Hall  
Marine Institute, Maynooth University, OPW  
Ireland  
11<sup>th</sup> March 2025

# Irish National Tide Gauge Network

- ▶ Public portal – real time display of water level data monitored every 5mins from ~19 stations including predicted and actual levels. Real time data to FTP site / ERDAP
- ▶ Archive – Marine Institute database request (usually 1-3 working days response for large data sets)
- ▶ Additional gauges maintained by Irish Office of Public Works

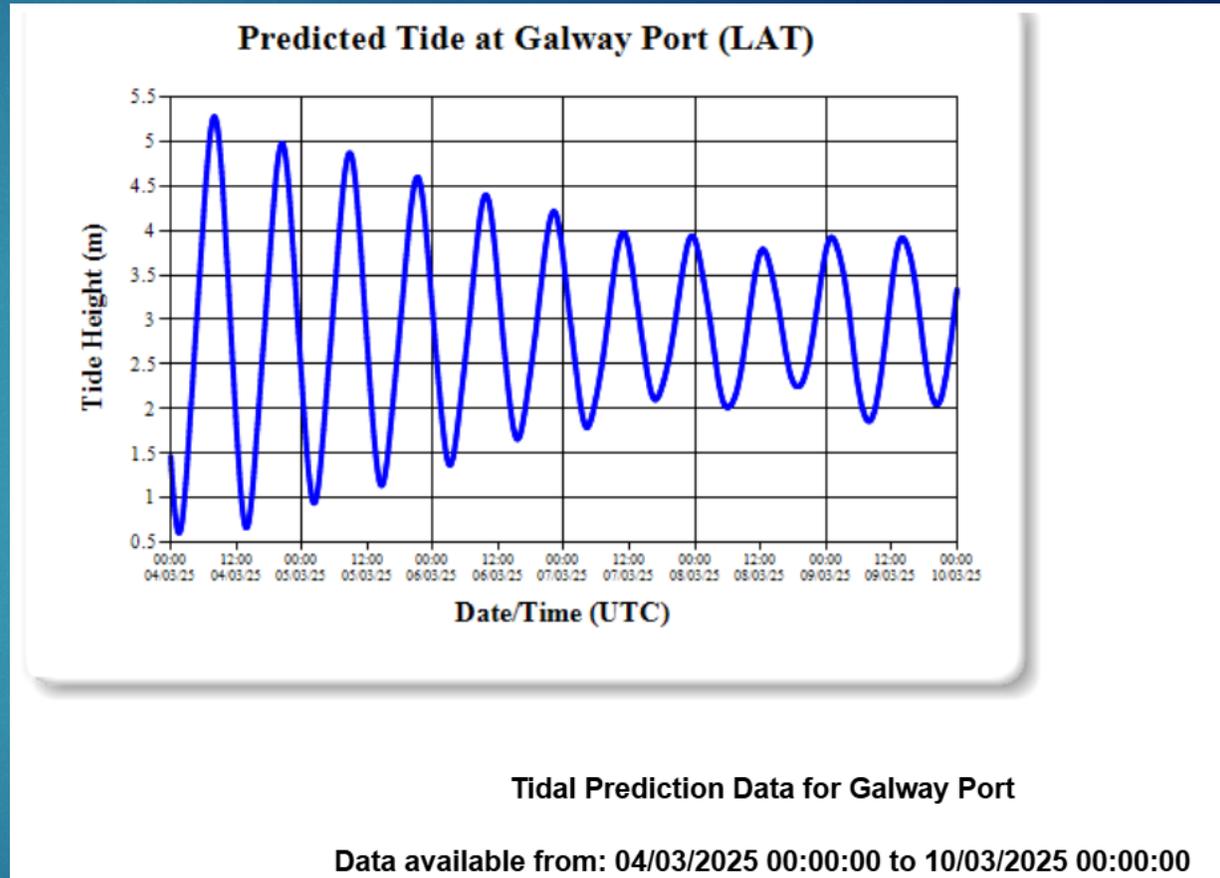


# Tidal surges in Galway since 2013



# [www.irishtides.ie/predict](http://www.irishtides.ie/predict)

- ▶ Free of charge public accessible portal – predictions for currently 41 locations up to 2 years ahead (rolling)
- ▶ Predictions from Irish in-situ observations are combined with Marine Institute ocean numerical modelling to increase coastal coverage
- ▶ Conditions can be hind / forecast for any time



# Irish GLOSS Tide Gauges

- ▶ Two GLOSS tide gauges have been installed in the Irish Tide Gauge Network by the Marine Institute (funded by Science Foundation Ireland)
  1. Union Hall Harbour in Cork – a new station
  2. Howth Harbour in Dublin – an upgraded station
- ▶ Malin Head is an existing operational station maintained by the Office of Public Works (OPW)

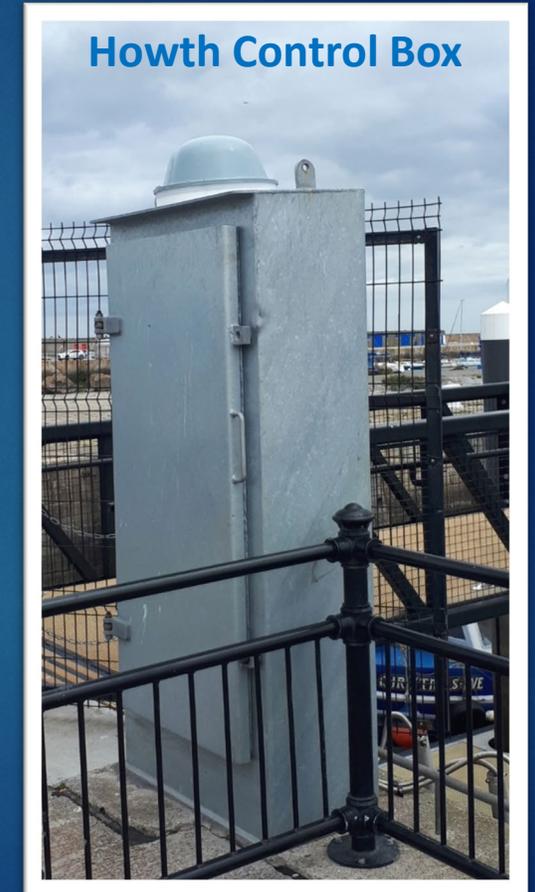
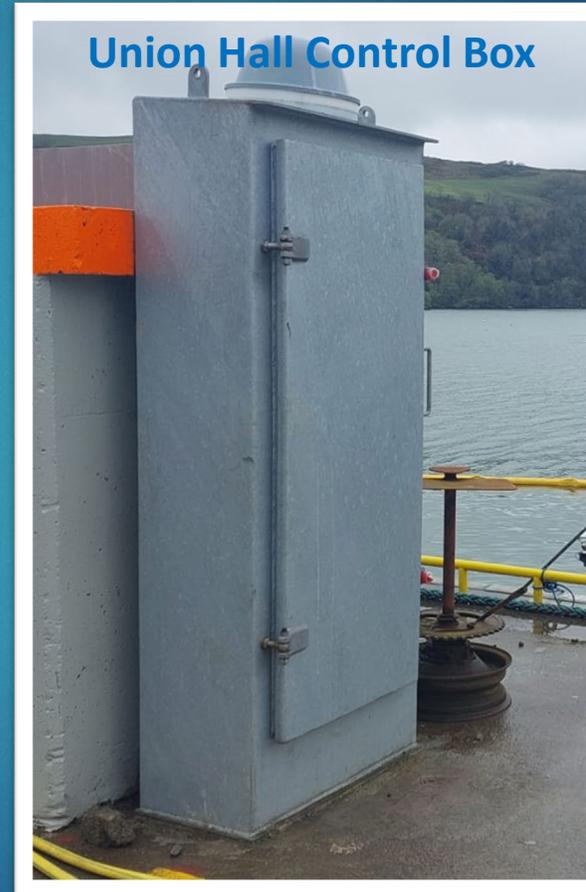


# Current Objectives for the Irish GLOSS Stations

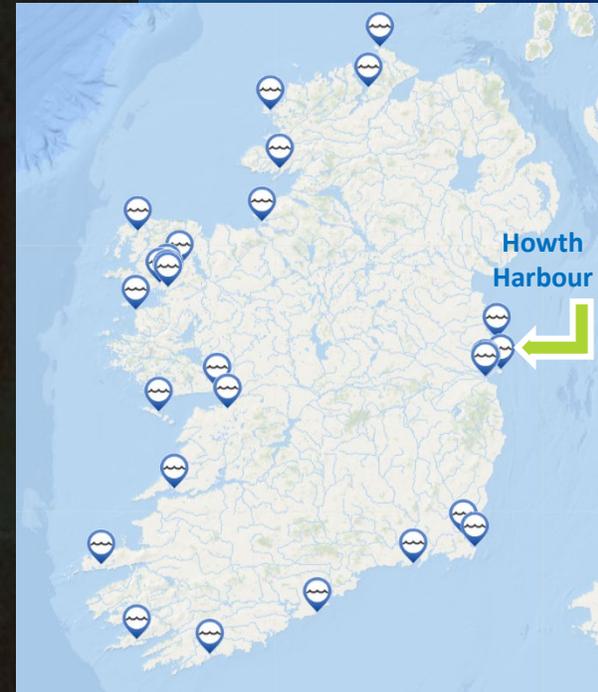
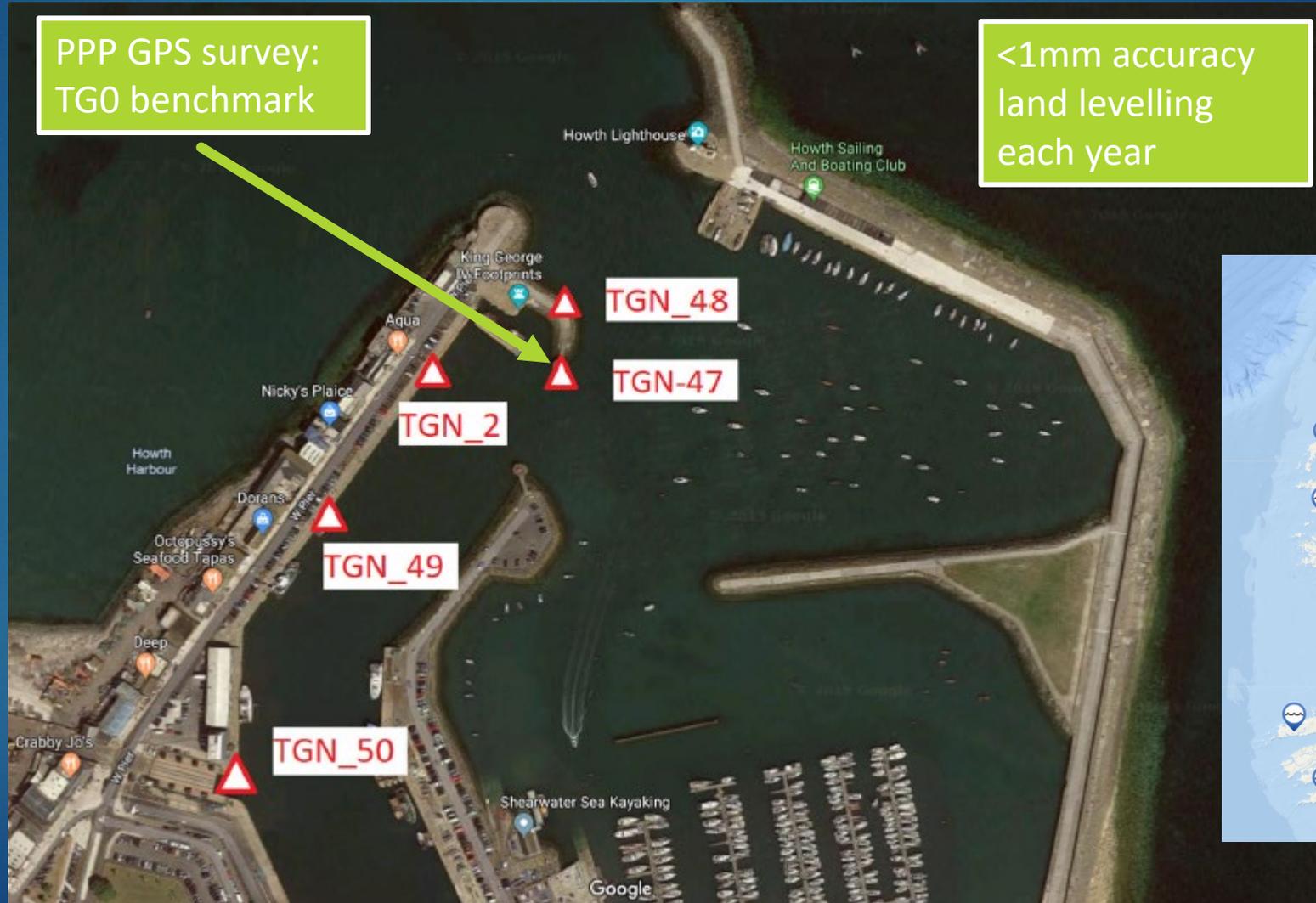
1. Submission of GNSS data to SONEI (Université de La Rochelle)
  - Annual wide area successive land level surveys have indicated movement <1mm per year (early days, 1999-2021). First GNSS station began transmitting operational data to SONEI May 12th 2022 (UH to follow).
2. Submission of water level data to PSMSL
  - After a protracted period of 'practice and refinement', high precision level checks and full tidal cycle inter-comparisons methodologies are providing a level of accuracy we can work with.
  - Assuming acceptable data confirm the observations, we will begin to report data to PSMSL after the next service / cal. visits: August 2022 (Union Hall), September 2022 (Howth).
3. Corrections database
  - Operational

# Irish GLOSS Stations – Union Hall & Howth

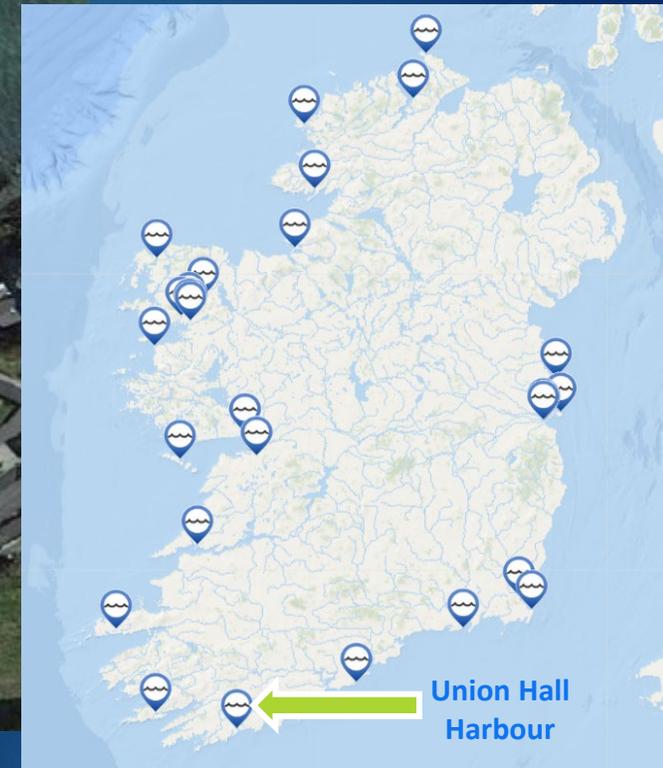
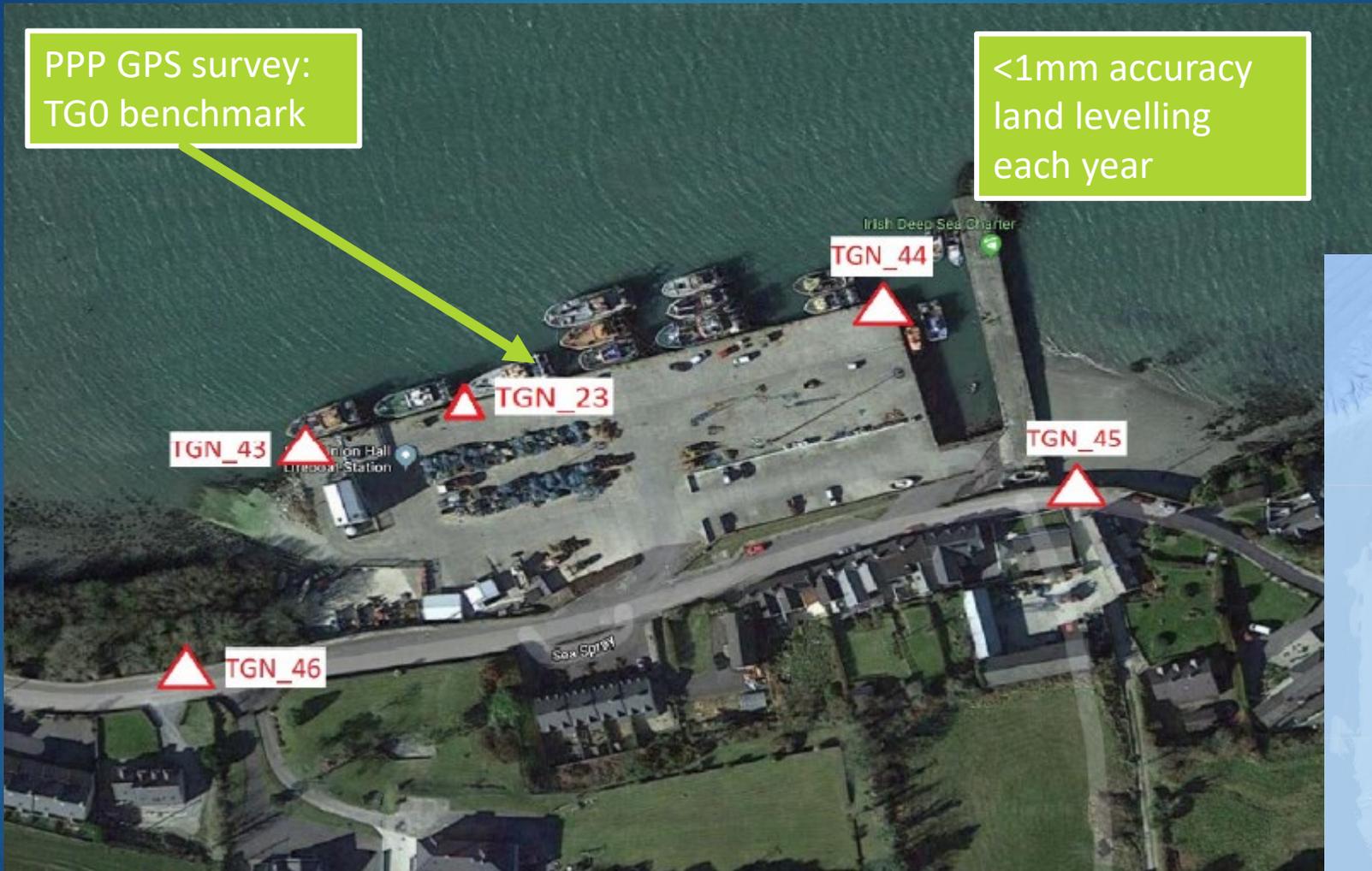
- ▶ 600kg 10mm plate custom built cabinets, bolted / concreted in.
- ▶ State of the art GNSS hardware
- ▶ Opportunistic nature of install = compromise
- ▶ Anticipate lead-in period where feedback from the SONEL team will be worked through in as far as is possible.
- ▶ 3\* managed OTT CBS bubbler gauges
- ▶ 2 service / cal. sessions from 2022
- ▶ Level check's (manual readings 90 minutes either side of high or low water)
- ▶ Full tidal cycle inter-comparison with a 4<sup>th</sup> CBS (working to implement a higher precision 'standard' instrument)



# Howth Harbour GLOSS Station



# Union Hall GLOSS Station



# Level 1 NRT QC and visual review

Appropriate NRT tests applied as defined by IOOS QARTOD within the database

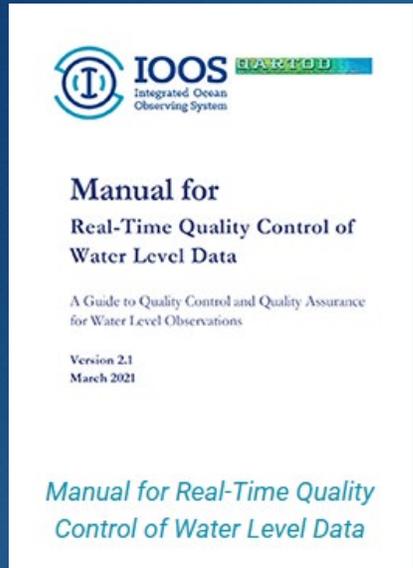
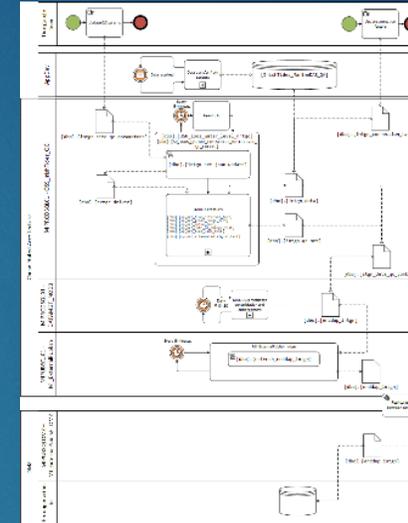
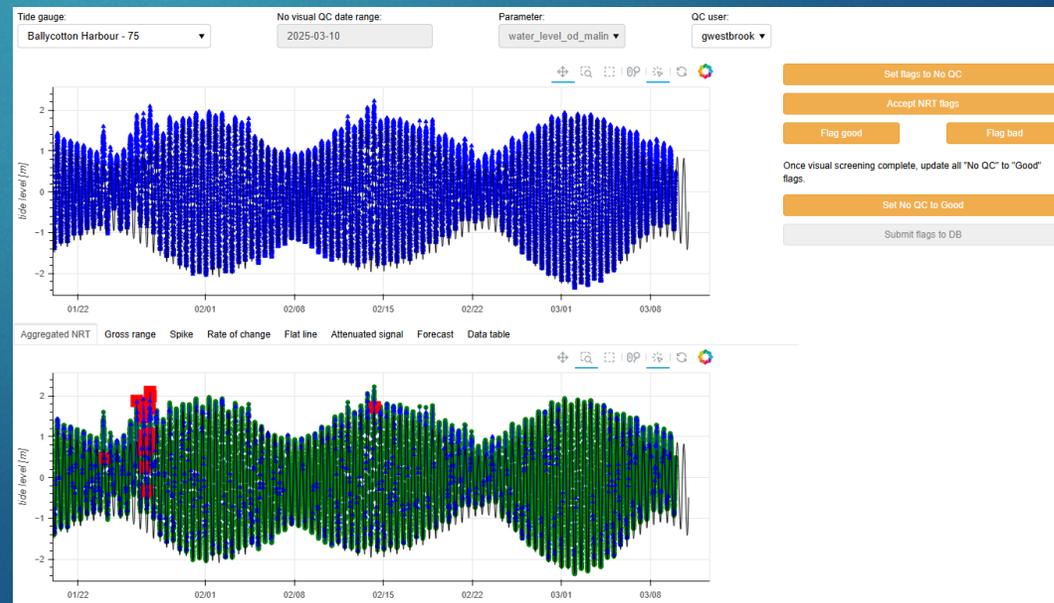


Table 3-2. QC Tests in order of implementation and hierarchy

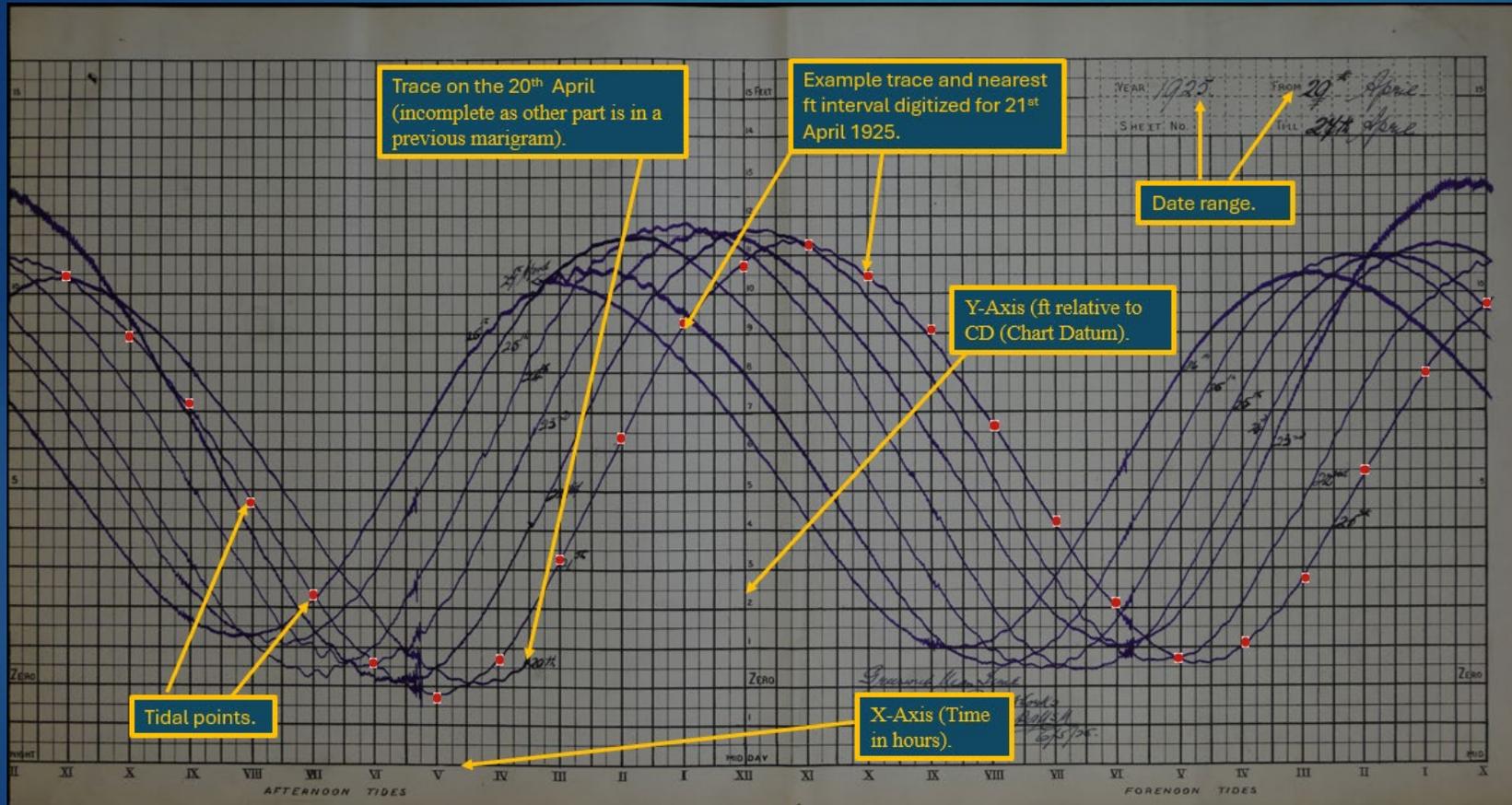
<b>Group 1</b> <i>Required</i>	Test 1	Timing/Gap Test
	Test 2	Syntax Test
	Test 3	Location Test
	Test 4	Gross Range Test
	Test 5	Climatology Test
<b>Group 2</b> <i>Strongly Recommended</i>	Test 6	Spike Test
	Test 7	Rate of Change Test
	Test 8	Flat Line Test
<b>Group 3</b> <i>Suggested</i>	Test 9	Multi-Variate Test
	Test 10	Attenuated Signal Test
	Test 11	Neighbor or Forecast Test



Dashboard to allow visual review of NRT outputs and apply manual flags after review



# Digitisation of historical records



Example of a tidal chart (marigram) from April 20 – 27<sup>th</sup>, 1925, showing hourly intervals digitized on a trace.

Image courtesy of Patrick Mc Loughlin, Maynooth University, Ireland

# Collaboration

- ▶ EuroGOOS Tide Gauge Task Team is a European network of tide gauge platforms. Compiles information on existing sea level networks, advises operators and scientists, and supports national and regional sea level initiatives towards enhanced and sustained system
- ▶ EU EuroSea project – EUTGN - European and Adjacent Areas Tide Gauge Network Inventory. A dashboard of tide monitoring stations and their status collated by the EuroGoos Tide Gauge Task Team as a deliverable in the EuroSea project. This is a metadata catalogue of all permanent, managed tide level monitoring stations across Europe and adjacent coastlines, including North Africa.(EuroSea Deliverable, D3.15 . EuroSea, 18 pp. DOI 10.3289/eurosea\_d3.15) - <https://eutgn.marine.ie/>

# Thank you

