



Sea Level Space Watch: A Prototype Service for Monitoring UK Sea Level

Workshop

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**National
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NATURAL ENVIRONMENT RESEARCH COUNCIL

Sea Level Space Watch

Short term project Funded (Jan-March 2015) by UK Space Agency's **Space for Smarter Government Programme**

- Prototype sea level monitoring service for UK seas, sea level variability from space-borne altimeter data, combined with tide gauge data.
- Support for national flood defence planning.
- Supplements UK Climate Projections with information on seasonal, regional variability



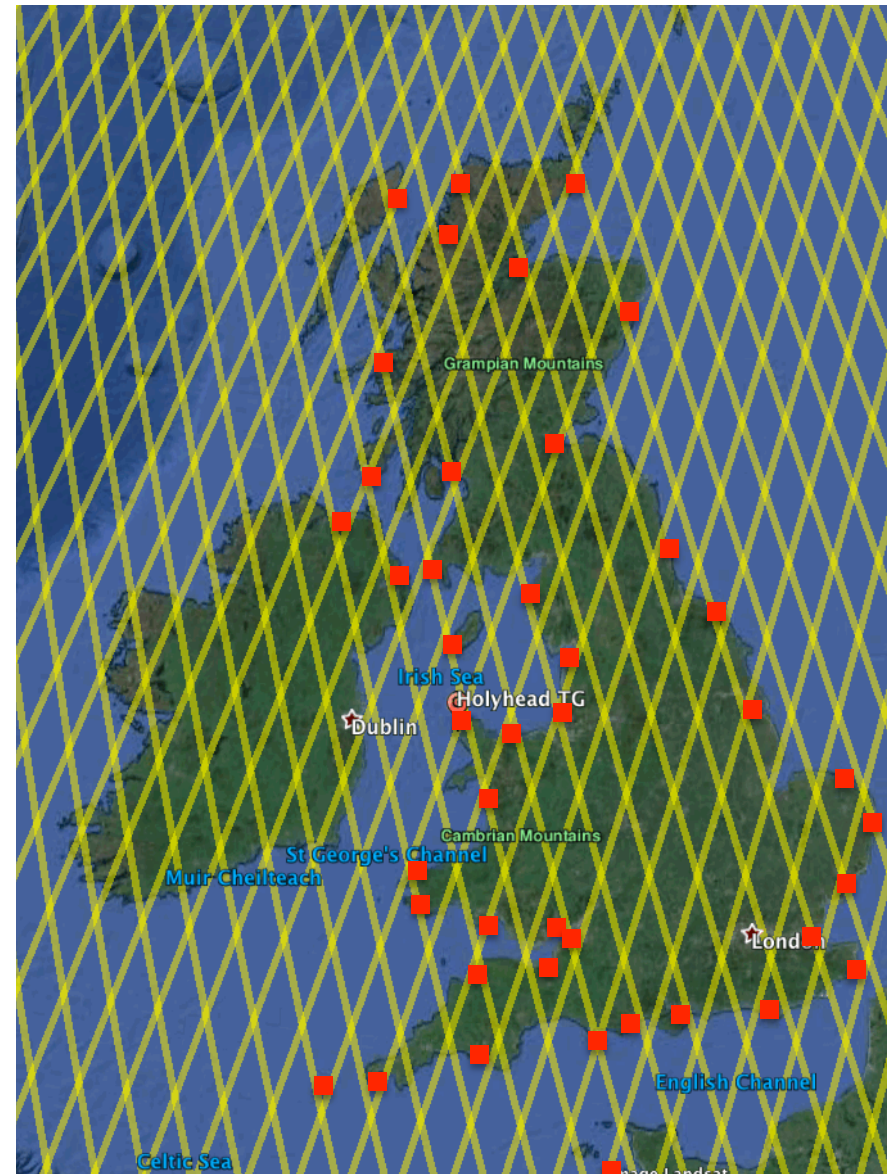
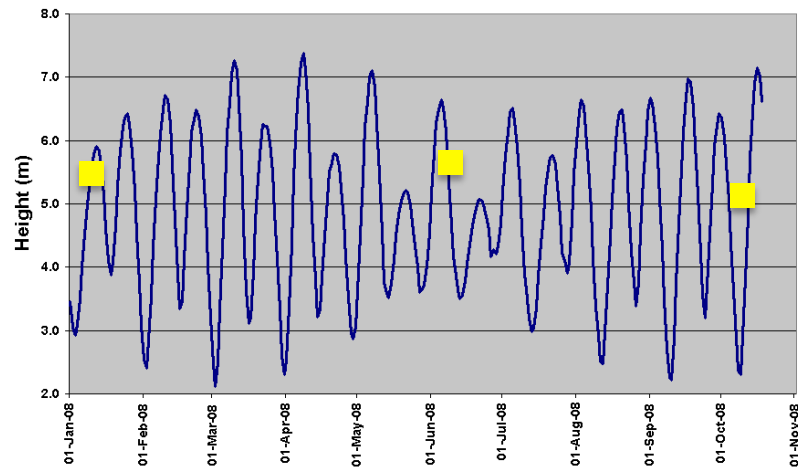
Tide Gauges and Satellite Altimeters



Tide Gauges
(ntslf.org)



Altimeter tracks
(Envisat / AltiKa)



Sea Level Measurements – Characteristics of Satellite Altimeter and Tide Gauge Data

- Tide gauges:
 - Continuous measurements at a fixed number of sites.
 - Long term record (> 100 years for some sites).
 - Current basis for monitoring tides, surges, flooding, long term trends.
 - Limited, site specific, spatial coverage.
- Satellite Altimeters:
 - Global coverage, supporting spatial mapping.
 - Intermittent sampling (revisits each location every 10-35 days, depending on orbit).
 - Sea Level climate quality record since 1992. Continuation missions confirmed to 2030.

Sea Level Space Watch

- Open ocean applications have been the historical focus of satellite altimeter research, because of difficulties of retrieving valid data close to the coast.
- NOC has led the international community in developing schemes to bring altimeter data to the coast – can now provide reliable coastal sea level products from altimetry.

Sea Level Space Watch

- Brings together altimeter data and tide gauge to combine the key characteristics of each
- A sea level advice service to support agencies responsible for planning coastal flood defences.
- Process altimeter data to provide regional variability of non-tidal sea level signal – referenced to equivalent tide gauge measurement.

Meeting Objectives

- Consider the context – planning for coastal flooding in a changing climate.
- Introduction to the capabilities of satellite altimetry
- Presentation of the prototype Sea Level Space Watch service.
- Review this service capability in the context of user needs.
- Discuss potential full-scale implementation of operational service to support long-term planning and risk management.
 - What modifications may be needed?
 - What are the costs?
 - Can we quantify the benefits?
 - How could it be funded?
- Consider possible overseas implementation at key high risk locations.

Workshop Agenda

1. Context: Planning for Coastal Flooding in a Changing Climate
2. Sea Level Space Watch: Variability in Coastal Sea Level from Satellite Altimetry
Lunch
3. Discussion / Breakout: Requirements / Benefits for an Operational Implementation
4. Summary / Conclusions

Discussion Questions

- Requirements / Key Gaps in information for coastal flooding planning.
- Usefulness of proposed parameters.
- Service presentation / ease of use.
- Further requirements for implementation of an operational service.
- Benefits of service vs costs of implementation / operation - can we build a business case?
- Possible implementation beyond UK