



# Integrating Satellite Data into Multidisciplinary Coastal Research



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National reporting, EU directives and international agreements (e.g. UN 2030 Agenda for Sustainable Development) require multi-disciplinary information solutions.

Increasing volumes of environmental information, held in Earth Observation (EO) datasets present us with opportunities to:

- Conduct exploratory **coastal and marine science** using EO data
- Develop novel, impactful and exciting **societal** and Earth systems **applications** involving multi-source data



Coastal Managers  
Oceanographers  
Ecologists  
Social Scientists  
Marine Planners

Call for solution



Multidisciplinary discussions

New knowledge and information

Solution application

Coastal query (non-EO)

Outputs and answers

Multidisciplinary global response to local, regional and global queries

## Case study: Ocean surface heterogeneity mapping from hypertemporal EO-based SST estimates

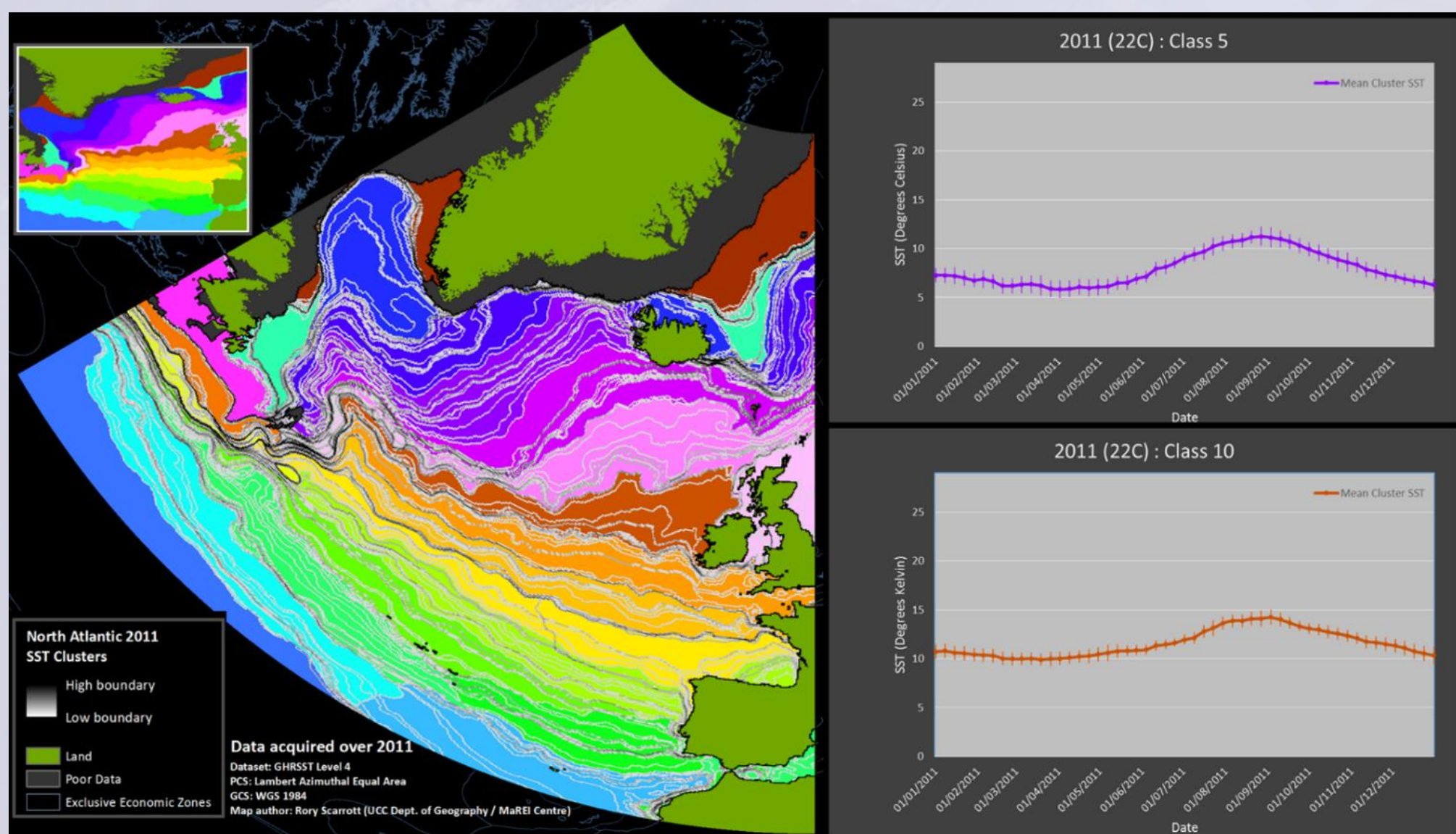


Figure: Ocean surface heterogeneity as derived from a single year (2011) of hypertemporal SST data, processed using a preliminary H2020-Co-ReSyF- and FP7-SAFI-adapted heterogeneity mapping algorithm.

### Research Application (without Co-ReSyF)

- Use potential being assessed through in-house multi-disciplinary discussions
- Technical and thematic skills, and interpretation, limited to in-house expertise and their collaborators
- Data volume for processing restricted by desktop limitations
- Requires days of computer work to achieve a single dataset run

### Research Application(s) (with Co-ReSyF)

- Assess potential by interaction, and seek advice and interpretation from a **global stakeholder group**
- Data volume for processing is magnified, **enabling far more temporally detailed and spatially extensive datasets** to be run
- **Runtime for single datasets reduced** to less than a day, with parallel processing possible
- Enables **more oceanographic research** to be conducted with **less resource effort**

Co-ReSyF has developed an exploratory online system to:

- Help research **communities interact** and build global collaborations to extract coastal information from multiple available data sources
- Equip users with **access to huge amounts of information** held in Big EO Data archives and portals
- Facilitate users with access to a **global multidisciplinary community and its research outputs**

The Co-ReSyF system:

- Features tools to specifically **support inexperienced EO users** enhance their research with information held in EO data
- Includes **advanced functionalities for EO experts and algorithm developers**
- Features an expert centre and whiteboard for **user interaction, problem solving and collaboration development**
- Builds upon an iterative stakeholder-led development framework **harnessing the perspectives of the multidisciplinary community**

### Stakeholder-targeted Strategic Development

- Co-ReSyF was developed as a research and education resource, coordinating with other online platforms (e.g. ESA Coastal-TEP) to compliment their capabilities.
- It is being strategically targeted through the guidance of:



WORLD METEOROLOGICAL ORGANIZATION



Co-ReSyF  
Coastal Waters Research Synergy  
Framework  
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