

HAZRUNOFF

PROJECT

Reviewing the potential of integrating satellite-based remote sensing technologies

- Christian Böding -



Funded by
European Union
Civil Protection
and Humanitarian Aid

About EOMAP

- Mapping & monitoring aquatic environments worldwide
- Founded in 2006 with HQ in Germany and office in Australia
- Service provider for coastal and offshore industry, academia and govern. entities
- Top ranked framework provider for UK Hydrographic Office
- Award winning cutting edge technology



EU SME
champion



Copernicus awards for
outstanding technology



Geospatial world
award winner 2017



Information
Program Partner



Solution
partnership



Data
Provider



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The Ocean...



www.eomap.com

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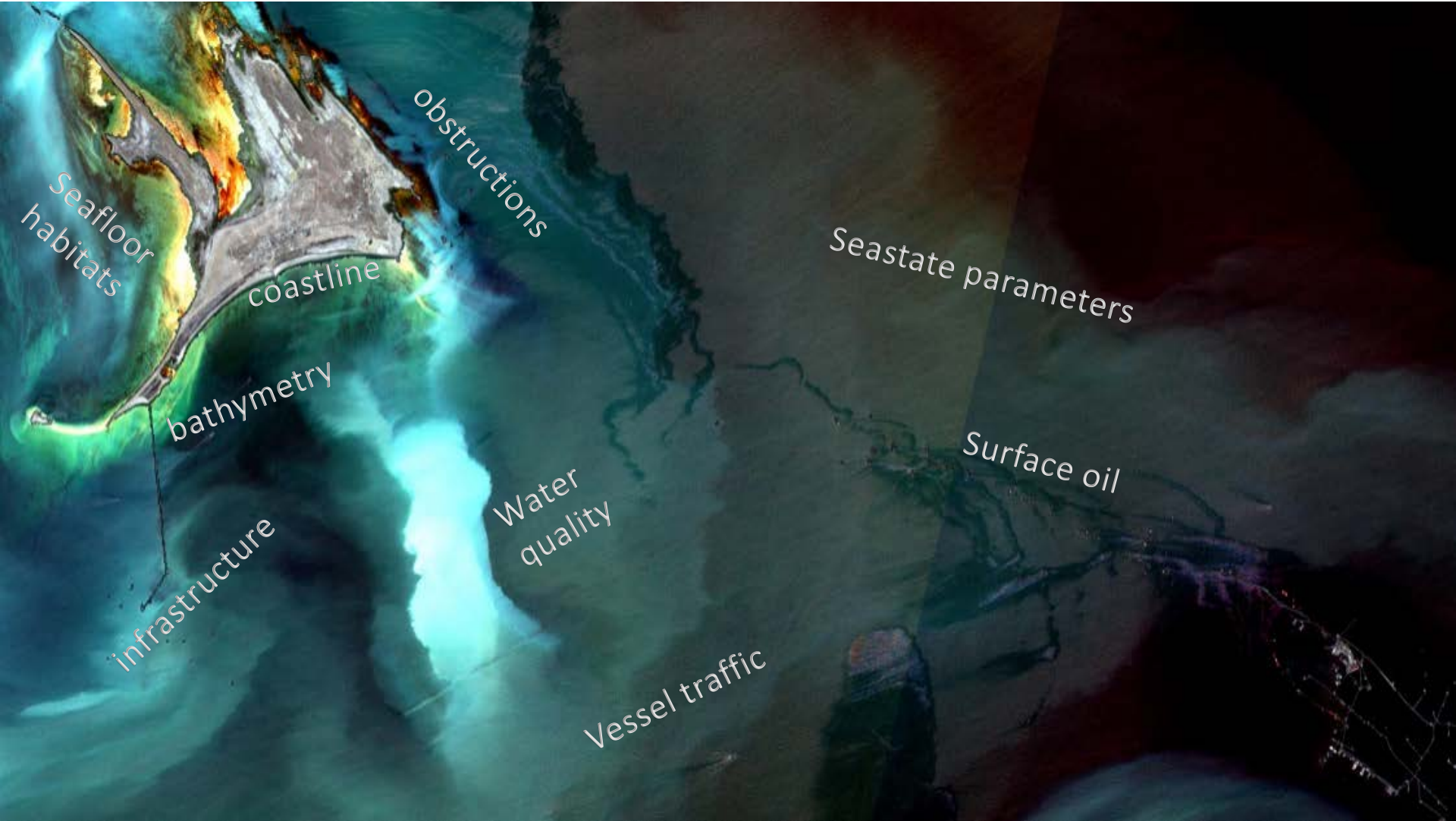


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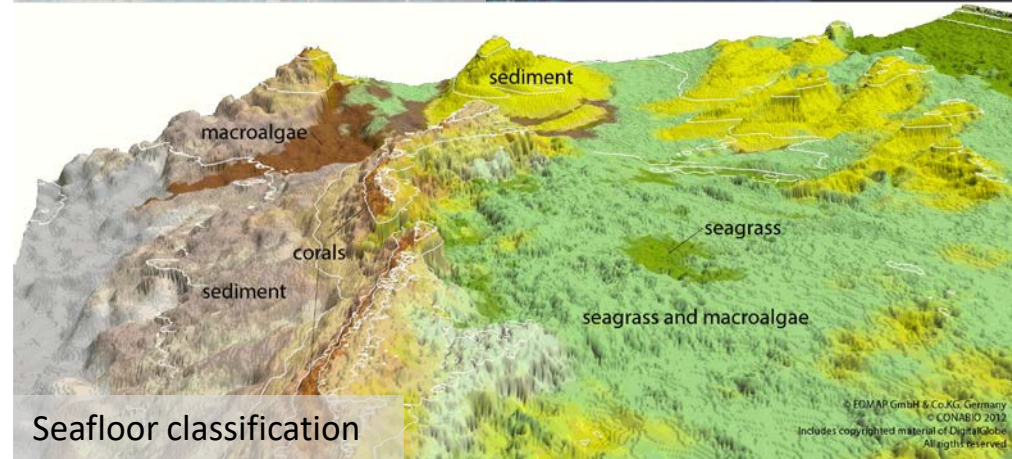
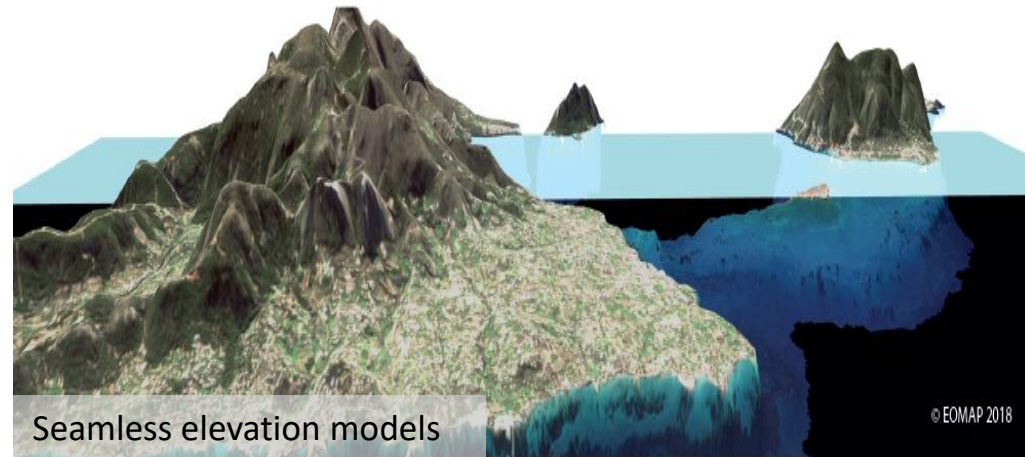
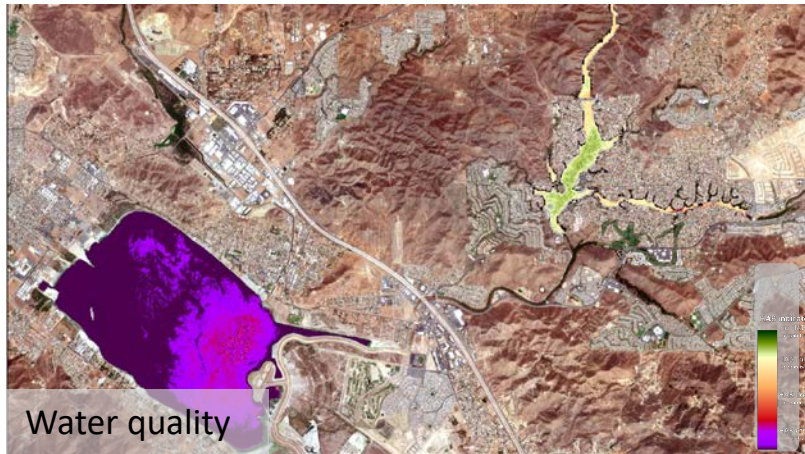


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... a sea of possibilities



On the water surface... ..and below



5 000 sqkm Mexican Maya Coast, EOMAP 2012 - 2014
Cerdeira-Estrada S. et al. (2012): Proc. IGARSS, p. 1-4

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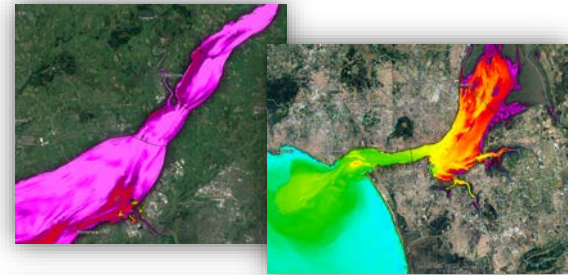


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Our tasks in HazRunOff

I. Turbidity

Monitoring Turbidity in river estuaries



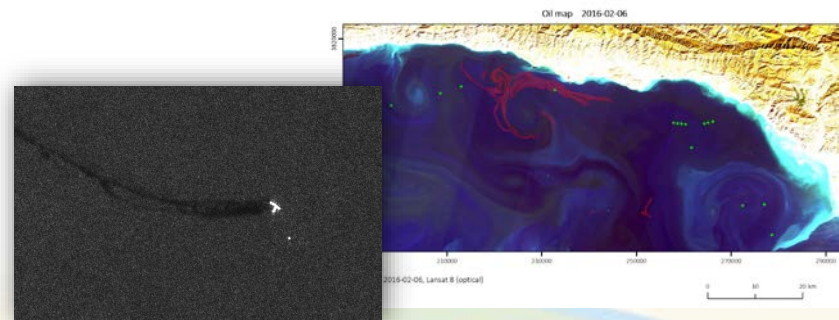
II. Water Level and Extent

Monitoring Water Level and Extent with both optical and radar satellites

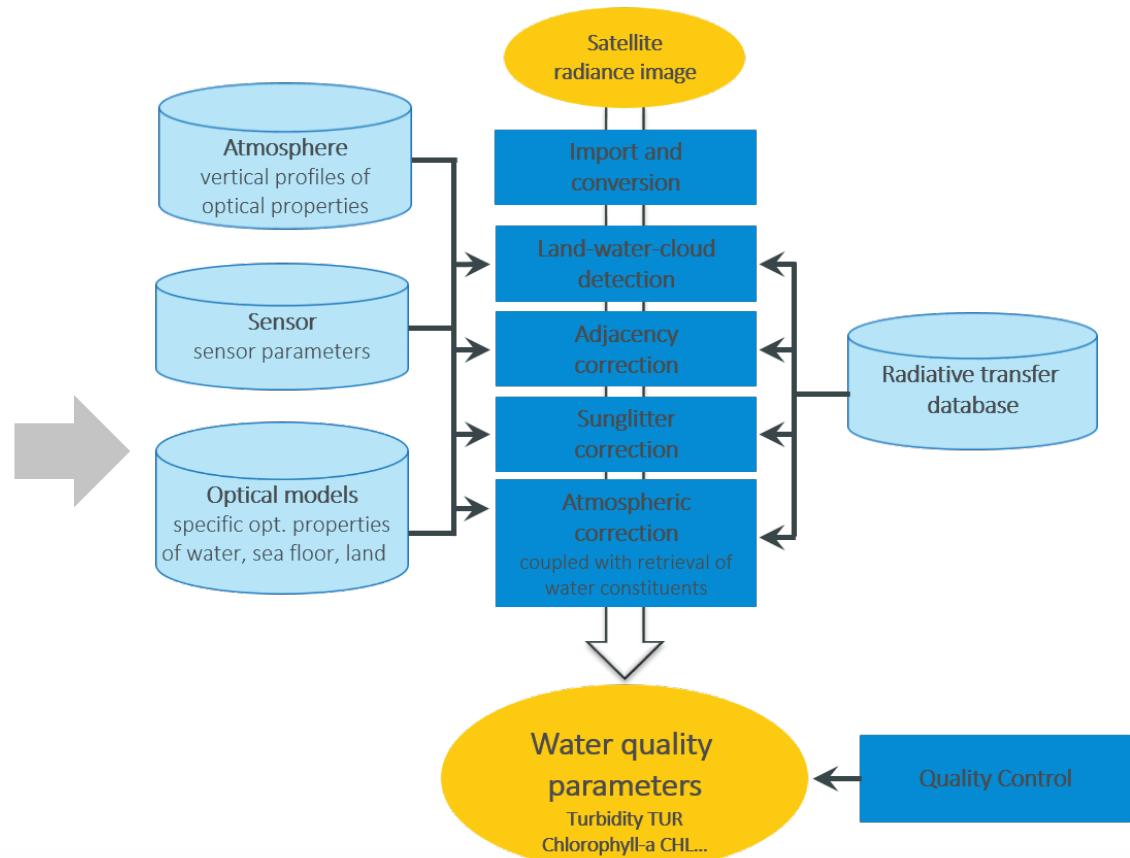
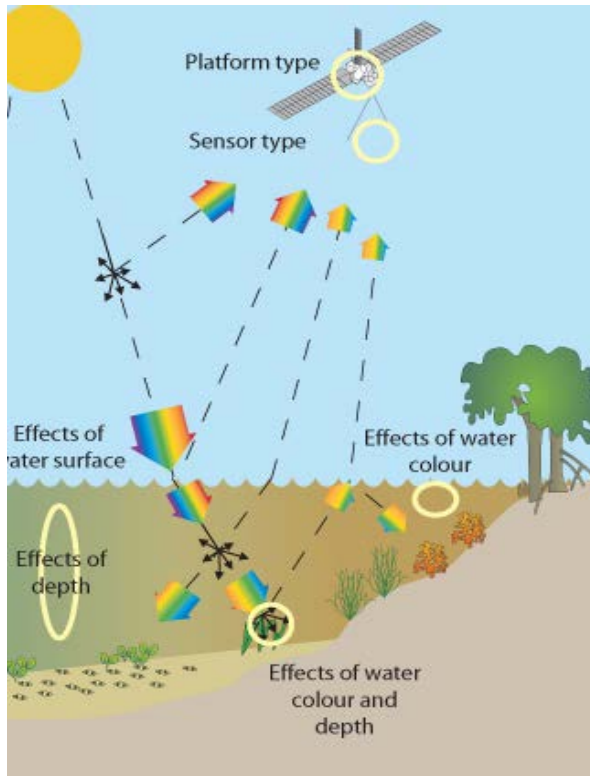


III. Oil and Chemical Spill

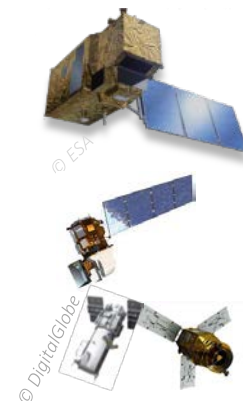
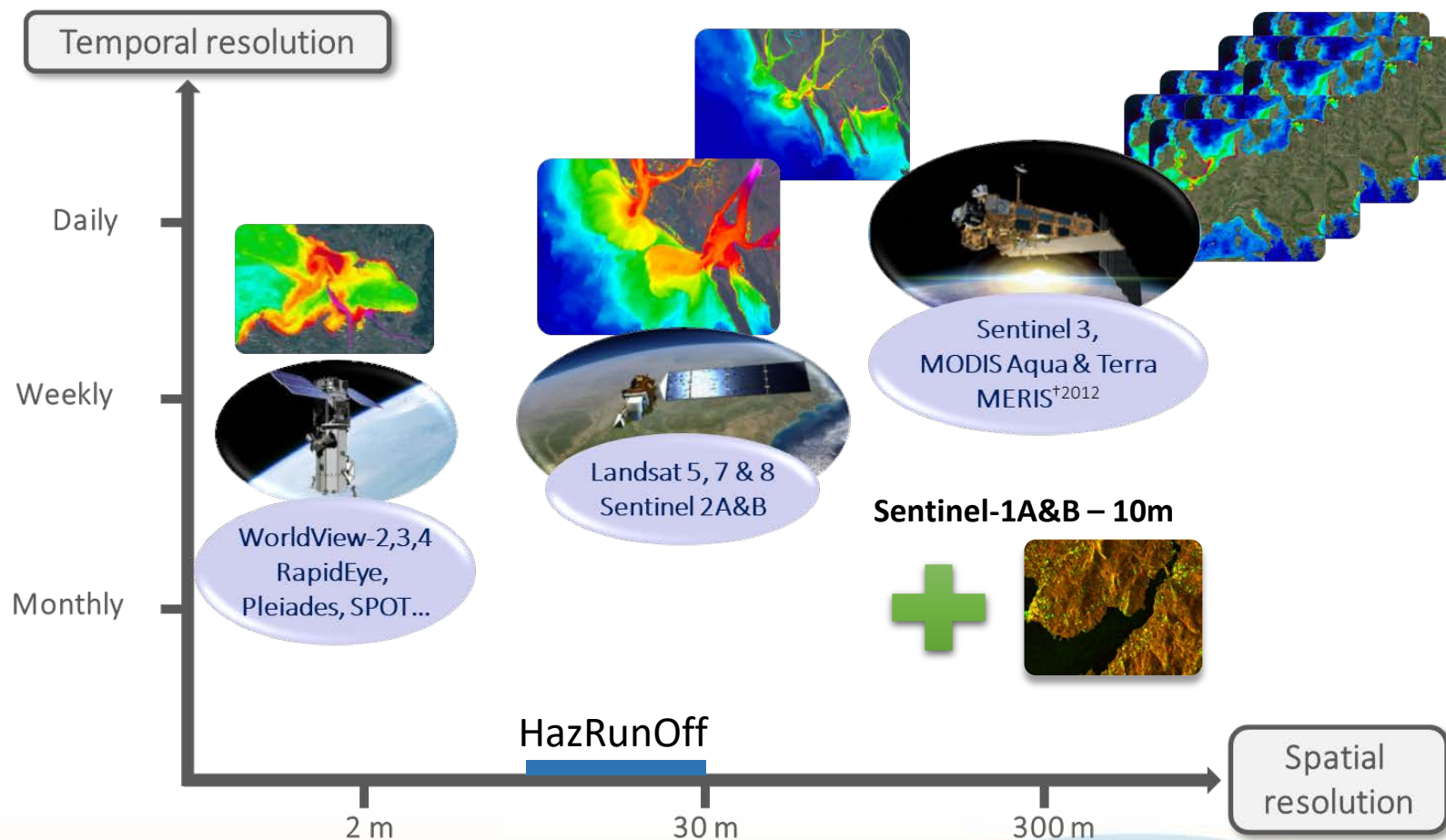
Working towards an improved Oil and Chemical detection system



Physics based models for Water Quality assessment

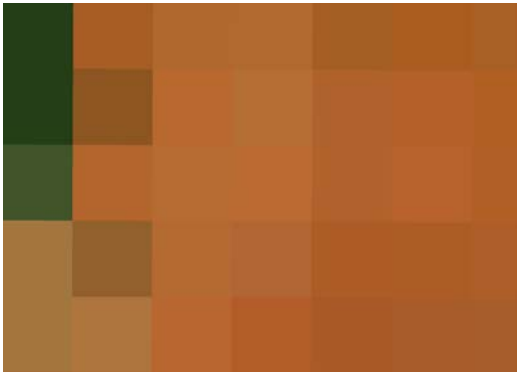
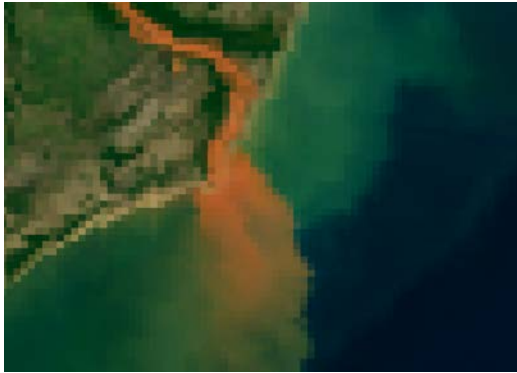


Satellite missions frequently used



Sensor differences (similar dates)

MODIS (500m)

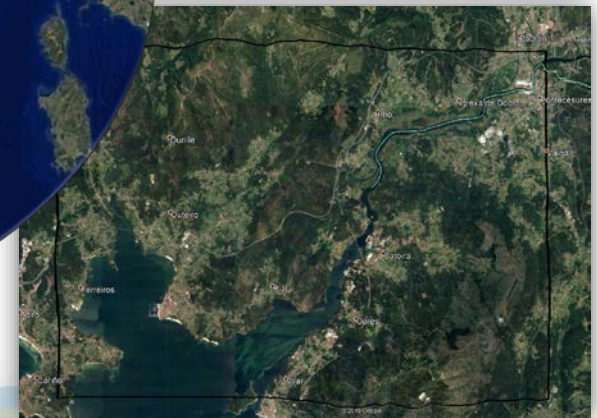
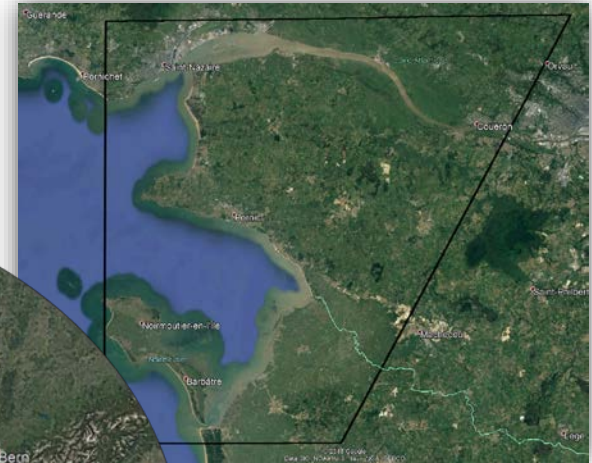


Landsat 8 (30m)

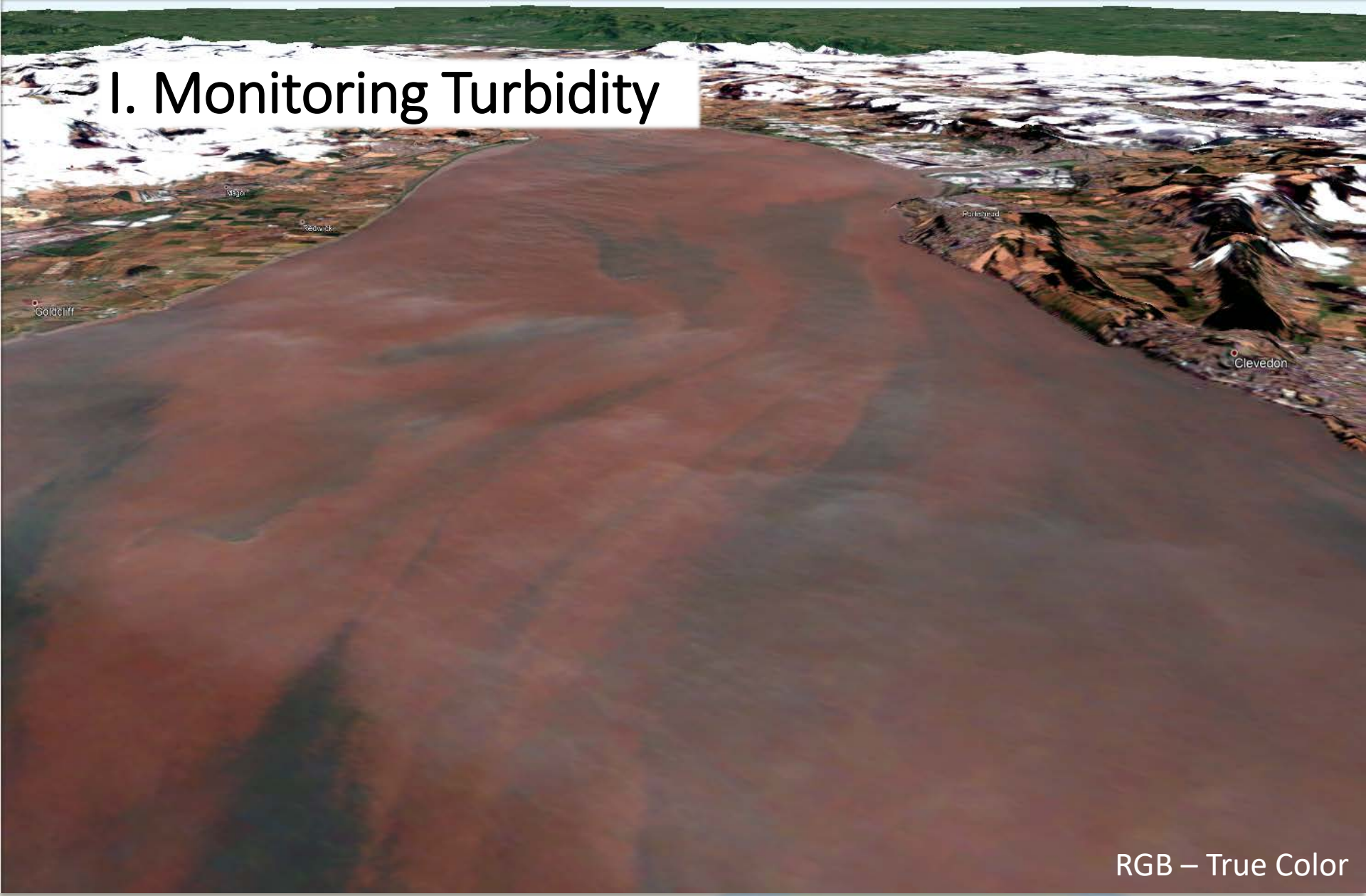


Sentinel-2 (10m)



[illegible]

I. Monitoring Turbidity



RGB – True Color

Severn Estuary – Close to Cardiff

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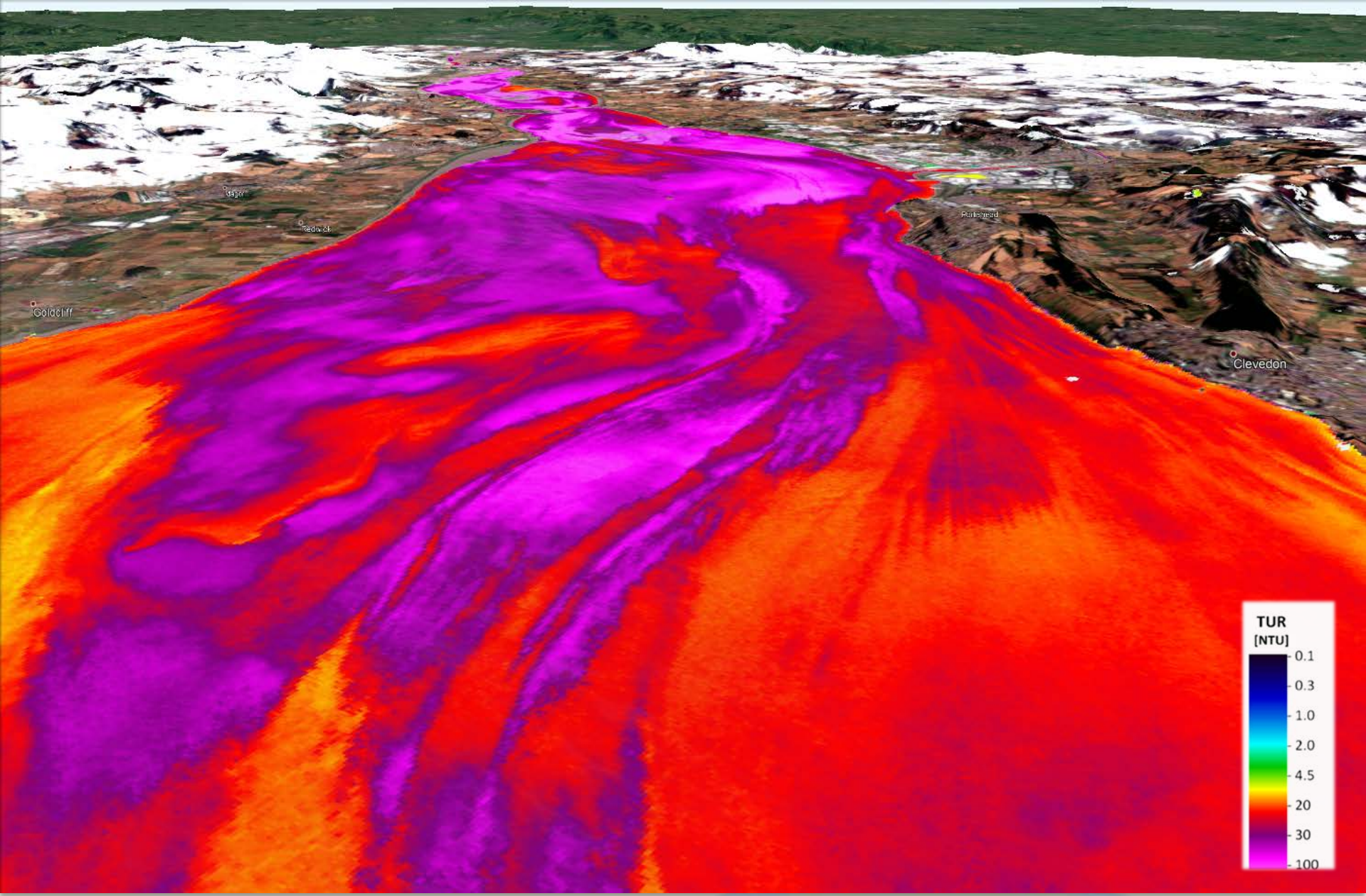
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Severn Estuary – Close to Cardiff

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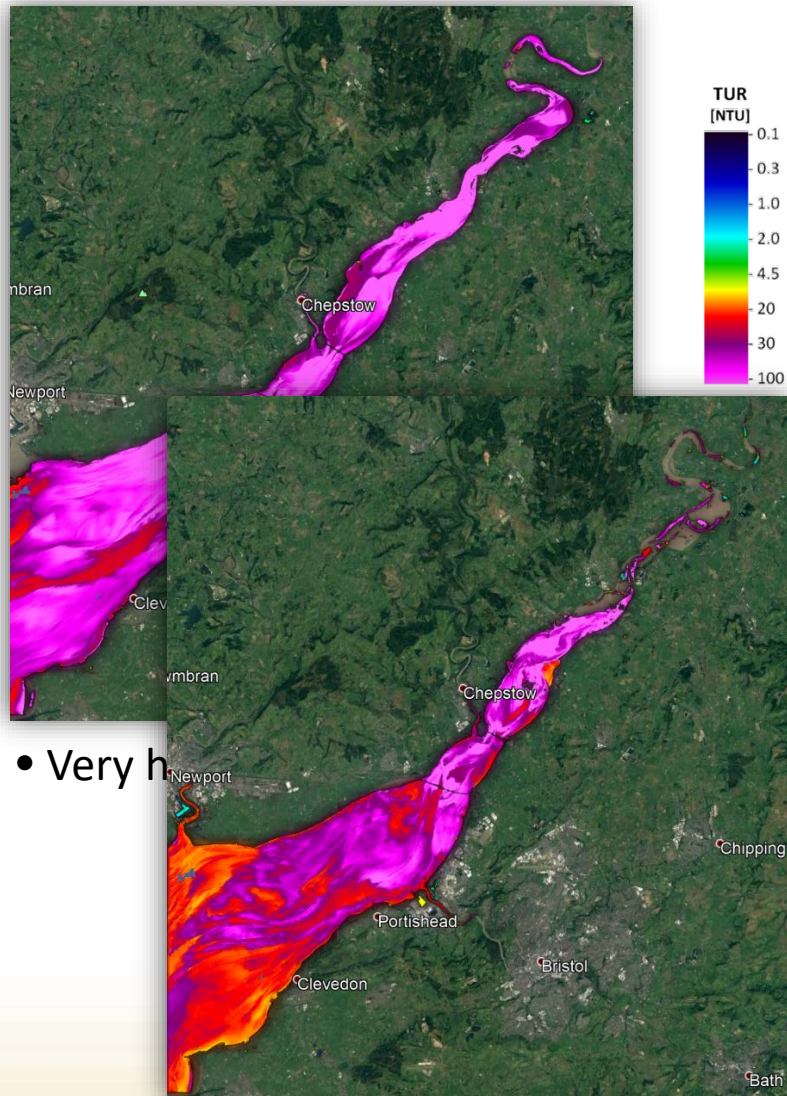


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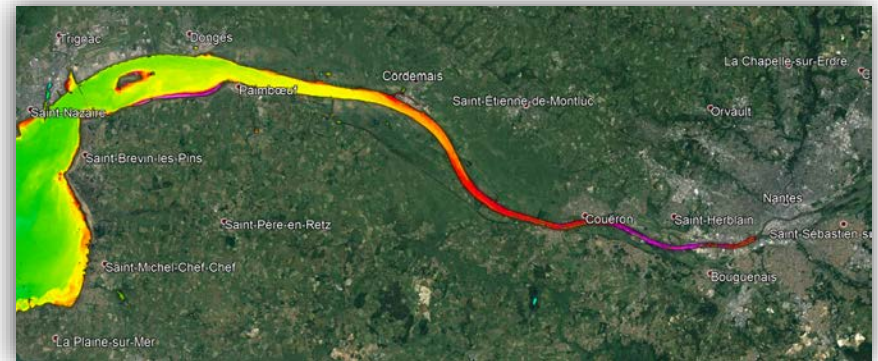
Monitoring over Time and Tide



- High tidal range (~6m)



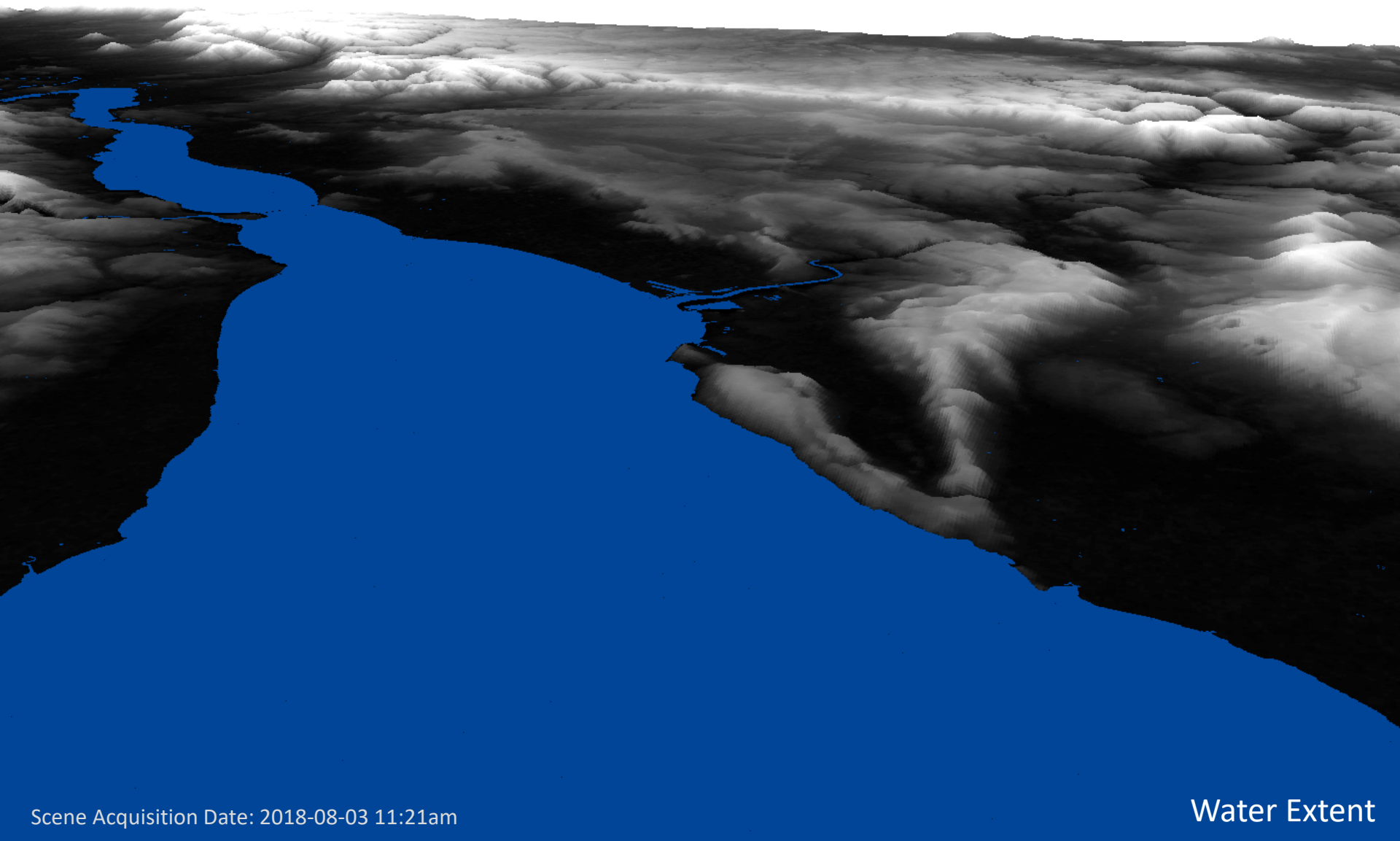
Low tide



High Tide

II. Monitoring Water Extent

■ Tidal height: 10.2m (Station: Newport)



Scene Acquisition Date: 2018-08-03 11:21am

Water Extent

Severn Estuary – Close to Cardiff

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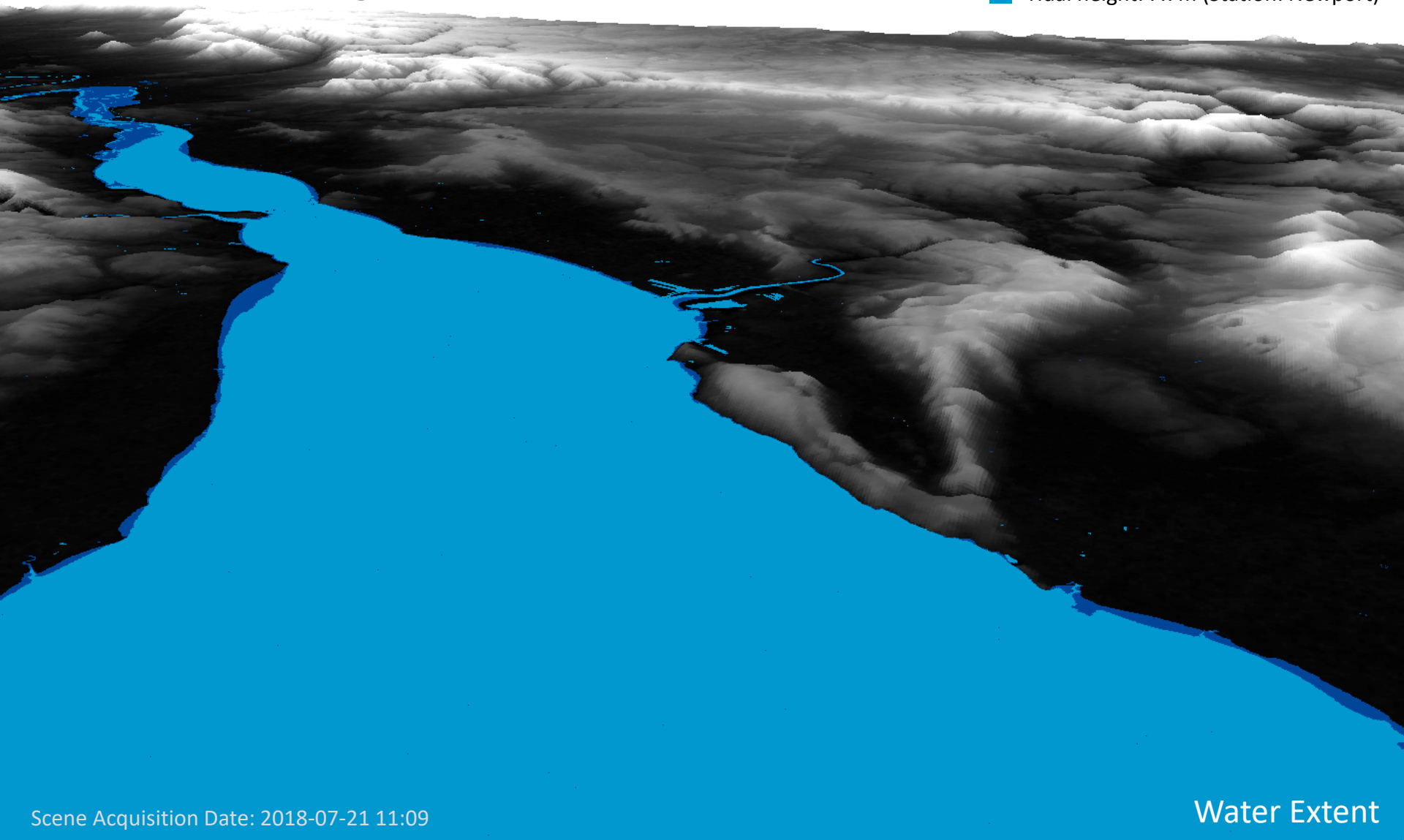


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II. Monitoring Water Extent

■ Tidal height: 10.2m (Station: Newport)

■ Tidal height: 7.7m (Station: Newport)



Scene Acquisition Date: 2018-07-21 11:09

Water Extent

Severn Estuary – Close to Cardiff

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Optical:

- Sentinel-2 – 10m
- Landsat 8 – 30m



*„What about the British W...
– eh – clouds?“*



... simply use Radar!

Sentinel-1 C-Band Radar

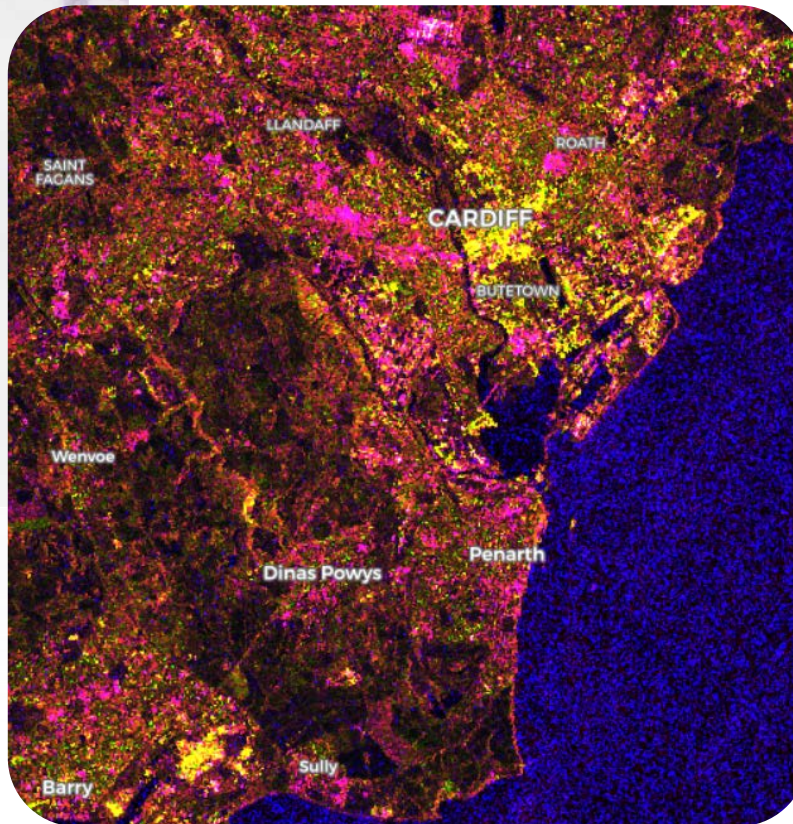


Sentinel-2 Optical



Images every
2-3 days!

27.06.2019



Images every
1-2 days!



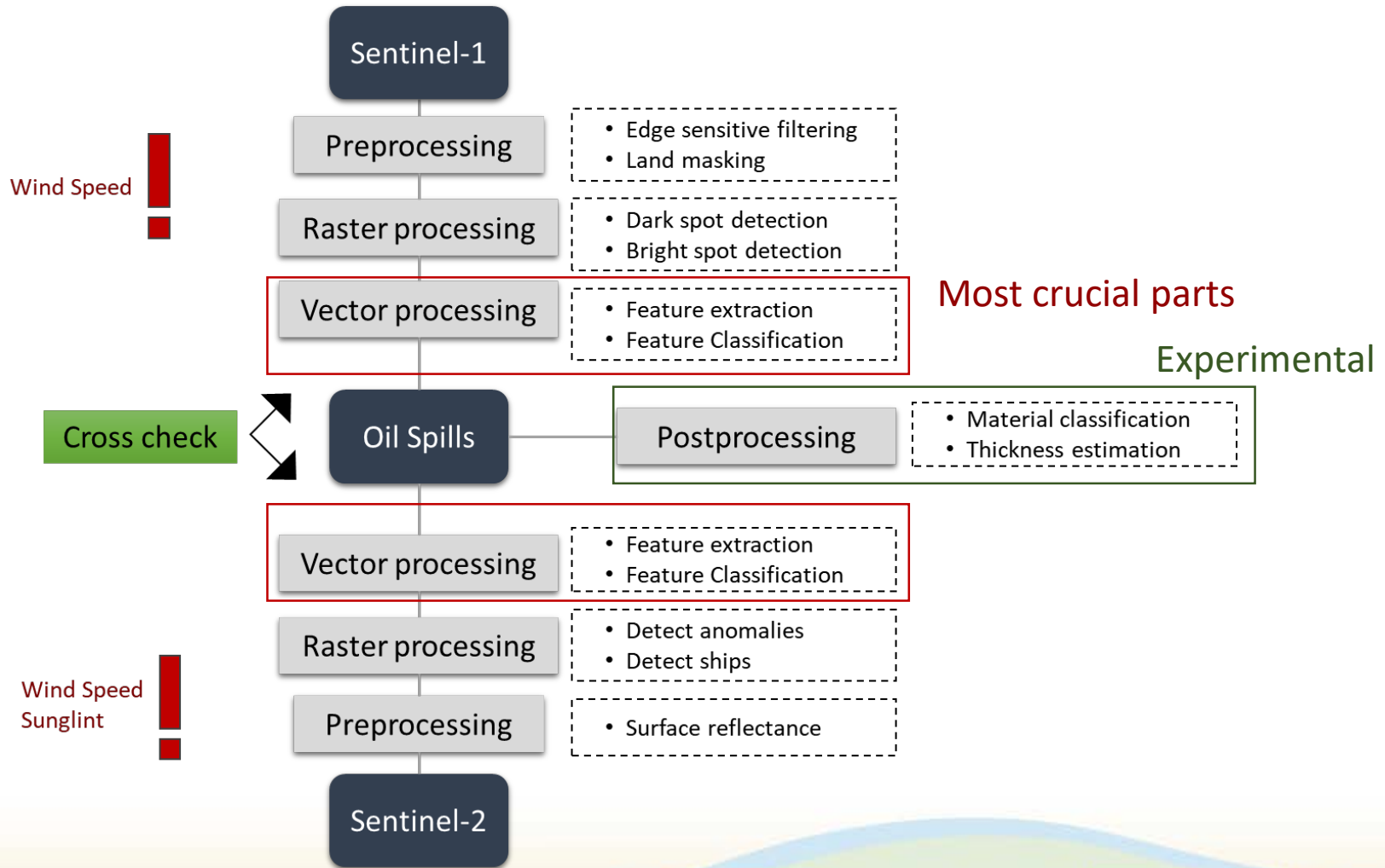
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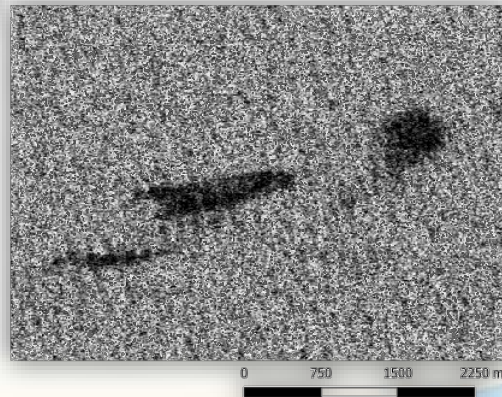
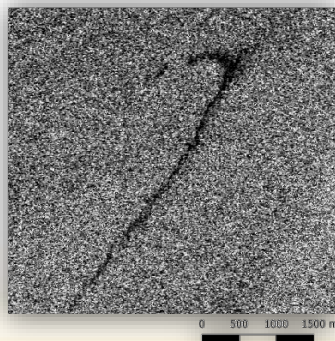
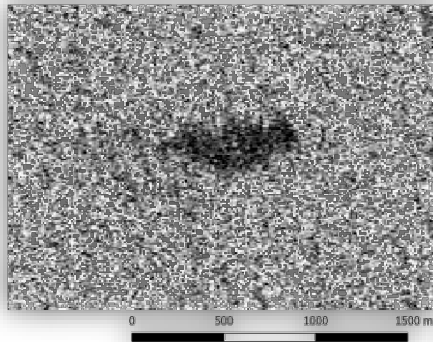
III. Oil Spill Detection – Technical Framework



Oil Spill in Radar & Optical


Extensive Database on Oil Spill Properties:

- ❖ Shape, Texture
- ❖ Spectral Signatures > Spectral Library

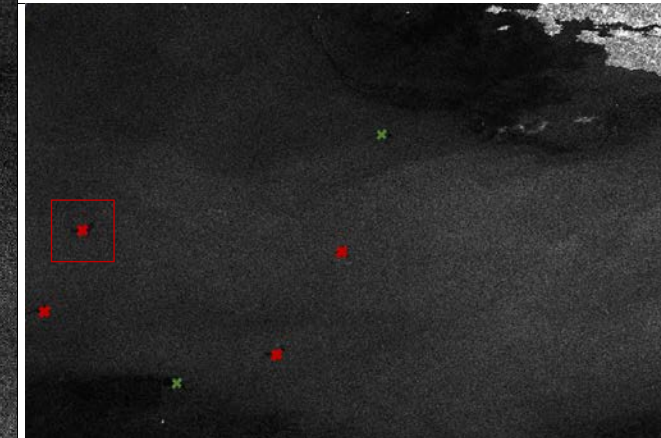


Specs:

- ✓ Following EMSA Standards
- ✓ Be Notified
- ✓ Generate Automated Reports
- ✓ Cross-check with other sensors (Sentinel-2 and Landsat 8 optical)

Centre Position		Wind Speed		Area (nm ²)	Length (nm)
Latitude	Longitude	Speed (m/s)	Class		
51° 05' 51" N	006° 16' 02" W	3.00 m/s	Low	0.61	1.80
				Spill Probability	
				High	
				Ships Detected	
				Yes	

Overview



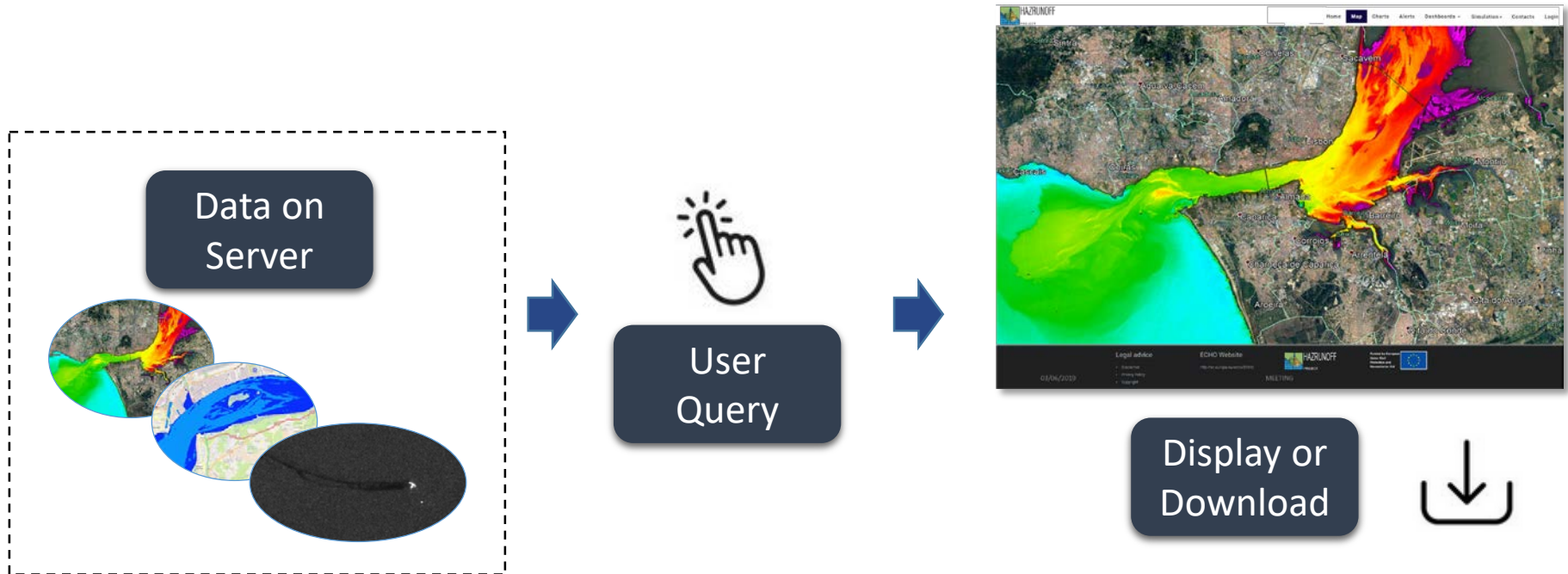
Further Information

Scene Date	2018-10-24 06:31:37
Sensor	Sentinel-1
	Yes
Additional Imagery Available	Sentinel-2 2018-10-23 11:21:11
	No Spill Detected

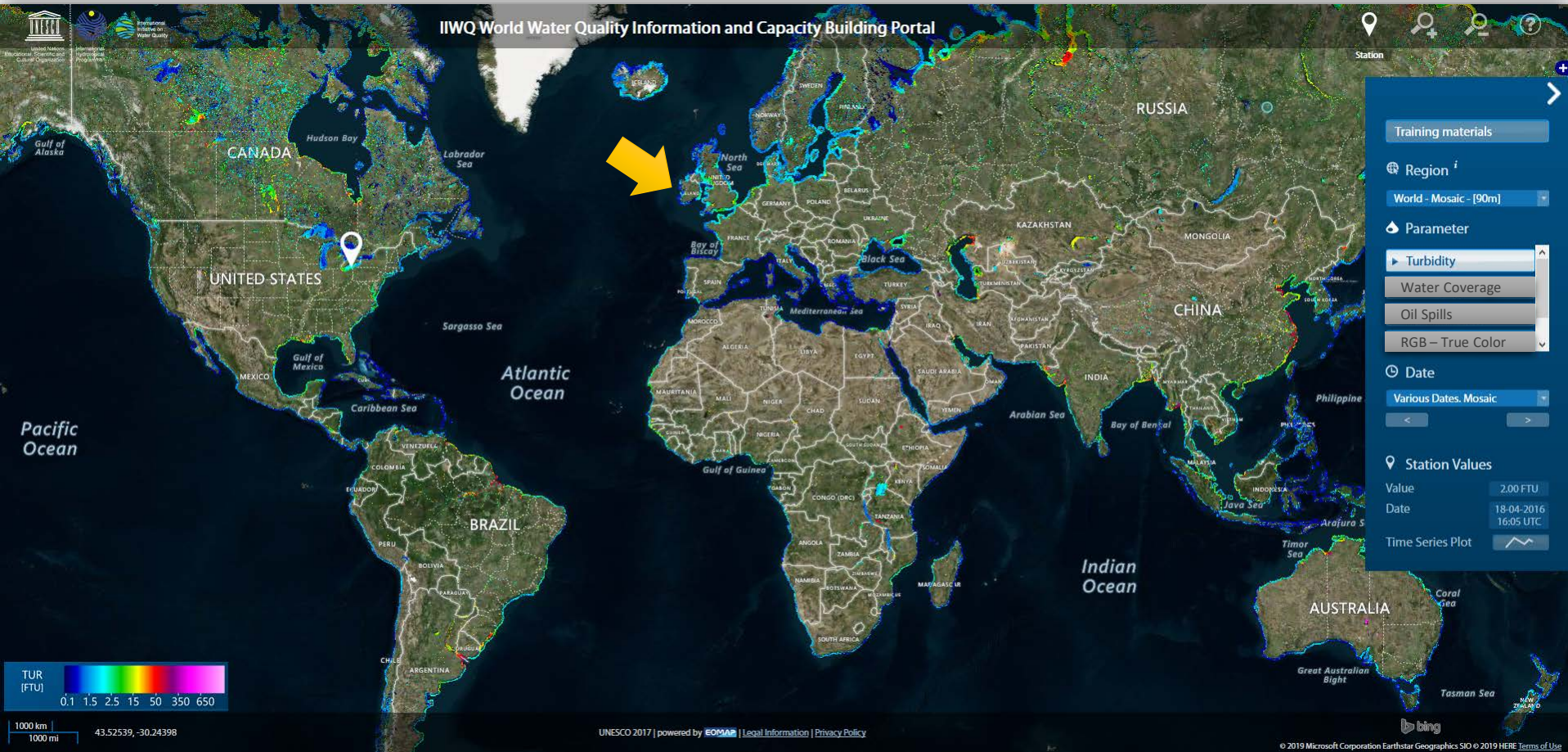


Integration into the HazRunOff Webtool

- Proposed workflow from data provision to the end user



How It May Look Like

www.worldwaterquality.org

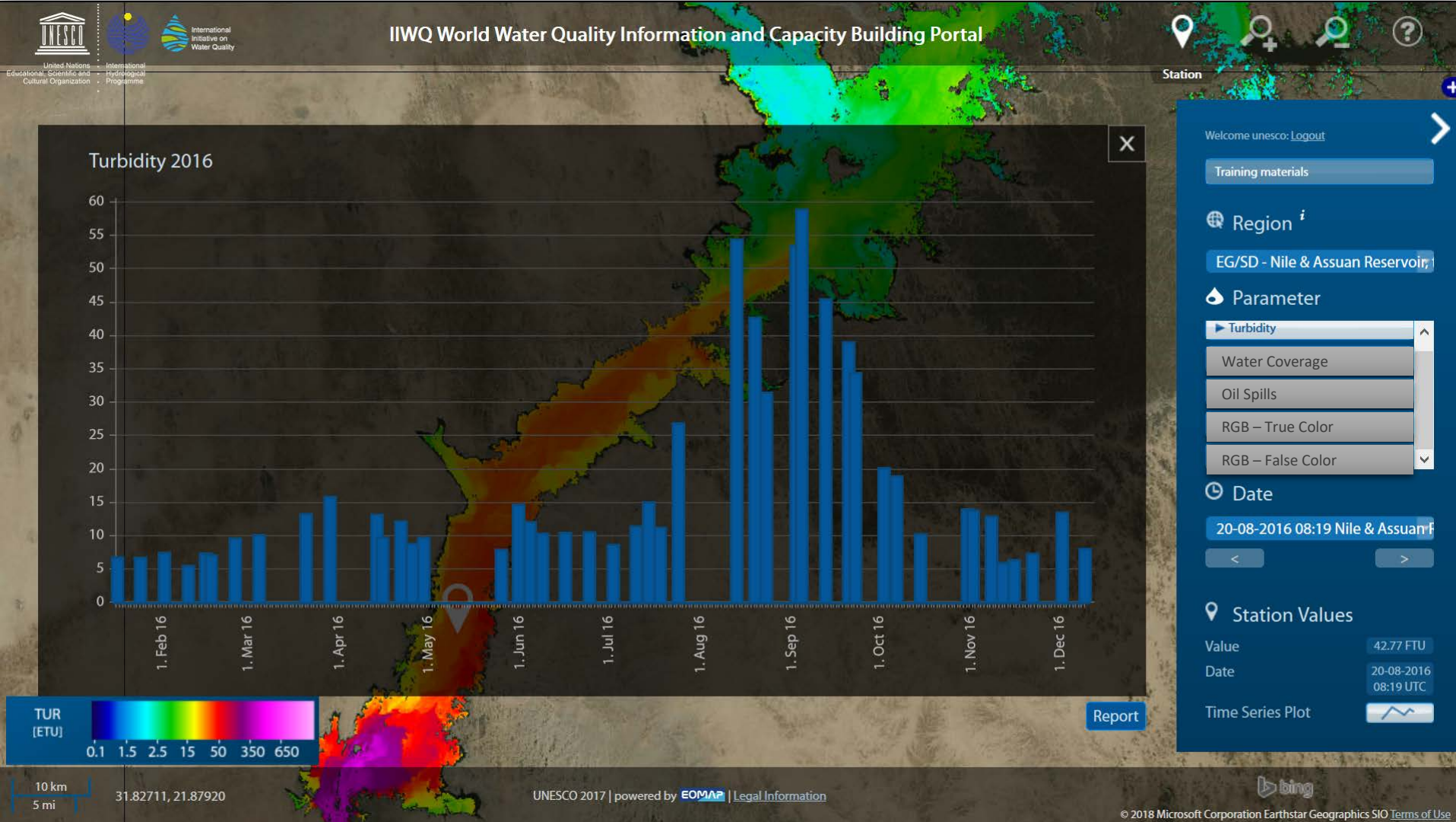
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How It May Look Like



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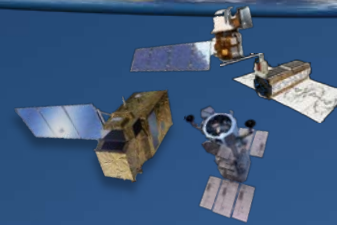
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