

Operational integration and initial assessments of the IWETT and EGNOS-derived service on the Guadalquivir River.



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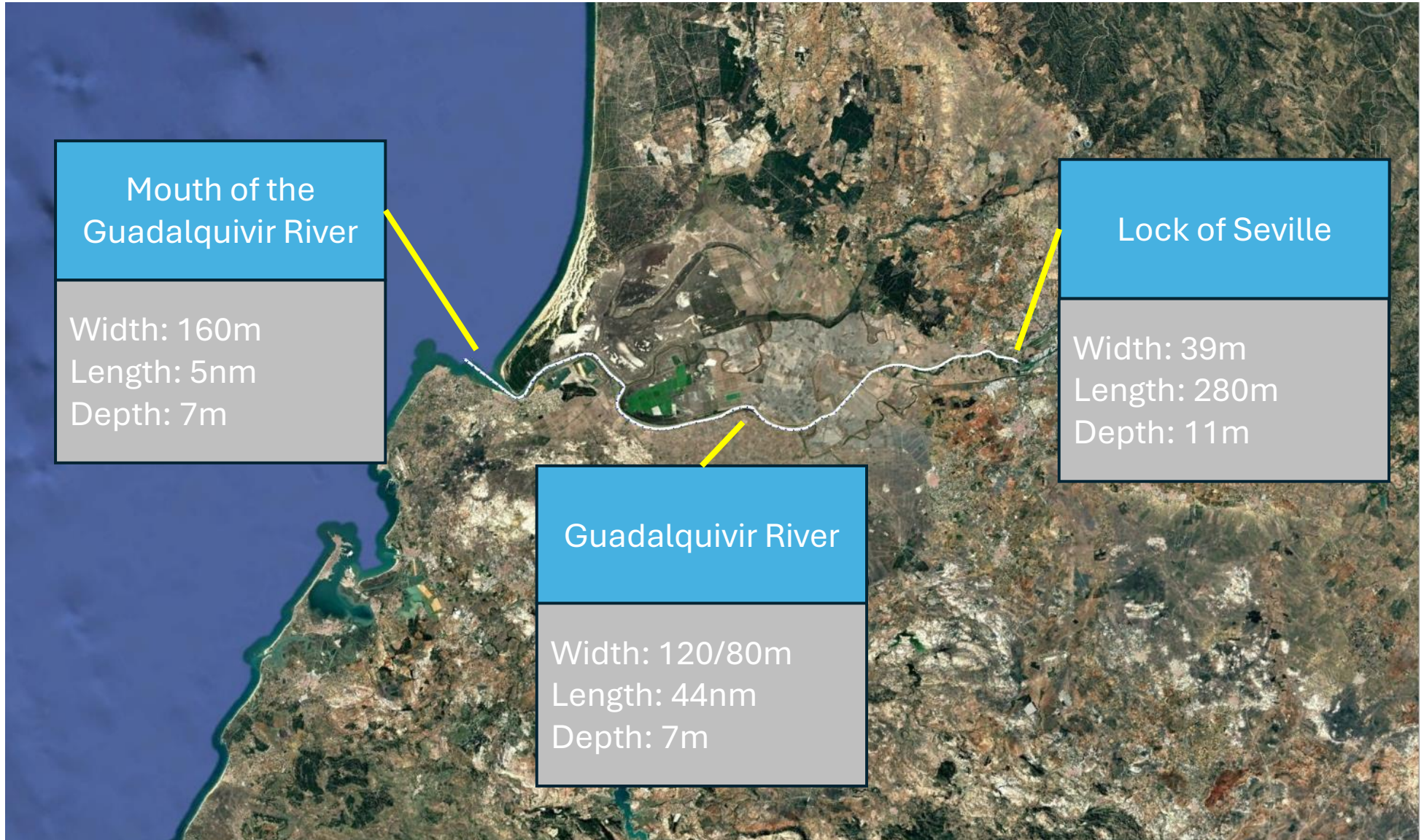
Spain's only inland seaport.

- The only inland port of Spain
- 850 hectares
- Important economic, logistics, and industrial platform in the southern peninsula (population 1.5M within 200 km).
- Technological and innovative hub
- Multimodal port: maritime, rail and road connections
- First port in railway traffic in Andalusia.
- More trains than ships: approximately 1000
- Node of the TEN-T Core Network.



E. 60-02. Access to the Port of Seville.

Waterway



Port of Seville needs differential corrections.

Spanish DGPS



IMO A.915(22)

Appendix 2

Table of the minimum maritime user requirements for general navigation

	System level parameters				Service level parameters			Fix interval ² (seconds)
	Absolute Accuracy	Integrity			Availability % per 30 days	Continuity % over 3 hours	Coverage	
	Horizontal (metres)	Alert limit (metres)	Time to alarm ² (seconds)	Integrity risk (per 3 hours)				
Ocean	10	25	10	10 ⁻⁵	99.8	N/A ¹	Global	1
Coastal	10	25	10	10 ⁻⁵	99.8	N/A ¹	Global	1
Port approach and restricted waters	10	25	10	10 ⁻⁵	99.8	99.97	Regional	1
Port	1	2.5	10	10 ⁻⁵	99.8	99.97	Local	1
Inland waterways	10	25	10	10 ⁻⁵	99.8	99.97	Regional	1

Notes: 1: Continuity is not relevant to ocean and coastal navigation.

2: More stringent requirements may be necessary for ships operating above 30 knots.

RTCA, RTCM.



EGNOS was originally
developed for aviation users



But can also be used by IWW

EGNOS data can be used on IWW.

EGNOS data could be used on IWW by:

- 1) EGNOS SiS
- 2) EDAS
- 3) Retransmission of the EGNOS augmentation corrections via AtoN services (DGPS or AIS Base Stations)





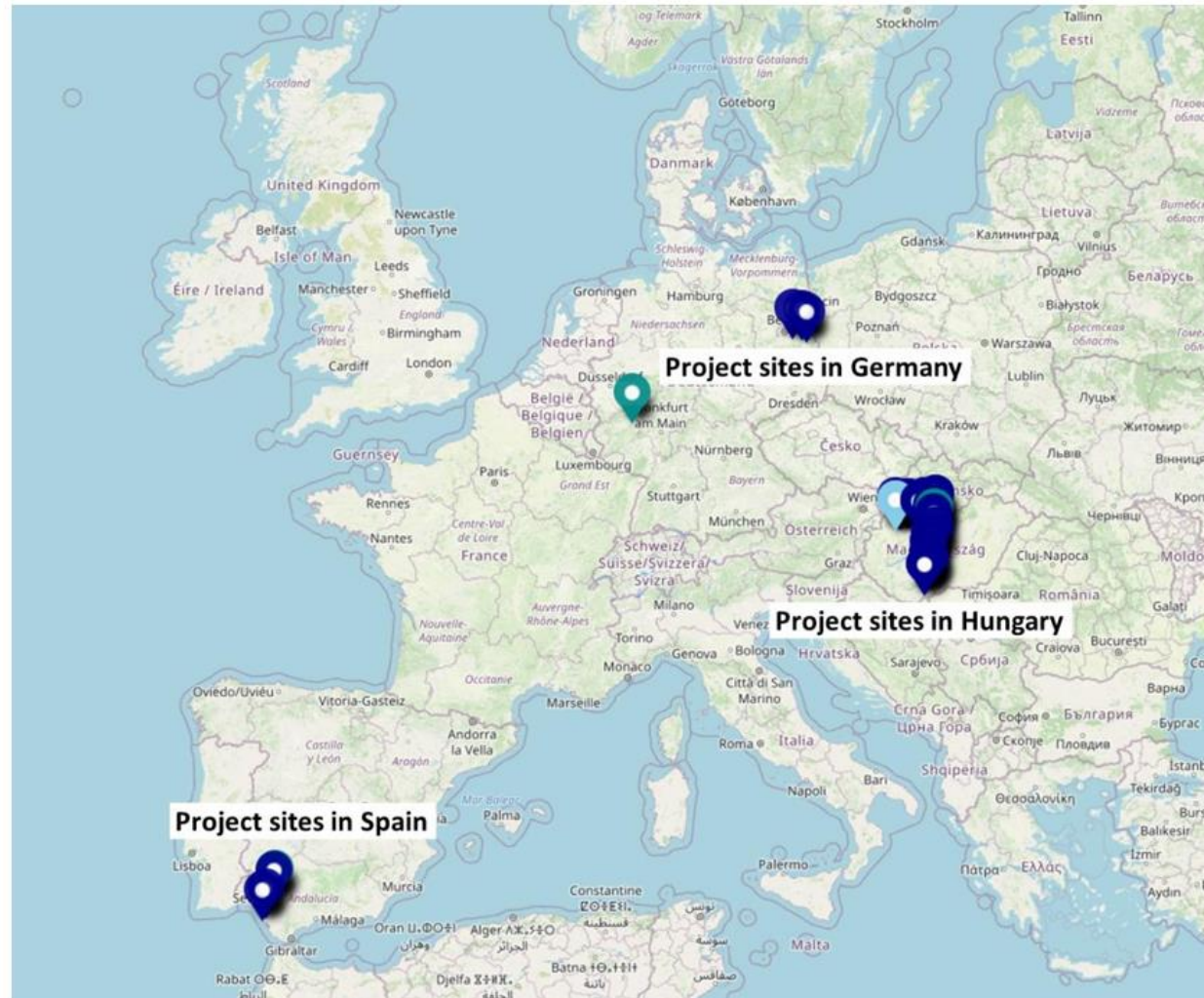
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Germany, Hungary and Spain.



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The IWETT project



Project sites in Hungary, Germany and Spain



WSV.de

Wasserstraßen- und
Schifffahrtsverwaltung
des Bundes



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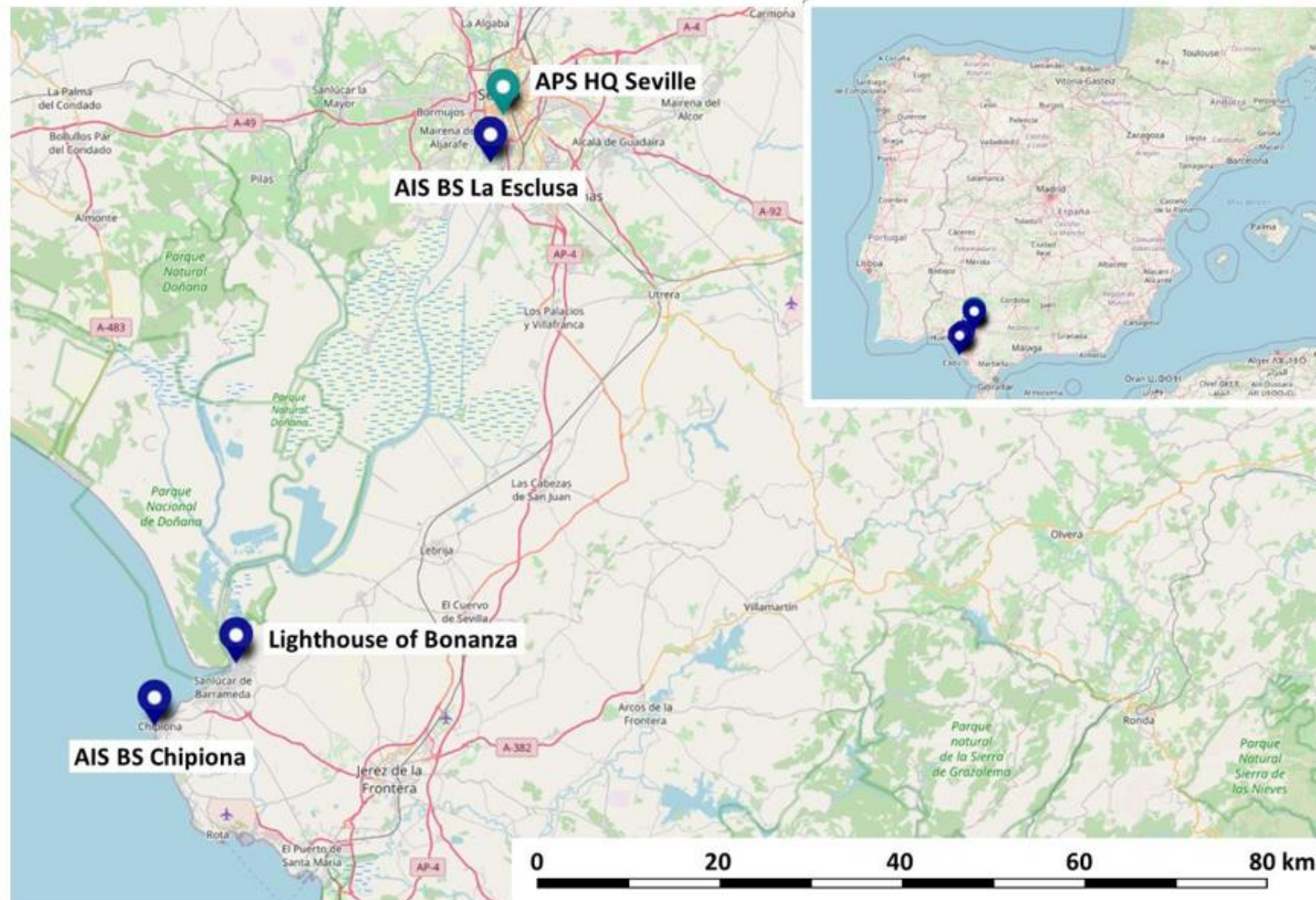
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Port of Seville. The Guadalquivir River.



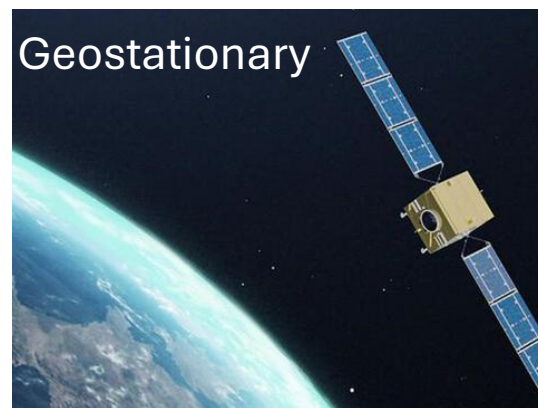
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IWETT in Spain



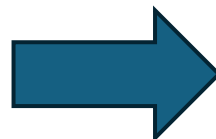


EGNOS Sources



Geostationary

Primary source



Alberding A10-RTK

EGNOS
RTCA

Raw
GNSS
data

PBM integrity monitoring

Central processing
software.
Server computer in
APS-HQ



Backup data source



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AIS Base Stations.



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EGNOS-VRS corrections



AIS Base Station
Lighthouse of Chipiona
EGNOS-VRS
corrections



AIS Base Station
La esclusa
EGNOS-VRS corrections

Data SIO, NOAA, JIS, Navy, NGA, GEBCO
Image Landsat, Copernicus

Google Earth



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Andalucian Positioning Network.



Local sources



Raw
GNSS
data

Central processing
software.
Server computer in
APS-HQ



Integrity, PBM

RAP Andalusian Positioning Network
Lebrija
(Raw data)



Output corrections

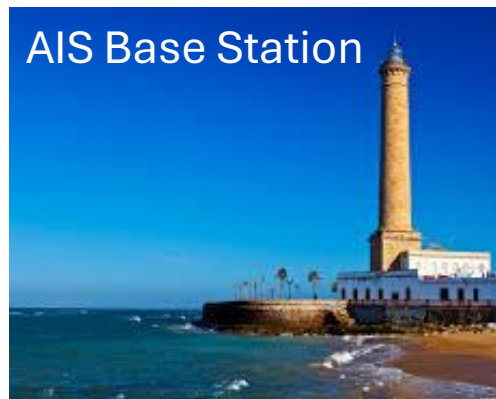
Central processing
software.
Server computer in
APS-HQ



Integrity, PBM

RTCM

AIS Base Station



AIS Base Station



EGNOS-VRS corrections

AIVDM
#17

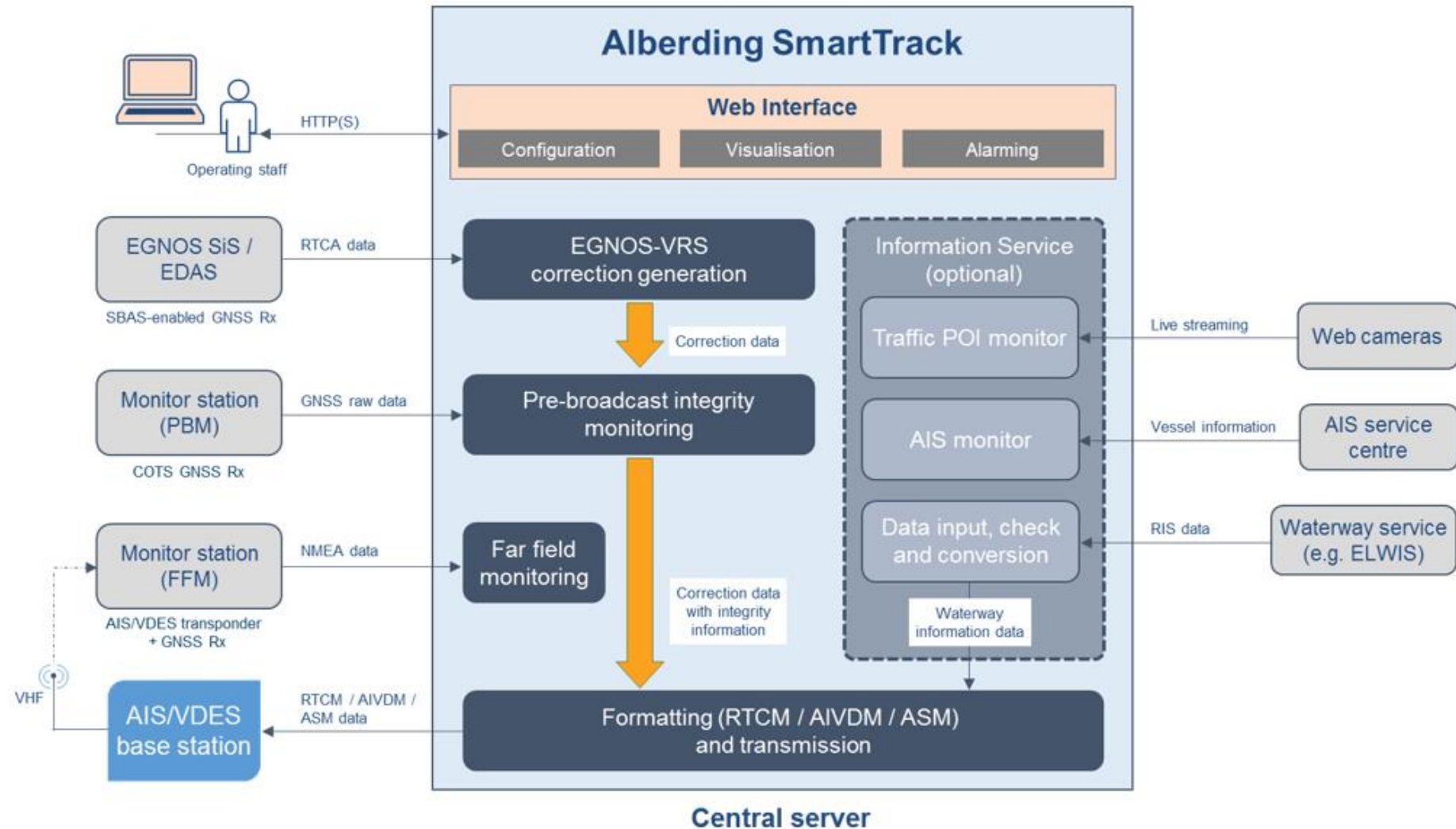




Integrity monitoring.



Central server





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APS-HQ, Bonanza.



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Far Field Monitoring Stations



FFM_2
Lighthouse
of Bonanza

AIS Transponder
Kongsberg AIS300
Debug tool (GGA,GSA,GSV, RSSI)



VHF
antenna

Trimble
GA830



FFM_1
APS-HQ



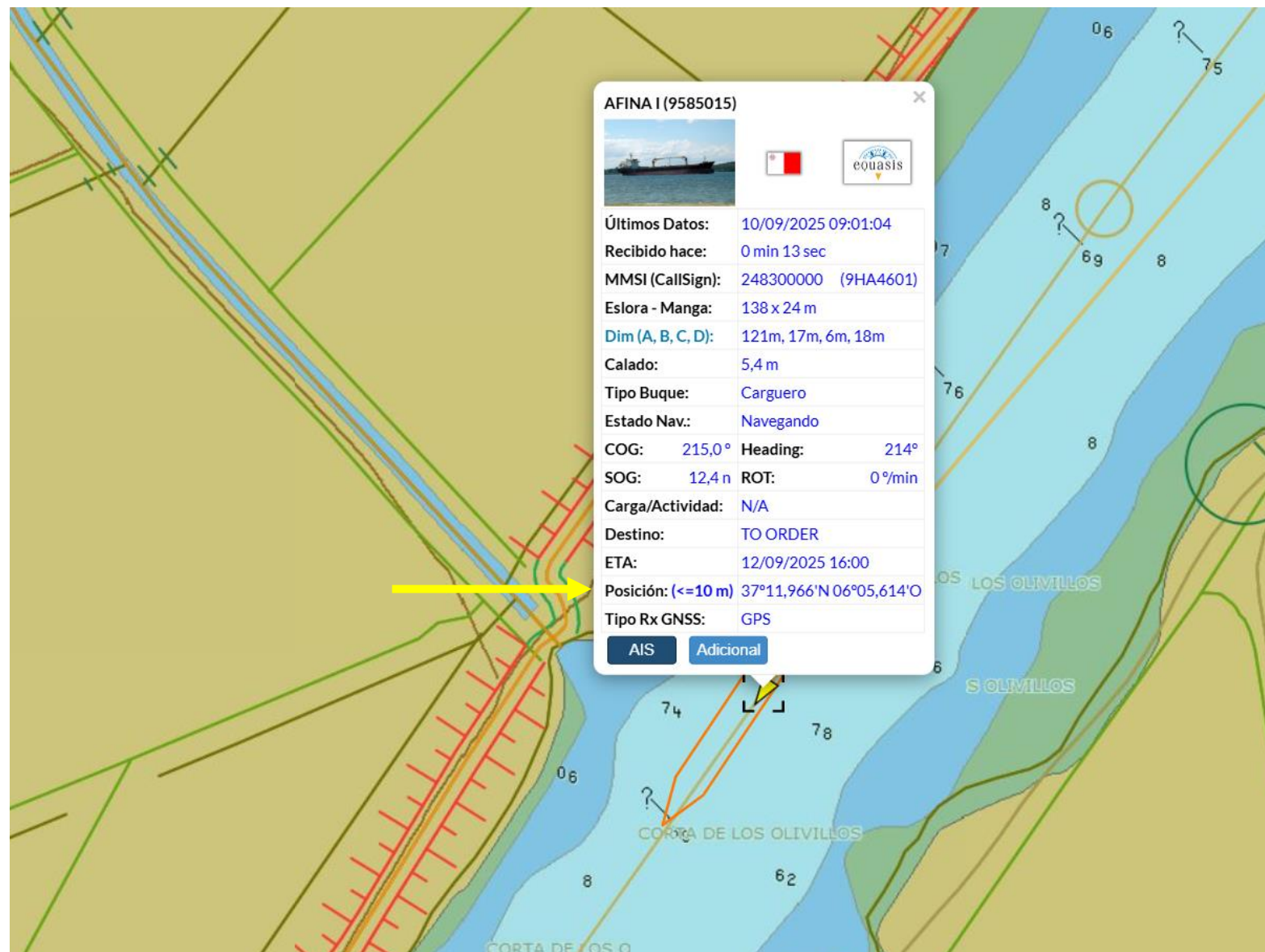
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EGNOS transponders.



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Shiplocus
Puertos del Estado.
GMV.



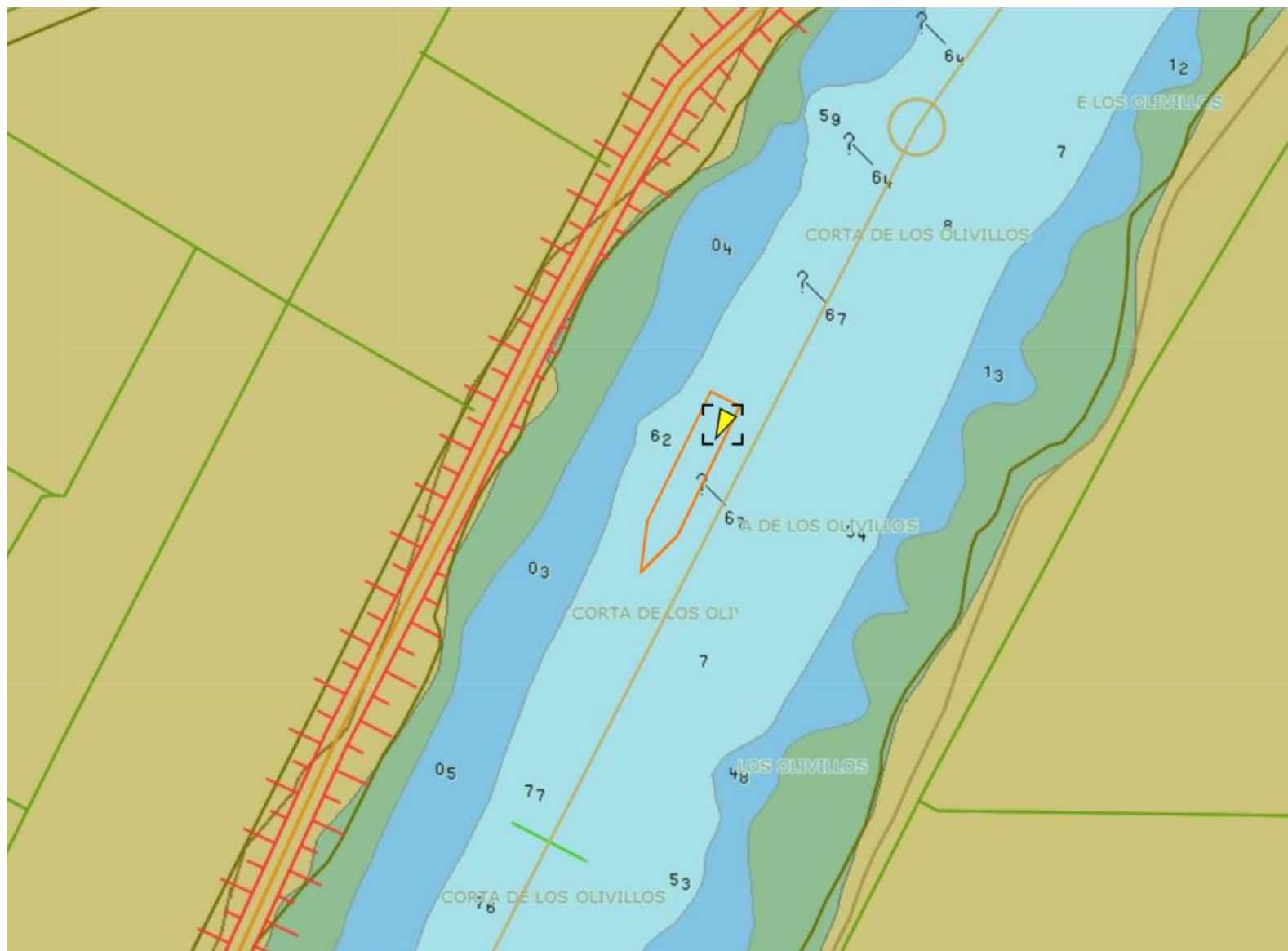
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Tracking.



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Shiplocus
Puertos del Estado.
GMV.



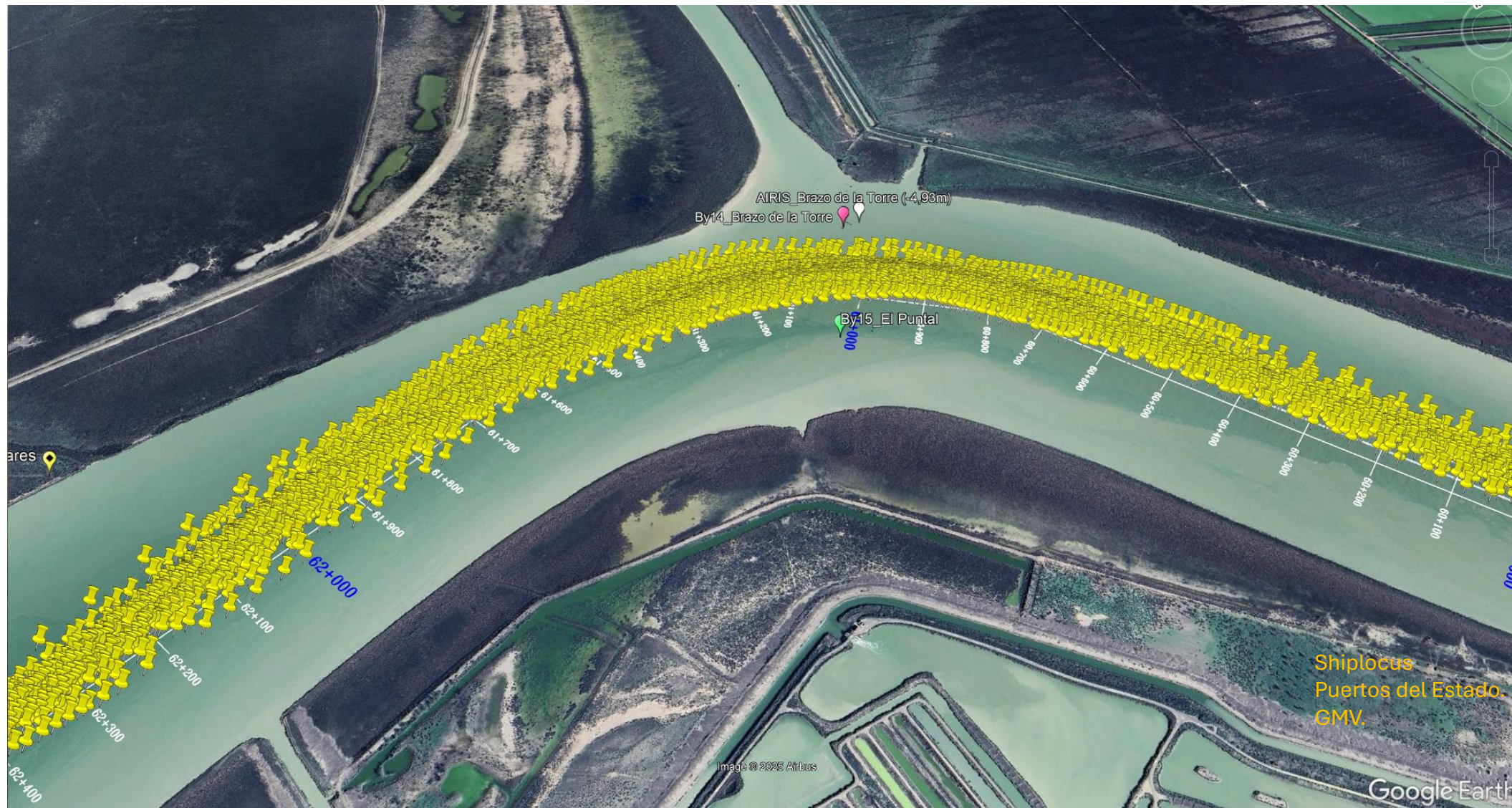
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Tracing.



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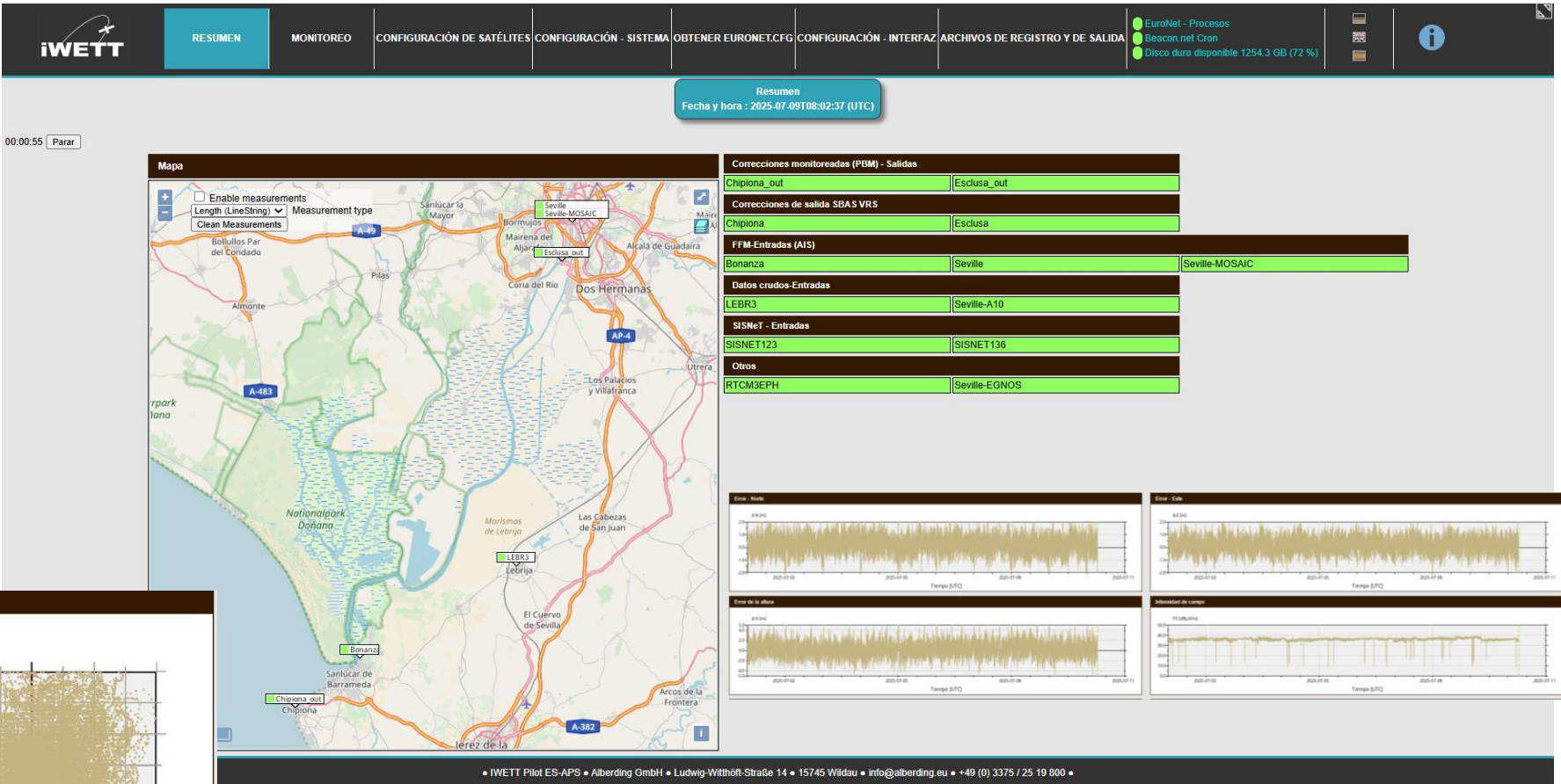


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Monitoring.



IWETT



Thank you for your attention.



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