Geoswath Plus Compact 2014-2016

Interferometric Sonar

An interferometric sonar can be considered a **multi-stave side scan**, collecting a wide swath of **bathymetry up to 12 times depth and sonar amplitude data**, with the angle of arrival of the seabed returns determined by **phase comparison** between the receive staves

Geoswath Plus Compact

The Interferometric Sonar Geoswath Plus, is a very useful tool for shallow waters where the Special Order is required.

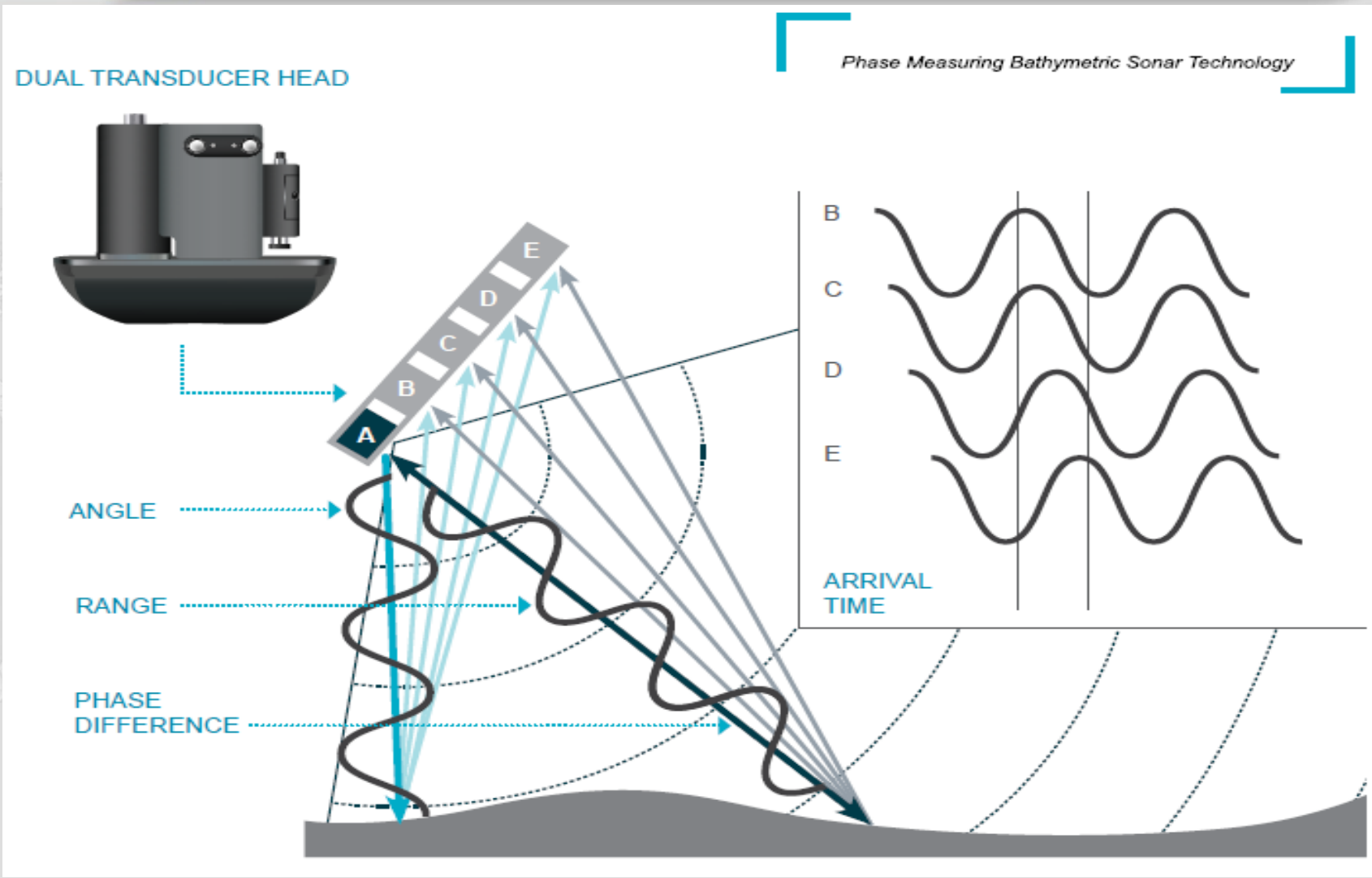
Geoswath Plus Compact

IHM: owns three Geoswath Plus Compact (one 250 KHz and two 500 KHz)

Geoswath Plus Compact

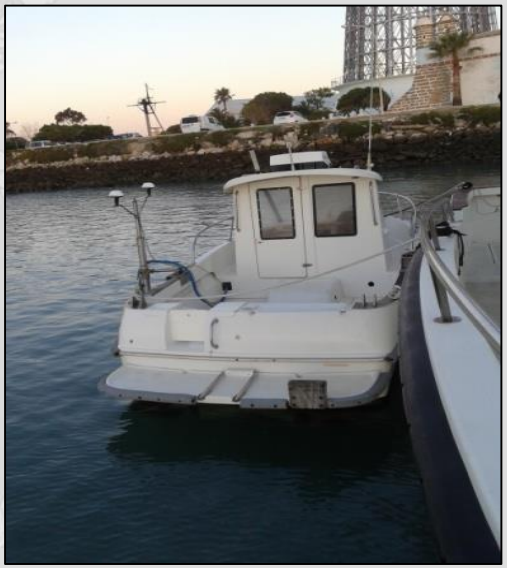
- **TWO TRANSDUCERS** IN A SINGLE-HEAD SYSTEM.
- **EACH TRANSDUCER**: 5 CERAMIC STAVES. 1 TO TX, 4 TO RX.
- **FIELD OF VIEW**: 240 º (VERTICAL) AND 0,5º (HORIZONTAL TWO WAY BEAM).
- **EFFECTIVE HORIZONTAL RANGE FOR BATHYMETRY**: UP TO 8 TIMES DEPTH (IHO SPECIAL ORDER)

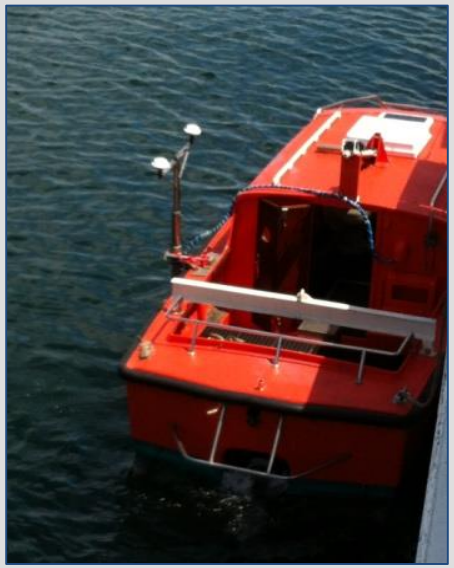
Geoswath Plus Compact



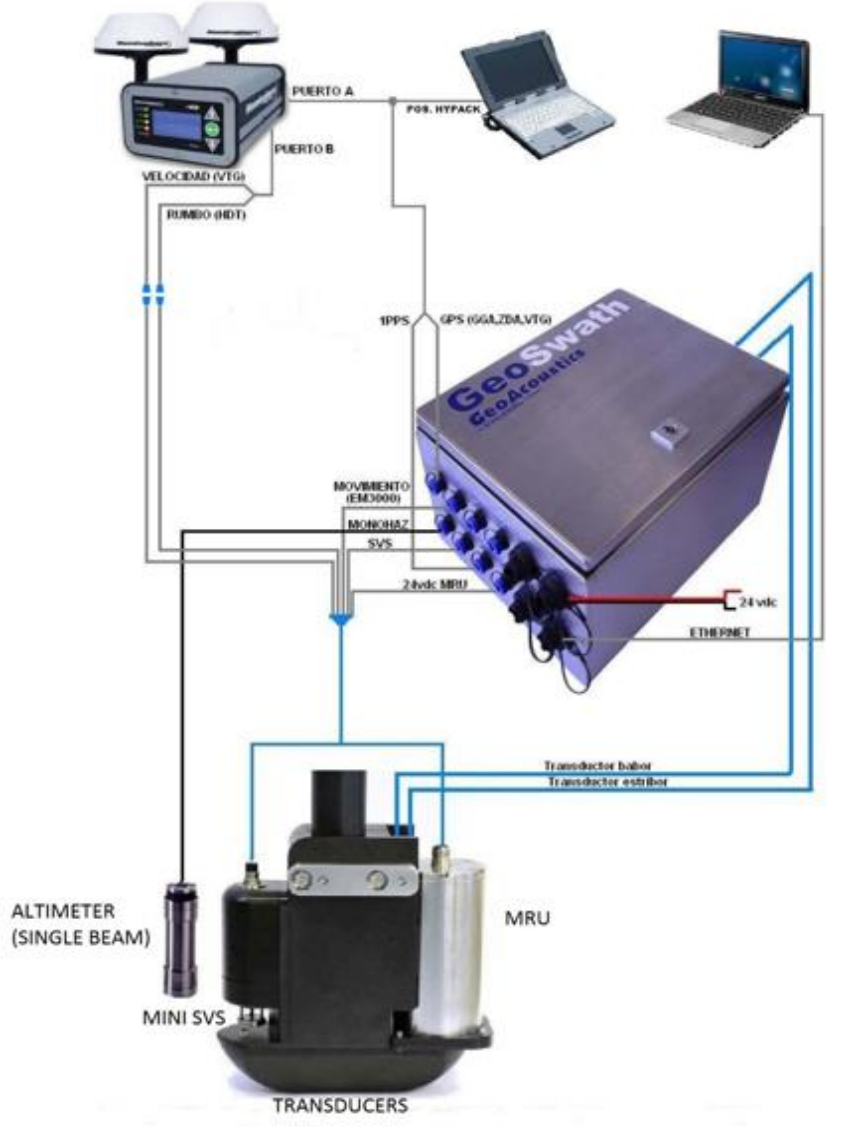
Geoswath Plus Compact

- **DEPLOYED OVER-THE SIDE POOL MOUNTED IN VESSELS OF OPPORTUNITY**





Geoswath Plus Set-Up



Geoswath : Advantages

- **HIGH PERFORMANCE: in very shallow waters,** in comparison to a multibeam (for example below 10 meters “8x GS vs 4x Multibeam”).

- **GEO-REFENRENCED SIDE SCAN SONAR** for a reliable bottom classification and object detection.

Geoswath : Disadvantages

- **NOT HIGH DATA COVERAGE WITHIN THE NADIR .** High overlap between lines to meet the IHO specifications for “Special Order” for feature detection.

- **SOPHISTICATED FILTERS REQUIRED** during acquisition or during a pre-processing stage, in addition to be supported during the post processing stage (CARIS processing) by a reliable error model, such as The Combined Uncertainty Bathymetric Estimator (CUBE).

PROCESS WORKFLOW: BEFORE GS4 AND CARIS 9.022

WITH THE PREVIOUS SOFTWARE GS+ AND EARLIER VERSIONS OF CARIS 9.022

- **SLOW WORKFLOW.** necessary to pre-process data applying filters to the raw data with the GS+ software.
  - Remove background noise coming from acoustic and electronic origin
  - Return from WC and surface backscatter
- **FILTERED POINTS** during acquisition or during a pre-processing stage not recoverable in CARIS.
  - If filters were not applied correctly you would have to run the line again

PROCESS WORKFLOW: WITH GS4 AND CARIS 9.022

- **THE NEW SOFTWARE GS4:**

  - GS4 replaced the GS+ software in 2015. A completely re-worked version, providing higher performance and a contemporary graphical interface.
  - Filters can be applied during acquisition

- **LATER VERSIONS OF CARIS 9.022**

  - Allow to recover the discarded points filtered with all processing filters used in GS4 during the acquisition stage.

  - Possible to apply processing filters during the acquisition survey. **Raw data can be treated directly in CARIS HIPS** without having to run the GS4 Processing Module.

PROCESS WORKFLOW: WITH GS4 AND CARIS 9.022

SURVEY LINE PLANNING

110% OVERLAP "SPECIAL ORDER"

ACQUISITION:

APPLYING GS4 PROCESSING FILTERS REMOVING BACKGROUND NOISE. (DISCARDED POINTS CAN BE RECOVERED)

CARIS PROCESING:

LINE CONVERSION *.RFF

- APPLY LINEAR SENSOR OFFSETS AND CALIBRATION OFFSETS.

CARIS PROCESSING:

- APPLY SVP
- LOAD TIDES/COMPUTE GPS TIDE (RTK)
- MERGE DATA.

CARIS PROCESSING:

COMPUTE TOTAL PROPAGATED UNCERTAINTY (TPU)

CARIS PROCESSING:

CUBE SURFACE ELABORATION

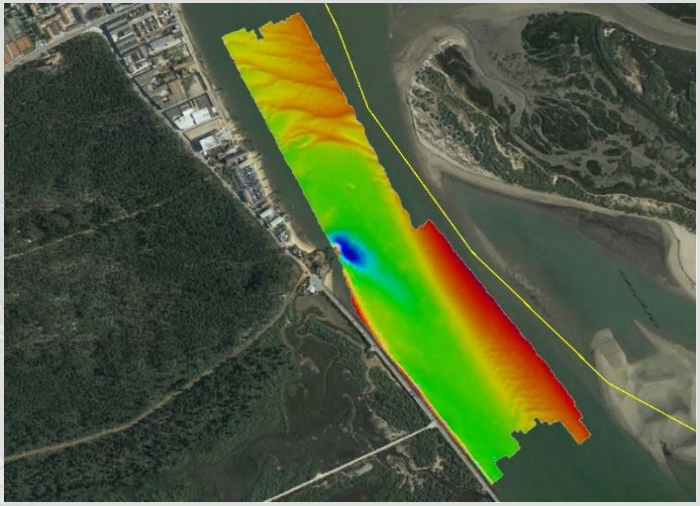
CARIS PROCESSING:

REMOVING AND DESIGNATION SOUNDINGS

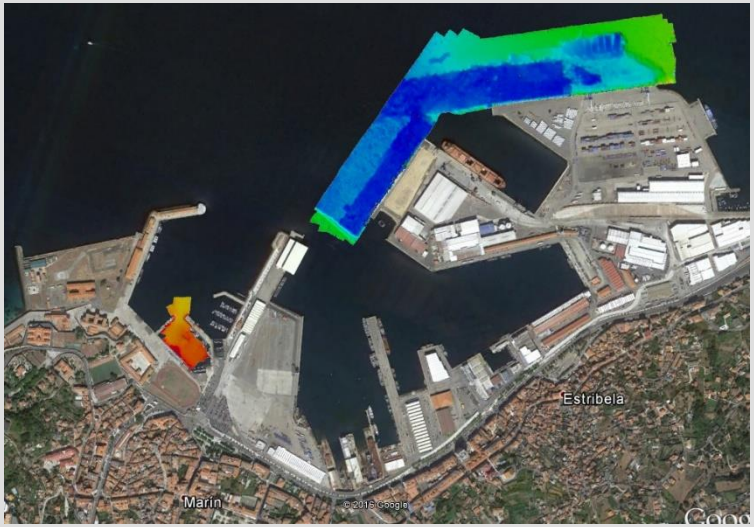
CARIS PROCESSING:

FINAL PROCESSED SURFACE

SURVEYED AREAS WITH GS500/250 2014-2016



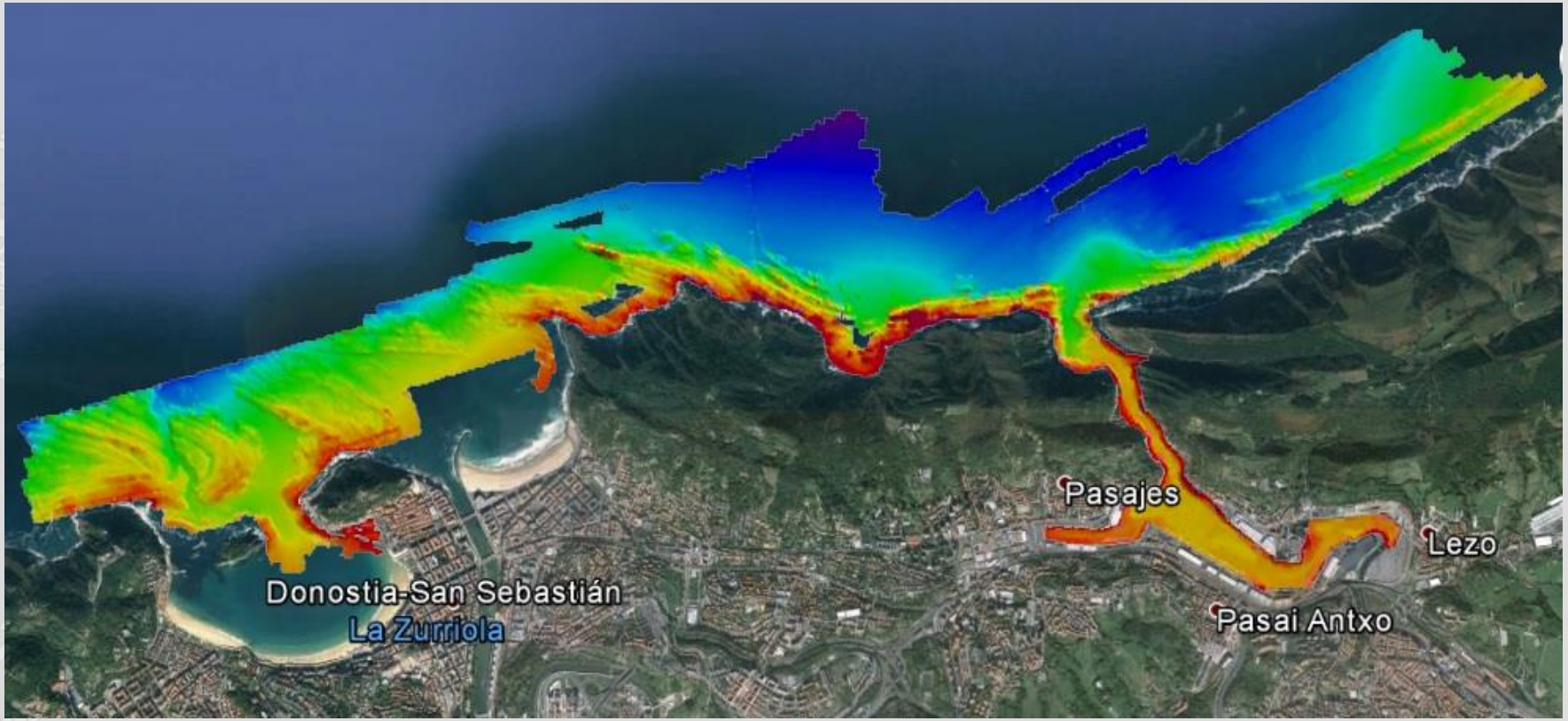
GUADIANA ESTUARY. GS500 2015



PORT OF MARIN. GS500 2015

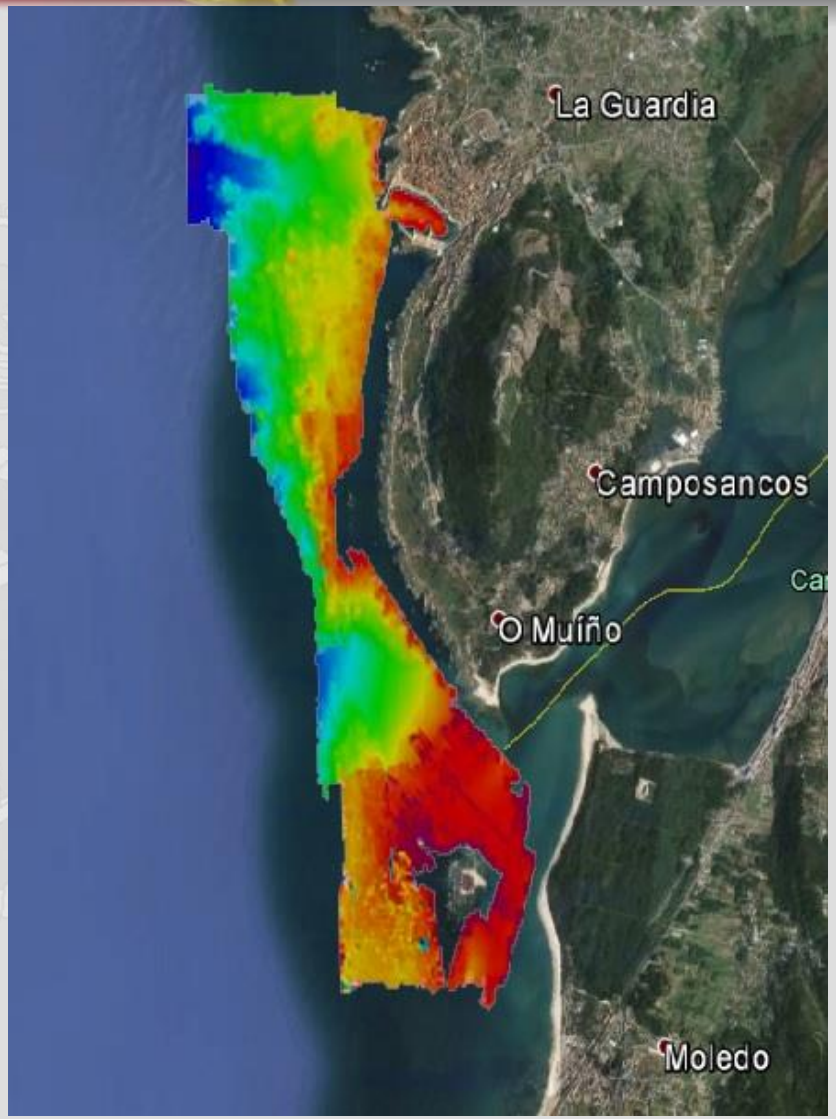
VIGO ESTUARY. GS500 2015

SURVEYED AREAS WITH GS500/250 2014-2016



PASAJES ESTUARY AND SAN SEBASTIAN COAST. GS250 2015

SURVEYED AREAS WITH GS500/250 2014-2016



MIÑO RIVER ESTUARY AND LA GUARDIA COAST. GS250 2015 AND 2016

SURVEYED AREAS WITH GS500/250 2014-2016

BALDAIO SHALLOWS. GS500 2016

FERROL PORT. GS250 2016

PORT OF BILBAO. GS500 2016

CONCLUSSIONS

-HIGH PERFORMANCE FOR VERY SHALLOW WATERS…RIVERS???

-EASILY TRANSPORTABLE

-CHEAP

-DOES NOT WORK PROPERLY WITH ROUGH SEAS

-PROCESSINGWORKFLOW STILL VERY LOW

-REQUIRES GOOD SKILLS AND STRONG KNOWLEDGE OF WHAT YOU´VE GOT IN YOUR HANDS