



Crowd Sourced Bathymetry

Andrew Schofield



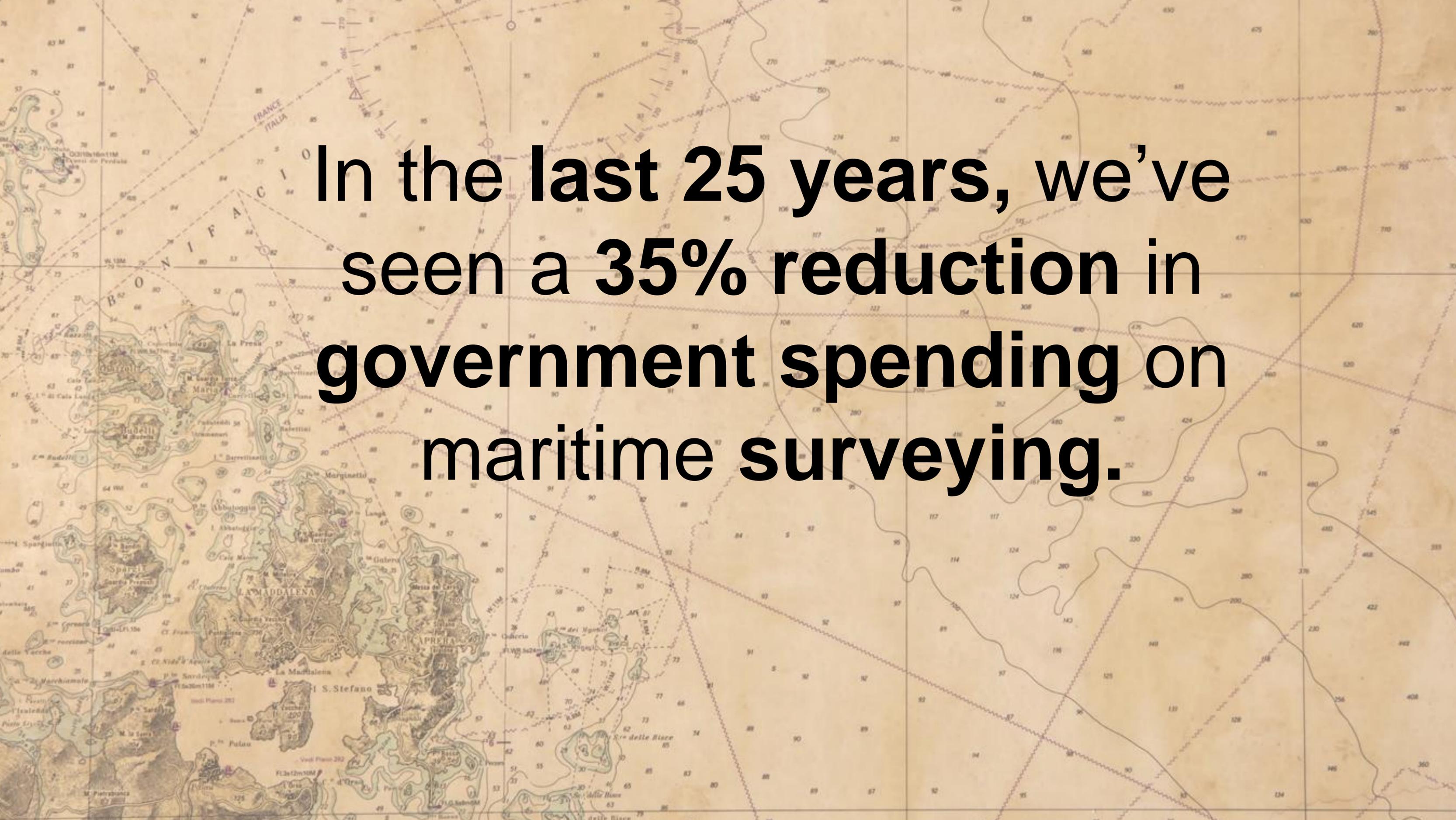
Crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call.

Jeff Howe, Wired, 2005



Missing data from 0 to 200 meters

Southwest Pacific	> 95%
Polar regions	> 95%
West Africa	> 80%
Caribbean	> 80%
Australia	~ 65%
Greece	65%
United States of America	~ 40%
United Kingdom	30%
France	19%



**In the last 25 years, we've
seen a 35% reduction in
government spending on
maritime surveying.**



**Captain Cook
leadline soundings!**



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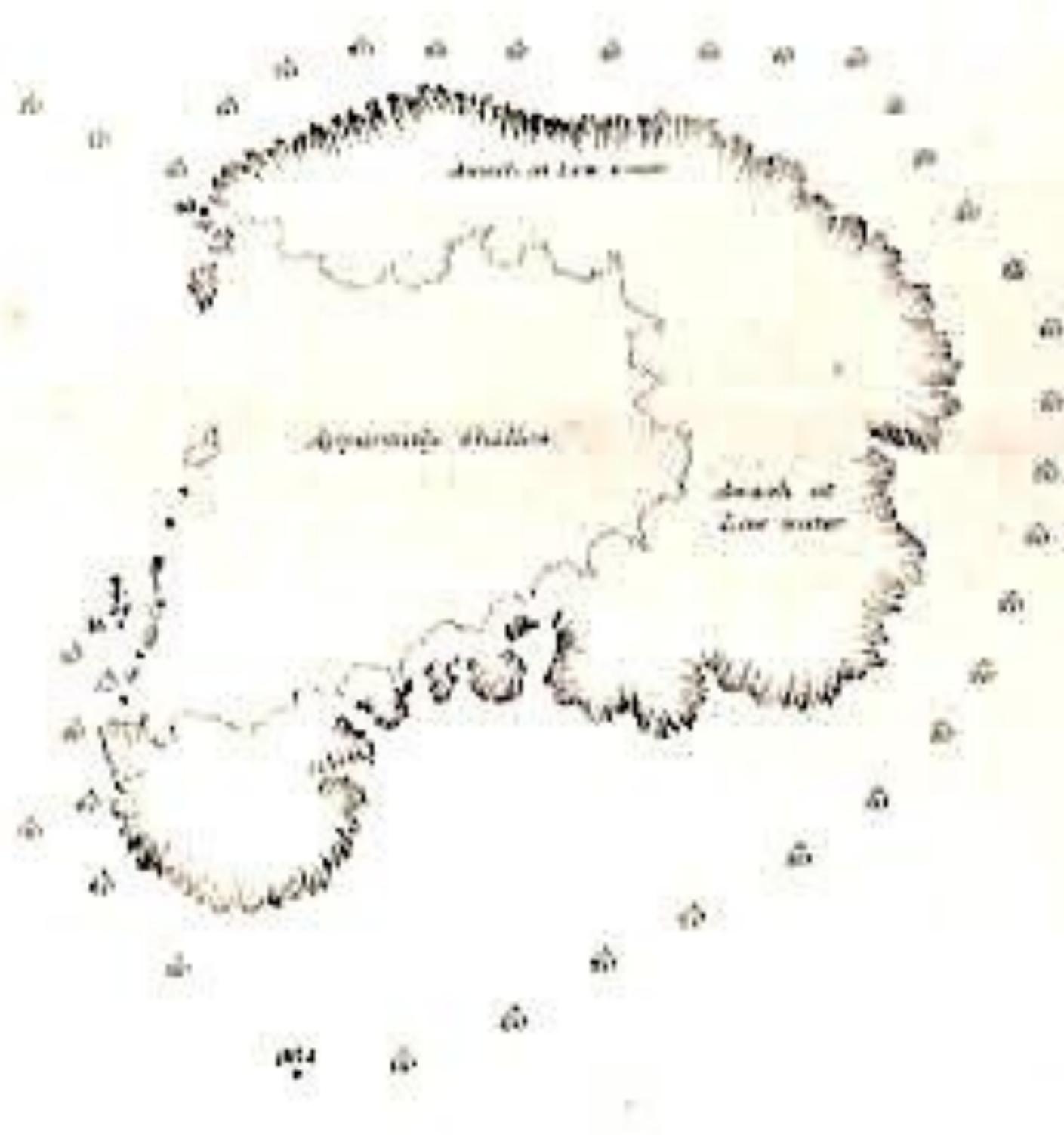
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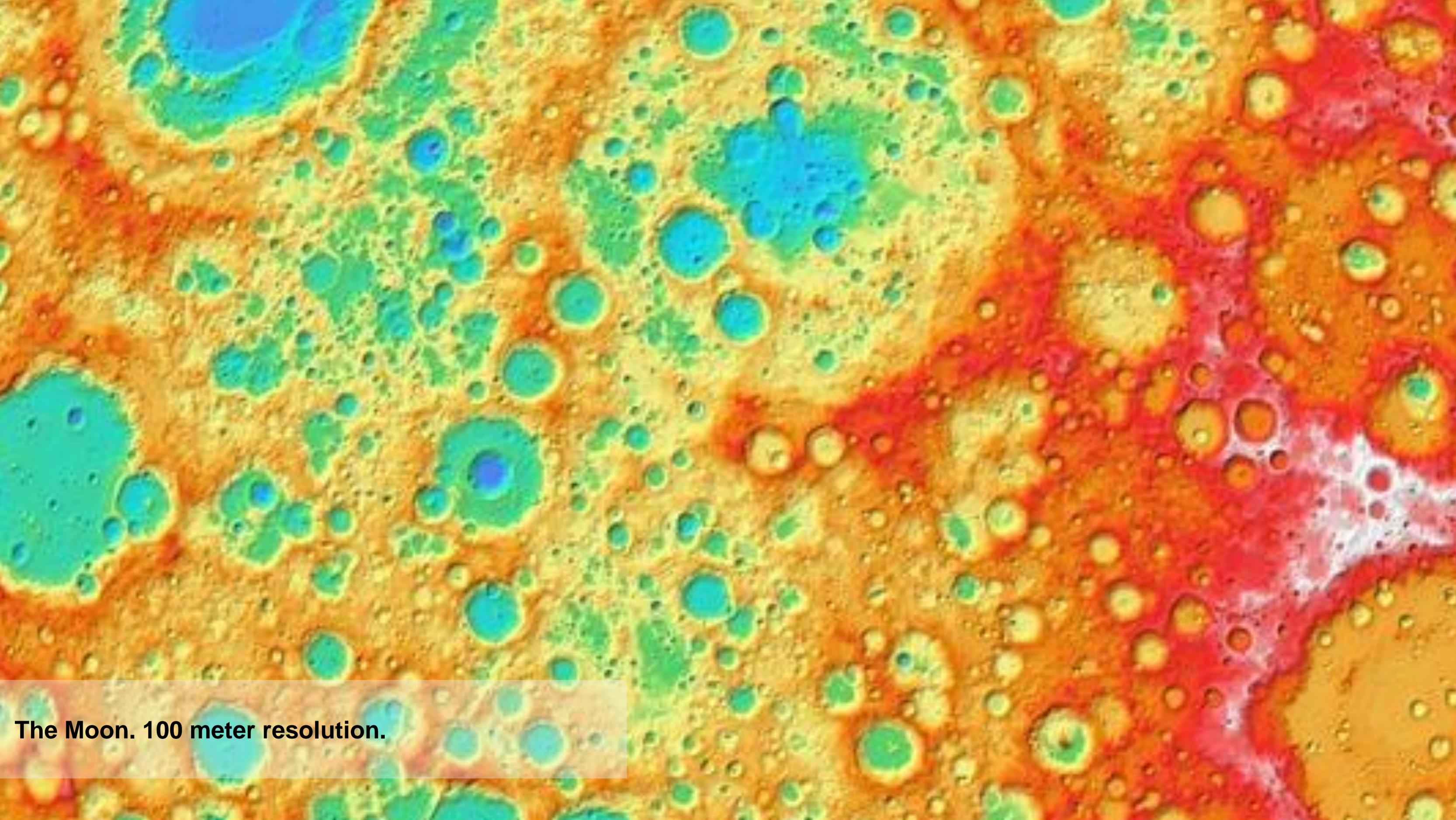
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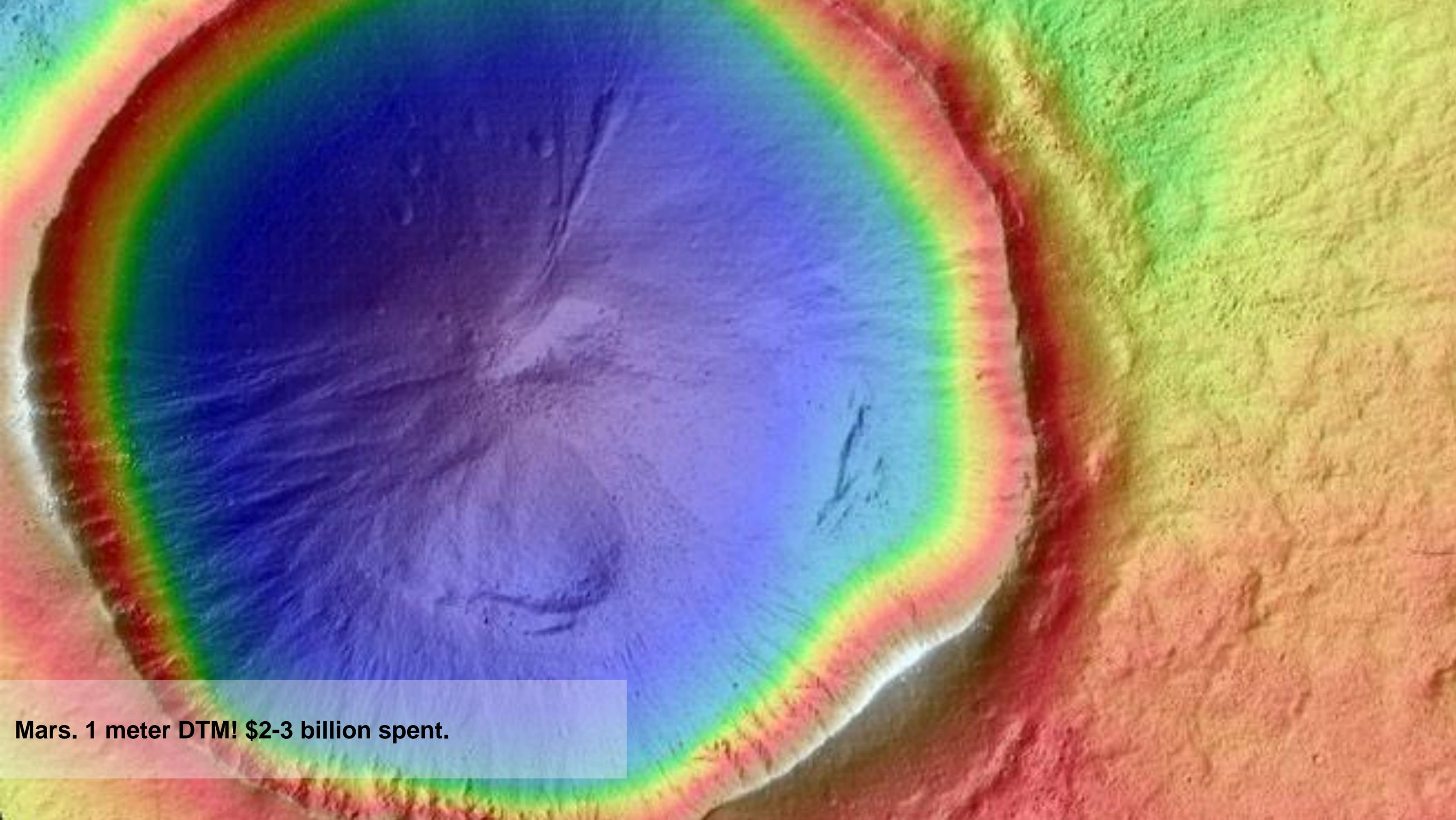
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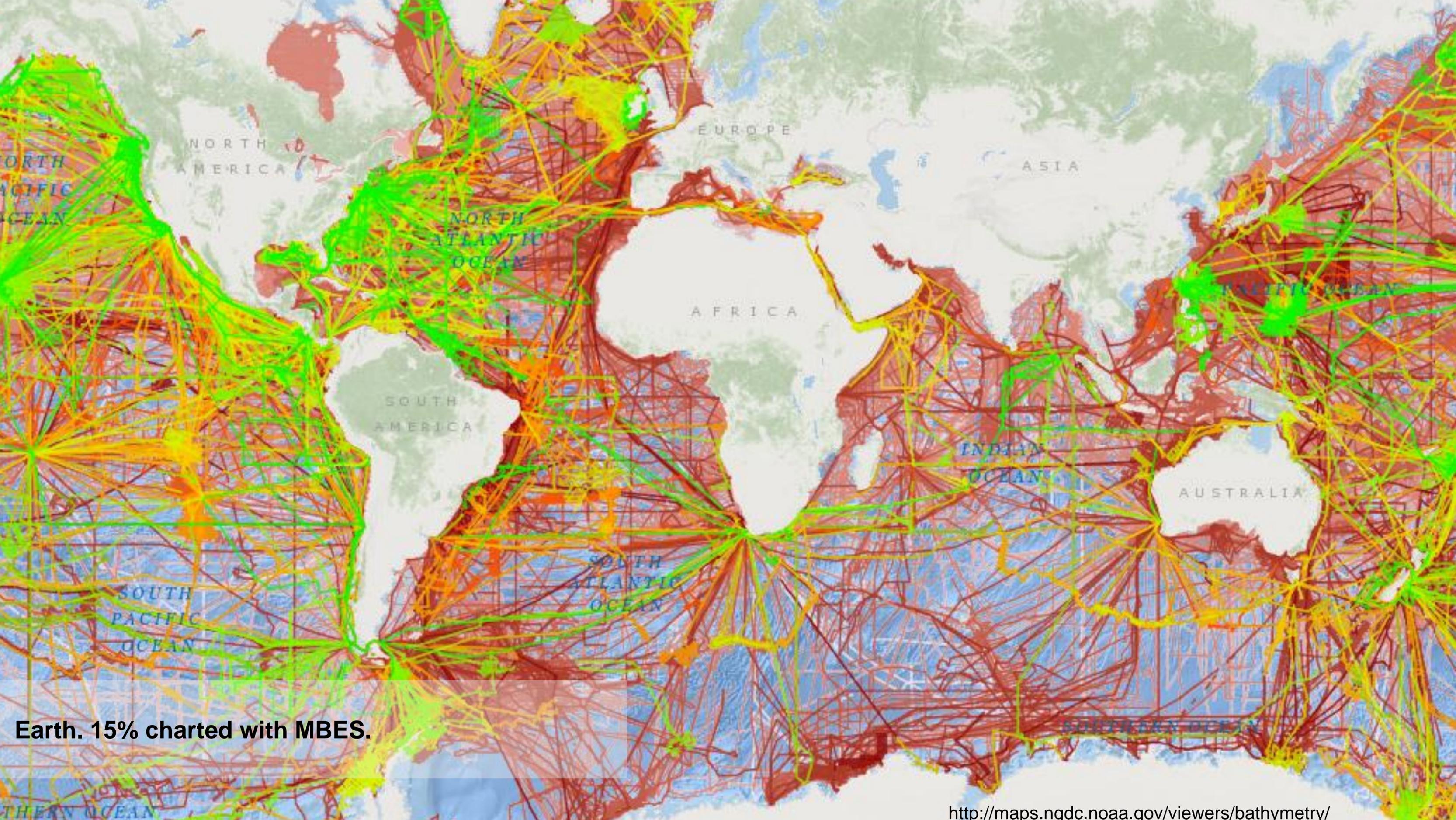
**“We have better maps of
the Moon and Mars than
of the ocean.”**



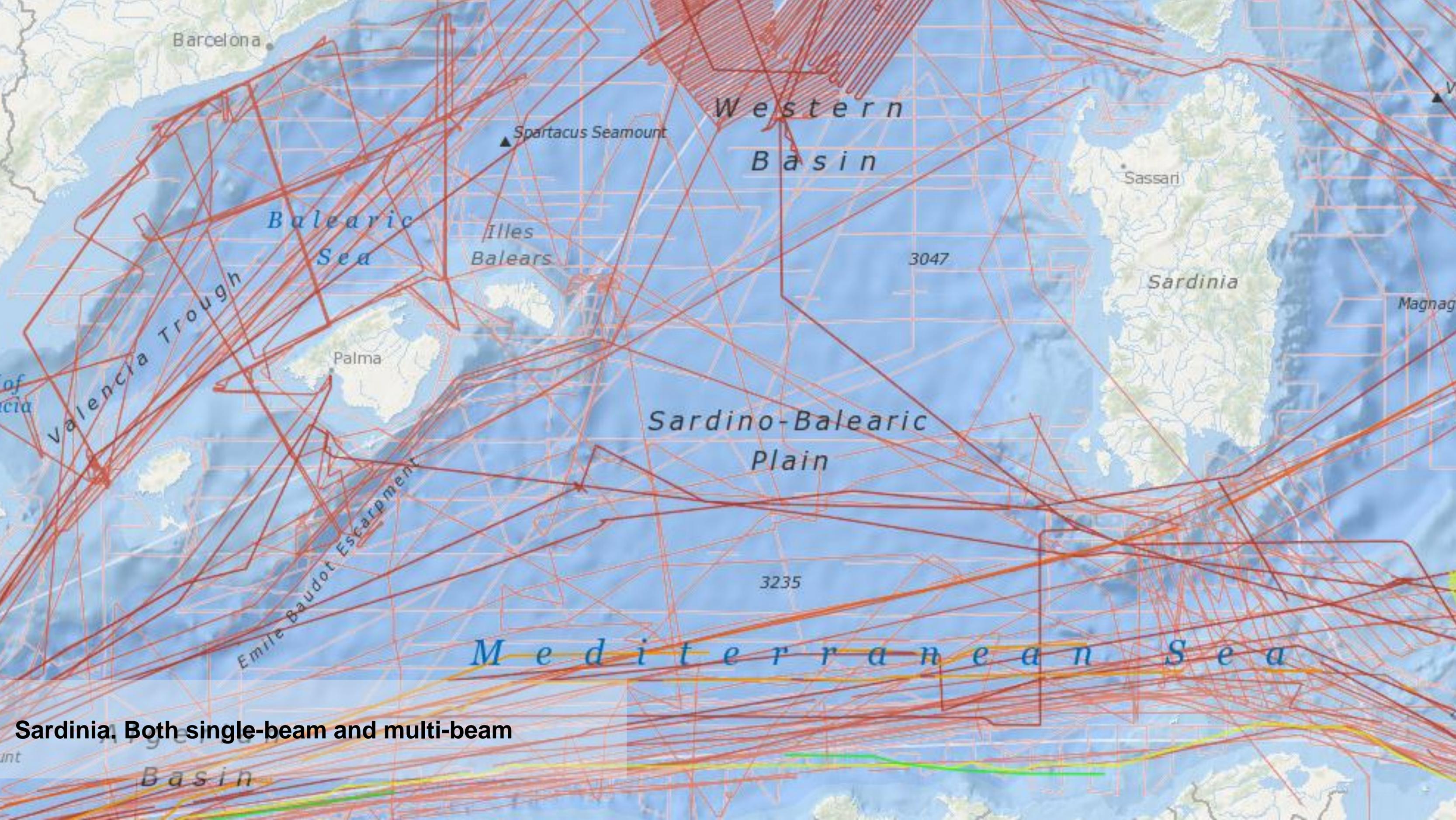
The Moon. 100 meter resolution.



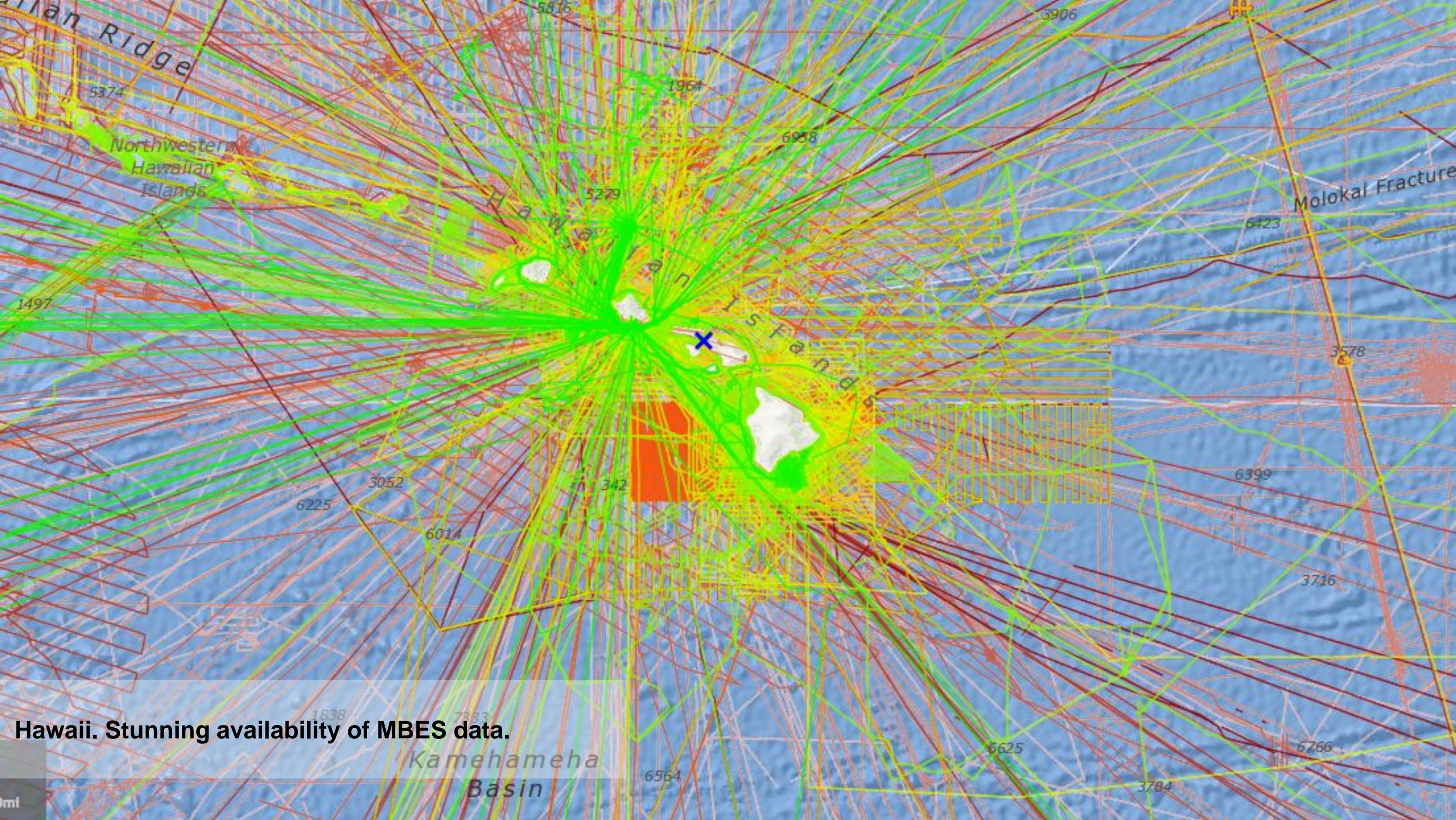
Mars. 1 meter DTM! \$2-3 billion spent.



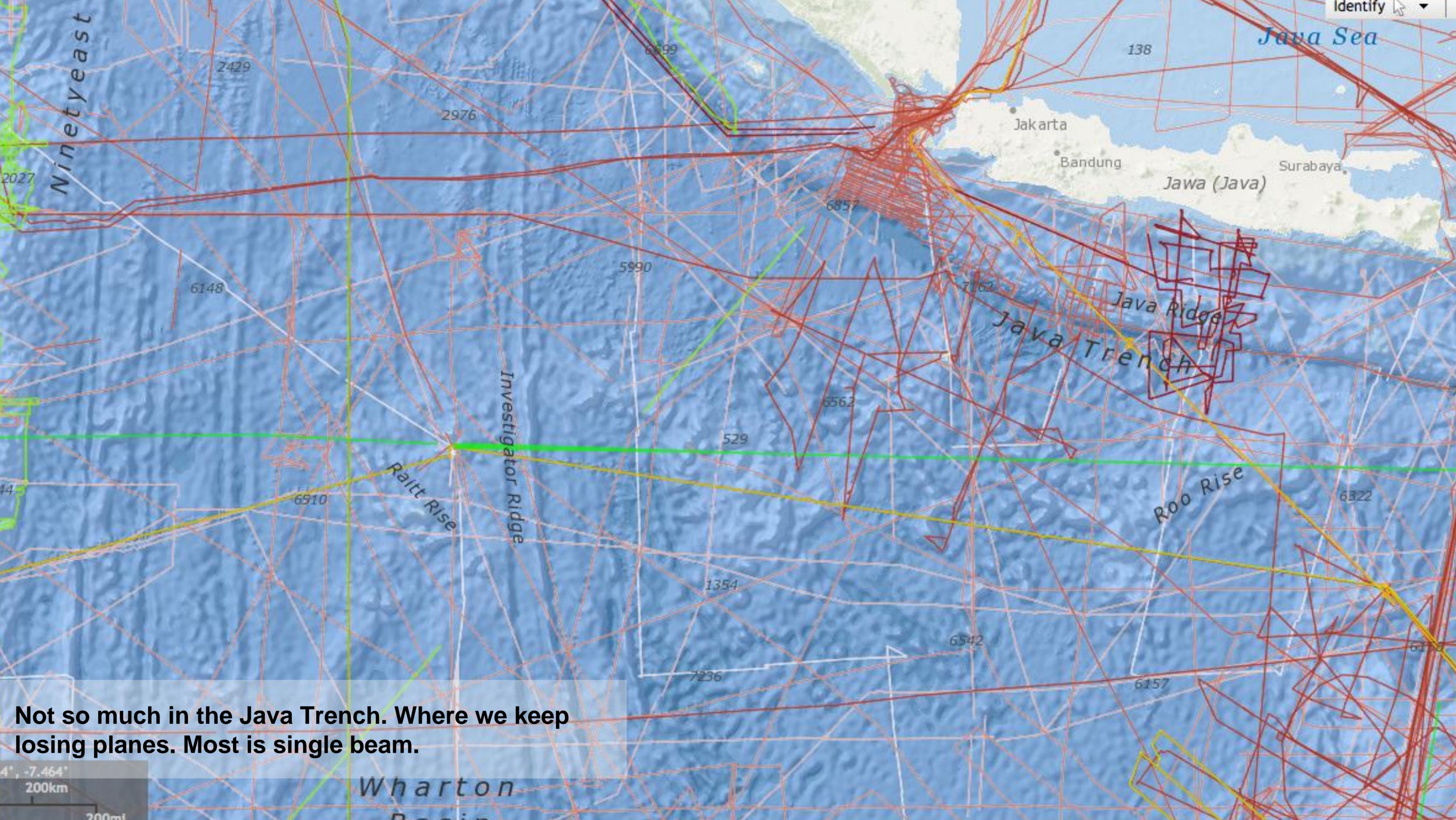
Earth. 15% charted with MBES.



Sardinia. Both single-beam and multi-beam



Hawaii. Stunning availability of MBES data.
Kamehameha Basin



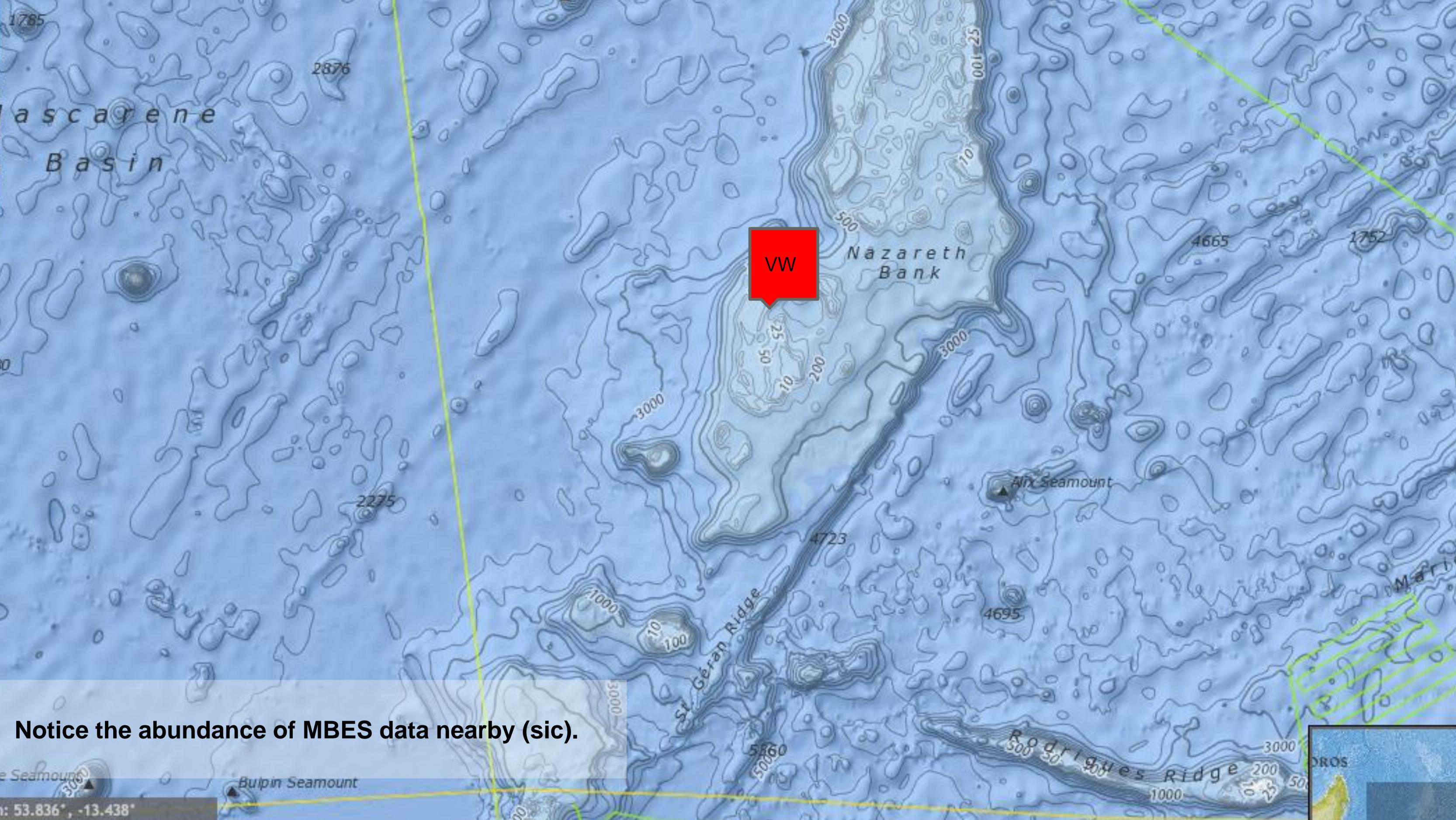
Not so much in the Java Trench. Where we keep losing planes. Most is single beam.

4°, -7.464°
200km
200mi

**But surely what we've got
is good enough, right?**



Grounding of VESTAS WIND during the 2014 Volvo Ocean Race (2014-11-29).



VW

Notice the abundance of MBES data nearby (sic).

53.836°, -13.438°

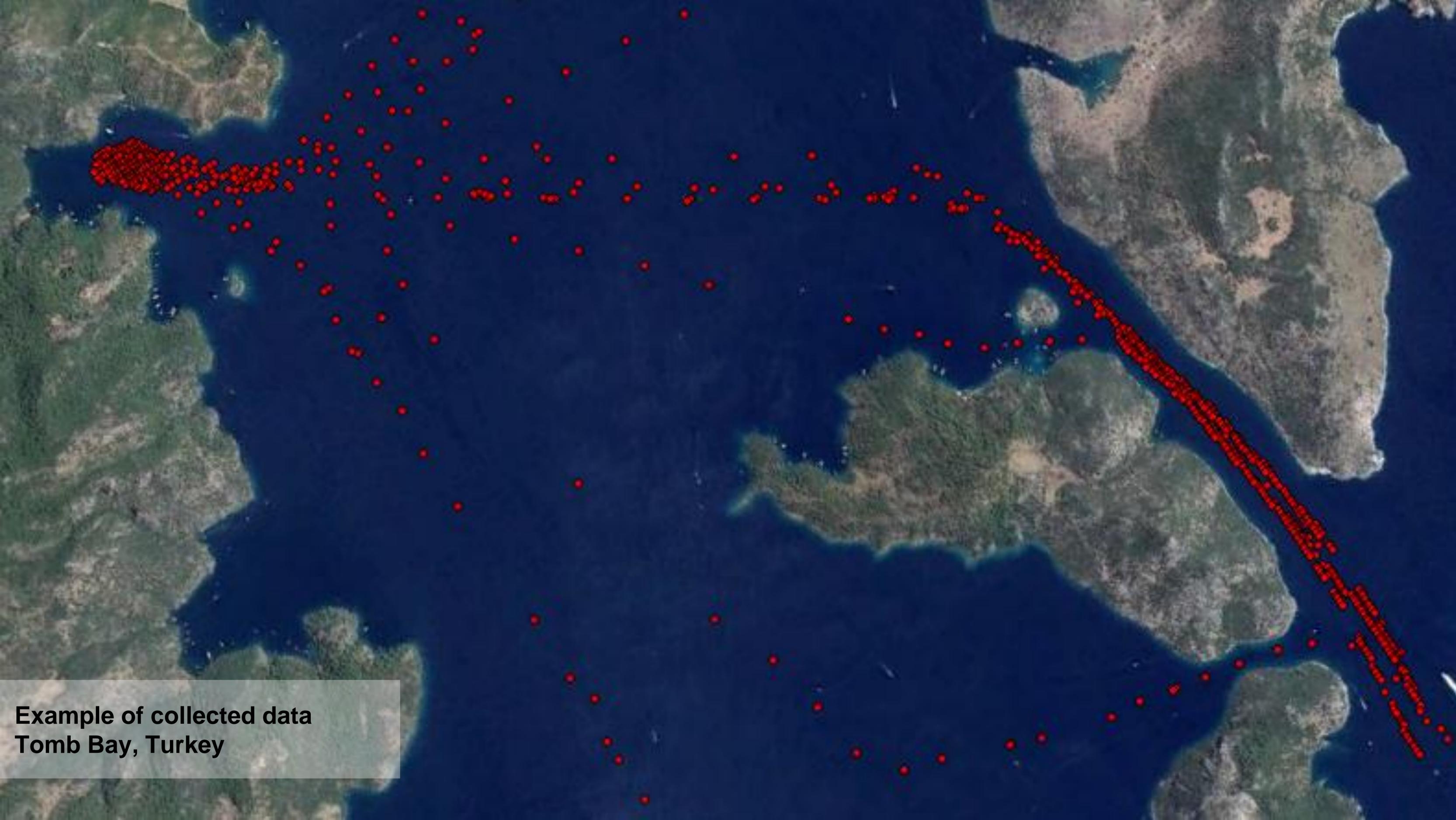
**So what can Crowd
Sourcing deliver?**



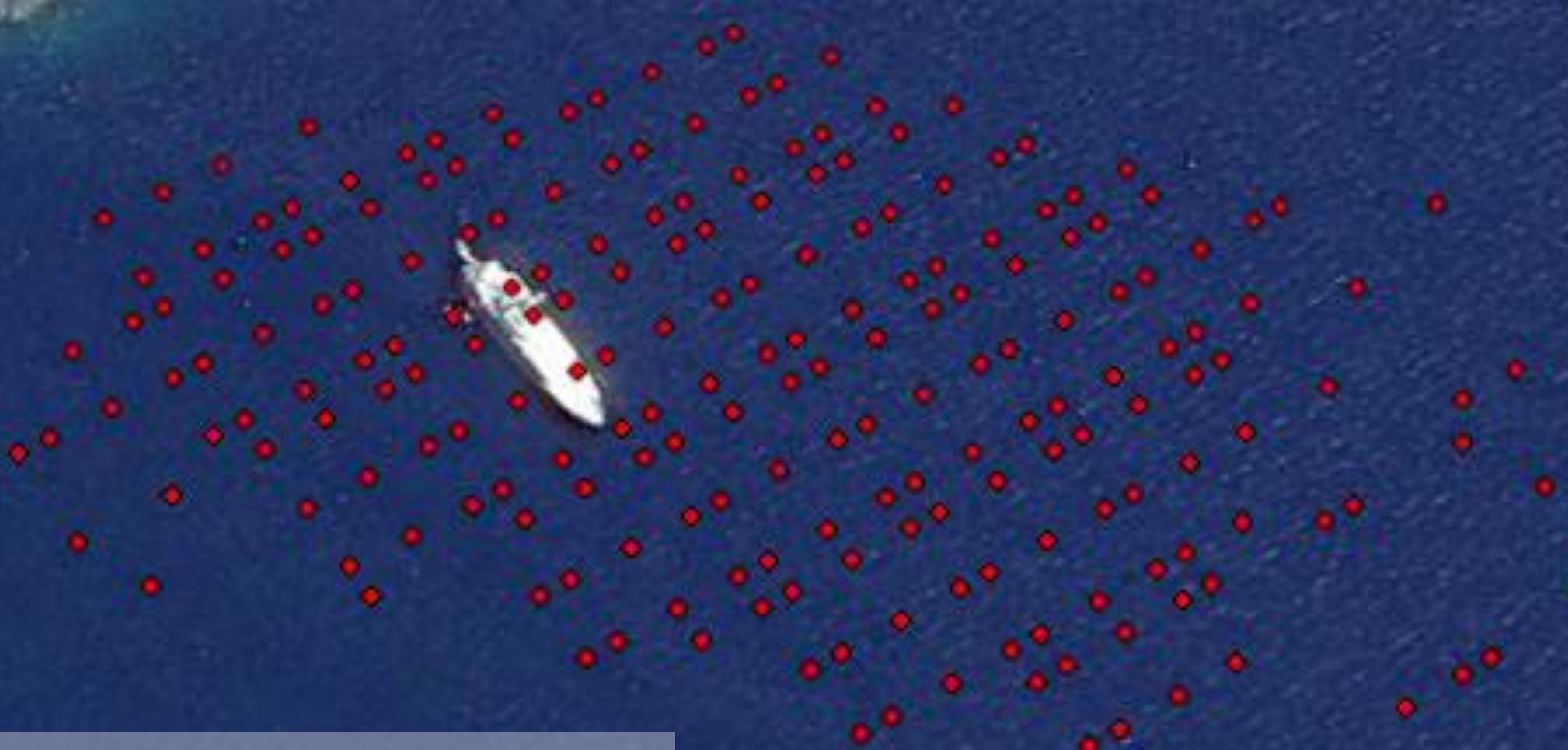
Sea ID

Rofis
Q.C. OK B210400
CE FC

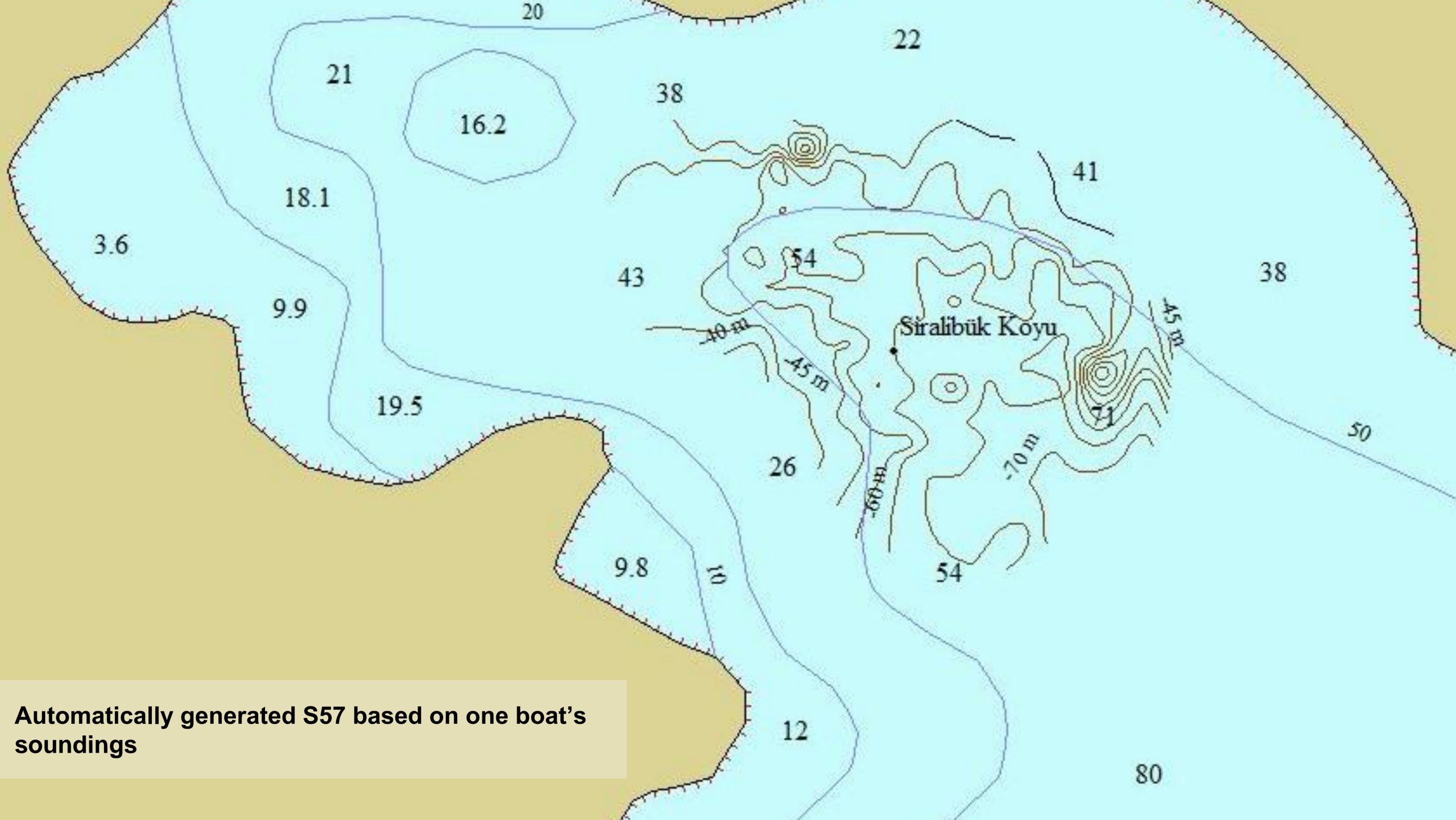
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SSDBT,	25.9, f,	7.88, M,	4.3, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	25.9, f,	7.88, M,	4.3, F
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SSDBT,	26.2, f,	8.00, M,	4.4, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	26.0, f,	7.92, M,	4.3, F
SSDBT,	25.9, f,	7.88, M,	4.3, F
SSDBT,	25.8, f,	7.85, M,	4.3, F
SSDBT,	25.6, f,	7.81, M,	4.3, F
SSDBT,	25.6, f,	7.81, M,	4.3, F
SSDBT,	25.8, f,	7.85, M,	4.3, F
SSDBT,	26.0, f,	7.92, M,	4.3, F
SSDBT,	26.0, f,	7.92, M,	4.3, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	26.0, f,	7.92, M,	4.3, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	26.0, f,	7.92, M,	4.3, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	26.1, f,	7.96, M,	4.4, F
SSDBT,	26.2, f,	8.00, M,	4.4, F



Example of collected data
Tomb Bay, Turkey

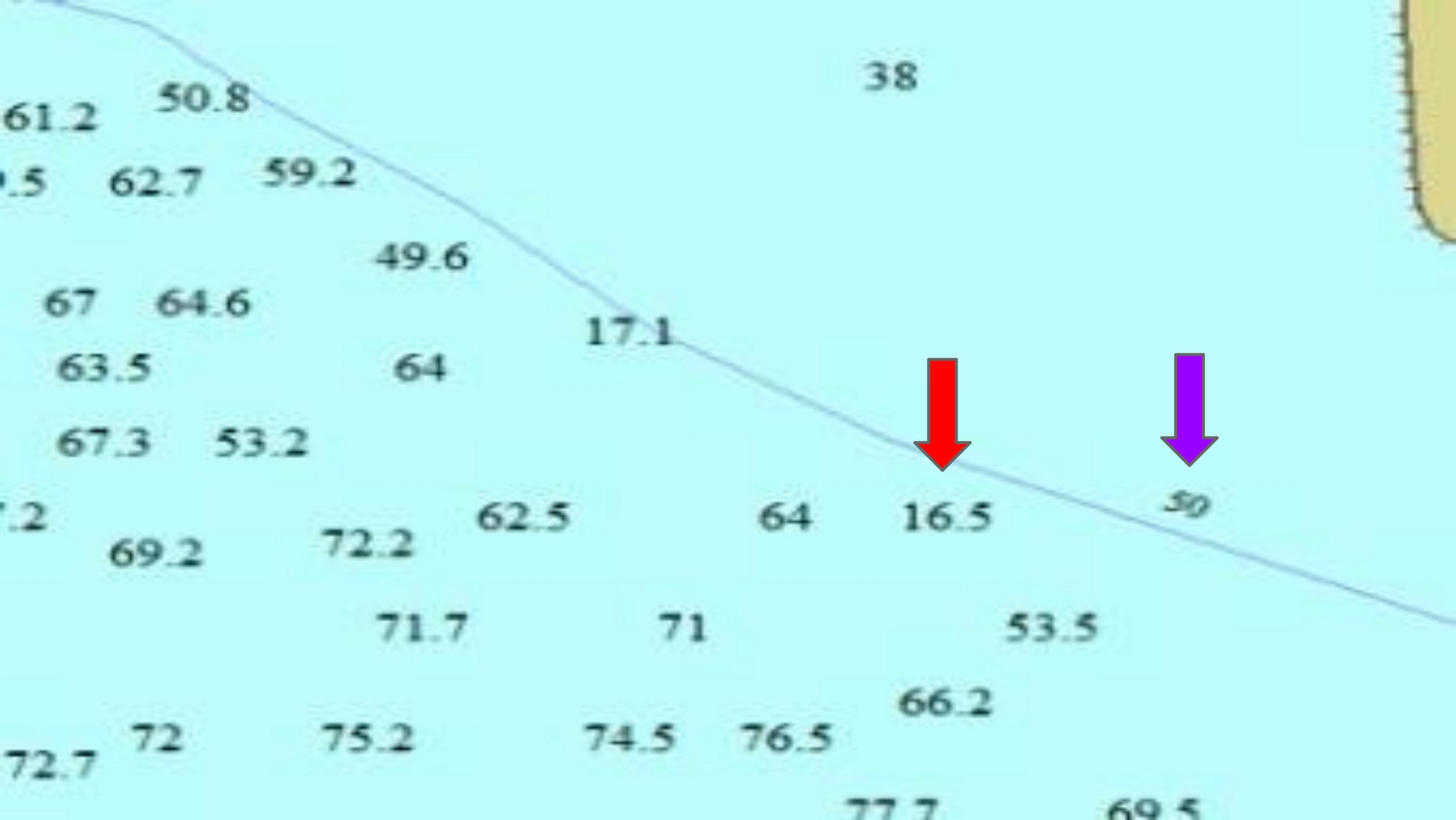


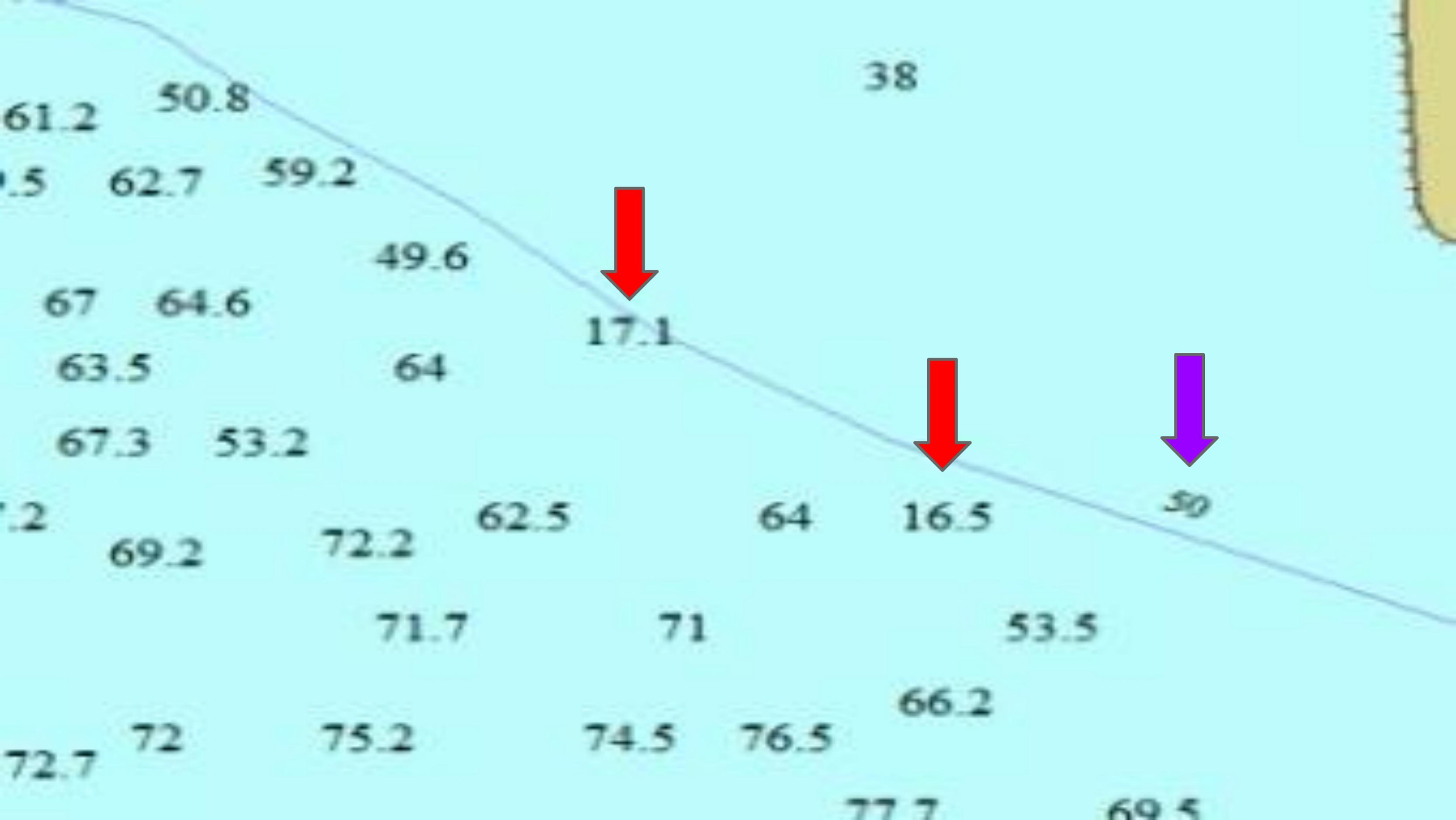
When scaled, and after curation, this is what we can accomplish

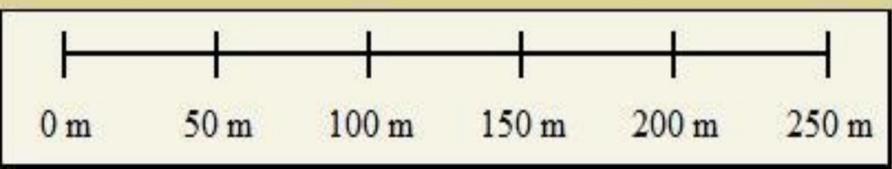
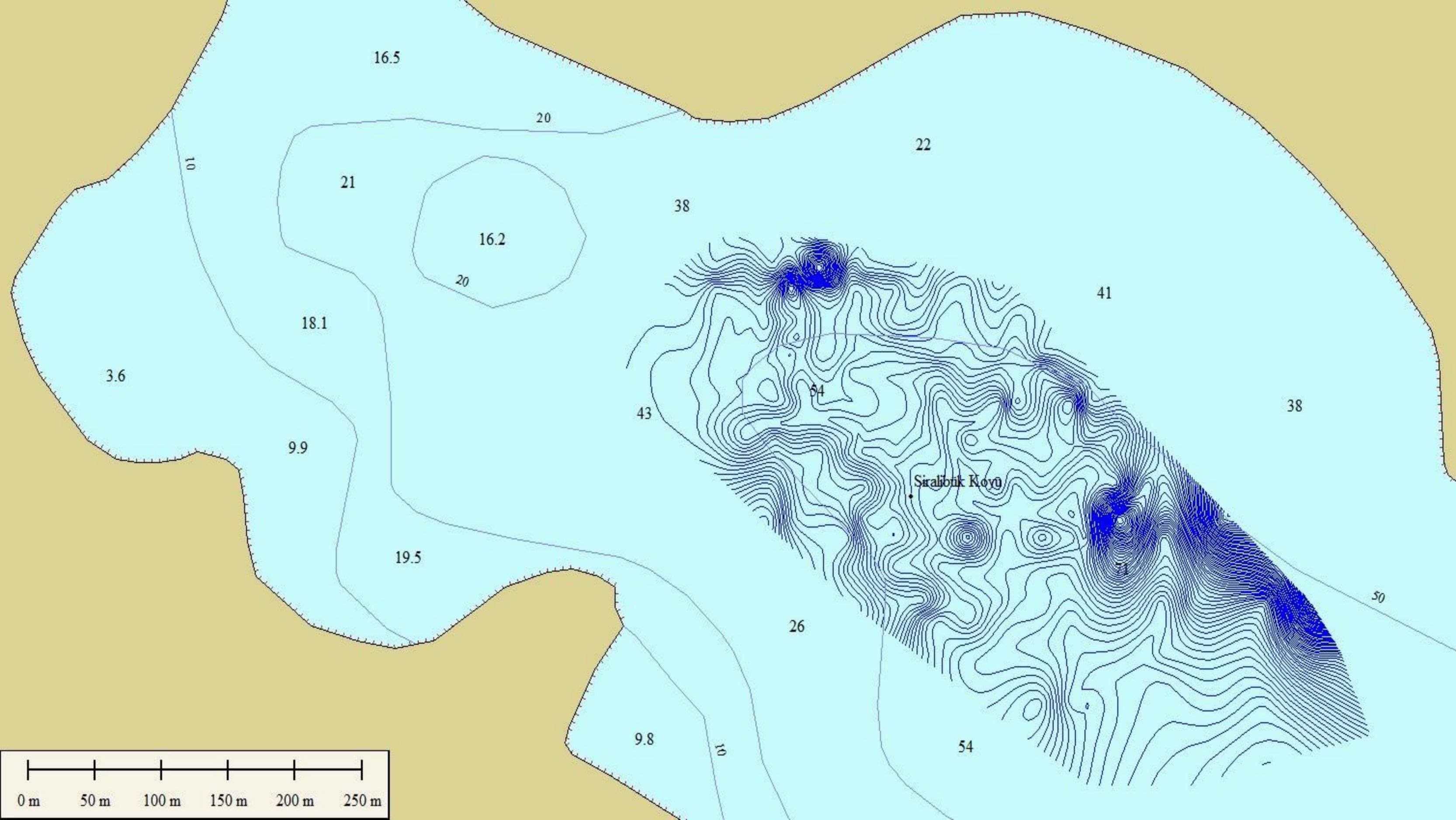


Automatically generated S57 based on one boat's soundings











Visited regions (6 ships)

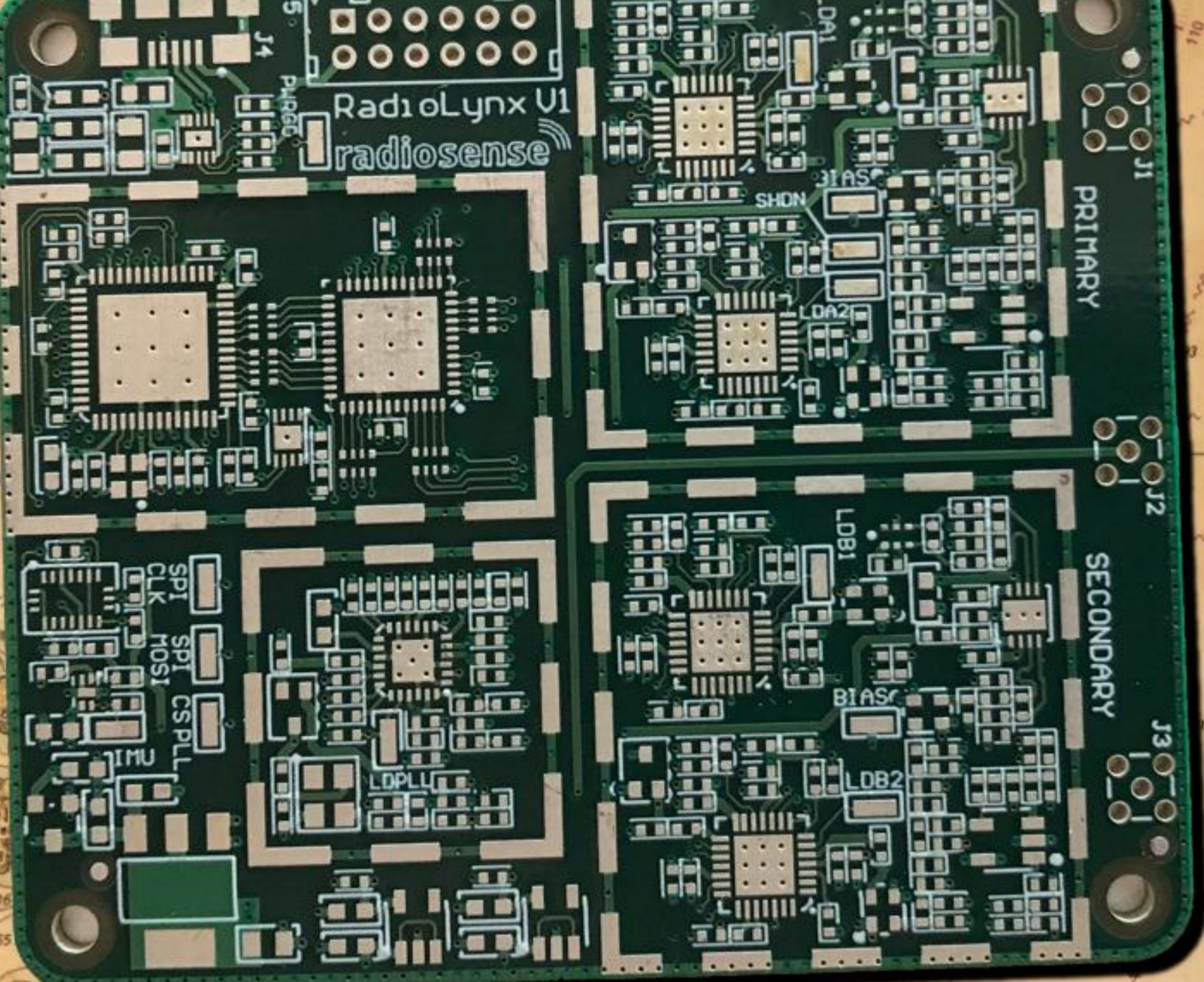
34 million soundings

26000 nautical miles traveled

The Next Step

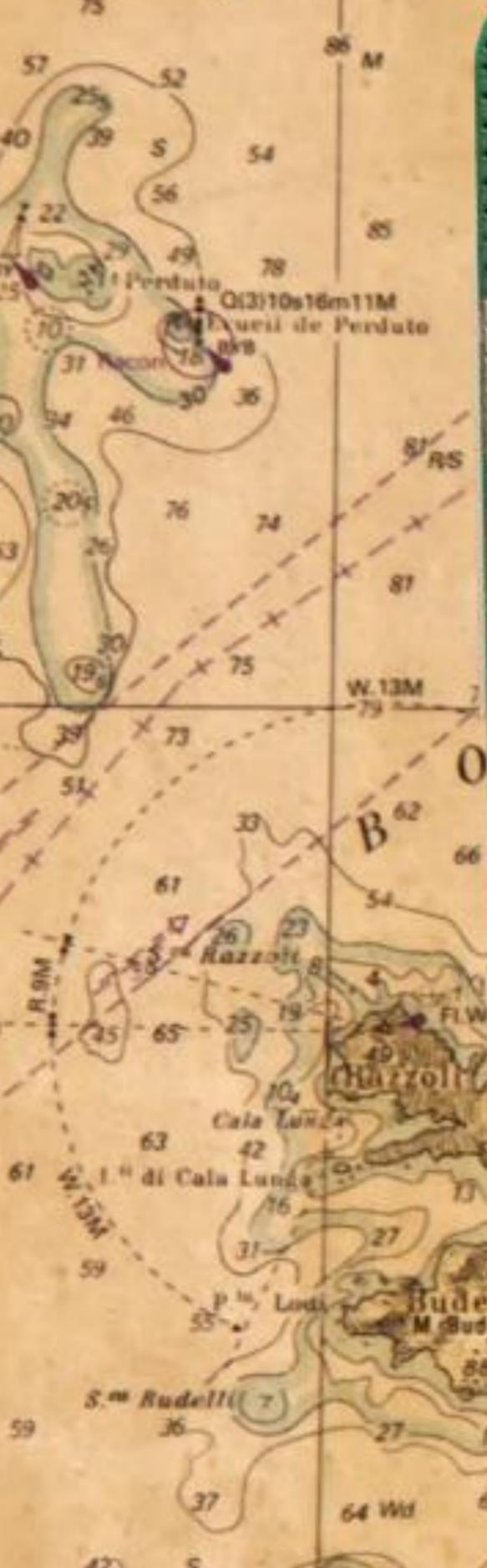
Precise
Point
Positioning

RadioLynx V1
radiosense

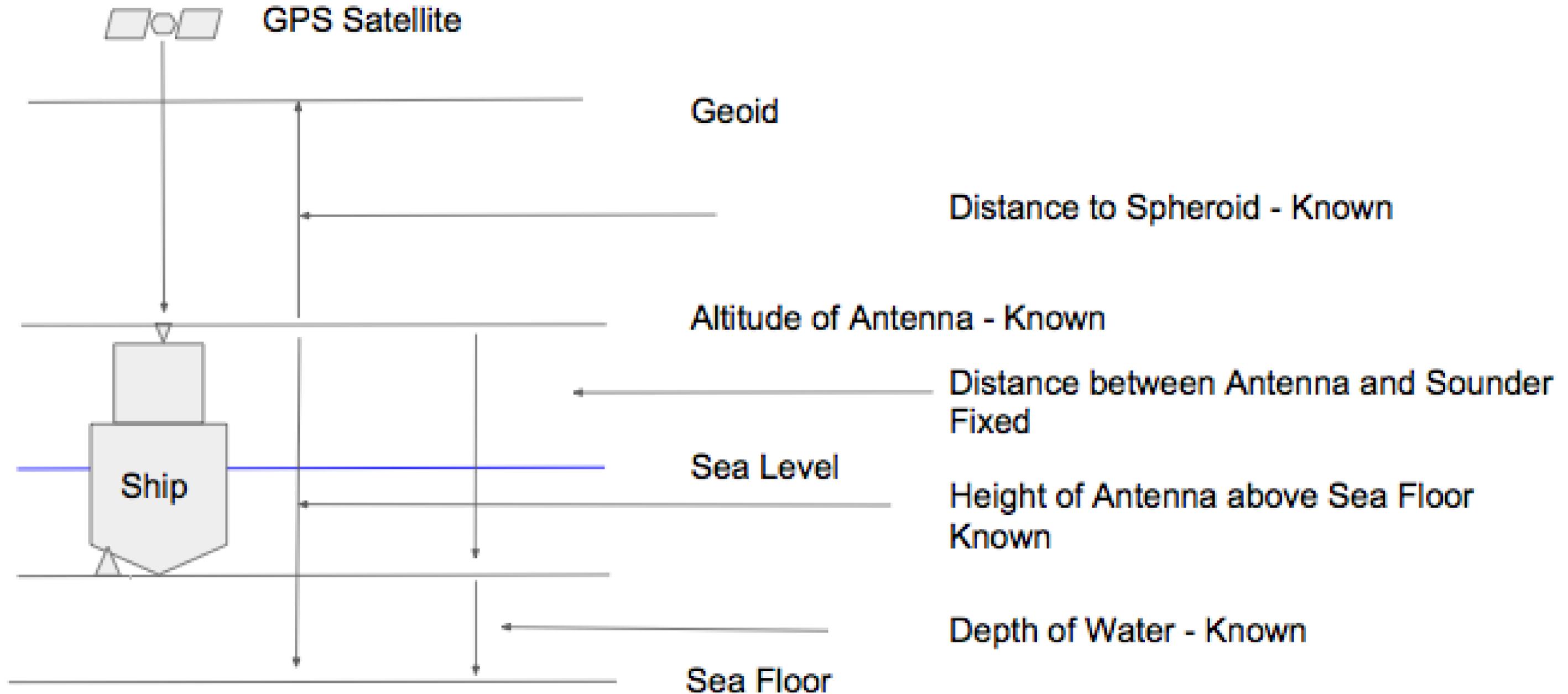


PRIMARY

SECONDARY



Precise Point Positioning



Crowd Sourced Survey



Sea ID

Bathymetric effects on the 2004
Indian Ocean tsunami striking
the east coast of Sri Lanka



Navigationnal Note

or

Illegal Survey?