

Title:

Blue Growth, Developing the Blue Economy and
the Surveyors' Contribution

Speaker:

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Vice-chair, FIG Commission 4 (Hydrography)

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Introduction

The Blue Economy and Blue Growth

Oceans and their inherent wealth

Sustainable elements towards the UN-SDGs

Surveying for the Blue Economy, Priority Areas, Standards, Data

Challenges for the Decade of the Ocean

Conclusions



Blue Economy¹ – the sum of economic activity having to do with coastal and intra-coastal waters, harbors, oceans, rivers, seas and fresh water resources

Blue Growth² – to describe “..a long term strategy to support growth in the maritime sector as a whole”

Marine Spatial Planning³ – the process which has the aim of establishing a binding plan which organizes all economic and ecological activities in a given geographical sea area.

NOTES:

- 1) The Maritime Alliance
- 2) The Maritime Affairs Dept. of the European Commission uses the term
- 3) Joint review of Marine Cadastre as a support for the Blue Economy (CLGE)

Commission 4 – Hydrography

This is a Work Group activity, WG4.2

The Blue Economy – involves the Geodesy to delimit marine and coastal areas and their jurisdictions, measurement and monitoring of the coastal and ocean areas for habitat, access and security of food sources and good environmental status. The Blue Economy is concerned with the revenues, taxes and socio-economic benefits that the coastal seas and marine areas can generate for the local communities and states. It is Hydrography and associated Spatial Data that underpins this.

The Blue Economy – is a starting point for the engagement and cooperation and collaboration between stakeholders in order that our precious resources can sustain themselves and the population in the urbanized coastal habitat. We too must collaborate and engage with our stakeholders



The Blue Economy

The Size and Dynamic of the Blue Economy – Statistics

Estimates of the total value of the oceans to the world's economy is vast — US\$24 trillion, according to the World Wildlife Fund, making it **the world's seventh largest** economy.

The **European Union** finds that it employs **3.48 m** people in the EU with an Annual Gross Profit of **\$96.1 billion** in the 2018 annual economic report on the EU Blue Economy.

In the **USA** the ocean economy has been **growing**, according to NOAA, at **twice the rate** of the rest of the US economy, **employing 3.2m** people and contributing **\$320 billion**.

The Organization for Economic Cooperation and Development estimates, by 2030, the annual Blue Economy could outperform the growth of the global economy at \$3trillion annually.

European Commission & World Wildlife Fund, Introducing the Sustainable Blue Economy Finance Principles, 2018. NOAA, Ocean Today

SUSTAINABLE DEVELOPMENT GOALS



- 1,2,5,11,15,16 are directly related to Land issues
- New Urban Agenda & Rapid Urbanisation
- **1,2,3,6,7,12,13,14 are related to seas and oceans**

Relating the SDG's to aspects of the Blue Economy:



It is an enormous, growing market
 Every 2nd breath of Oxygen we take is from ocean organisms
 Fundamentally

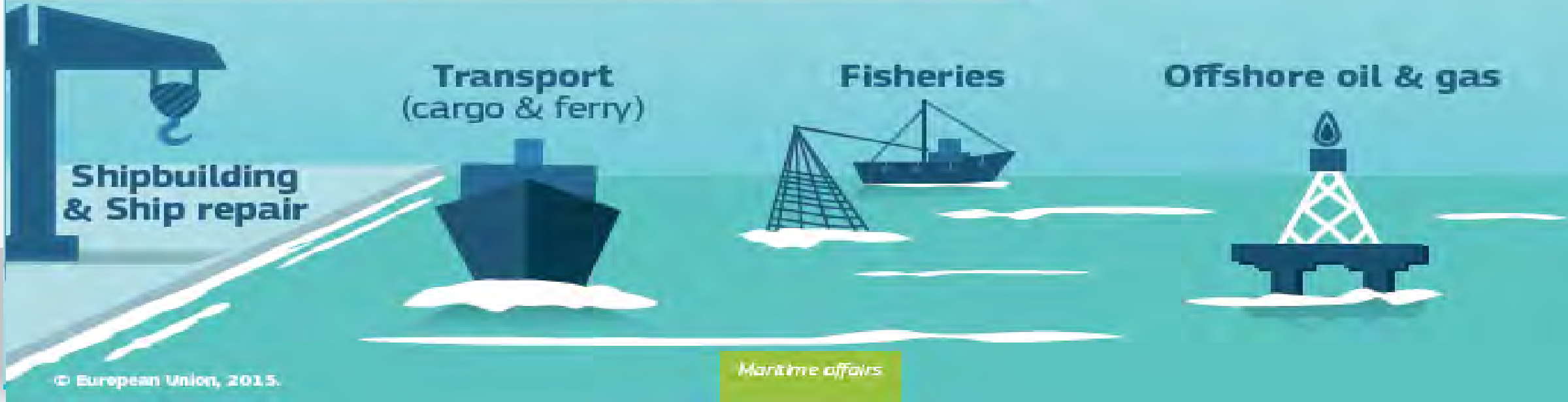


Food:	aquaculture/mariculture essential to feed humanity
Water:	97% of earth's water in the ocean
Ocean energy:	inexhaustible, clean, renewable energy
Medicine:	Exploring for organisms to seed new drug research e.g. Seabiotech & Pharmasea in Europe NOAA scientists have also extracted chemicals from corals & sponges that fight some of the worst infectious bacteria.
Real estate:	Especially around our coasts with water rising...much infrastructure will float

European Commission & World Wildlife Fund, Introducing the Sustainable Blue Economy Finance Principles, 2018. NOAA, Ocean Today



other sectors of the blue economy crucial for value & jobs

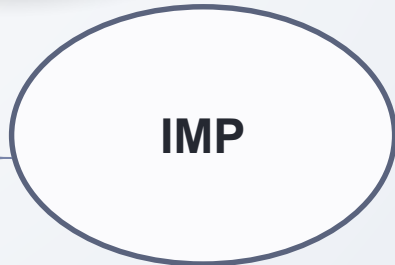


Blue Growth

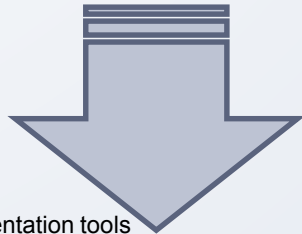
1st phase (2006-2012)

2nd phase (2012-2020)

Reaffirmed maritime dimension of EU



Maritime's contribution to achieving Europe's 2020 goals for smart, sustainable, inclusive growth



Cross sectoral implementation tools

Marine Knowledge

Marine Spatial Planning

Maritime Surveillance



Hydrographic survey and data

Basic components

1) Blue Growth focus areas

2) Components to provide knowledge, legal certainty, and security

3) Sea basin strategies



The Blue Economy is important as it provides a vital source of food and benefits from a host of industry sectors, technology and innovation.

It can provide a valuable Return On Income (ROI) for investors.

The UN SDG's, especially SDG-14 cannot be obtained without a much more systematic survey coverage of our oceans.

The GEBCO Seabed 2030 project has this objective. (See: <https://seabed2030.gebco.net/>)

The pressures on limited ocean and sea resources continue.

Resilience to the impact of man, climate or natural disasters needs to be developed and enhanced.

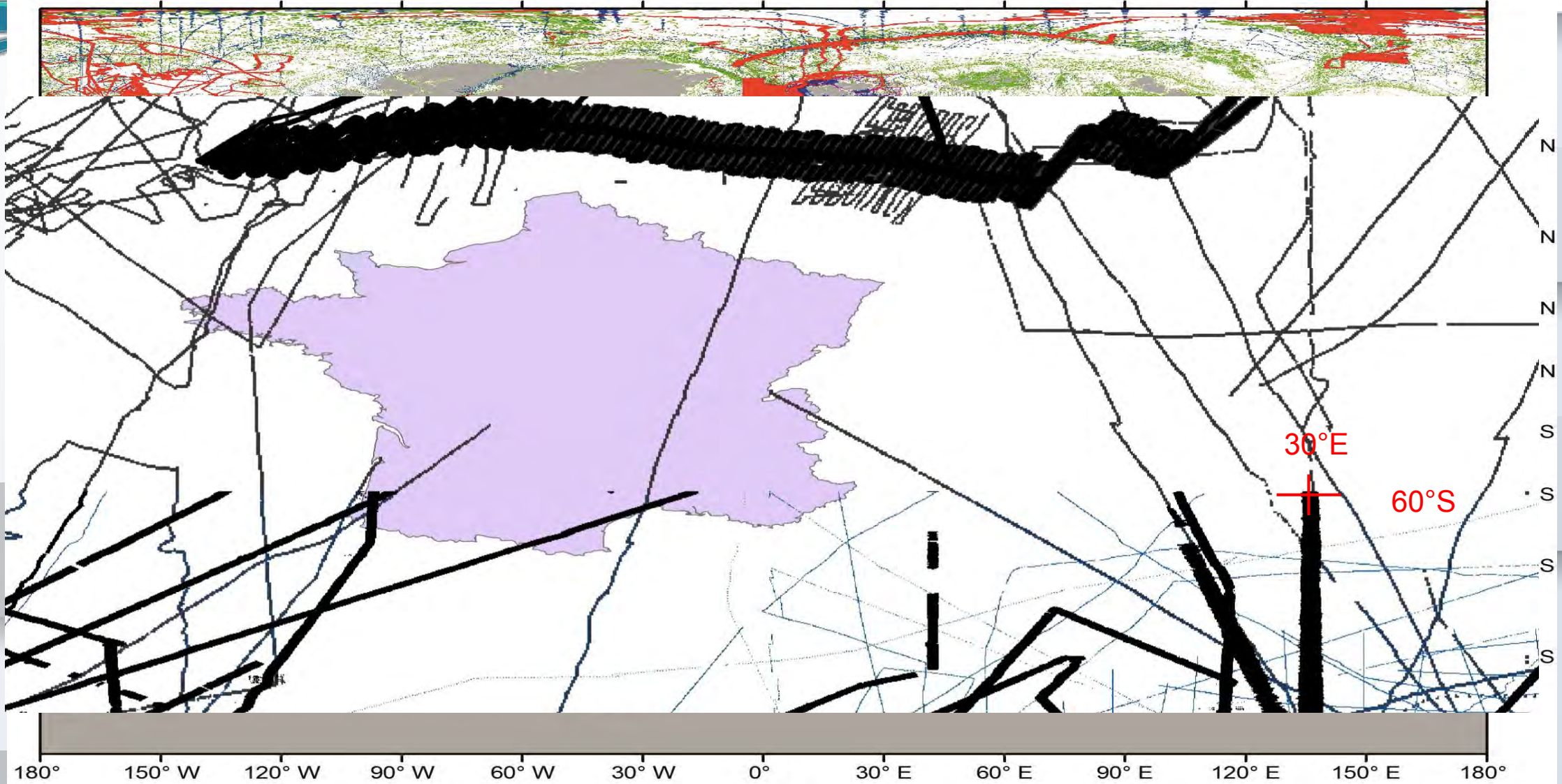
Fifty years ago the Ocean was considered non-finite and extractive.

Today the Ocean is finite, considered an ecosystem that requires management to enable Ocean Health to be sustainable.

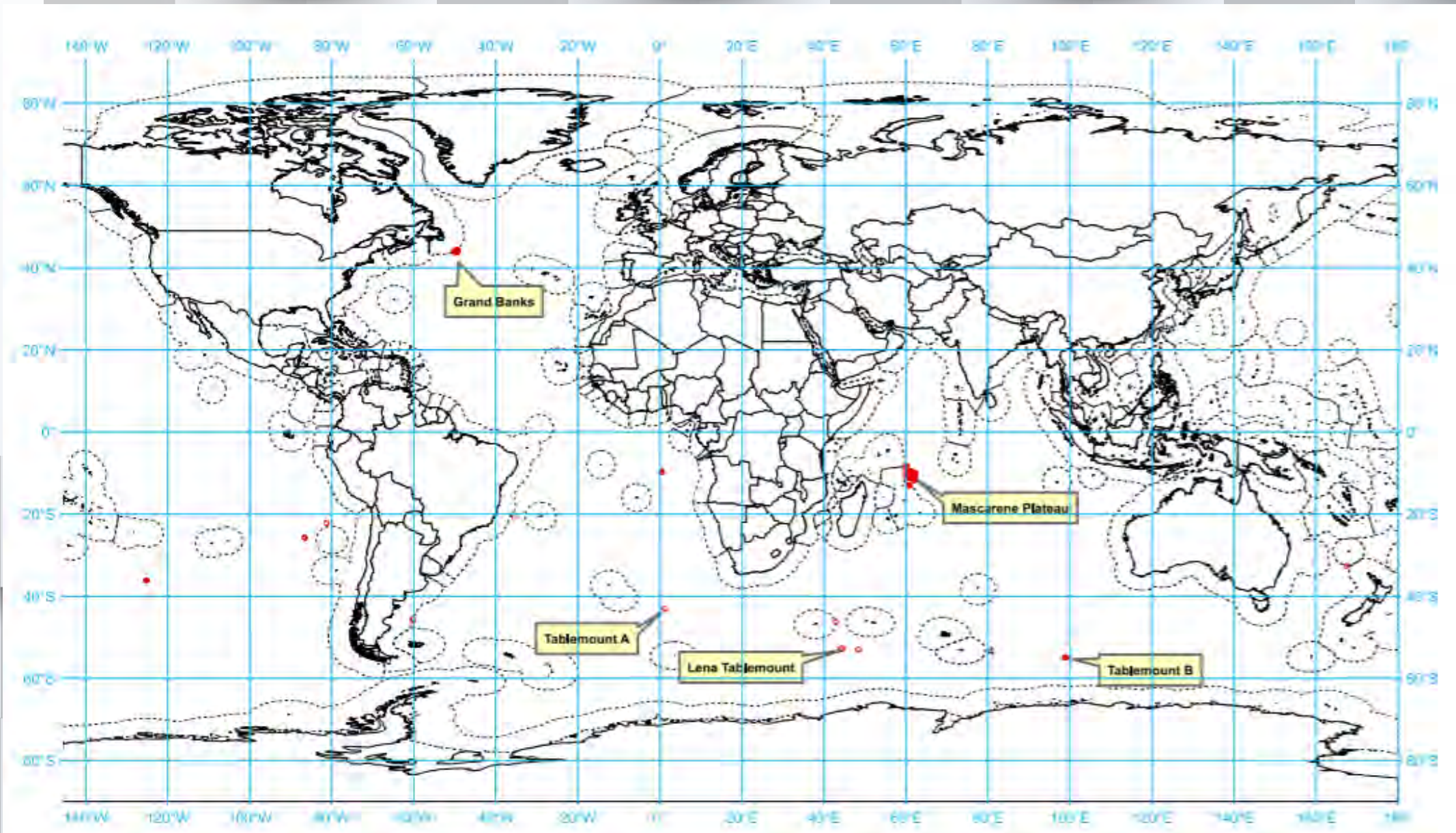
There are Challenges!



How little data there is in some areas...

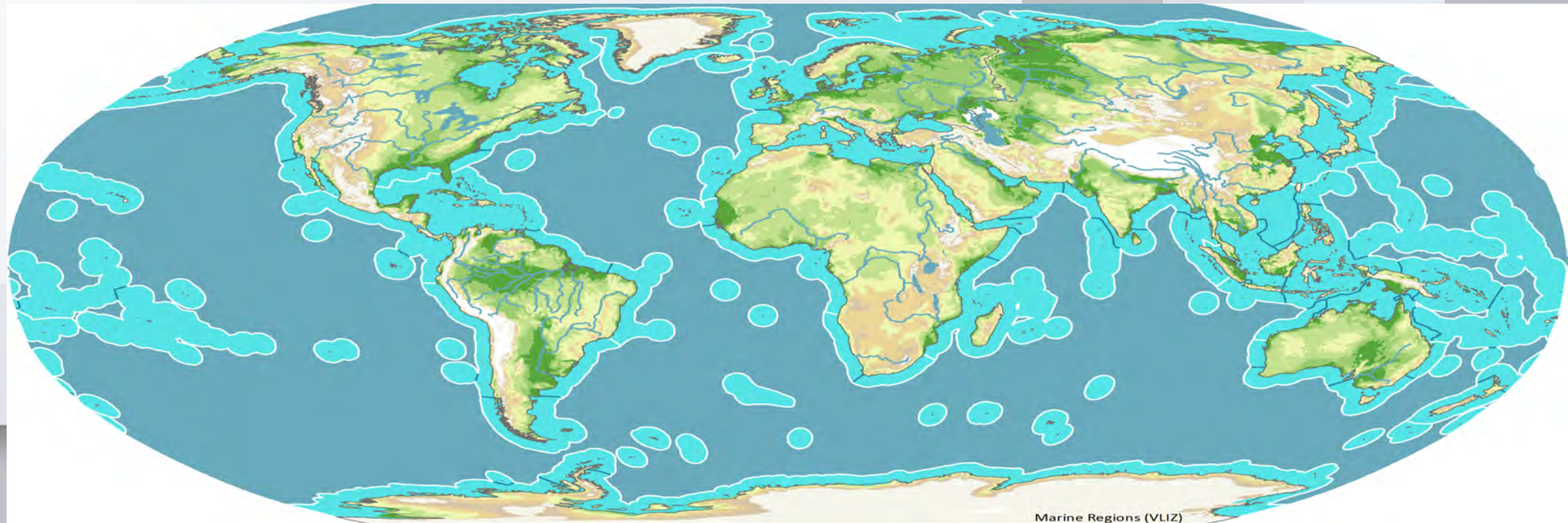


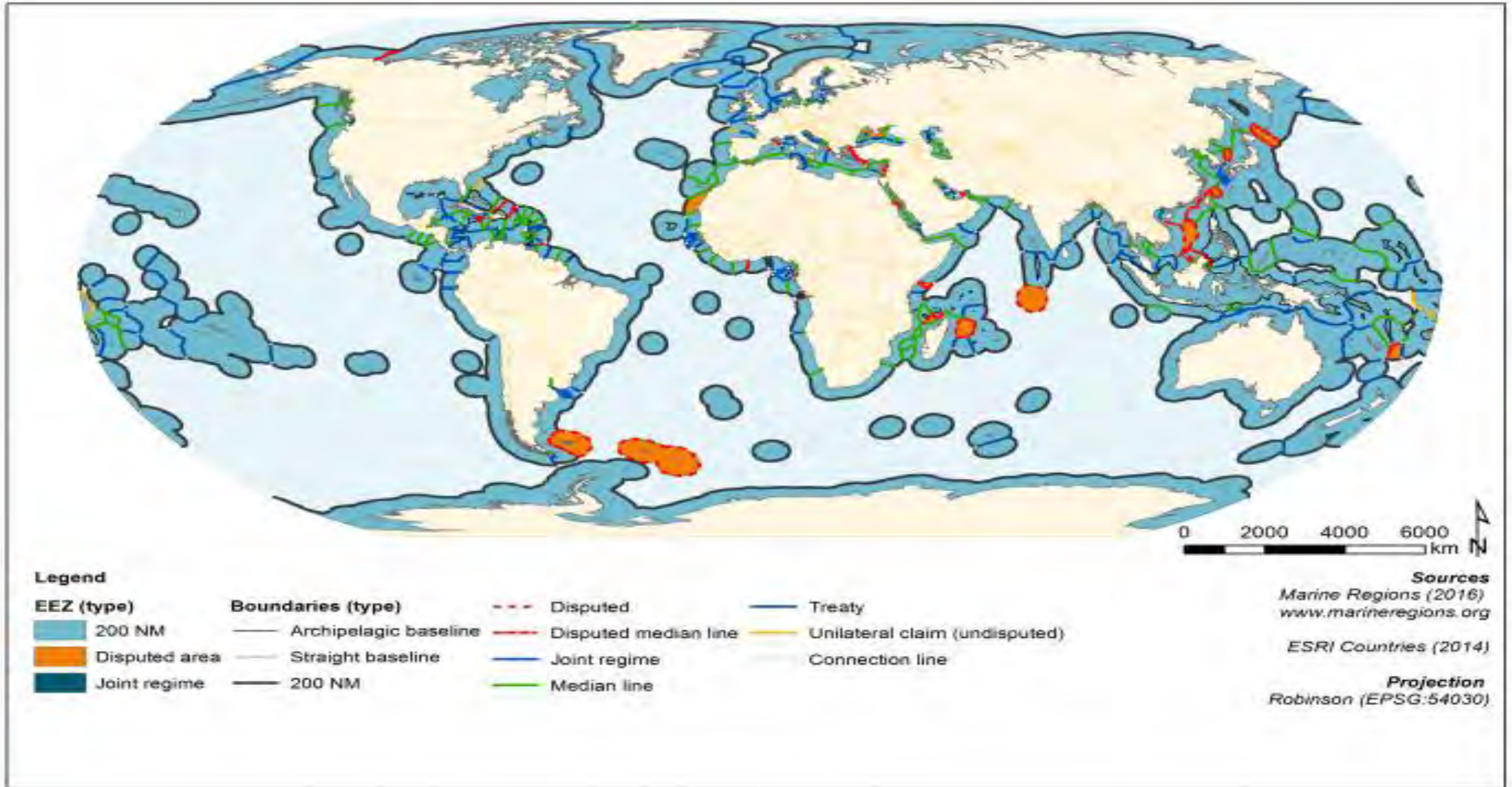
Wind farms in the high seas: shallow waters but with what jurisdiction?



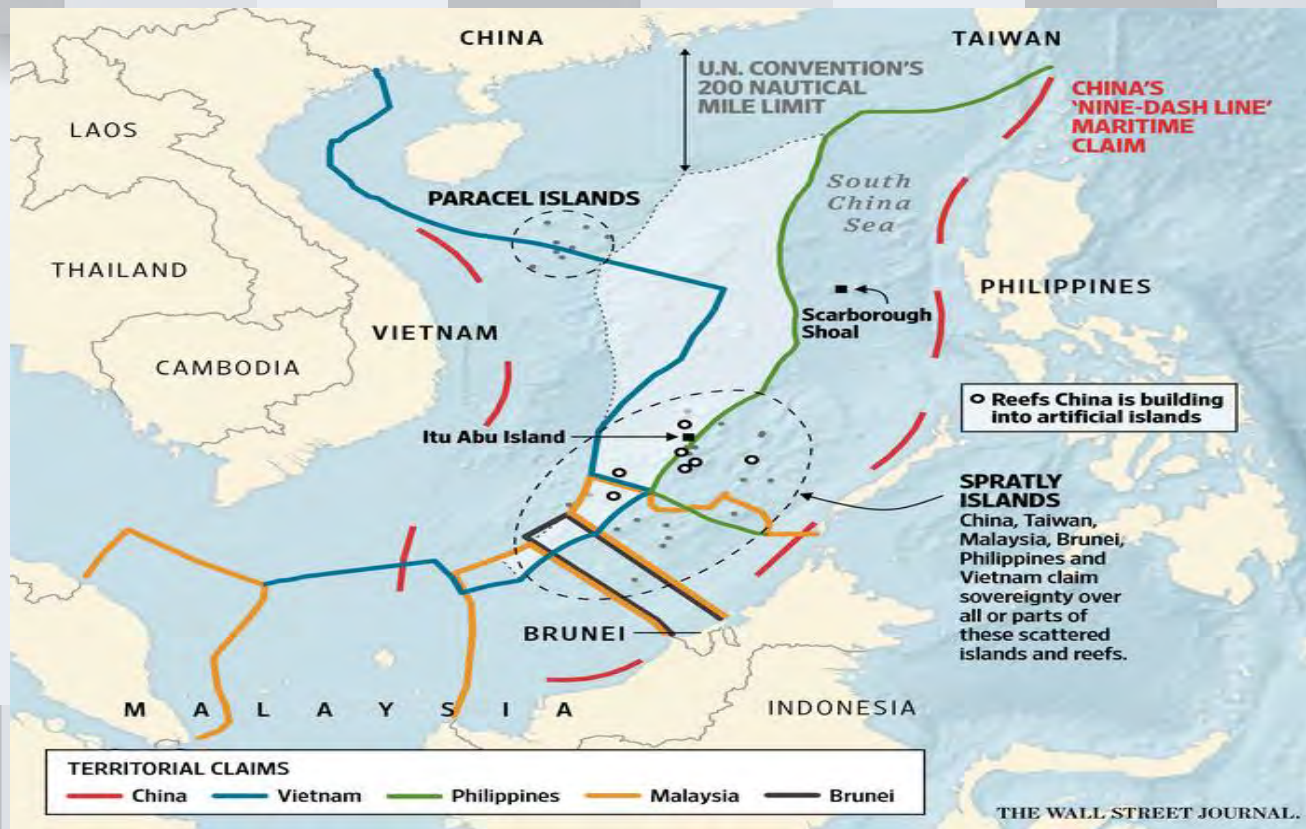
Exclusive Economic Zones (EEZ) at 200 nM

200 nM = 230 miles = 370 km

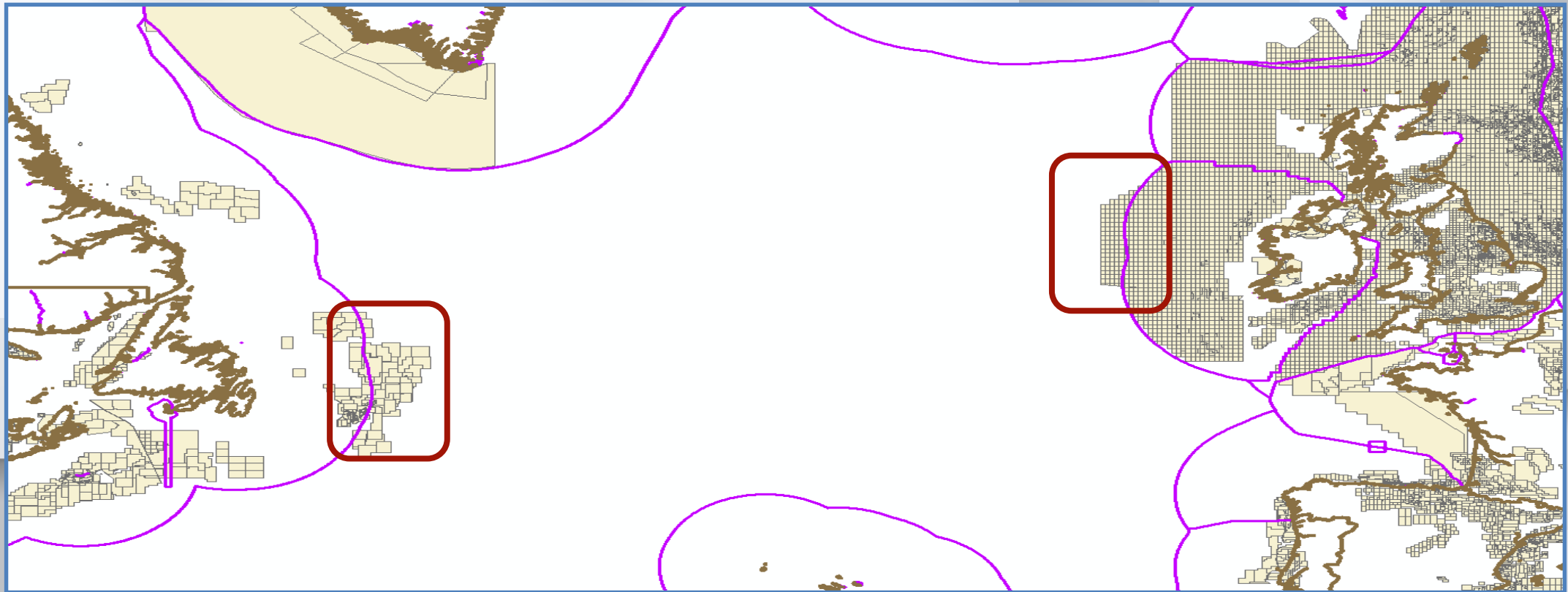




Geopolitical tangle
in South China Sea
with a complex
situation of
overlapping claims



Subject to International Seabed Authority



The Business Context of Boundaries

There is a business impact on the Blue Economy:

Uncertain international boundary delineation affects various industry sectors in the following ways:

Unstable geopolitical status is commercially unattractive

Energy and biotechnology operators: their concessions, licenses and regulations

Data purchases and in-situ operational permissions

Product transportation by pipelines and vessels

Reliable and accessible information about boundary disputes and affected block licenses is not **always available.....**

Trusted international maritime boundaries require applied geodesy, hydrography and cartography

This impacts the commercial, legal, and technical disciplines of all phases of the enterprise cycle; from discovery, access, sustainable management & monitoring to retirement

Another Reason to.....

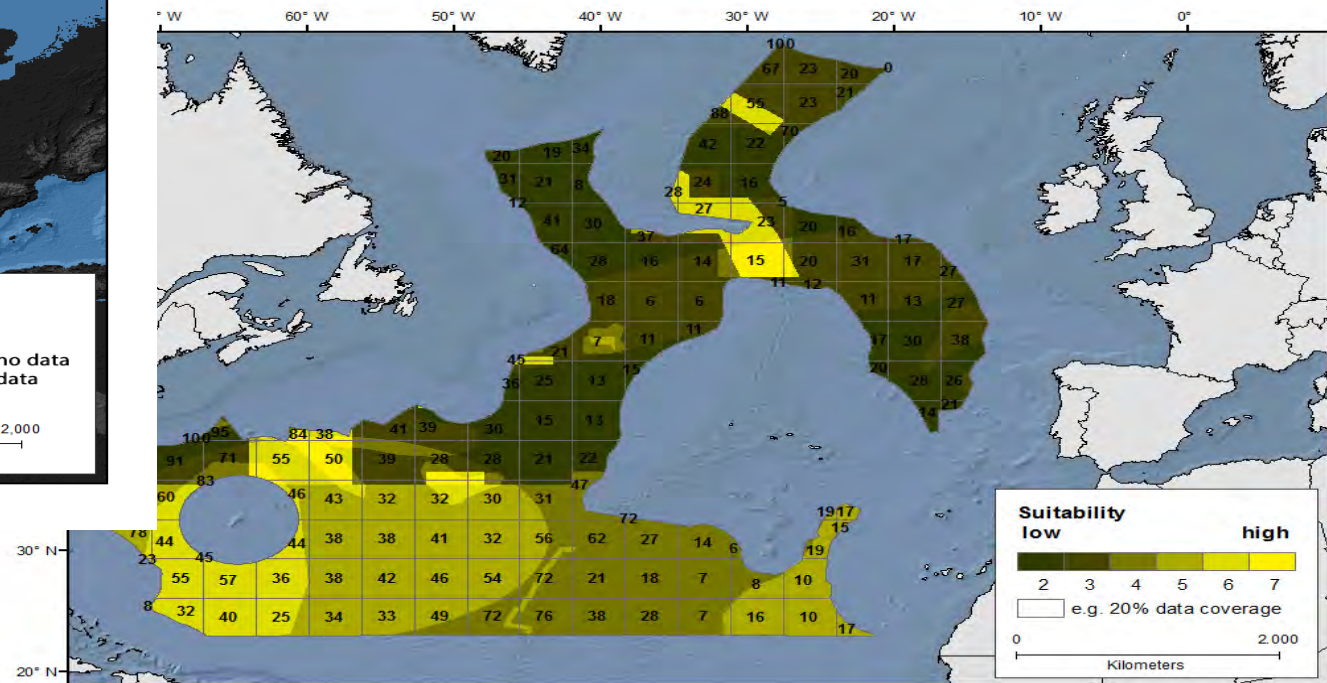
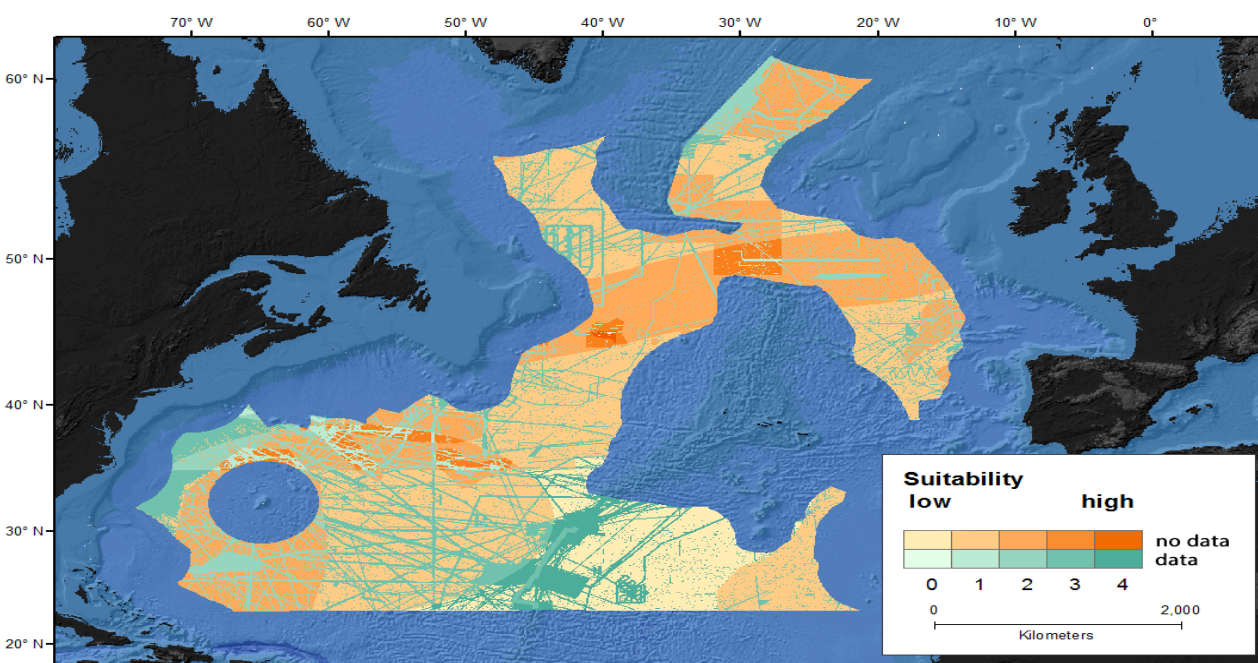
Share Data and Manage Data,
Act responsibly, Plan, Prepare, Test & Learn.

Promote and benefit!

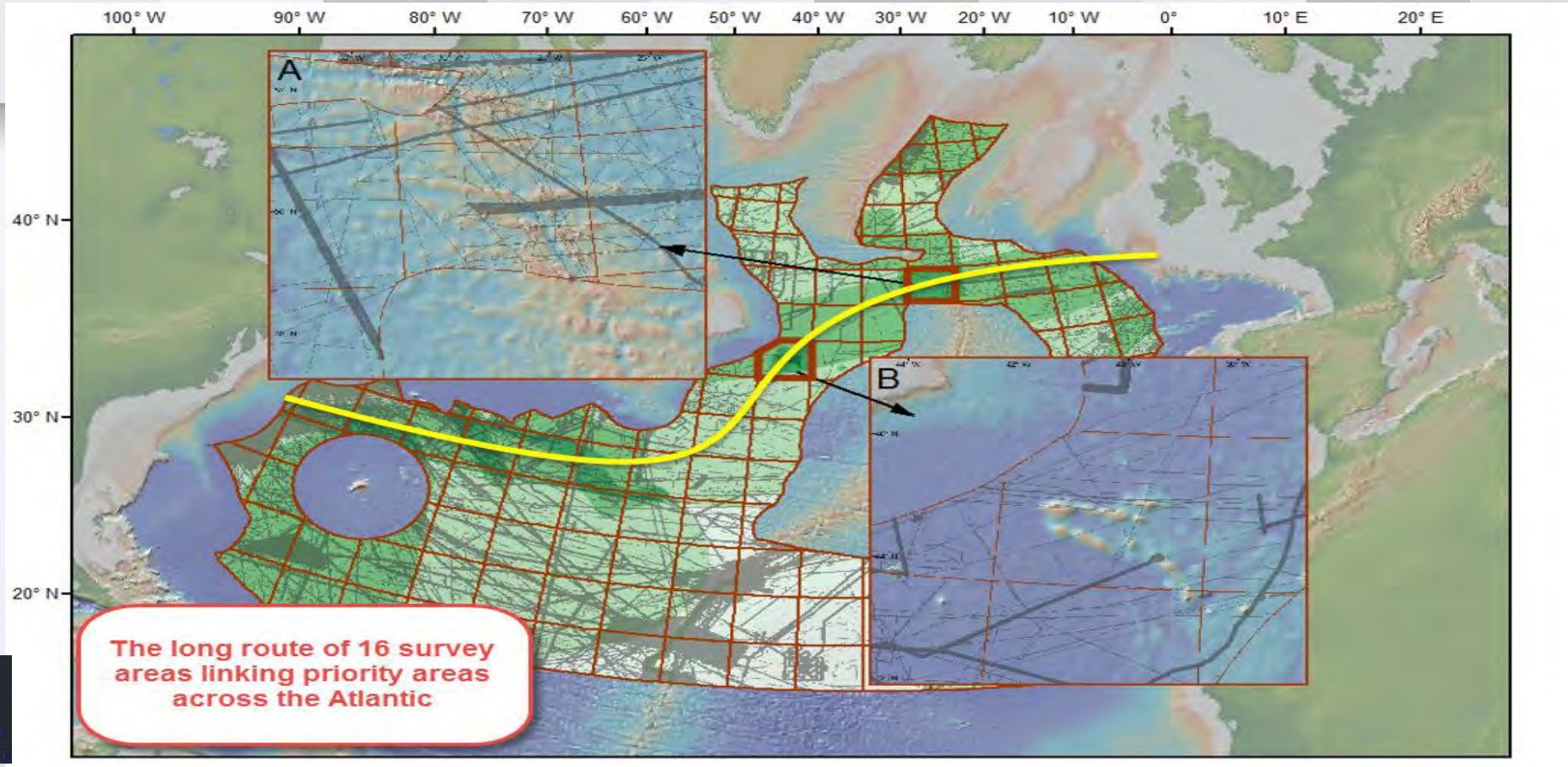


Our environment is often under threat





The North Atlantic Seabed Mapping Priority



A Canada/EU/USA government funded initiative to develop a survey strategy

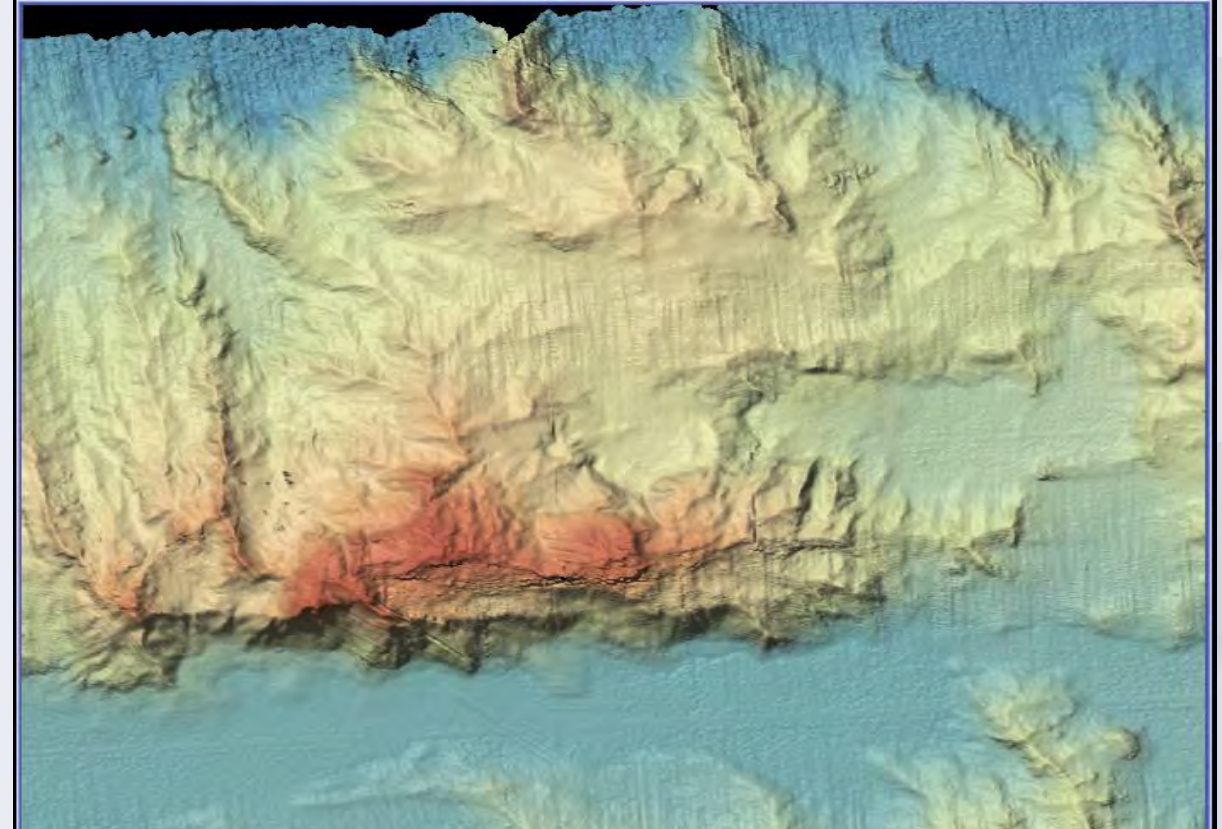
Improving Resolution

Just slightly!

Before

50x50 Km

After



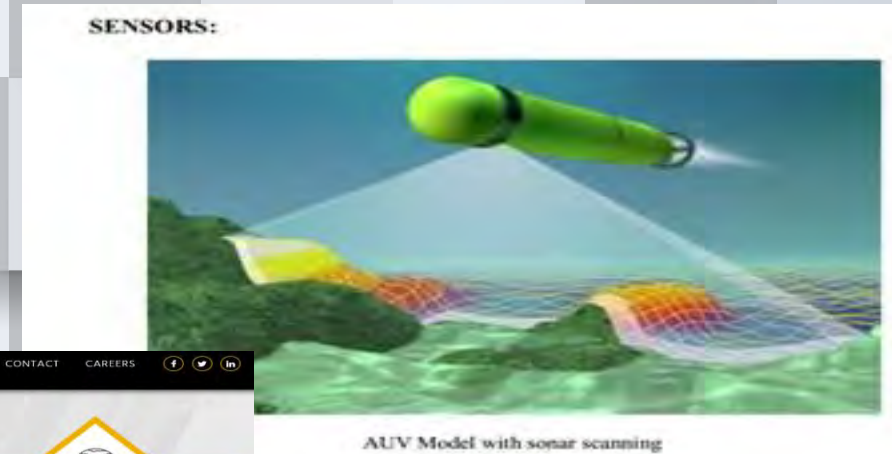
Mapping with the EM122 system on RV "Sonne II" gridded at 50m. Courtesy GEOMAR

There are over 1000 MBES around the world capable of deep ocean surveying. Even so these are expensive items installed on relatively expensive ships.....so can we introduce some improvements?



- Automated processing of sensor data
- Multi sensor capability: core & peripheral
- Multi platform capability
- Consistent processing, QC and "near edge" outputs
- Efficiency of operations

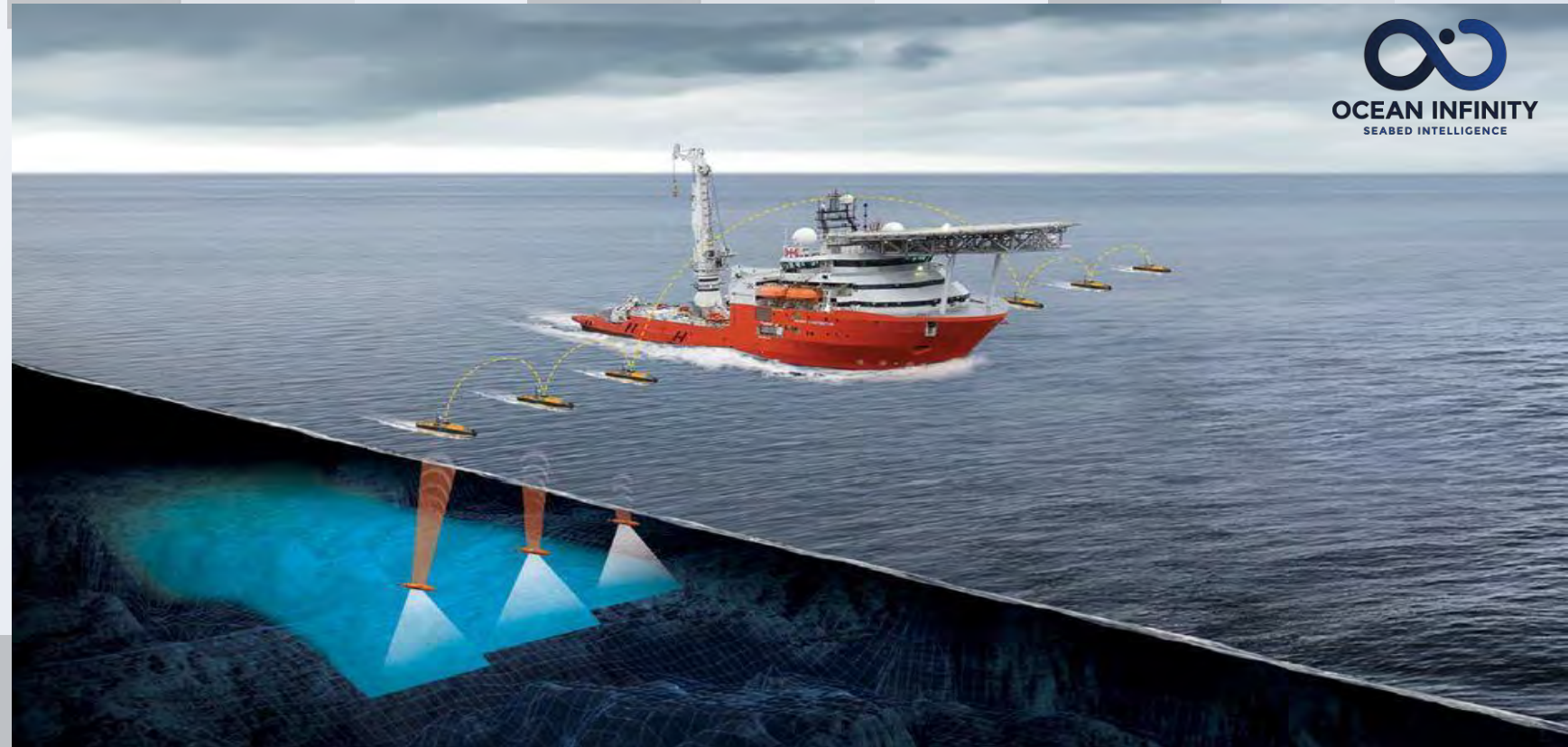
and Skilled staff!!



Increase efficiency by:

evolving from the traditional one vessel and one AUV model

utilizing one vessel with up to 8 AUV's & 8 USV's





30 m x 15 m long array → 17 x 34 m resolution in 4000 m water
 ~1/3 the operating cost of a research vessel (and a lot less to build)

Robotics and Drones

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GETTING TO THE BOTTOM OF OUR OCEAN



The Blue Economy is growing and is already large

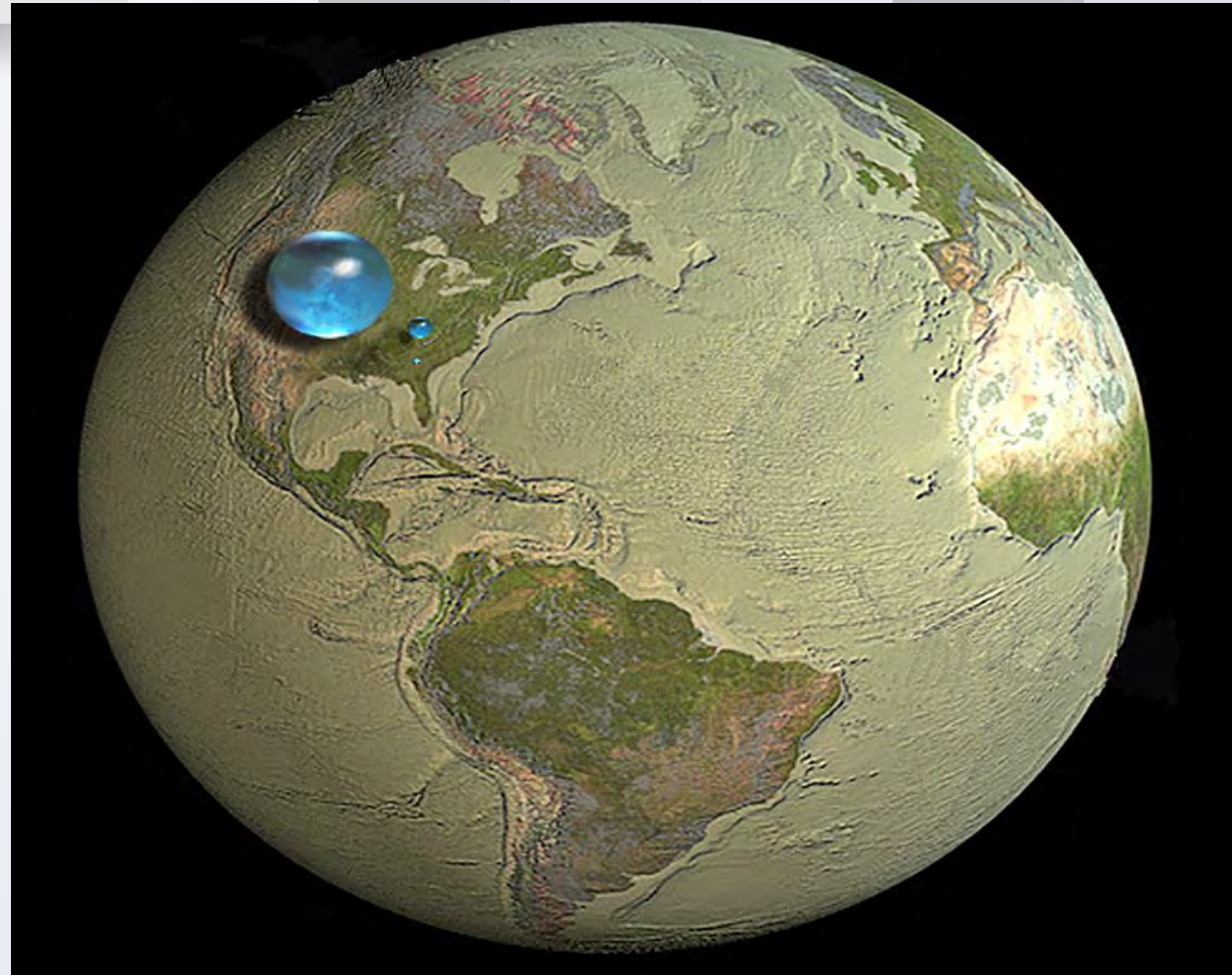
There is not enough survey data to support the initiatives of the UN SDG's nor the Decade of the Ocean

More skilled staff and cost effective solutions are required to offset and mitigate the threats to our oceans

These are being developed now so it is timely for you to get involved!

The rate of Blue Growth suggests more interest and benefits will come from our Oceans so it is imperative we steward our natural resource wisely.

All the World's water in a drop



It is our job to help manage it wisely!



Questions? *Thank You!*

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#GordonJHydro