An introduction to the MEDTOP program

Combining satellite telemetry with “slow surveys”

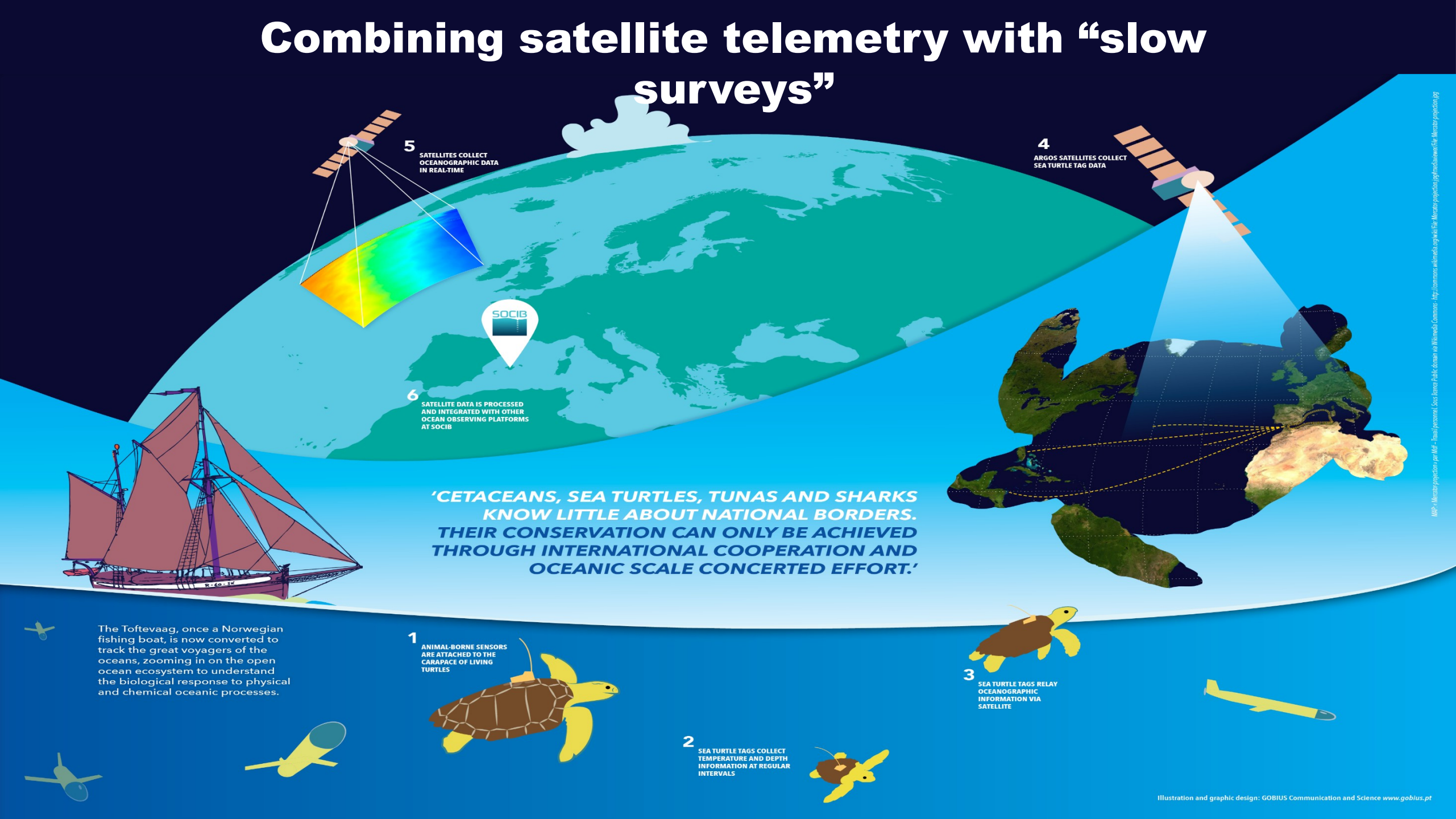


Illustration and graphic design: GOBIUS Communication and Science *www.gobius.pt*

M E D T O P

Monitoring the open ocean

The Mediterranean Sea is a **“miniature ocean”**. A hotspot of biodiversity exposed to extraordinary pressures from the sectors of transport, security, tourism, fishing & agriculture, energy, etc.

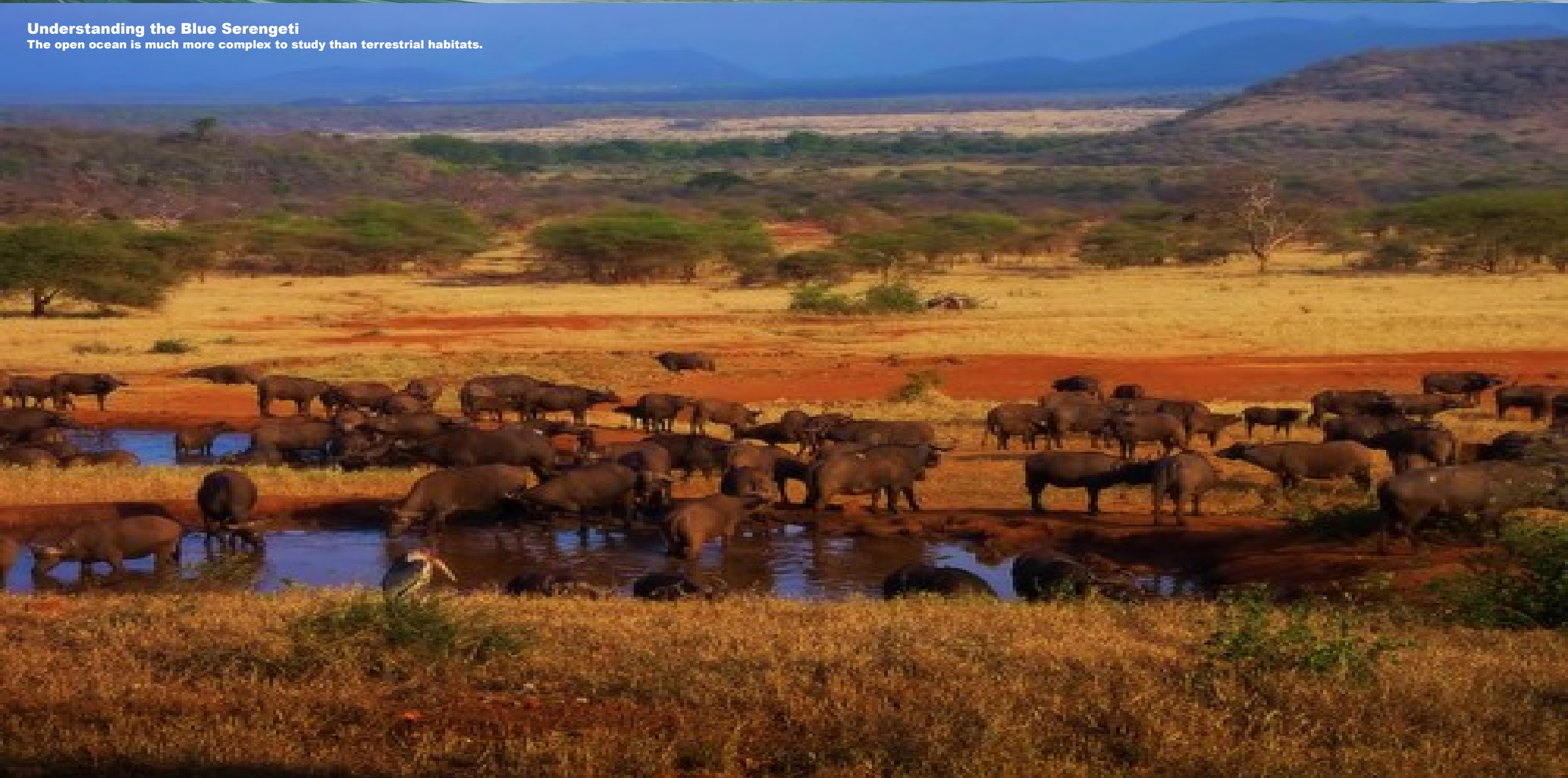
It is therefore a unique **laboratory** to study the open ocean ecosystem and develop and test technological measures for mitigating risks.

The open ocean ecosystem

The largest and least known ecosystem on Earth. We like to call it the “Blue Serengeti”. It is critical to understand and conserve this ecosystem that is critical for our climate, the air we breathe and our food security.

Understanding the Blue Serengeti

The open ocean is much more complex to study than terrestrial habitats.

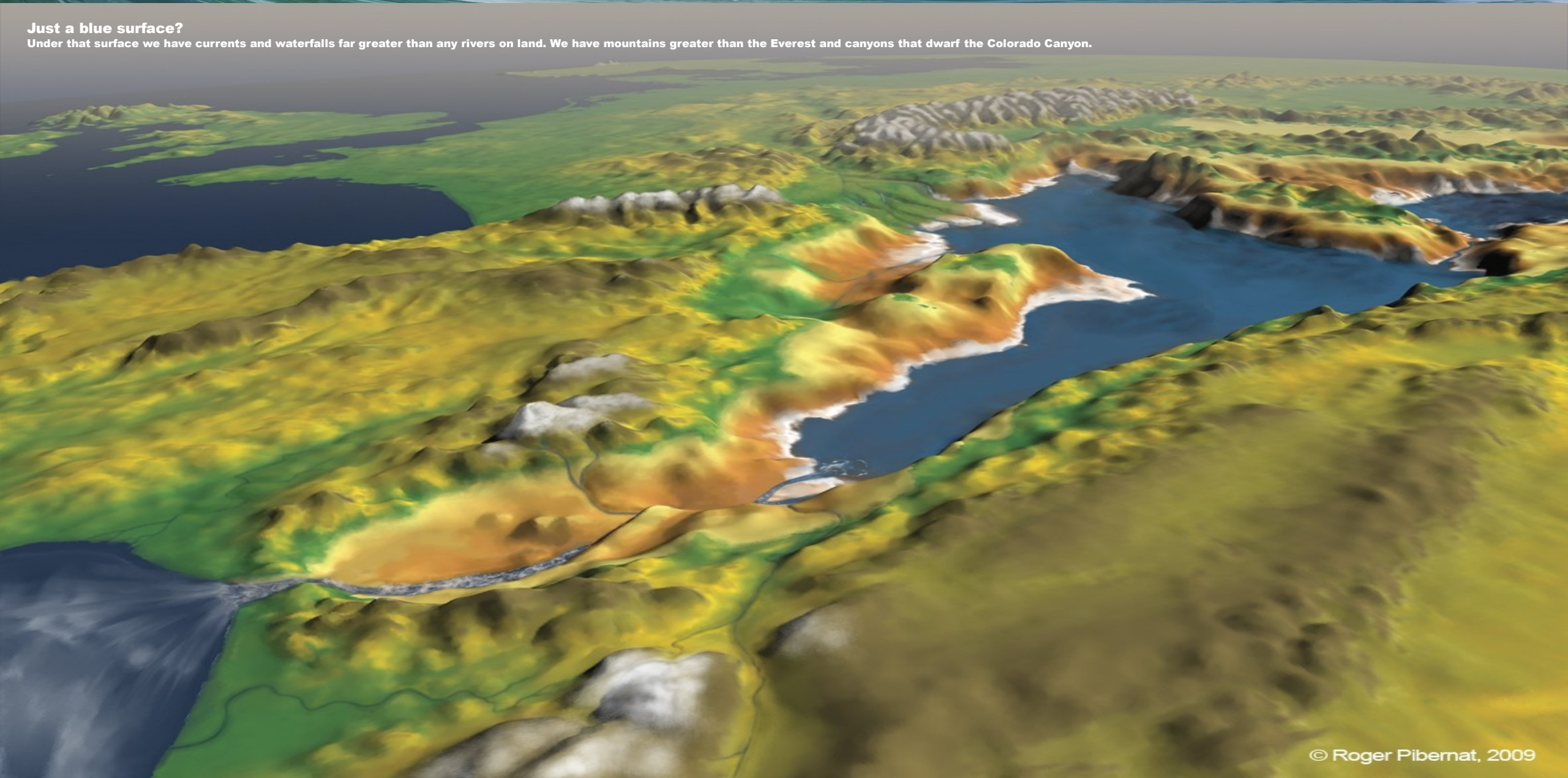


Just a blue surface?

It's vast, 3-dimensional, and going out there to do research and monitoring poses important economical and logistical challenges.

Just a blue surface?

Under that surface we have currents and waterfalls far greater than any rivers on land. We have mountains greater than the Everest and canyons that dwarf the Colorado Canyon.



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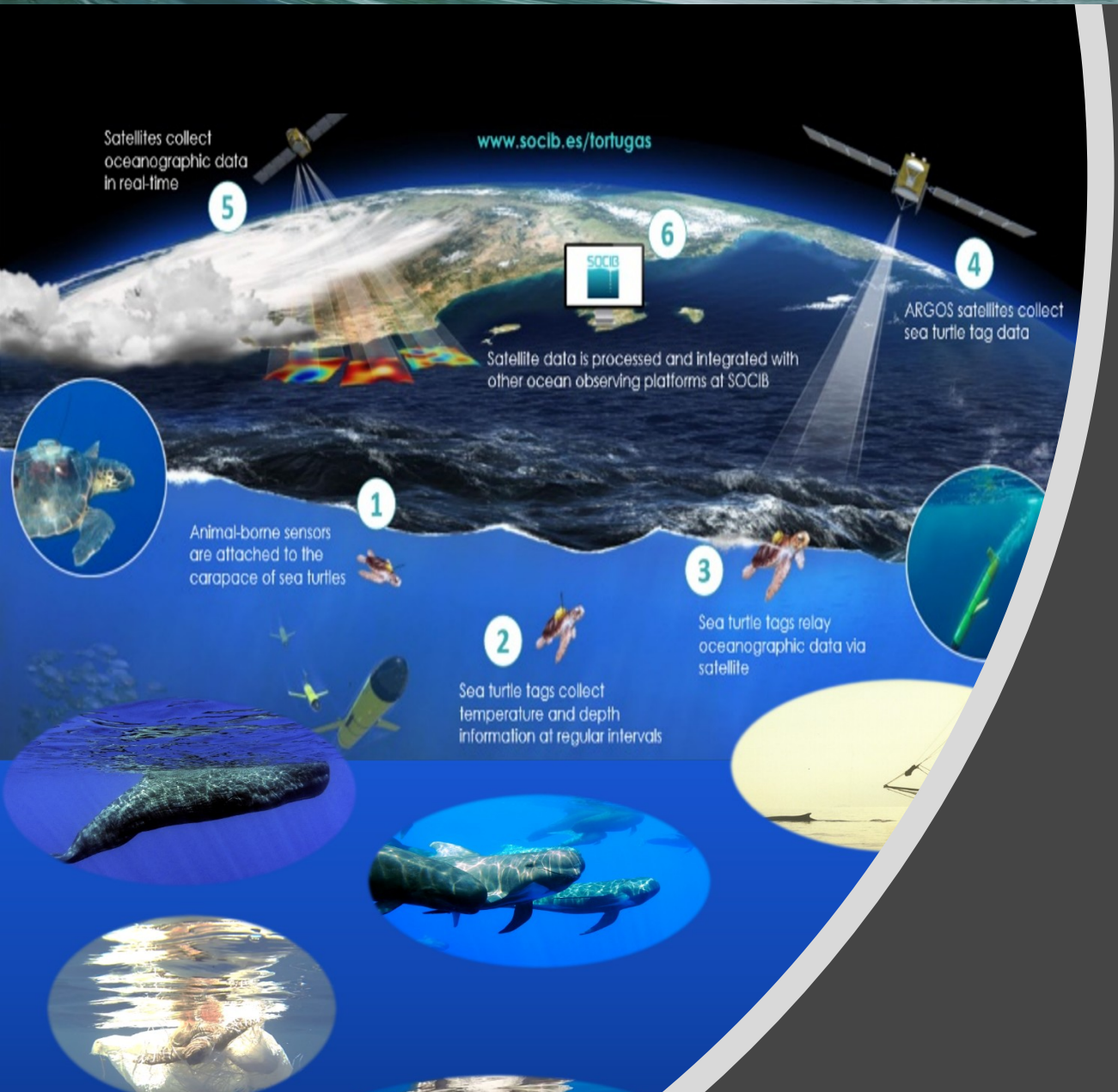
Using Mediterranean megafauna as “umbrella species”

In MEDTOP, cetaceans, seabirds, sharks, tunas and marine turtles serve as indicator species that help us better understand the open ocean ecosystem.

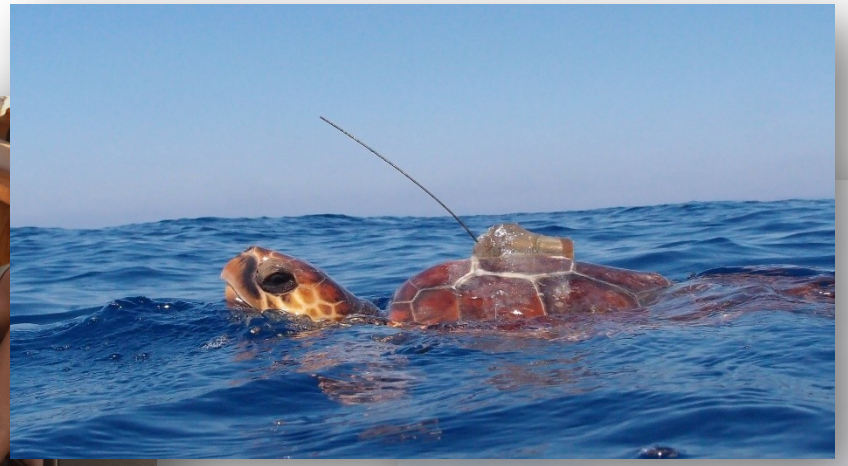


The revolution in atmospheric and oceanographic research

Modern-day computers, satellite telemetry, bioacoustics and electronic monitoring systems have opened a new era for research and monitoring the ocean and atmosphere.

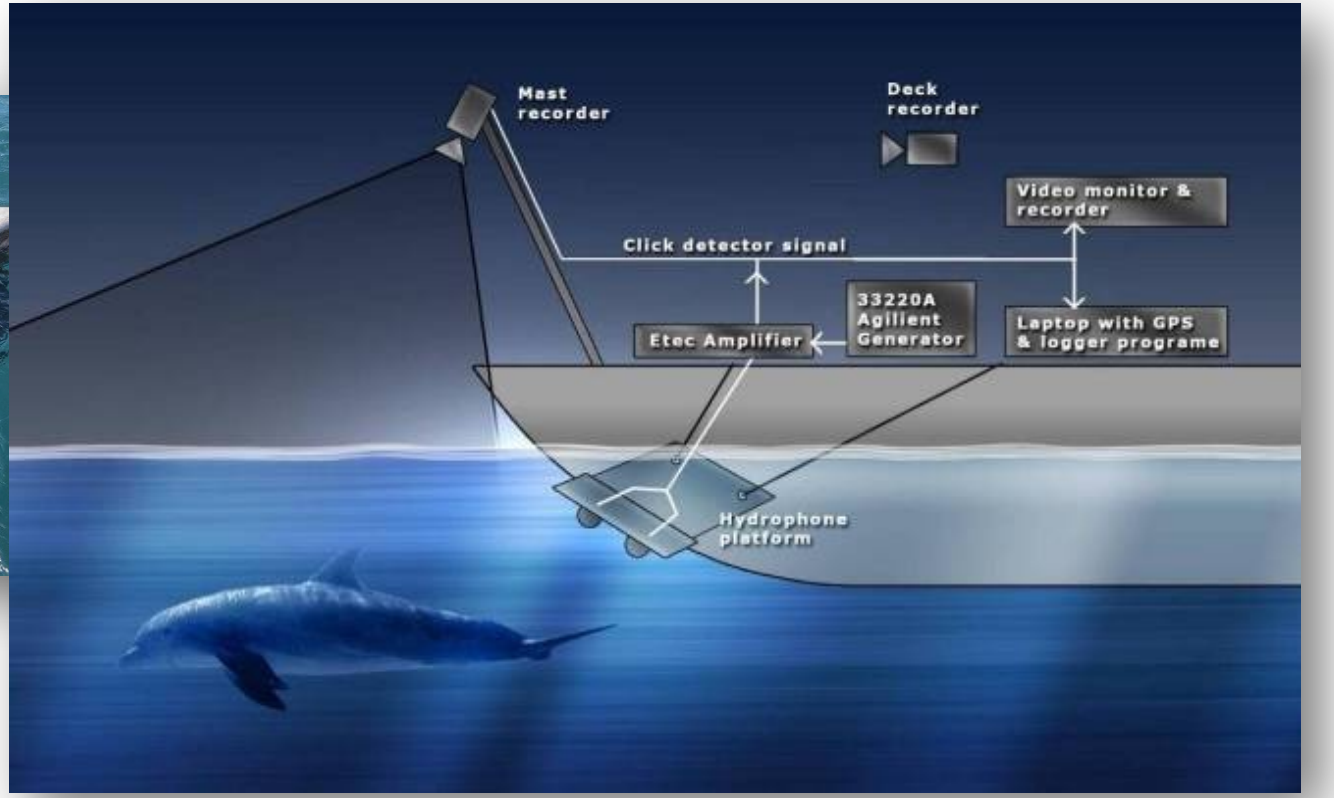
MEDTOP – Toftevaag expeditions / satellite telemetry

Since 2002 we have deployed over 80 satellite transmitters on loggerhead turtles, sharks and bluefin tuna.

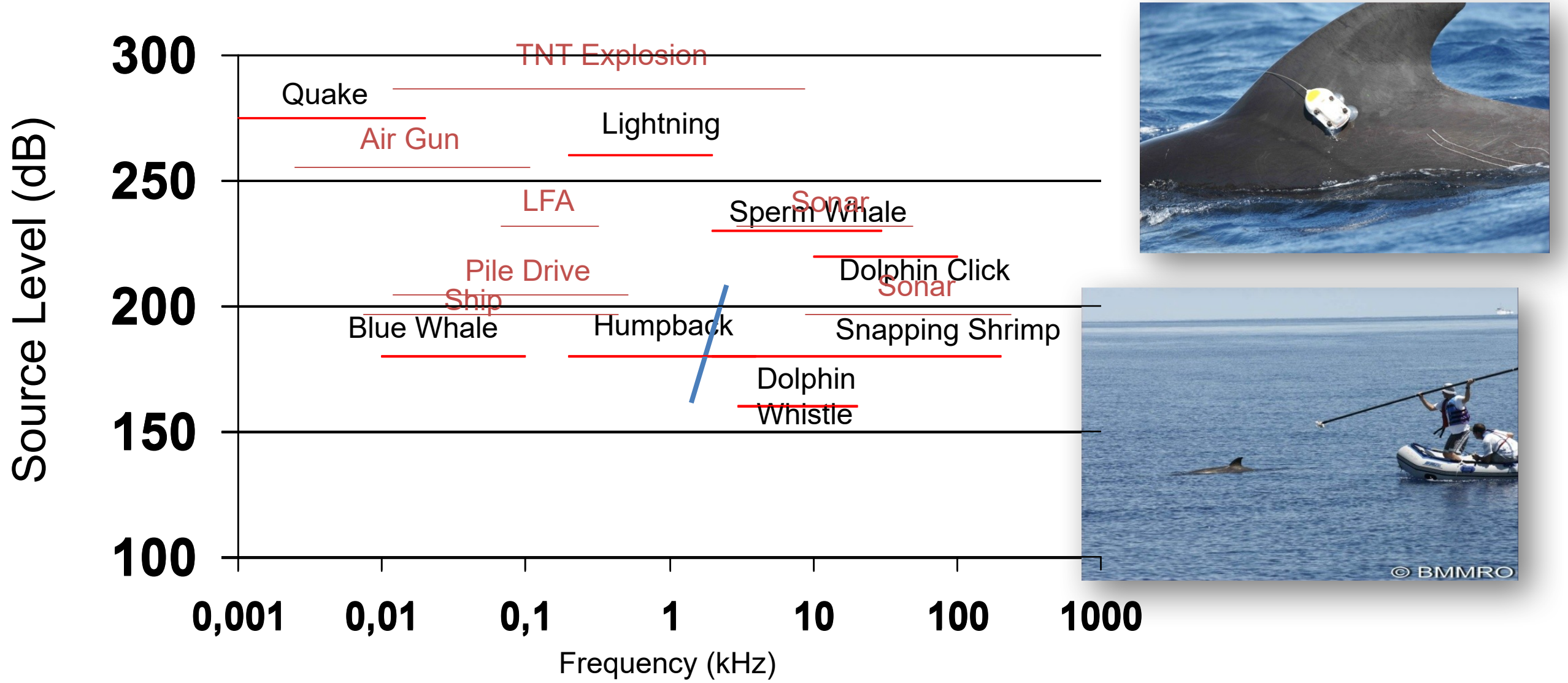


MEDTOP – Toftevaag expeditions / acoustic tracking

In 2013 we deployed the first acoustic tags on turtles in the Mediterranean.



MEDTOP – Toftevaag expeditions acoustic tracking
Since 1994 we track whales using passive acoustic monitoring technology.

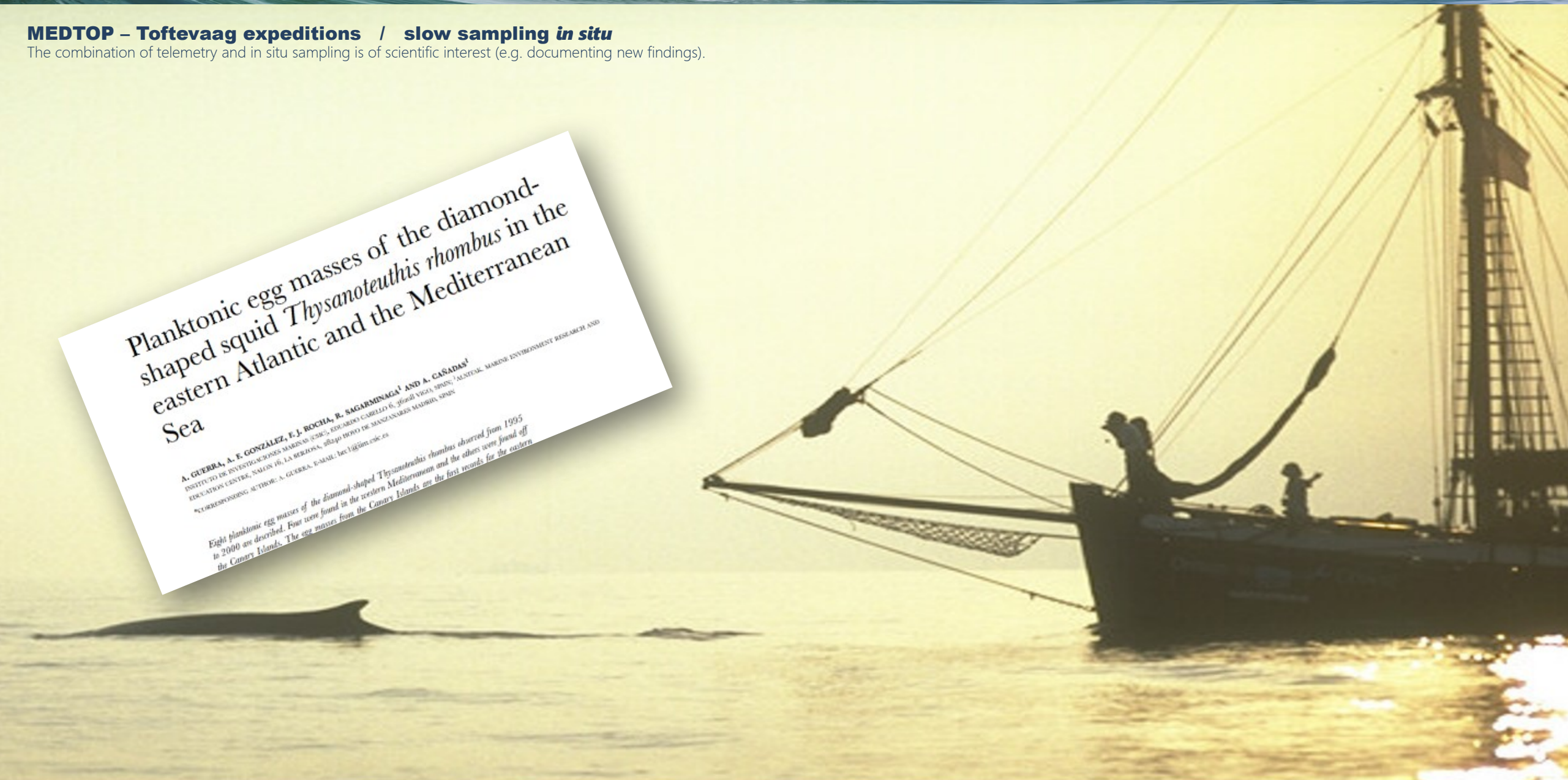


MEDTOP – Toftevaag expeditions / slow sampling *in situ*

Since 1990 slow pace visual and acoustic surveys, calibrating satellite information and sampling human activities and pelagic fauna and flora.

MEDTOP – Toftevaag expeditions / slow sampling *in situ*

The combination of telemetry and in situ sampling is of scientific interest (e.g. documenting new findings).



Planktonic egg masses of the diamond-shaped squid *Thysanoteuthis rhombus* in the eastern Atlantic and the Mediterranean Sea

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INSTITUTO DE INVESTIGACIONES MARINAS (CSIC), EDUARDO CABELLO 6, 36208 VIGO, SPAIN; [1]ALNITAK, MARINE ENVIRONMENT RESEARCH AND EDUCATION CENTRE, NALON 16, LA BERZOSA, 28240 HOYO DE MANZANARES MADRID, SPAIN
*CORRESPONDING AUTHOR: A. GUERRA, E-MAIL: hec1@iim.csic.es

Eight planktonic egg masses of the diamond-shaped Thysanoteuthis rhombus observed from 1995 to 2000 are described. Four were found in the western Mediterranean and the others were found off the Canary Islands. The egg masses from the Canary Islands are the first records for the eastern

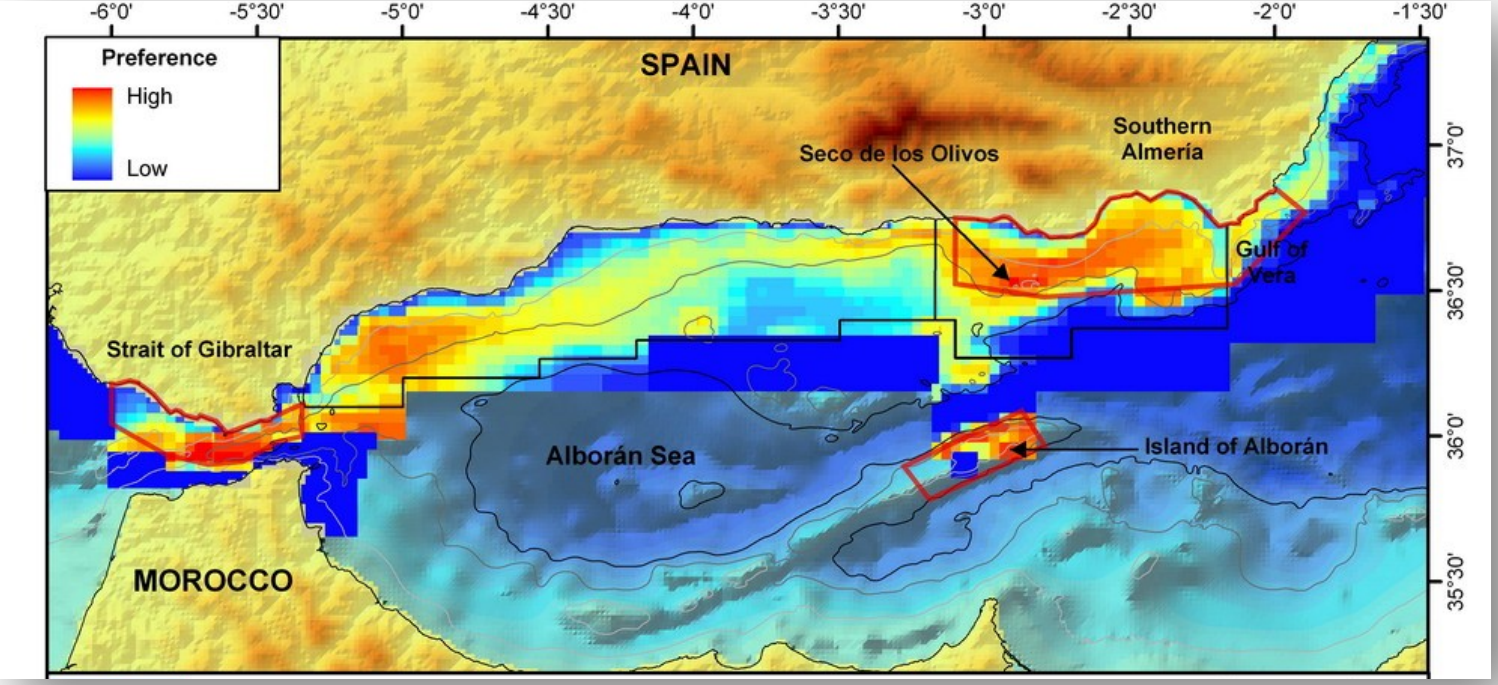
MEDTOP – Toftevaag expeditions / slow sampling *in situ*

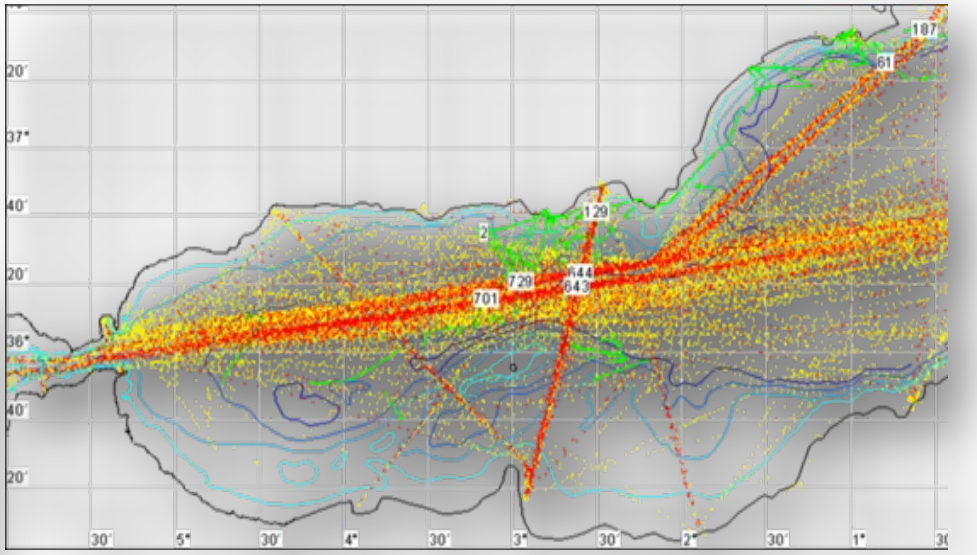
Slow surveys in situ allow us to collect high-quality multimedia that can complement scientific data.

MEDTOP – Where does the data & multimedia go?

All the data of MEDTOP is directly processed to be a contribution to international marine biodiversity conservation policy and sustainability strategies.

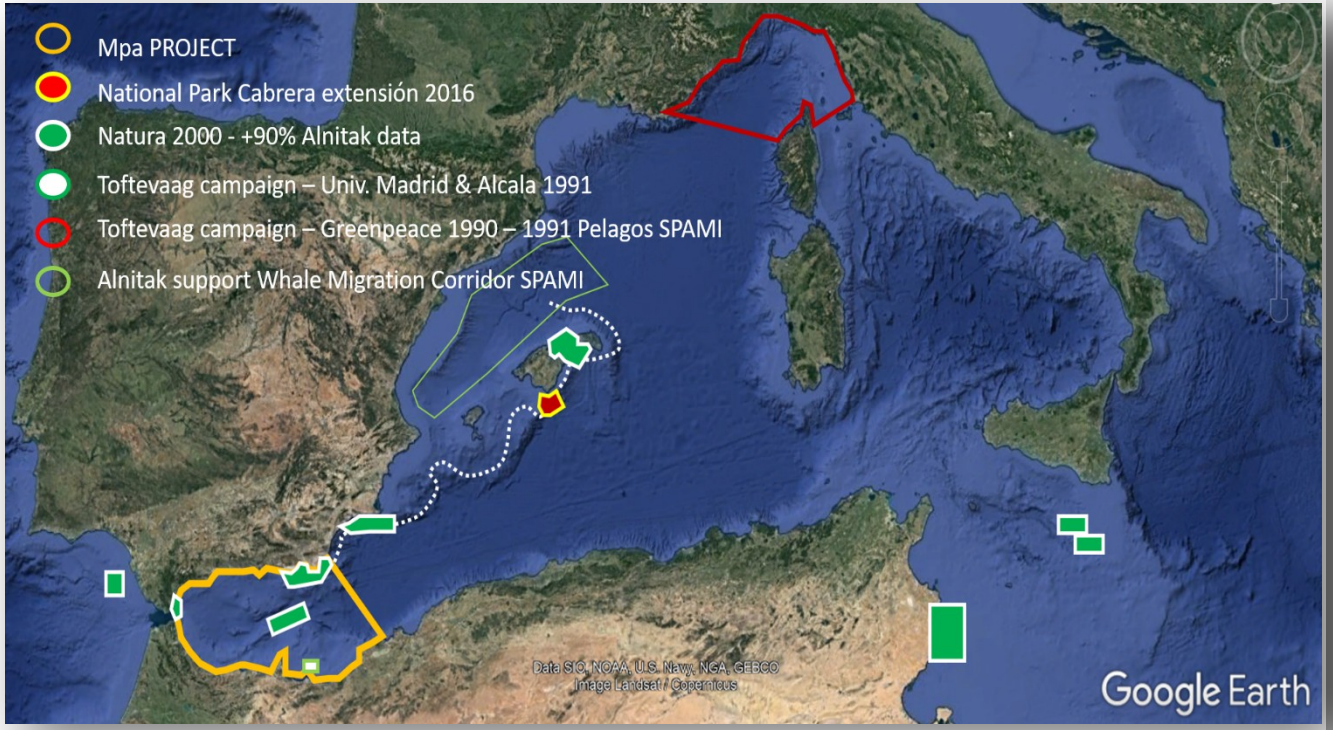
DATA – MAPS – IMAGES for management

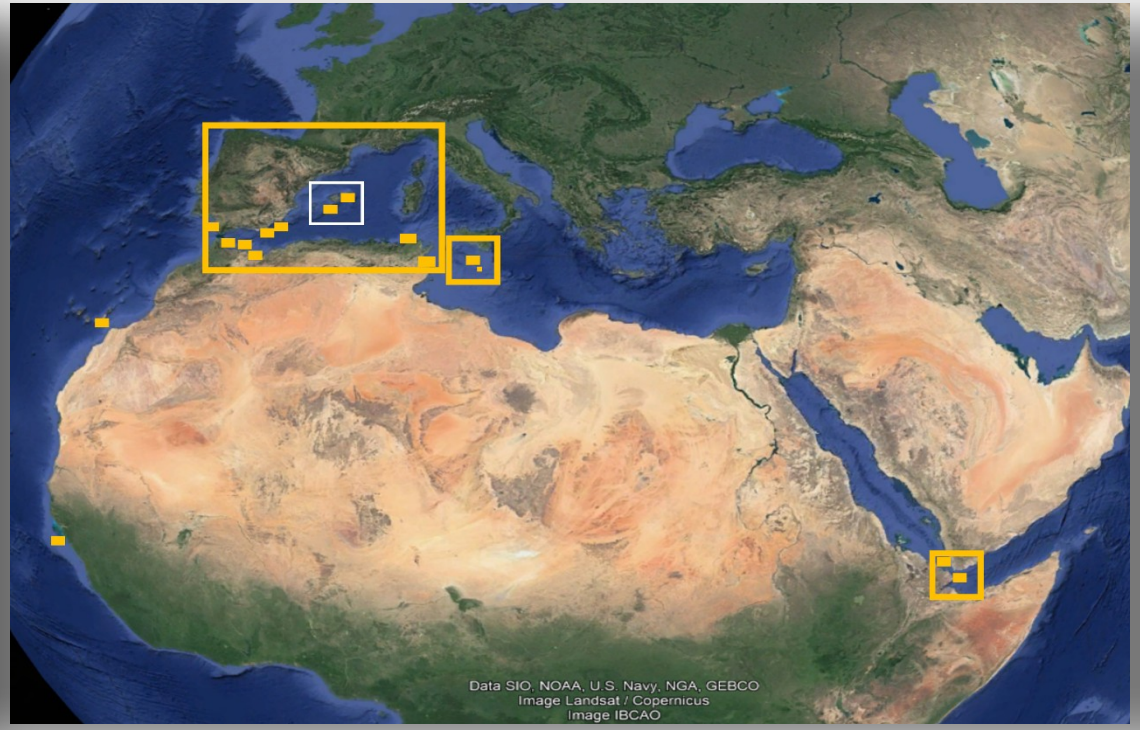




MEDTOP – The outcome since 1990

18 MPAs / Reconfiguration of shipping lanes in Alboran / 95% reduction in bycatch of turtles in LLSWO / Risk zone mapping for SONAR – Beaked whale stranding risk / Capacity development, standardizing of protocols, international networking and collaboration / Education / **Stakeholder engagement** /
Replicating the Alnitak formula in S & C America, Africa and throughout the Mediterranean.





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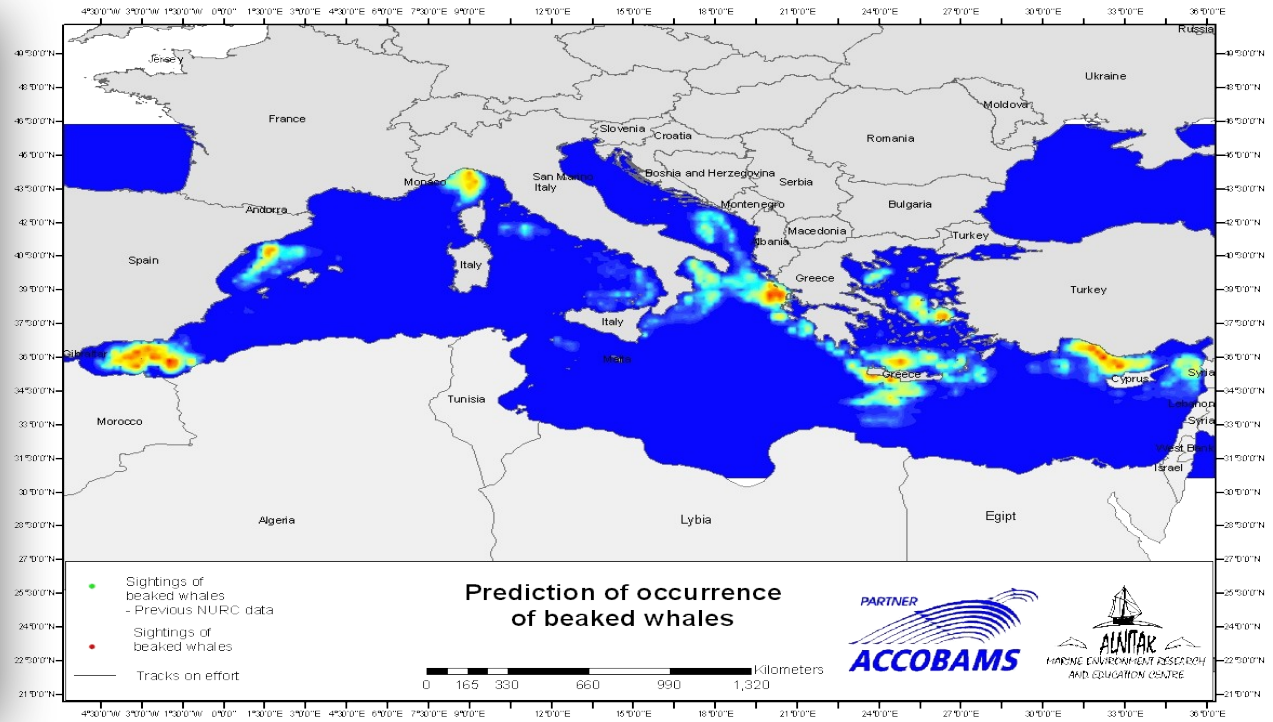

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The role of the International Maritime Organization in reducing vessel threat to whales: Process, options, action and effectiveness

Gregory K. Silber [a,*], Angelia S.M. Vanderlaan [b,c], Ana Tejedor Arceredillo [d], Lindy Johnson [e], Christopher T. Taggart [b], Moira W. Brown [f,g], Shannon Bettridge [a], Ricardo Sagarminaga [d,h]

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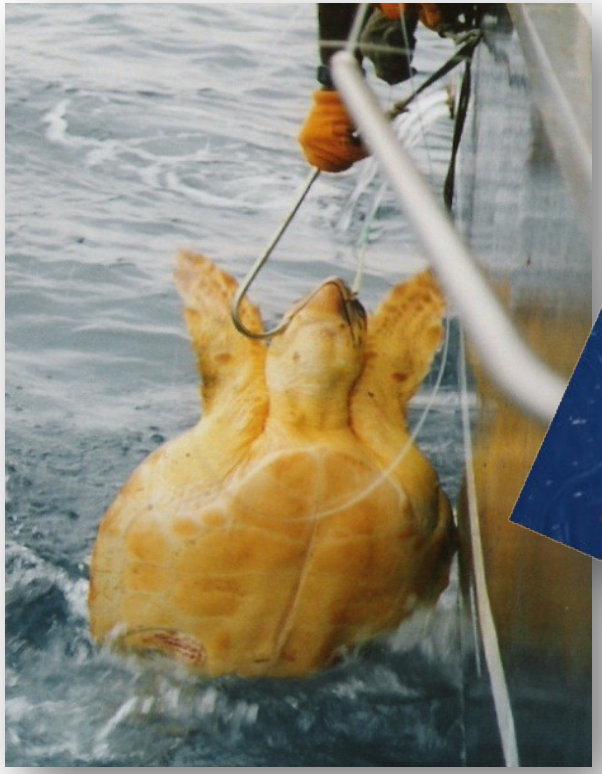
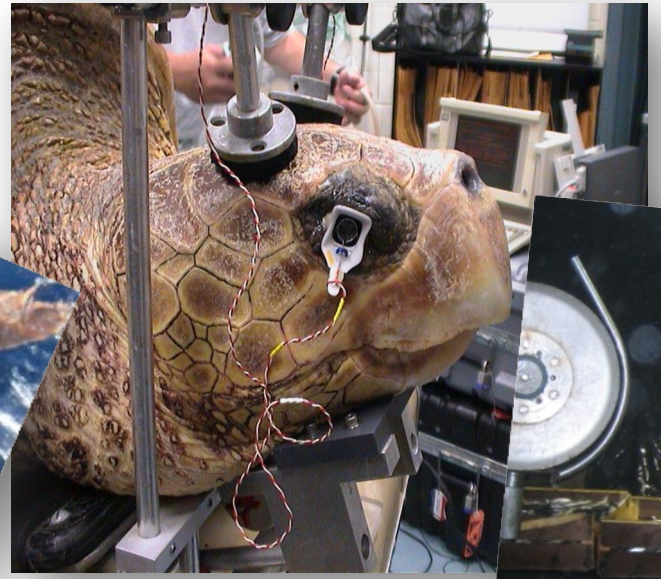




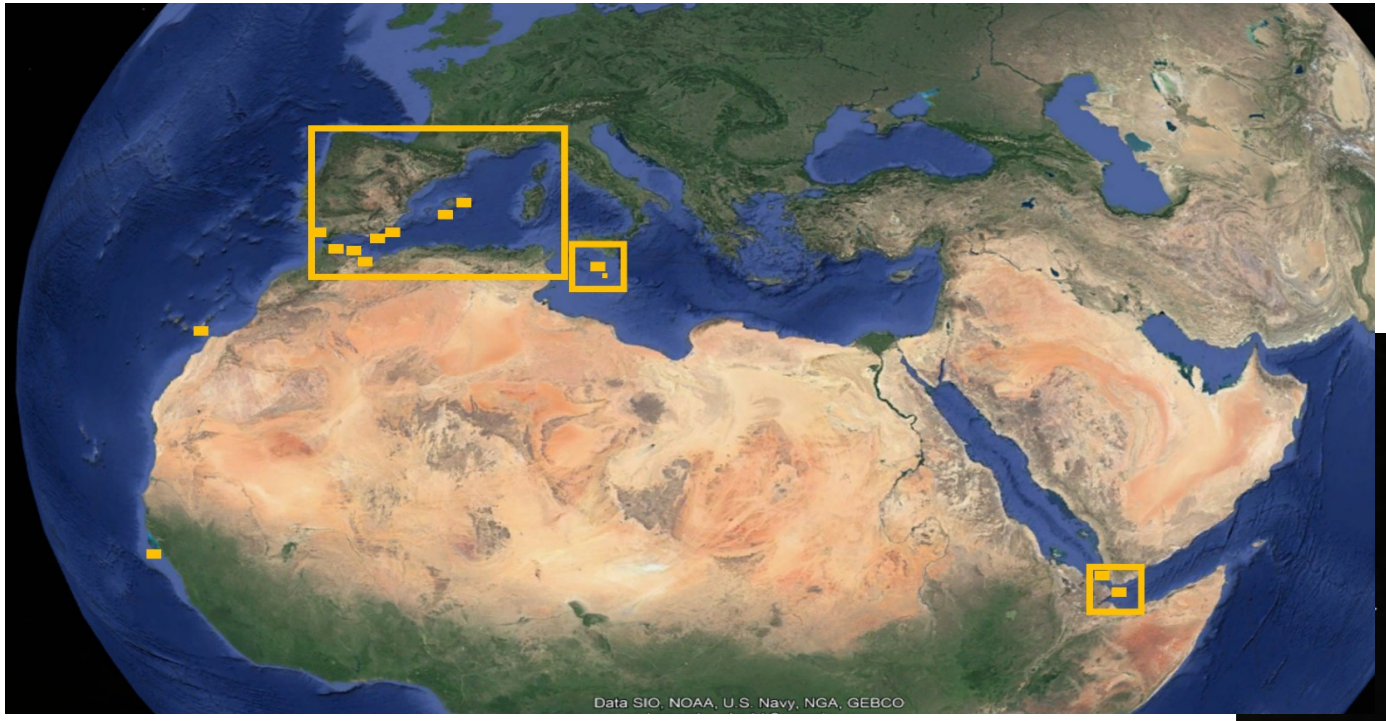
MEDTOP – Alnitak formula

Our formula is simple. Put the science on the table and engage all relevant stakeholders from day-1 in the search for win-win solutions to concrete problems. Build bridges with empathy and mutual respect.

MEDTOP – Alnitak formula

The final phase of this formula is sharing perspectives worldwide with other institutions and people working on the same challenges.
And replicating solutions.

MEDTOP
Replicating



MEDTOP 2022 – 2025 Road map

Research site - The MEDTOP surveys and sea trials of 2022 will be conducted in MPA's of the Western and Central Mediterranean.

Targets (per year):

- 180 days of shipboard survey / 5.000+ nmi
- 1000+ hours of acoustic sampling
- 2000+ point sampling stations
- 50 micro plastic / plankton sampling stations
- 8 satellite transmitters & 4 acoustic tags deployed
- Retrieval of 15+ cubic meters of marine litter and ghost gear
- 4 sea trials of "Oasis III Satlink ELB intelligent at AD" (60 sea days)

Thanks