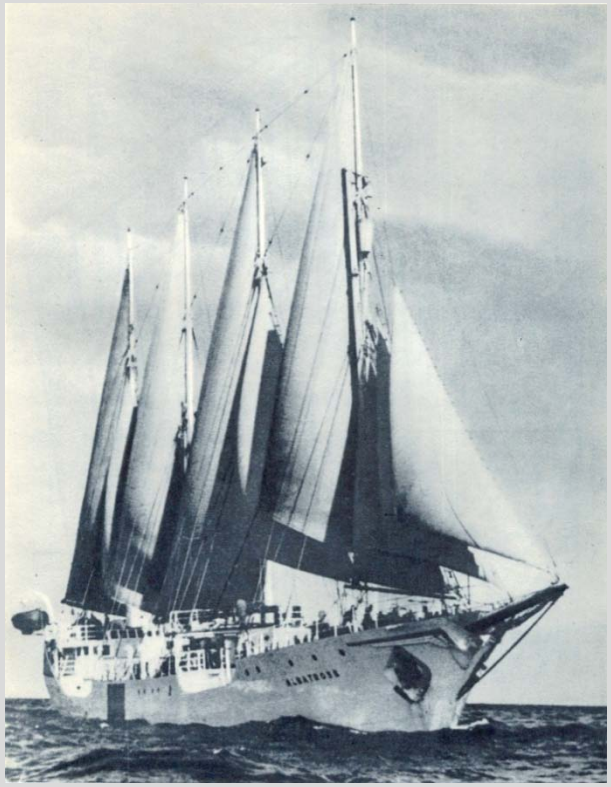
EurOCEAN 2010
Thermae Palace (Oostende, Belgium, 12-13 October 2010)

Training the Next Generation of Marine Scientists -

Sailing the Future



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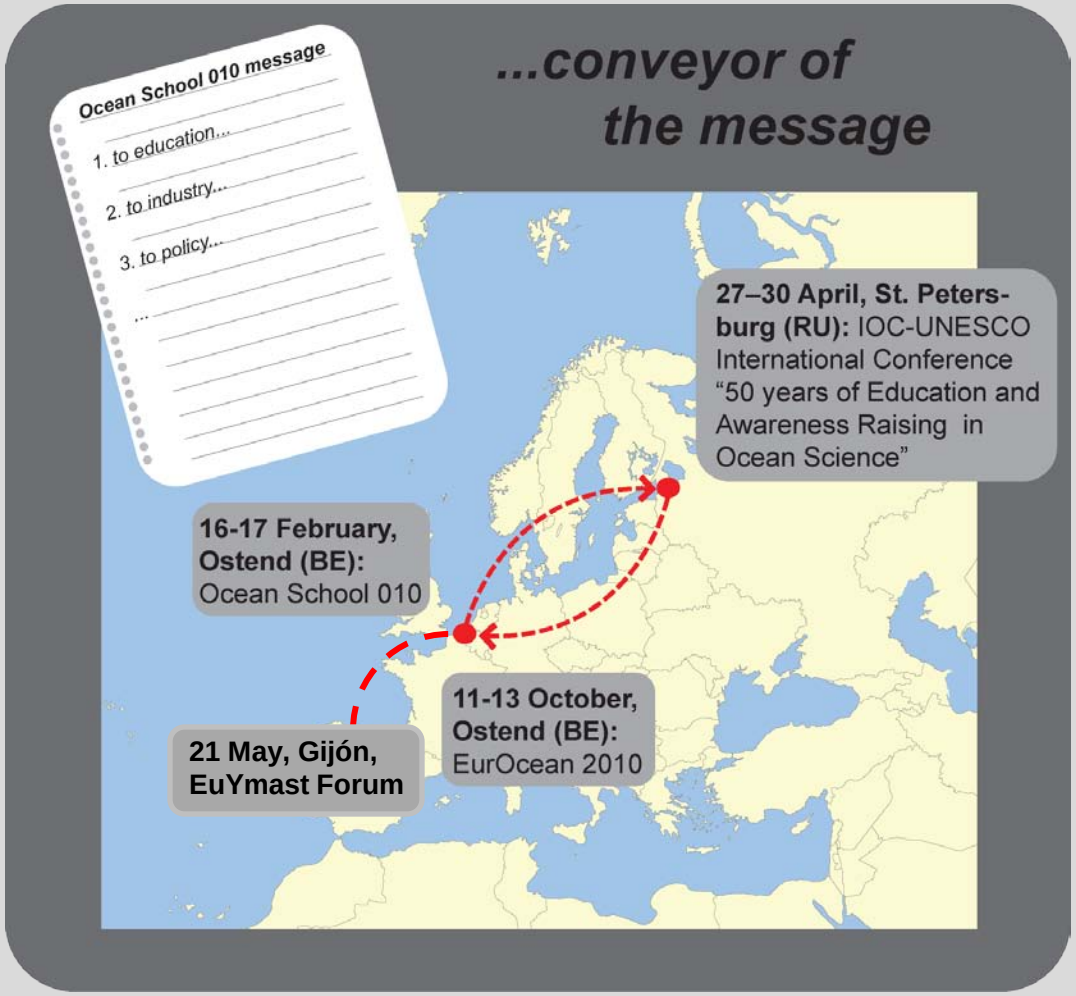
Renard Centre of Marine Geology,
Ghent University, Belgium

Ostend Declaration

Training and Career Development

"Establish appropriate training and mobility opportunities for marine ***researchers and technologists*** to deliver both ***stable and attractive*** career pathways and the ***highly skilled*** workforce that will be needed to support ***expanding marine and maritime*** sectors".



The voice of

- Academia
- Industry
- Policy
- Youth

A review of opportunities

- Training / programmes
- Infrastructure

An analysis and some actions

The voice of academia

System view: requires a **strong background** for observing, monitoring, understanding and modelling ecosystems, and for critically assessing strengths and limits of analytical tools.

New challenges:

- ***linkages*** between fluxes (bio-geo-chemical)
- ***tipping points,*** where systems change from one state to another
- ***ultra-high resolution*** of archives

Applied research: scientific support in ocean governance studies, in studies towards the sustainable use of the ocean, in biotechnology, in industry, maritime transport, coastal protection and impact assessment.

Data management: what are relevant data and where to find, how to promote an attitude of data sharing and integrating – ethics.

The voice of Industry

(sea food, aquaculture, offshore, …)

Trans-disciplinarity

The Engineer

He knows "How"

The Scientist

He knows "Why"

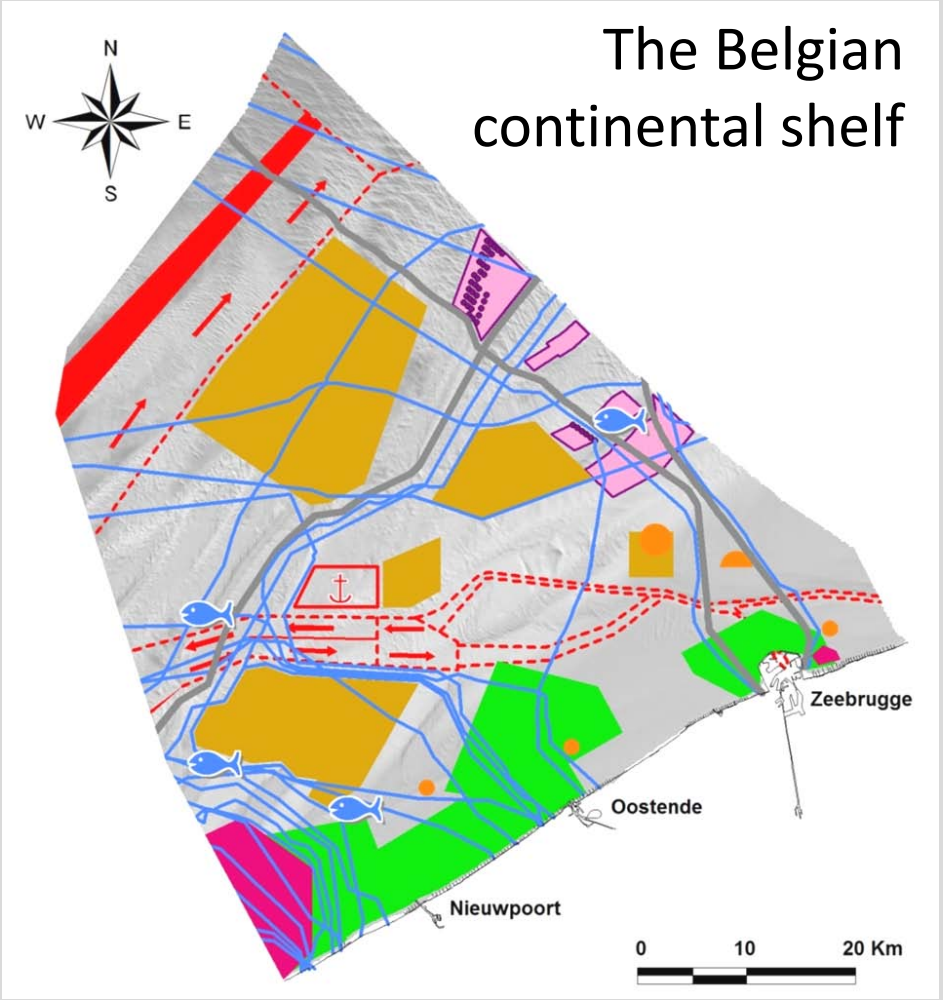
*shape more "**Polytechnicians of the Sea**"!*

A better co-ordination of international educational efforts

If needed: prepared for taking over education and training, tailored to their needs, to fill gaps

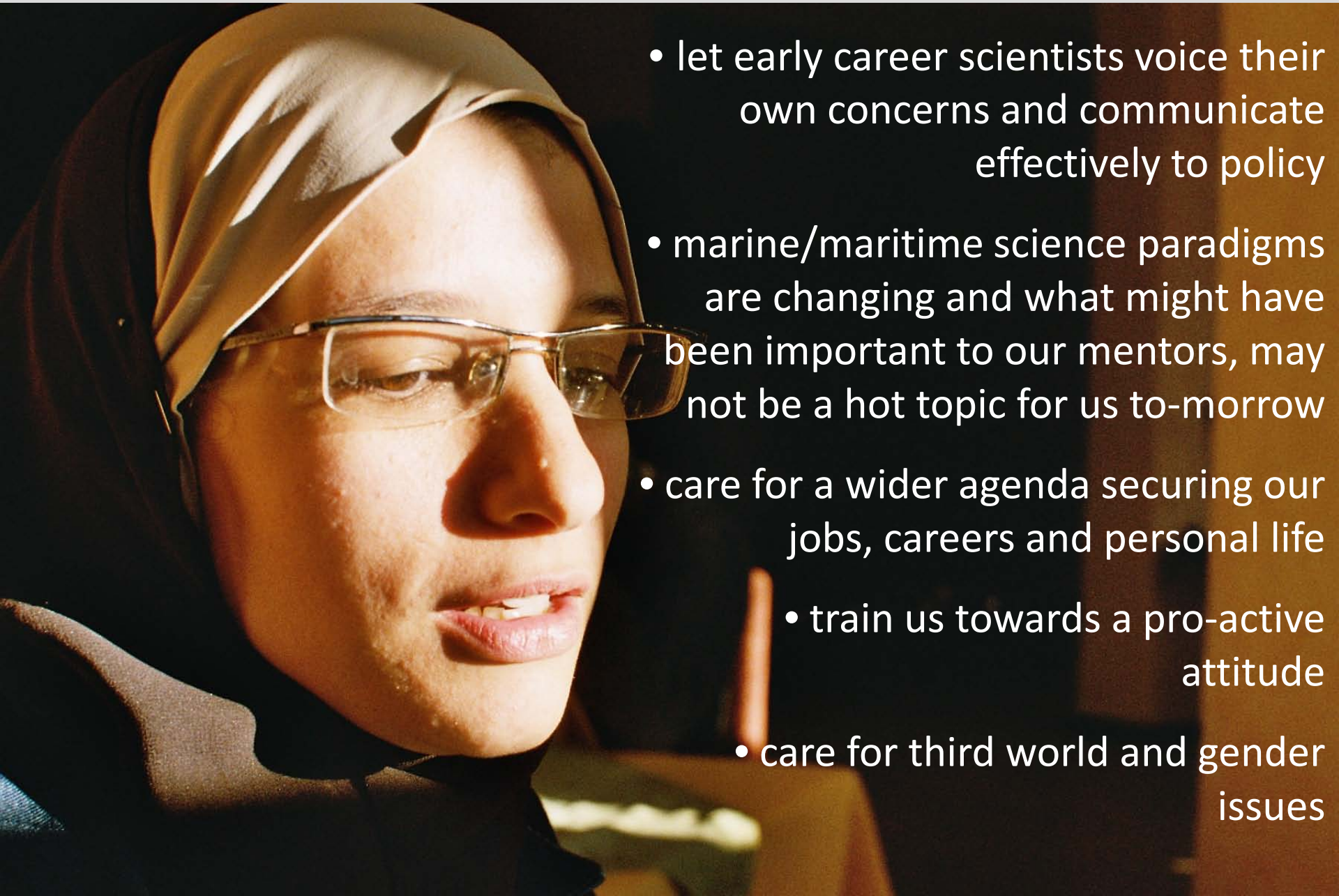
The voice of Policy

The learning of the Governance of the Sea, MPA's, *complex issues*



- Navigation
- Danger areas (old munitions)
- Wind mill parks
- Natural reserves
- Gas pipes and cables
- Dumping areas
- Fisheries and aquaculture
- Sand extraction

The voice of Youth



- let early career scientists voice their own concerns and communicate effectively to policy
- marine/maritime science paradigms are changing and what might have been important to our mentors, may not be a hot topic for us to-morrow
- care for a wider agenda securing our jobs, careers and personal life
- train us towards a pro-active attitude
- care for third world and gender issues

Training the next generation of marine scientists (a)

– the *right scale*, the *right time*, with the *right resources* –

- ***spark the curiosity*** and excitement of kids, start small, locally, with “top-down” stimulated “bottom-up” initiatives

- ***provide*** to motivated youngsters professional ***guidance*** towards the horizon, which will meet their expectation

Training the next generation of marine scientists (b)

• at graduate level: *develop* education and training schemes and opportunities towards *the highest standards* of science and technology, by clustering and international cooperation around large facilities

⇒ *track 1 (short term)*

• *tune* and match *the expectations* of both early career scientists and Society: *dreams are not incompatible with reality*

⇒ *track 2 (mid term)*

• radically *innovate*

⇒ *track 3 (long term)*

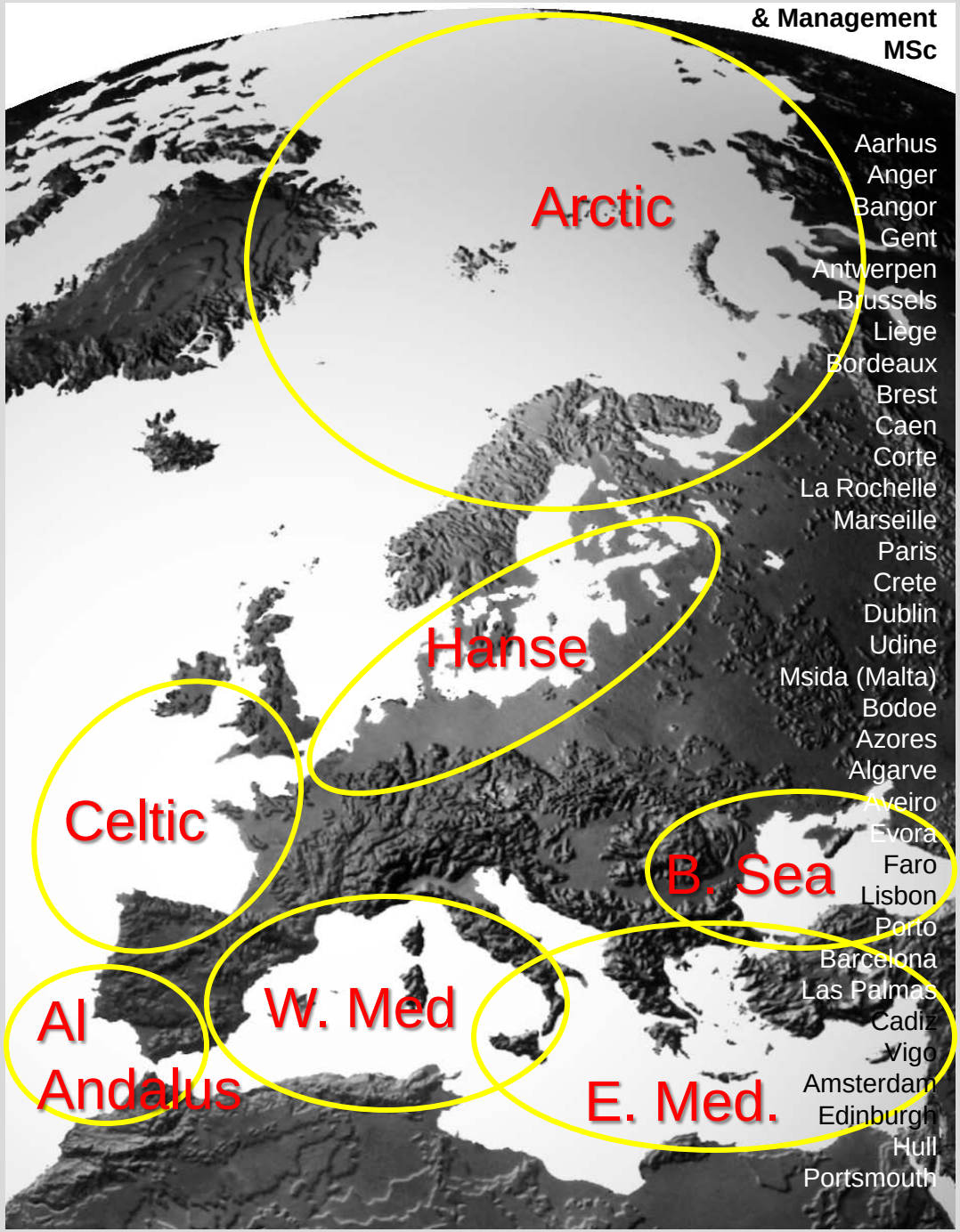
track 1

Clustering

Shape **regional Ocean Schools**, achieving

- an **E**ducational critical mass
- a **S**cientific logic
- a **C**ultural dimension

+ cooperation with developing countries



Ocean Science & Management MSc	Fisheries and Aquaculture MSc
Aarhus	Berlin
Anger	Bremen
Bangor	Gent
Gent	Haskola
Antwerpen	Montpellier
Brussels	Nantes
Liège	Perpignan
Bordeaux	Rennes
Brest	Tartu (Est)
Caen	Zagreb (Croa)
Corte	Cork
La Rochelle	Bergen
Marseille	Tromsoe
Paris	Trondheim
Crete	Bodoe
Dublin	Olsztyn
Udine	Szczecin
Msida (Malta)	Faro
Bodoe	Lisbon
Azores	Cluj-Napoca
Algarve	Wageningen
Aveiro	Canakale
Evora	Erdemli-Mersin
Faro	Aberdeen
Lisbon	Bangor
Porto	Hull
Barcelona	Stirling
Las Palmas	Swansea
Cadiz	
Vigo	
Amsterdam	
Edinburgh	
Hull	
Portsmouth	

Source: EurOceans

Track 1 - example 1 : regional clustering

Regional clustering of programmes and facilities

"North-West European Ocean School" from Ostend to St. Petersburg - *from Secondary School to Doctoral School*,

FOCUZ

GLOMAR

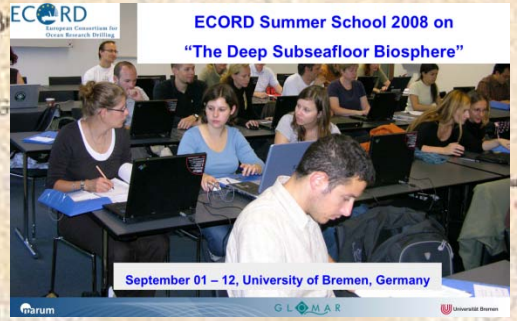
IODE

EMBC

Flanders Marine Institute

Université de Liège

OCEANS & LAKES

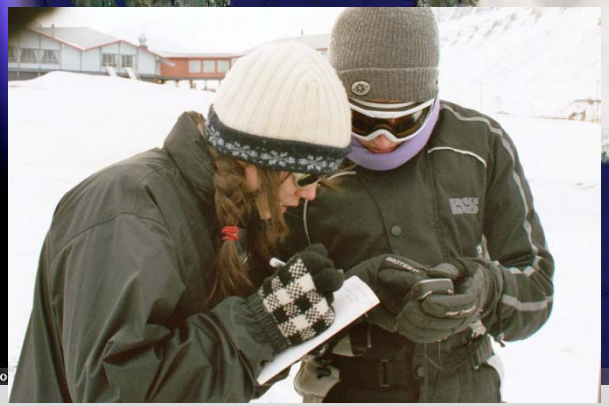


The role of coastal stations, regional vessels, museums and aquaria within regional clusters

- Coastal stations + regional vessels as Windows on the Ocean

- Museums, aquaria: datasets and experiments accessible to students and scientists

Track 1 – example 2 : clustering around a unique infrastructure (a)



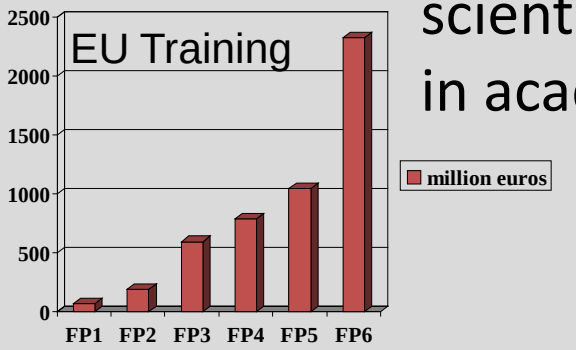
Clustering around a unique infrastructure (b): large global vessels

- IOC – UNESCO Training Through Research (Floating University)
- EU EuroFleets global vessels

Track 2

matching the expectations of early career scientists and Society

- **The problem**: the success story of MAST 1 (1989), 2, 3 and its legacy – a wealth of top quality young marine scientists trained, for too few jobs in academia, R & D



⇨ Brain drain
Brain loss

- **In parallel**: a recruitment problem in the maritime sector

- **A solution**: build bridges between the marine science and the maritime sector (naval officers) training and education worlds

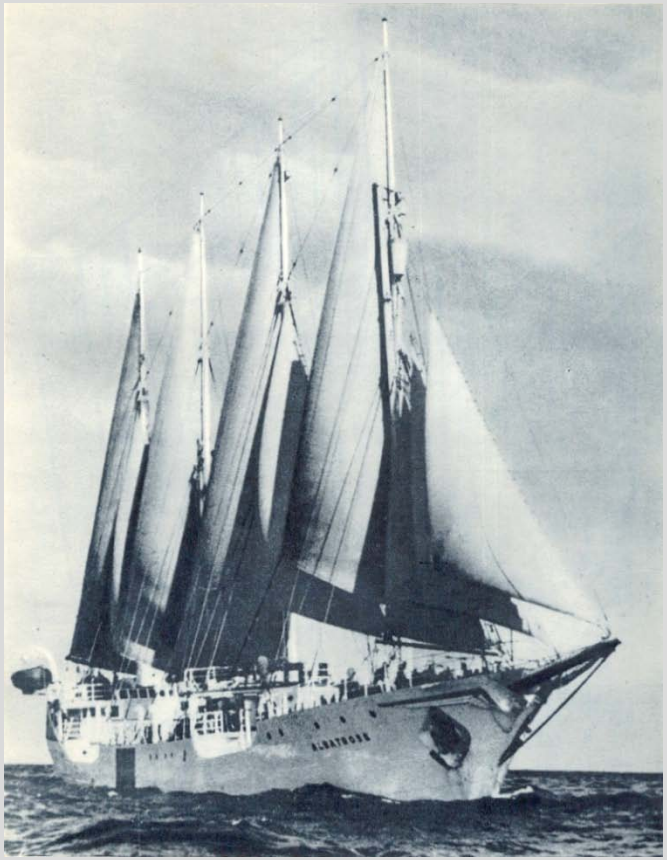
⇨ *naval officers with a marine science background*

⇨ *marine scientists acquiring a maritime culture*

Marine scientists acquiring a maritime culture: bring marine science and young marine scientists to the tall vessel fleet (school boats) - *the short term option*

Statsraad Lehmkuhl

Albatross, Hans Pettersson 1947



HMS Beagle
HMS Challenger
RV Atlantis
Albatross
…

Back to the Future ?

Track 3 – long term option

radically innovate

Exhaust from ships kills 90.000 people every year
Scientific American, "the end.", Sept. 2010, p. 54

The dirtiest variety of bunker fuel – the kind ships burn when on open ocean – is 4.5 percent sulfur by weight.
…
If the international shipping fleet were a country, it would be the world's sixth-highest greenhouse gas emitter, right behind Japan and just ahead of Germany.

Sail the Future: build upon the European ocean science and technology momentum to design the high-tech, green and clean fleets of the future, scientific and commercial, joint platforms for marine science and maritime training and education