

Presentation for National Advisory Panel



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Sustaining Oceans

- **Oceans Act**

Maintaining biological diversity and productivity
Precautionary approach
Integrated management



- **Fisheries Act**

Sustainable fisheries
Critical habitat
Integrated management

Habitat
Connectivity
Insurance

- **Species at Risk Act**

Conserving biological diversity
Conserving habitat

- **Indigenous Protected & Conserved Areas**



C. Cockburn Globe & Mail

What to Protect?

Canada promises 10% (!!!) by 2020

- Charismatic / emblematic species
- Special habitat (productive, pristine, diverse, structural)
- Representative habitat
- Strategic species



P Snelgrove



P Snelgrove/ROPOS



P Lawton/ROPOS



M. Strong/M. Inez-Buzeta

All good!!!!

“Sea Blindness”

When we clearcut rainforests...



When we clearcut oceans...



“Healthy” Oceans

The devil is in the details.

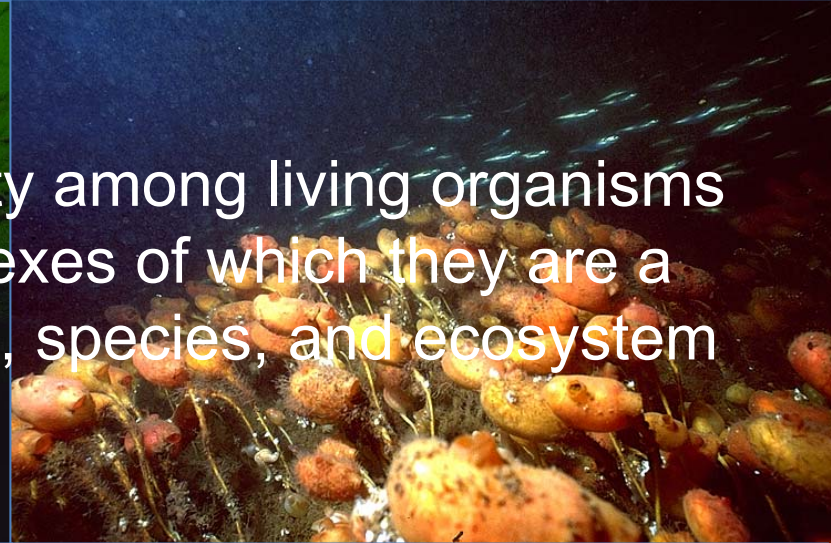
A need for clear and measurable
conservation objectives.



Marine Biodiversity

Biodiversity - the variability among living organisms and the ecological complexes of which they are a part; this includes genetic, species, and ecosystem diversity.

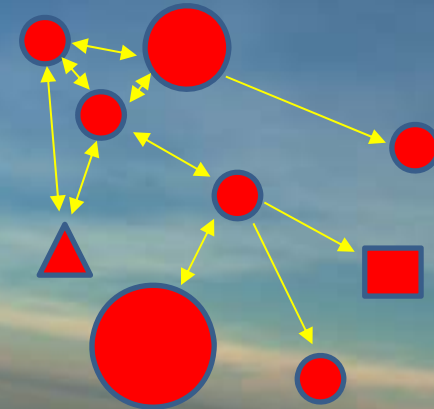
Mike Strong/Maria Inez-Buzeta



Peter Lawton/Anna Metaxas

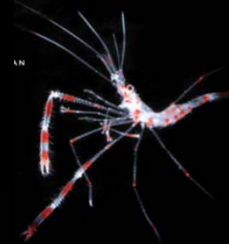
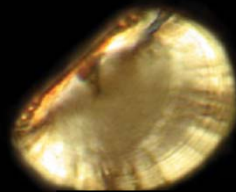
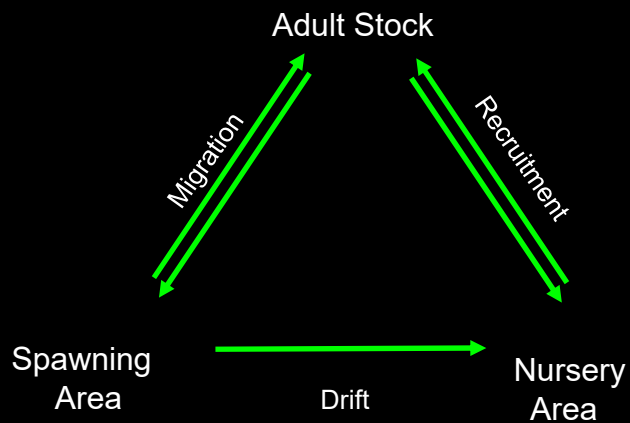
Connectivity

07:30	AC 1210	ATLANTA	Cancelled	G
07:30	AC 8018	DETROIT	Early - 07:50	G
08:05	AC 1226	ORLANDO	Early - 07:55	G
08:05	AC 1332	FORT MYERS	Early - 07:55	G
09:10	AC 781	LOS ANGELES	Early - 07:50	G
08:30	AC 737	SAN FRANCISCO	On Time	G
08:20	AC 920	WEST PALM BCH	On Time	G
08:25	AC 8902	NEW YORK-JFK	On Time	G
09:30	AC 8109	HOUSTON-IAH	Cancelled	G
08:45	AC 356	BOSTON	Cancelled	G
08:45	AC 7903	CLEVELAND	Cancelled	G
08:45	AC 7895	ST. LOUIS	Cancelled	G
08:50	AC 939	FT LAUDERDALE	On Time	G
08:55	AC 591	LAS VEGAS	Cancelled	G
08:55	AC 7928	BALTIMORE	Cancelled	G
09:00	AC 7920	CHARLOTTE	Cancelled	G
09:10	AC 1037	DENVER	Cancelled	G
09:15	AC 914	MIAMI	On Time	G
09:15	AC 7282	PROVIDENCE	Cancelled	G
09:15	AC 7891	DALLAS/FT.W	Cancelled	G
09:25	AC 589	PHOENIX	On Time	G
09:30	AC 7266	HARRISBURG	Cancelled	G
09:30	AC 7302	RICHMOND	Cancelled	G
09:30	AC 7891	COLUMBUS.OH	Cancelled	G
09:30	AC 8034	PITTSBURGH	Cancelled	G
09:35	AC 7262	GRAND RAPIDS.MIC	Cancelled	G
10:25	AC 777	SAN DIEGO	On Time	G
		SAN ANTONIO	Cancelled	G



Networks of MPAs

Connectivity - the process by which genes, organisms, populations, species, nutrients and/or energy move among spaces.

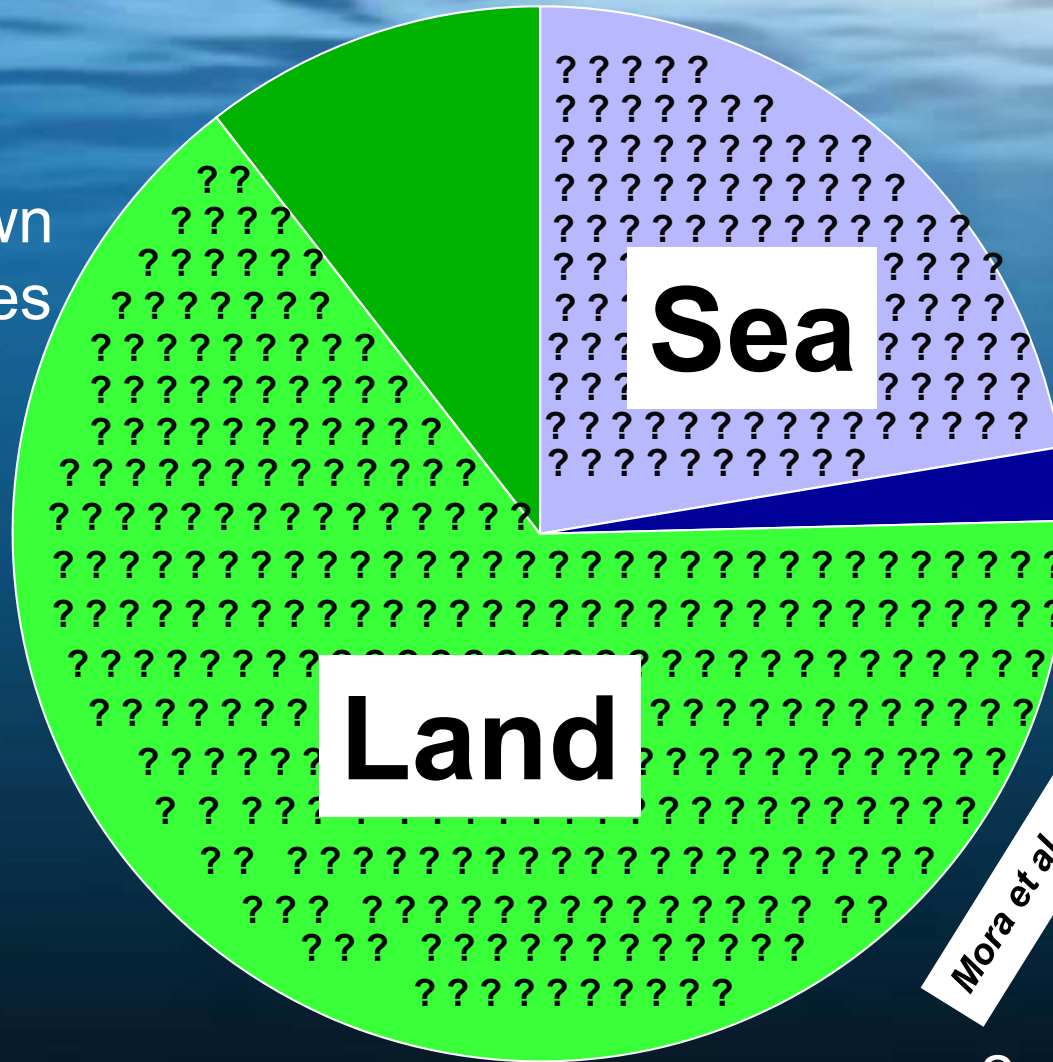


Insurance



Many Unknowns

245,000 known
marine species



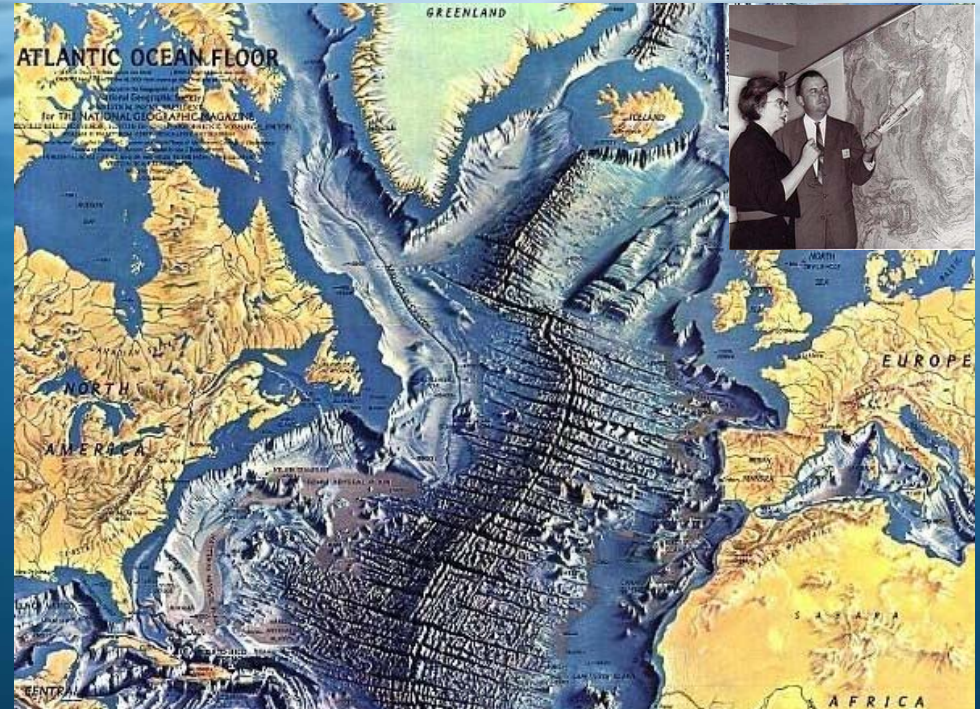
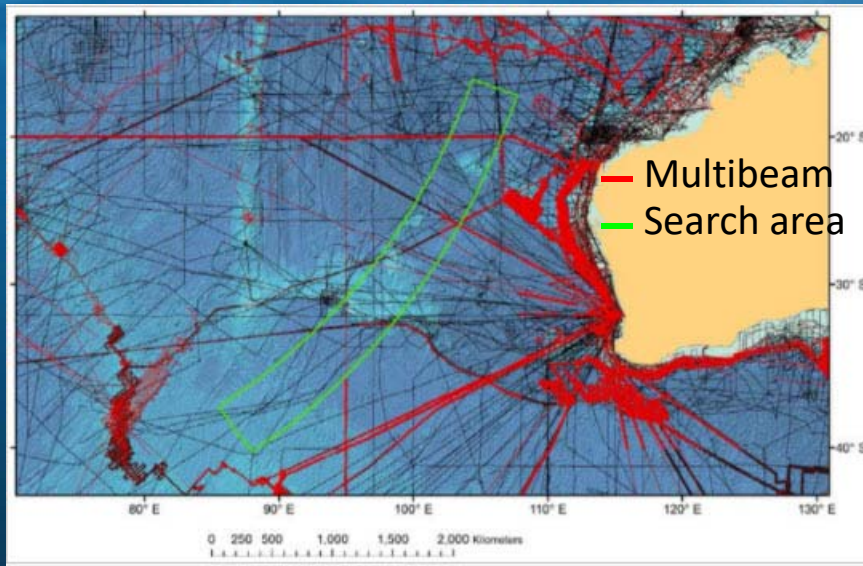
9% known

Mora et al. 2011

2 million in total?

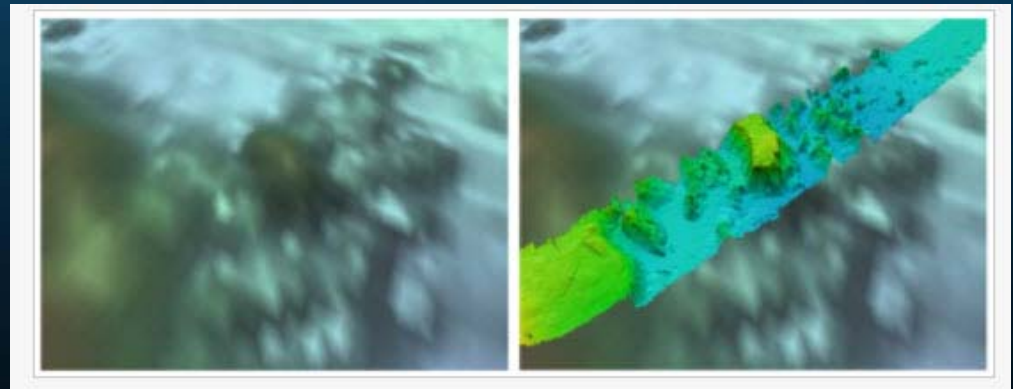
Mapping our Own Planet

Tharp and Heezen's 1977 map



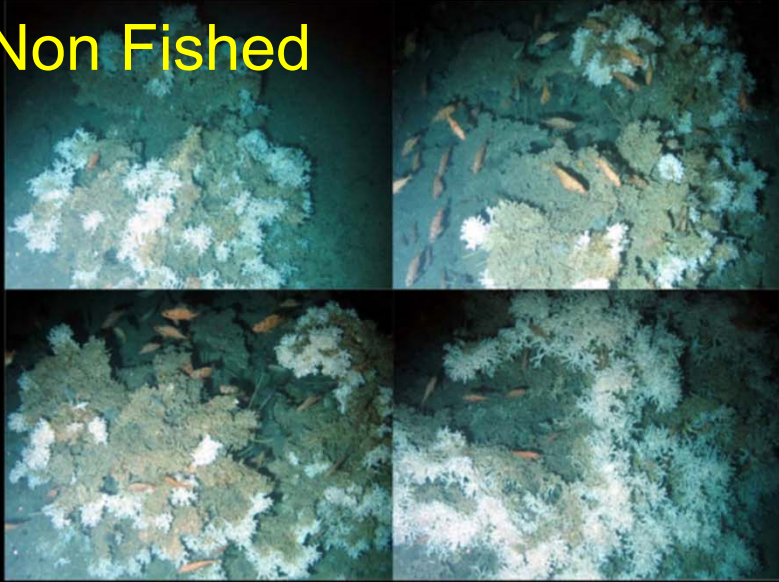
Malaysia Airlines MH370

Satellite topography vs. multibeam



The Role of Habitat

Non Fished



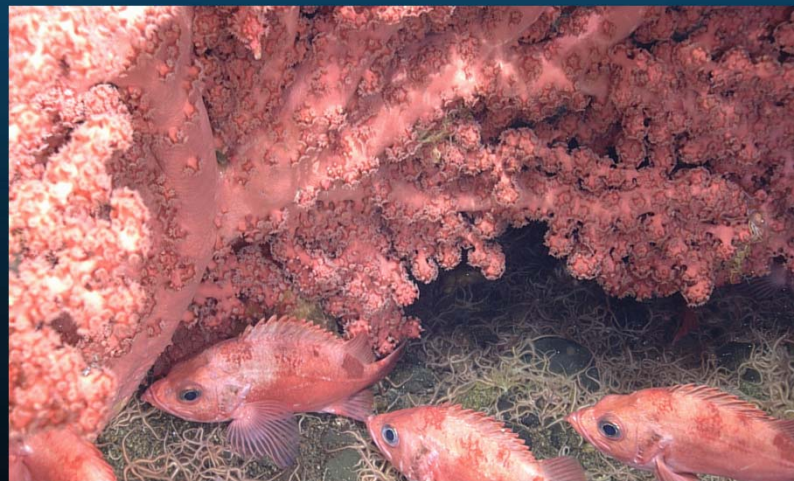
RRS *James Cook* cruise 060, 9 May – 12 June 2011; © NOC, NERC, UK, 2011

Fished



RRS *James Cook* cruise 060, 9 May – 12 June 2011; © NOC, NERC, UK, 2011

Rockall Bank - B. Bett, NOC



P Lawton/ROPOS

Marine Biodiversity & Ocean Health

Human Society, Well Being

Impacts

Biodiversity

Drivers

Ecosystem Functions

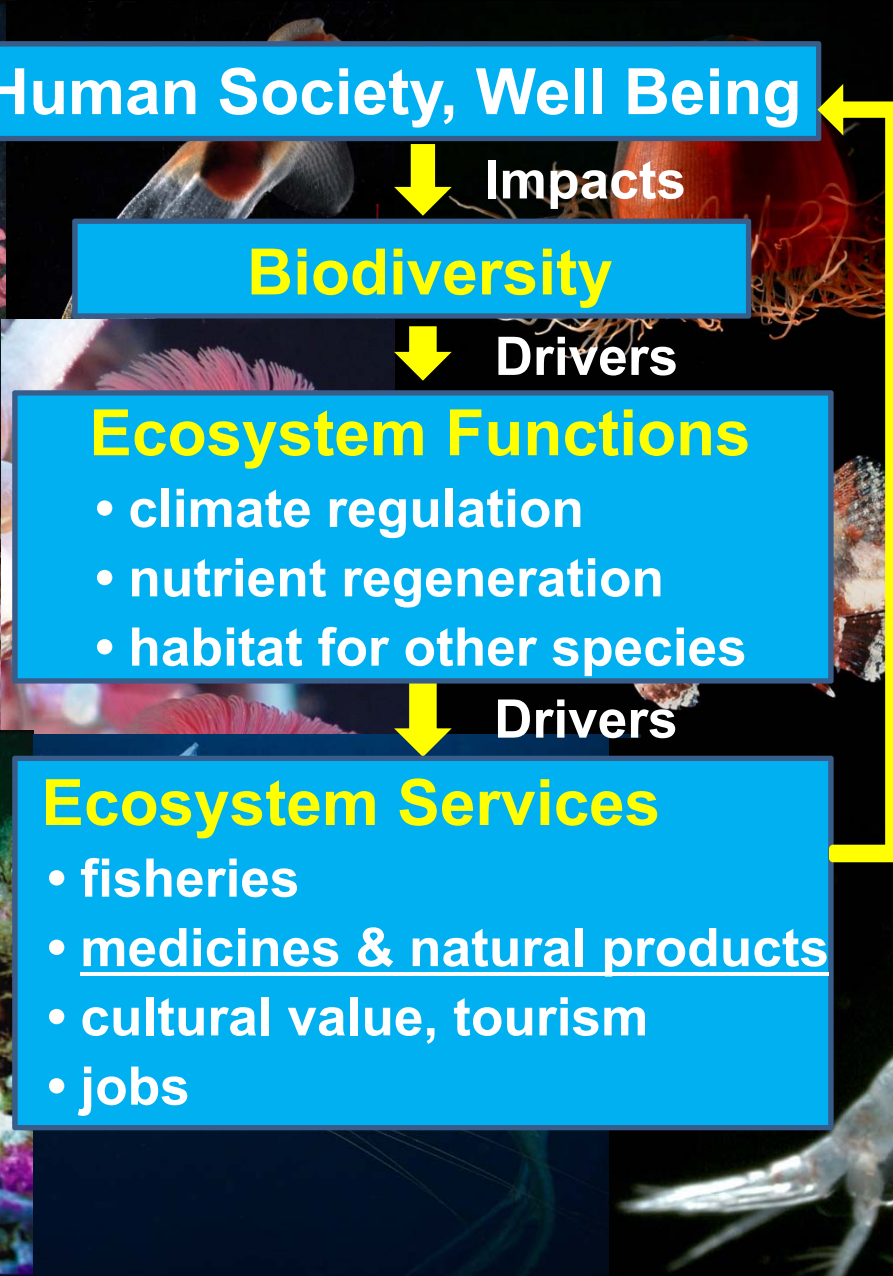
- climate regulation
- nutrient regeneration
- habitat for other species

Drivers

Ecosystem Services

- fisheries
- medicines & natural products
- cultural value, tourism
- jobs

Benefits
to humans



Natural Hatcheries



Age 0
cod

Age 2 cod
cannibal

R. Gregory

Many Challenges

SPM 5 Trends in the provision of nature's contributions to people (NCP) for each unit of analysis.

Trends and importance values are based on a modified Delphi process* to build consensus, as indicated by synthesis among experts from Chapters 2 and 3. Values were assigned based on the proportion of the unit of analysis that has not been converted by human activities. Squares without arrows indicate that there is no clear link [or trend] between nature's contributions to people for that category and the corresponding unit of analysis. (Note: the cryosphere is not considered in this analysis.)

UNIT OF ANALYSIS	MATERIAL NCP			NON-MATERIAL NCP				REGULATING NCP									
	Food and Feed	Materials and assistance	Energy	Medicine, biochemical and genetic resources	Learning and inspiration	Supporting identities	Physical and psychological experiences	Maintenance of options	Climate regulation	Regulation of freshwater quantity, flow and timing	Regulation of freshwater and coastal water quality	Regulation of hazards and extreme events	Habitat creation and maintenance	Regulation of air quality	Regulation of organisms detrimental to humans	Pollination and dispersal of seeds and other propagules	Regulation of ocean acidification
Tropical and subtropical moist forest	↘	→	↗	↗	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Tropical and subtropical dry forest	↘	↘	→	↗	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Temperate and boreal forests and woodlands	↘	→	→	→	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Mediterranean forests, woodlands and scrub	↘	↘	↘	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Tundra and high montane habitats	↘	↘	↘	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Tropical and subtropical savannas and grasslands	↘	↘	↘	↗	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Temperate grasslands	↘	↘	↘	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Drylands and deserts	↘	↘	↘	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Wetlands – peatlands, mire, bogs	↘	↘	↘	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Inland surface waters and water bodies / freshwater	↘	→	↗	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Coastal habitats and nearshore marine	↘	→	→	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Marine/ deepwater/ offshore systems	↘	→	→	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘
Urban areas	↘	↘	↘	↘	↗	↗	↗	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
Agricultural, silvicultural, aquacultural systems	↗	↗	↗	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘

* The Delphi method is a structured and iterative evaluation process that uses open panels to establish consensus regarding the assessment of a specific topic.

Importance of unit of analysis for delivering each nature's contribution to people
 ■ Very High ■ High ■ Medium High ■ Medium ■ Medium Low ■ Low ■ Very Low

Direction of change in provision of each nature's contribution to people
 ↑ Strongly Increasing ↗ Increasing → Stable ↘ Decreasing ↓ Strongly Decreasing

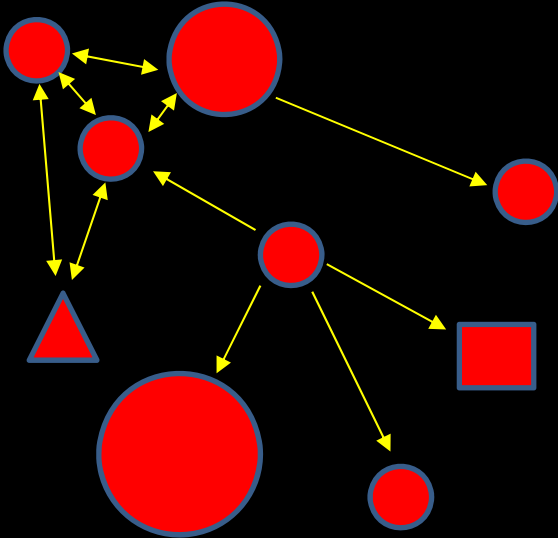
Nature's Contribution to People

Coastal habitats and nearshore marine	↘	→	→	↘	→	→	→	↘	↘	↘	↘	↘	↘	↘	↘	↘	↘
Marine/ deepwater/ offshore systems	↘	→	→	↘	→	→	→	↘	↘	↘	↘	↘	↘	→	↘	↘	↘

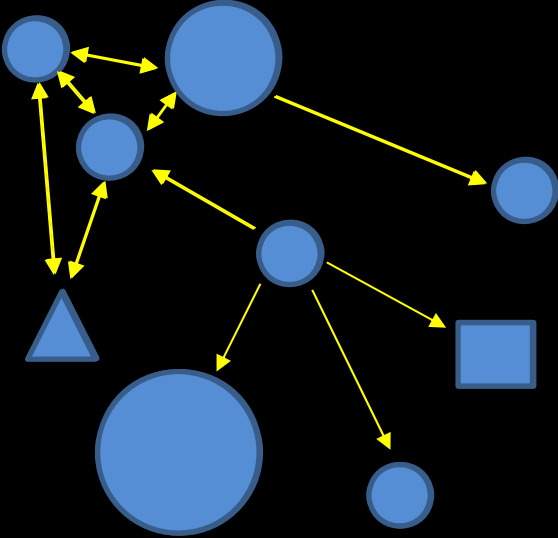
Importance of unit of analysis for delivering each nature's contribution to people
 ■ Very High ■ High ■ Medium High ■ Medium ■ Medium Low ■ Low ■ Very Low

Direction of change in provision of each nature's contribution to people
 ↑ Strongly Increasing ↗ Increasing → Stable ↘ Decreasing ↓ Strongly Decreasing

Networks Matter

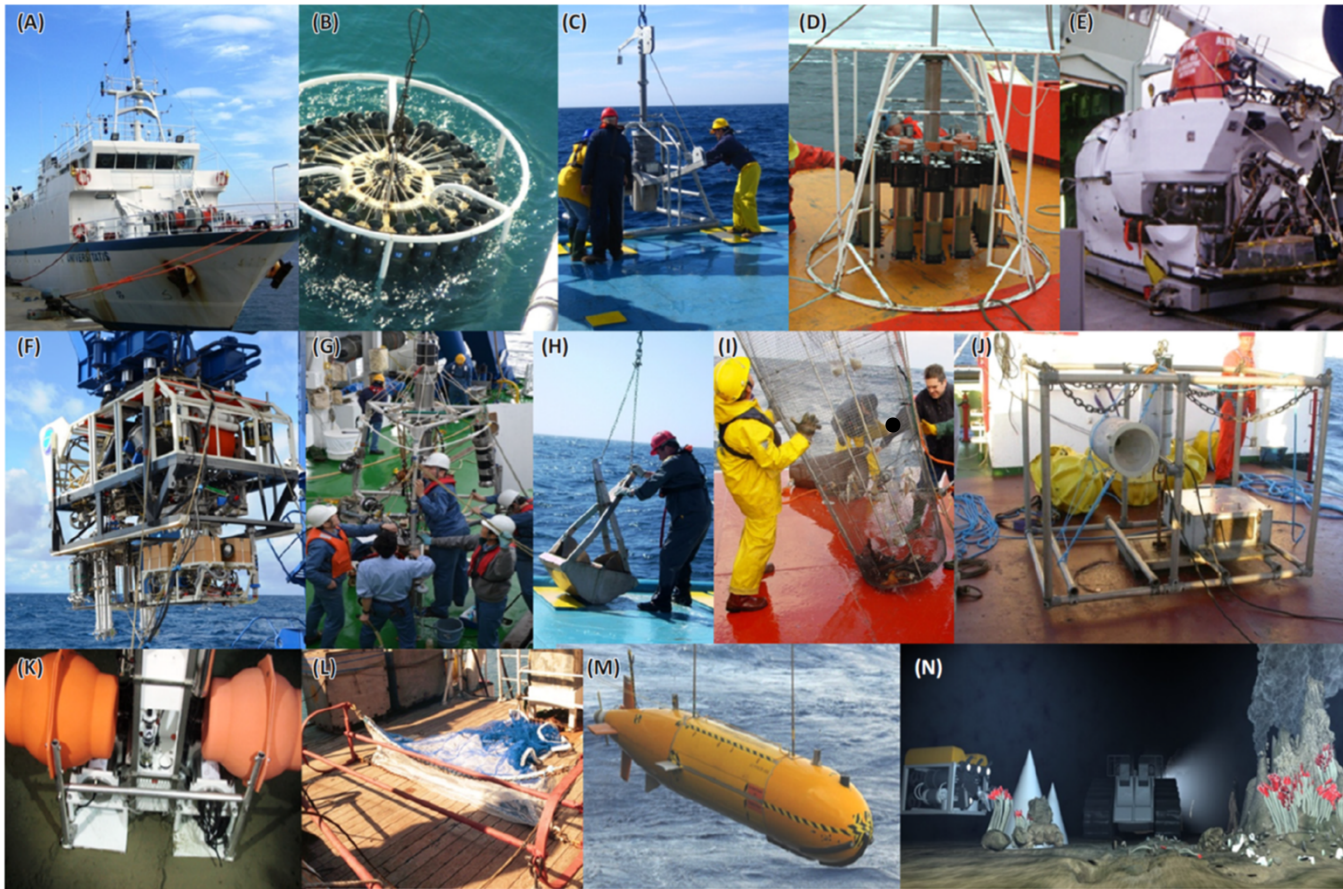


Networks of MPAs



Rapidly Evolving Tools

- Sensors
- Platforms
- Autonomy
- Genetics
- Imaging
- Computation
- TEK



TRENDS in Ecology & Evolution

Danovaro, Snelgrove & Tyler (2014)

An Ocean of Opportunity



*If the highest aim of a captain were to preserve his ship,
he would keep it in port forever. Thomas Aquinas*



We protect what we love, we love what we know.

Jacques Cousteau