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Harmonized indicators for the health of the oceans

May 28, 2018



An international group of marine ecosystem experts has just identified the main biological data to be measured to establish and monitor the state of the ocean. The standardization of these variables aims to obtain globally usable observations that are accessible to all.

A few simple indicators will soon be able to more effectively monitor the health status of the oceans. An international study, bringing together the skills of specialists in the main ecosystems and marine

organisms, has defined the essential biological variables to be measured ¹ [\(#Anchor1\)](#). "Our goal is to bring out standardized observation data, usable by all, comparable in time and space, and exploitable on a global scale," says marine ecologist Francis Marsac. The collected data will be made available to the

entire scientific community ² [\(#Anchor2\)](#). This initiative, supported by UNESCO, has the ambition to create in the field of marine ecosystems a dynamic equivalent to that of the IPCC on climate. It responds to the need to assess the impact of climate change and human pressure on marine biodiversity. The

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challenge is to provide the necessary and relevant data for the major instruments for monitoring global biodiversity, the Convention on Biological Diversity and IPBES ³ [\(#Anchor3\)](#).

Badly known environments

In contrast to physical oceanography or terrestrial biodiversity, which are well studied and have standard indicators established for decades, marine environments remain poorly known. Hidden below the surface, difficult to access, poorly observable by satellites and driven by very complex interactions, they are unevenly followed from one oceanic region to another. The information collected is heterogeneous, at the level of the observed variables, the sampled spaces and the temporal sequences considered. As a result, the synthesis of the data is difficult and the results can not be generalized. " *Estimates of fish populations, for example, are mostly based on commercial catch data* ," says Yunne Shin. *Dependent on the activity of this sector and biased by the targeting of the catches, these data do not make it possible to establish precisely the state of the stocks, that of the ecosystems or the impact of the fisheries. Data from scientific sampling exist, however, and in large quantities, but they are disparate and so far not accessible to all* .

Solid and coordinated information

To arrive at solid, sustained and coordinated observations, the specialists did not initiate new research. " *We preferred to identify the most useful variables, among all those already measured by the observation systems and mentioned in the major international conventions on the protection of the sea* , says Francis Marsac. *We have inventoried them, then ranked according to their utility, their ease of implementation by all actors involved in the observation and their scientific relevance* ". The researchers thus managed to distinguish eight essential variables. Four of them illustrate the components of the marine environment ⁴ [\(#Anchor4\)](#), such as plankton and fish, and the other four are

evidence of habitat expansion and the health status of ecosystems ⁵ [\(#Anchor5\)](#), such as coral reefs and mangroves. " *They correspond to the basic information to be observed* ," says Yunne Shin. *For fish, the recommendation is at least to monitor abundance and spatial distribution. But we also define complementary variables, such as taxonomy or fish size, that can be observed according to the means and the needs* " .

In addition to the measured variables, experts have worked to harmonize the ⁶ [\(#Anchor6\)](#) process of gathering scientific data on the marine environment. The dynamic generated by this work could herald a new era of sea observation involving researchers, policy makers and civil society.



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Notes:

1. ()_Patricia Miloslavich, Nicholas J. Bax, Samantha E. Simmons, Eduardo Klein, Ward Appeltans, Octavio Aburto-Oropeza, Melissa Andersen Garcia, Sonia Batten, Lisandro Benedetti-Cecchi, David M. Checkley Jr., Sanae Chiba, J. Emmett Duffy, Daniel C. Dunn, Albert Fischer, John Gunn, Raphael Kudela, Francis Marsac, Frank E. Muller-Karger, David Obura, Yunne-Jai Shin, [Essential Ocean variables for global sustained observations of biodiversity and ecosystem changes](#) (<https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.14108>), Global Change Biology, April 2018
2. ()_As part of the [Global Ocean Observing System](http://www.goosocean.org) (<http://www.goosocean.org>)
- 3 **program.** ()_Intergovernmental Platform on Biodiversity and Ecosystem Services
4. ()_Biomass and phytoplankton diversity, Biomass and zooplankton diversity, Abundance and distribution of fish, Abundance and distribution of marine turtles, seabirds and marine mammals
5. ()_Extent and composition of corals, Extent of macroalgae, Extent of seagrass beds, Extent of mangroves
6. ()_Framework for Ocean Observations, published by UNESCO

For further

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