



International
Ocean Colour Science
Meeting 2025

Advancing Global Ocean Colour Observations

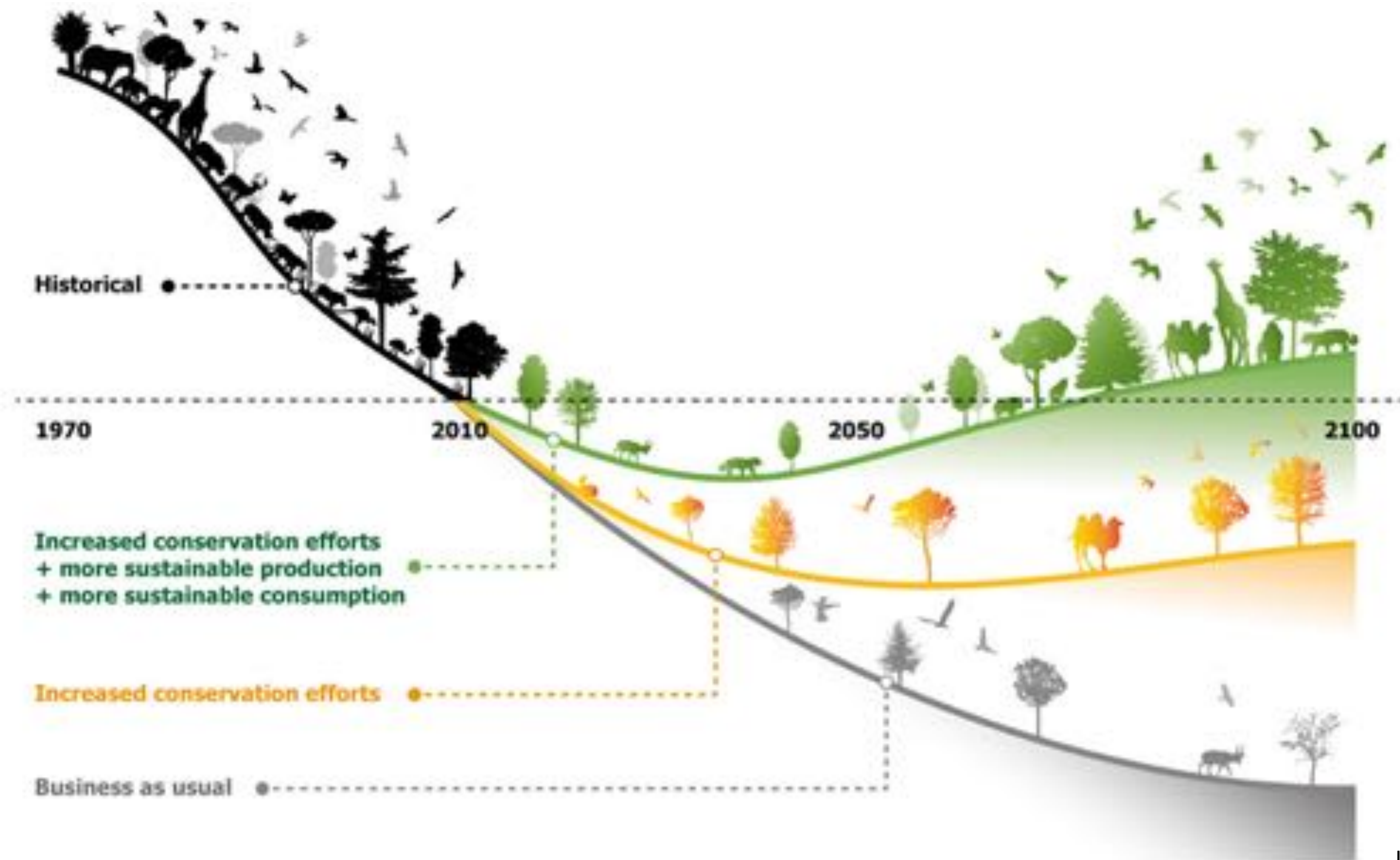
Priority list of marine biodiversity metrics
to observe from space: synthesis and
planning for next steps

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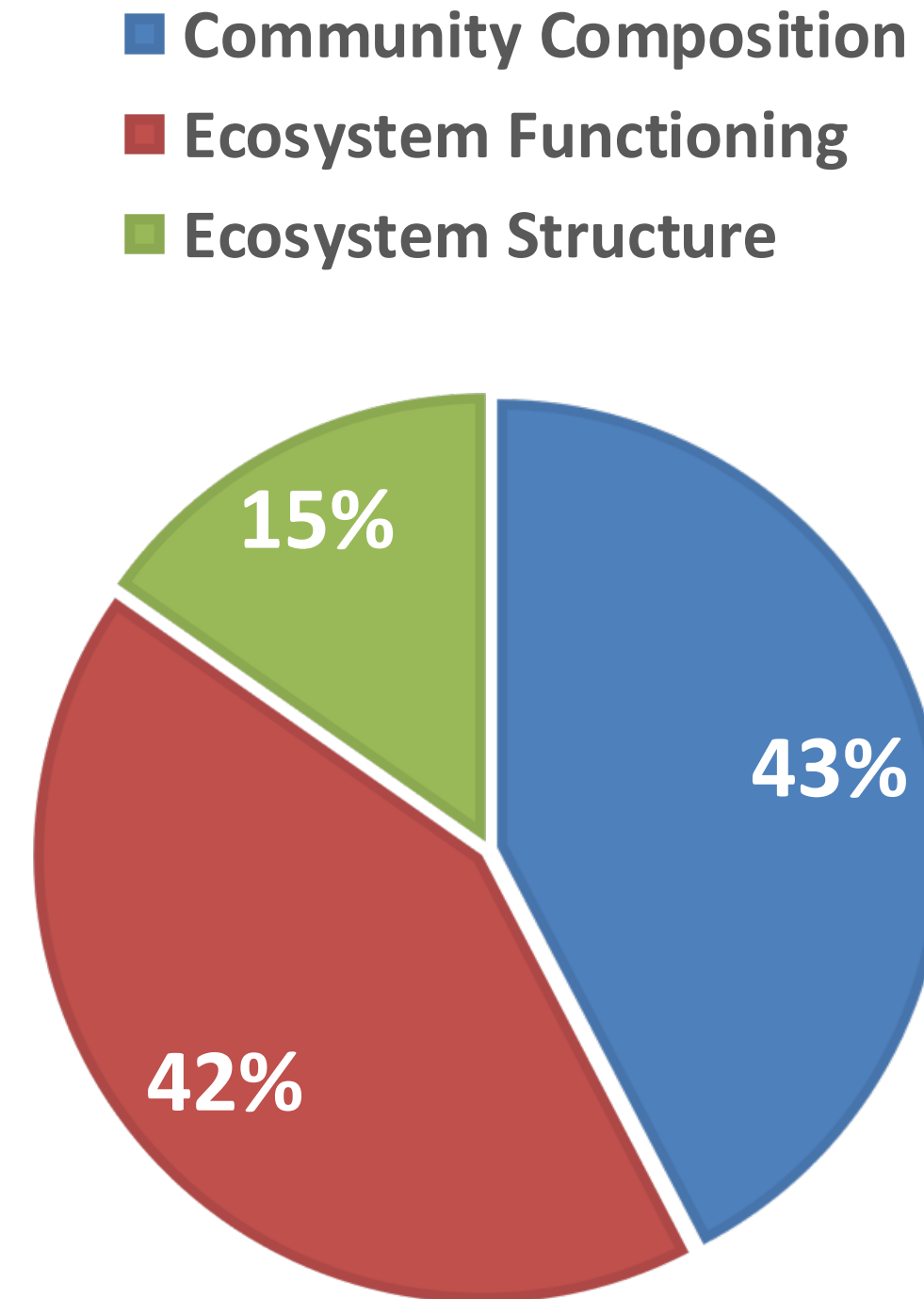
1-4 December 2025

Why monitor biological diversity?



This artwork illustrates the main findings of the article, but does not intend to accurately represent its results (<https://doi.org/10.1038/s41586-020-2705-y>)

- ✓ Survey online, so far, pictures the interests of this community:
 1. Phytoplankton is a main target. Benthic habitat mapping is emerging.
 2. Community composition and ecosystem functioning EBV classes accumulated most responses
 3. A preliminary list of priorities has been drafted: primary production, benthic habitat structure , phyto functional groups, phenology, phytoplankton taxonomy, pelagic habitat structure and benthic functional diversity



Please fill in the survey! QR code at the end, get your phone ready!

Challenges

- 1) Technology (Satellite Earth Observation)
 - a) Spatial and Temporal resolution is not enough
 - b) Spectral bands are limited
- 2) Methods and algorithms
 - a) Atmospheric correction
 - b) dealing with water attenuation – tide, turbidity, bathymetry
 - c) with labelling data for machine learning/ in situ data
- 3) Using SEO supporting policy and management
 - a) Communication!

Recommendations

- 1) Recommendation 1: To the Space Agencies to promote development of SEO with higher spatial resolution (~ 2-5m) and revisit frequency, with good signal-to-noise and more spectral bands in the long term (constellation?) and lidar.
- 2) Recommendation 2: The community (specialists on atmospheric correction) need to consider the atmospheric-bottom reflectance challenge in the medium term with the support from the Space Agencies.
- 3) Recommendation 3: The Space Agencies should support research to upscale from field, drone, airborne data to satellite and differentiating species distribution in the medium term.
- 4) Recommendation 4: In situ coastal habitat datasets need to be aggregated in repositories and Satellite derived labelled data for machine learning training (IOCCG WG?) in the short term.
- 5) Recommendation 5: the OC community needs to understand the management requirements better, educate management on SEO and communication communication of uncertainty short term

Challenges

- 1) Technology (Satellite Earth Observation)
 - a) Temporal frequency of hyperspectral data is not enough
 - b) Penetration to depth is challenging and would be important in thin layers (HABS) and down to the DCM (PP) and pycnocline (phenology)
- 2) Methods and algorithms
 - a) Lack of collocated optical data with biological data on diversity
 - b) Missing fundamental experiments and modelling to investigate the link between optics and diversity, to improve uncertainty characterization and to define the limits of operation of the algorithms
- 3) Using SEO supporting policy and management
 - a) Strong discrepancies within our community on the terminology and
 - b) Potential disconnection with marine biology community, policy and management due to language mismatch
 - c) Biological diversity has a strong policy drive, requirements need refining (e.g. biodiversity indices minimum requirements?)

Recommendations

- 1) Recommendation 1: Space Agencies to support GLIMR and/or studies with other geostationary sensors already deployed to investigate high frequency dependence of plankton diversity in the medium term. Vertical extension of Ocean colour passive remote sensing to be complemented with active and other methods by the community in the long term.
- 2) Recommendation 2: Space agencies to support regional algorithm development and in situ data collection in coastal areas in the presence of different levels of other optically active substances in the medium term.
- 3) Recommendation 3: To the Space Agencies to support the collocation of in situ (as a minimum hyperspectral Remote Sensing reflectance) and laboratory optical data in the medium term for algorithm development.
- 4) Recommendation 4: The IOCCG to promote conceptual standardization within and outside of our community as part of an IOCCG WG/Task force in the short term, as well as refinement of requirements. The Space Agencies to support cross discipline workshops to find consensus on standard terminology in short term.





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Thank you!

Questions and Answers

Join the discussion on
Thursday 4th Dec. @13.00
– 14.00 at the info-desk

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