

Glossary of Terms



**Marine Ecosystems
Research Programme**

The definitions below reflect how the terms are used within the Marine Ecosystems Research Programme and should not be considered as definitive.

Abundance: the quantity of a species e.g. number of individual organisms.

Assimilation: the absorption of food or nutrients by an organism or biological system.

Benthic: relates to the seabed. Organisms living in or on the seabed are known as the benthos.

Biomass: the combined weight of individuals or a group of species. Often measured in units of wet weight, dry weight, carbon or nitrogen.

Cetaceans: aquatic mammals, such as whales, dolphins and porpoises.

CFP: the European Union's Common Fisheries Policy is a set of rules for managing European fishing fleets and conserving fish stocks.

Confidence: the level of certainty that model outputs are representative of a real ecosystem.

Coupling: the communication and interchange of information between models or materials between different part of the ocean e.g. the benthos and the water column: benthic-pelagic coupling.

Cumulative effects: how multiple activities interact over time to affect the state/function of a marine ecosystem and the species therein.

Ecology: the study of organisms and their environment.

Ecosystem model: computerised/mathematical representation of an ecosystem.

Ecosystem services: (also known as ecosystem goods & services) the benefits provided to humans by the natural environment.

Empirical: data and knowledge that is verifiable by observation or experimentation.

Ensemble: a collection of different models that are run independently and whose outputs are then combined and compared.

Forcing: elements that drive a model, such as environmental conditions or fishing pressure.

Functional groups: a group of organisms with similar roles in the ecosystem, such as carnivores or herbivores.

Hindcast: using a modern model to simulate historical trends, often to ensure that a model is performing as expected.

Macroecology: the study of the distribution, abundance, and diversity of organisms and their associations with the environment at large spatial scales.

Management tools: resources, such as databases, workflows and information sources, to support management activities.

MSFD: the European Union's Marine Strategy Framework Directive requires an adaptive management approach and aims to protect and achieve Good Environmental Status (GES) of the EU's marine waters by 2020.

Natural capital: a concept that unites the economy and the environment and refers to stocks of natural assets, which including water, land and all living things, from which humans derive goods and services.

Parameters: values used to build a model, representing the basic properties of model components (e.g. growth rate, reproduction rate) or the relationship between different parts of a system (e.g. grazing rate, diet composition).

Phytoplankton: plankton consisting of microscopic marine plants.

Primary production: the mass of new plant material accumulated over a period of time as a result of photosynthesis.

Projection: how a potential future state might look according to a model.

Recovery: the process assisting the restoration of an ecosystem that has been degraded, damaged, or destroyed previously.

Resilience: the capacity of an ecosystem to respond to a change or disturbance by recovering to a previous state.

R: a free, open source programming language and software environment for data science, statistical computing and graphics. It consists of collections of functions, datasets and packages developed by the R community.

Scenarios: a set of possible future events that can be applied to models, to develop projections of the result or impact of activities or changes. MERP has focused on the Intergovernmental Panel on Climate Change (IPCC) and National Ecosystem Assessment scenarios.

Sensitivity: how the outputs of a model respond to changes in the model's inputs.

Skill: how well a model represents a real life process.

Size spectrum: a method of quantifying the size distribution of a species or community.

Traits: functional attributes or other characteristics (such as diet or body size) of individuals or species.

Top-down/bottom-up processes: how changes in one part of the ecosystem influence changes in other parts of the ecosystem. Bottom-up process result from changes in the lower parts of food webs (i.e. phytoplankton), whereas, top-down processes result from changes in higher parts of food webs (i.e. top predators).

Top predator: (also known as apex predator) these are carnivorous and omnivorous organisms at the top of a food web. These include whales, dolphins, sharks, turtles, seabirds and humans.

Trade-offs: the relative gains or losses in different outcomes resulting from a common cause, such as habitat degradation. Knowledge of which is often necessary to support and understand the impact of management decisions or ecological processes.

Trophic cascade: the effects of adding or removing predators or plants to an ecosystem, which propagate up or down through food webs.

Trophic level: the number of steps (defined as one organism eating another) an organism is from the base of a food web. Primary producers, such as plants and phytoplankton, are often trophic level 1 whereas top predators are typically level 4 or 5.

Uncertainty: occurring when imprecise and/or unmeasurable values of unobserved real-world quantities have been applied to a model. Uncertainty may be due to: imperfections in model structure; inexact parameter values; inherent randomness in an ecosystem, or a limited knowledge about the scenario or forcing variables.

Validation: processes and activities to verify that a model is performing as expected against real data.

Zooplankton: plankton consisting of microscopic animals and the larval stages of some larger animals.