



## A Brief Overview on Marine Biology and the Steps Used in the Study of Marine Biology

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### Perspective

Marine biology, the science that deals with animals and plants that live in the sea. It also deals with airborne and terrestrial organisms that depend directly upon bodies of salt water for food and other necessities of life. In the broadest sense it attempts to describe all vital phenomena pertaining to the myriads of living things that dwell in the vast oceans of the world. Some of its specialized branches concern natural history, taxonomy, embryology, morphology, physiology, ecology, and geographical distribution. Marine biology is closely related to the science of oceanography because of the relationship of the physical features of the oceans to the living organisms that dwell in them. It aids in the understanding of marine geology through the study of those organisms that contribute their skeletal remains to the floors of the oceans or that elaborate the vast coral reefs of the tropic seas [1-3].

Marine biology is the study of marine organisms, their behaviors and interactions with the environment. Marine biologists study biological oceanography and the associated fields of chemical, physical, and geological oceanography to understand marine organisms.

Marine biology is a very broad area, so most researchers select a particular area of interest and specialize in it. Specializations can be based on a particular species, group, behaviour, technique, or ecosystem.

Molecular biology is a related area of specialization in marine biology. Researchers apply molecular techniques to many environments ranging from coastal marshes to the deep sea and to various organisms such as viruses, plants, and fish.

A principal aim of marine biology is to discover how ocean phenomena control the distribution of organisms. Marine biologists study the way in which particular organisms are adapted to the various chemical and physical properties of the seawater, to the movements and currents of the ocean, to the availability of light at various depths, and to the solid surfaces that make up the seafloor. Special attention is given to determining the dynamics of marine ecosystems, particularly to the understanding of food chains and predator-prey relationships. Marine biological information on the distribution of fish and crustacean populations is of great importance to fisheries. Marine biology is also concerned with the effects of certain forms of pollution on the fish and plant life of the oceans, particularly the effects of pesticide and fertilizer runoff from land sources, accidental spills from oil tankers, and silting from coastline construction activities [4,5].

### These steps are all used in the study of marine biology

**Microbiology:** The study of microorganisms, such as bacteria, viruses, protozoa and algae, is conducted for numerous reasons. One example is to understand what role microorganisms play in marine ecosystems. For example, bacteria are critical to the biological processes of the ocean, as they comprise 98% of the ocean's biomass, which is the total weight of all organisms in a given volume. Microbiology is also important to our understanding of the food chain that connects plants to herbivorous and carnivorous animals. The first level in the

food chain is primary production, which occurs at the microbial level.

**Fisheries and Aquaculture:** to protect biodiversity and to create sustainable seafood sources because of the world's dependence on fish for protein. There are many areas of study in this field. The ecology of fisheries includes the study of their population dynamics, reproduction, behavior, food webs, and habitat. Fisheries management includes studies on the impact of overfishing, habitat destruction, pollution and toxin levels, and ways to increase populations for sustainability as seafood.

Aquaculture includes research on the development of individual organisms and their environment. The objective is most often to develop the knowledge needed to cultivate

**Environmental marine biology:** includes the study of ocean health. It is important for scientists to determine the quality of the marine environment to ensure water quality is sufficient to sustain a healthy environment. Coastal environmental health is an important area of environmental marine biology so that scientists can determine the impact of coastal development on water quality for the safety of people visiting the beaches and to maintain a healthy marine environment. Pollutants, sediment, and runoff are all potential threats to marine health in coastal areas.

**Ichthyology:** is the study of fishes, both salt and freshwater species. There are some 25,000+ species of fishes including: bony fishes, cartilaginous fishes, sharks, skates, rays, and jawless fishes. Ichthyologists study all aspects of fish from their classification, to their morphology, evolution, behavior, diversity, and ecology. Many ichthyologists are also involved in the field of aquaculture and fisheries.

**Marine mammology:** This is the field of interest to most aspiring marine biologists. It is the study of cetaceans-families of whales and dolphins, and pinnipeds (seals, sea lions, and the walrus). Their behaviors, habitats, health, reproduction, and populations are all studied. These are some of the most fascinating creatures in the sea; therefore, this is an extremely competitive field, and difficult to break into because the competition for research funding is also quite heavy.

### References

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