

CNIDARIA



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The phylum *Cnidaria* contains some of the most beautiful - and some of the most dangerous - aquatic creatures in the ocean. If you've ever witnessed the awesome presence of a Portuguese man-o-war, whose opalescent tentacles deliver a painful injury to all that cross its path, you'll understand what we mean. All members of the Cnidarian phylum come equipped with stinging cells called nematocysts; just one casual touch to any Cnidarian organism will explain why Cnidarians are commonly referred to as "the stingers." Cnidarians are also characterized by a hydrostatic skeleton, meaning their entire bodies are little more than sacks of cells and water and that their movement is very fluid. This phylum is home to the sea anemone, coral, jellyfish, and sea pen, and contains over 15,000 different species spread throughout the world's oceans. Although they are the second-most simplistic marine creatures in the Animal Kingdom, Cnidarians are much more complex than the sponges of the phylum *Porifera* and are therefore challenging to explain.

Cnidarians are divided into two bodily forms: the medusoid form, which is most commonly seen in jellyfish and some forms of hydroids, and the polyp form, which is usually attributed to most species of sea anemone and coral. Medusa-type Cnidarians pulse and glide through the water without any idea where they're going due to a characteristic lack of a brain and basic nervous system. Polyps, on the other hand, are sessile and usually attach themselves to a strong surface. While most Cnidarians stick to one form or the other over the course of their lifetimes, some alternate between the stages and spend parts of their lives as a structurally different organism.

The main classes in the Cnidarian phylum are *Anthozoa*, *Hydrozoa*, *Scyphozoa*, and *Conulata*. The Anthozoa class contains creatures more commonly known as the "flower" Cnidarians; this would include sea anemones, true corals, and sea pens. *Anthozoans* are usually found in large colonies, though some species can be seen existing solitarily. The next class of *Cnidarians* is *Hydrozoa*. These Cnidarians include fire corals and other similar animals, like hydroids. Like Anthozoans, Hydrozoans are colonial, but while Anthozoans are mostly found as polyps, Hydrozoans can be either of the two Cnidarian forms. The third class of the phylum is the Scyphozoa, which contains all true jellyfish. Scyphozoa contains a sub-class known as Cubozoa; these jellyfish are actually box-shaped. Members of this class range in size from little more than twelve millimeters to an astonishing two meters across with tentacles reaching almost forty meters down! The last class of the Cnidarians is the Conulata; these cone-shaped Cnidarians became extinct during the Triassic period.



In San Diego Bay, the phyla Cnidaria is represented by the burrowing anemone and the aggregating anemone, which are found on the shores of Coronado.

Intent of Study

The San Diego Bay Field Guide is a diverse exploration into the many facets of life, civilization, culture, and history of the Bay. By merging cartography, humanities, biology, and art, we created a comprehensive guide that not only explains concepts and creatures, but also draws connections between the possibilities that exist within the waters of San Diego.

These waters are not dead by any means. Even through enduring industrialization and development, marine creatures still thrive in certain areas throughout the Bay. Some of the most interesting and dissimilar creatures appear in the intertidal zones along the shoreline. As the tides are pulled away by the moon and the sun, vast expanses of life are uncovered. This guide provides insight into the many creatures that live and thrive in these areas between the tides. From the simplest sponge to the many sea birds and marine mammals, the San Diego Bay Field Guide offers quick ways to identify some of the common species found around the Bay during a scientific expedition or a casual stroll. If the original and highly detailed photographs and information are not enough to identify a creature, a dichotomous key has also been provided to identify an organism based on a series of questions and simple observations.

Not only does this book provide information on the various animals of the San Diego Bay, it also includes a scientific study on the distribution of the more common animals. One key aspect of the Bay is that no two areas are exactly the same. As the Bay gets used for various purposes, the life in different areas inevitably changes as well. In order to document, observe, and analyze these shifts, a biodiversity study was conducted at six locations around the Bay. Surveys, analysis, and observation were carried out from the Boat Channel by the old Naval Training Center, to the historic Spanish Landing near Harbor Island, to the tip of Shelter Island, to the Ferry Landing on Coronado Island, to America's Cup Harbor, and the Scripps Nimitz facility in Point Loma.

To add extra dimension to the study, advanced cartography and mapping systems were used to plot biodiversity results on high resolution satellite imagery of the Bay. Through collaboration with the University of San Diego, Geographic Information Systems (GIS) were used to plot biodiversity surveys using high accuracy Global Positioning Systems (GPS). Data was then overlaid onto the satellite image using a computer to create magnificent maps that gave spatial, not just quantitative, information about the organisms around the Bay.

To parallel the scientific aspects of these endeavors, this guide also embraces the beauty of thought, nature, and reflection in order to join the sciences and the arts in harmony. The many research expeditions made in order to create the major part of this book were paused for an hour or two to allow imaginations and inspiration from nature to soar. As a result, this guide is filled with poems and prose whose subjects stretch from simple musings on the beauty of the waterfront, to lengthy commentaries on the importance of ecological conservation. In the analysis of nature, history, and culture, the meanings of both humanity and human interactions were pondered upon and interpreted. When one looks around and

sees drainage pipes, concrete blocks, and pollution to one side with one eye, and fish, mollusks, and sea lions with the other, the task to find the connection and the change between nature and civilization is an interesting one indeed.

It is this merging of thoughts and ideas that this guide hopes to embrace and explore in an attempt to bring the different perspectives of the San Diego Bay together in a comprehensive field guide for your perusal. We hope our studies inform and inspire you to explore the many different parts of the Bay and discover for yourself which perspective you like the best.

INTEGRATED PROJECT-BASED LEARNING

