

What do we mean by natural ocean water quality for an ASBS?

Natural ocean water quality: That water quality (based on selected physical chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, *i.e.*, an absence of significant amounts of:

- a) man-made constituents (*e.g.*, DDT),**
- b) other chemical (*e.g.*, trace metals), physical (temperature/thermal pollution, sediment burial) and biological (*e.g.*, bacteria) constituents at concentrations that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question, and**
- c) non-indigenous biota (*e.g.*, invasive algal bloom species) that have been introduced either deliberately or accidentally by man.**

Natural ocean water would be expected to vary noticeably both from place to place, and from time to time. For example, there are significant variations in the composition of minor constituents of seawater (*e.g.*, nutrients, oxygen, trace metals) with depth in the ocean, as well as with distance from land and even between ocean basins. Furthermore, significant ocean properties such as salinity, temperature, and pH vary appreciably with location, season, and year to year due to natural oceanographic processes.

Even within California's coastal ocean, spatial differences exist as a result of regional differences in solar radiation, precipitation, and naturally occurring fresh water. Coastal seawater will differ measurably in trace element composition as a consequence of local watershed geology. Various places on the California shelf have naturally occurring hydrocarbon and groundwater seepage. In near-shore seawater, temporal and seasonal differences in suspended sediments result from variations in wave action. Naturally occurring marine life itself also alters water quality by various processes. For example, seawater near a sea lion haul-out may be high in fecal bacteria levels.

In addition, there are naturally occurring large-scale ocean cycles that dramatically influence the physical, chemical and biological components that support marine life along the California coast. For example, El Niño and La Niña oceanographic events can significantly alter the surface water temperature along the California coast thus extending or diminishing the range and abundance of cold versus warm water species. Rainfall during such El Niño events can also exert large influences on coastal water quality due to significant flood events that deliver (natural) sediments from undeveloped watersheds. Turbidity events associated with California river systems during large flood events have been observed from space.

However, the reality is that vast areas of the ocean are no longer pristine. Truly natural water quality probably does not now exist in California's coastal ocean, and may be rare throughout the world. For example, plastic debris can be found in remote areas of the ocean thousands of miles from continents, and persistent organic pollutants may be found in marine life inhabiting equally remote regions. Even if anthropogenic land-based waste

discharges were to be completely eliminated from a section of coastline, there is no guarantee that natural water quality would be reestablished there. Aerial deposition, pollutants carried by oceanic currents from distant sources, and vessel discharges may influence water quality conditions.

It is the goal of this definition to acknowledge that any definition of *natural water quality* for an ASBS must satisfy the following criteria:

- it should be possible to define *reference* areas that currently approximate *natural water quality*
- any detectable human influence on the water quality must not hinder the ability of marine life to respond to natural cycles and processes

Such criteria will ensure that the beneficial uses identified by the Ocean Plan are protected for future generations.