



Fact Sheet

2024 Integrated Report: Assessing Ocean Acidification and Hypoxia Impacts in Oregon Marine Waters

Summary

The Oregon Department of Environmental Quality's draft 2024 Integrated Report includes proposed 303(d) listings of marine waters for ocean acidification and hypoxia, or OAH. Oregon marine waters are defined as the area from the shore to three miles out into the Pacific Ocean, and do not include estuaries. Water quality impacts of OAH are an emerging climate change-related threat to Oregon's marine waters. This is the first time an ocean area has been listed as impaired for ocean acidification in the United States. By including these issues in the Integrated Report, DEQ is recognizing the impact of changing ocean conditions on plants and animals in the ocean, while also understanding more information is needed to determine how Oregon's actions on climate change policy and water quality management can influence these largely global water quality stressors.

What is ocean acidification and hypoxia?

The ocean absorbs about 30% of the carbon dioxide released into the atmosphere. As levels of atmospheric CO₂ increase from human activity, the amount of CO₂ the ocean absorbs also increases. As the ocean absorbs this additional CO₂, a series of chemical reactions result in changes to the ocean's chemistry, lowering the pH of ocean waters. Lower pH is more acidic, which is why this process is called ocean acidification.

Additionally, increasing occurrences of severely low to no measurable dissolved oxygen in waters on the Oregon coastal shelf during summer upwelling, raise concern for impacts to resident biological communities and habitats. Severely low dissolved oxygen is referred to as hypoxia, meaning there is less than 1.4 milliliters of oxygen per liter.

Water quality impacts related to both ocean acidification and low dissolved oxygen are commonly referred to as ocean acidification and hypoxia, or OAH. Localized processes in the nearshore ocean waters such as seasonal upwelling, freshwater inputs, and, in some cases, land-based activities can worsen the impact of OAH. This combination of factors makes nearshore waters and the animals that live there some of the most vulnerable to early impacts of changing ocean conditions related to climate change.

Assessing marine waters

In consultation with a [technical workgroup of OAH experts](#), DEQ's Integrated Report Team developed methodologies to assess both ocean acidification and hypoxia based on narrative water quality criteria relevant

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to marine waters. Both ocean acidification and hypoxia methodologies include an approach that uses multiple lines of evidence to assess water quality impact with a comparison to natural background conditions. More information about the methodology updates and assessment conclusions can be found in the [Assessment Methodology for Oregon's 2024 Integrated Report](#) and an accompanying [Technical Support Document](#).

In applying the ocean acidification and hypoxia methodologies to the data and using the tools available for the 2024 assessment, DEQ is proposing to list one ocean area (Cape Foulweather to Siltcoos River) as impaired for OAH, and one area (mouth of the Columbia River to Cape Lookout) as impaired for ocean acidification only. The remaining four ocean assessment units have insufficient data to conduct complete assessments. DEQ will use a new classification when including these areas on the 303(d) list to specify these impairments are primarily caused by climate change.

Implications for waterbodies with 303(d) listing for changing ocean conditions

Waterbodies are identified as impaired and added to the 303(d) list when one or more beneficial use is not *fully* supported. In most instances, placing a waterbody on the 303(d) list initiates the prioritization and development of a water quality management plan, such as Total Maximum Daily Load, for attaining better water quality. While a TMDL can be an effective approach to identifying and controlling sources of pollutants within a watershed, regulating small point source discharges into marine waters may not be the most effective use of resources given the global influence of changing ocean conditions. By identifying these stressors to marine life as pollution under the Clean Water Act, DEQ's goal is to continue to work collaboratively with existing state programs on climate solutions that will increase coastal resilience and with the scientific community to better understand effective solutions at the state level.

Public process

DEQ offered several opportunities for public engagement this reporting cycle. DEQ would like to acknowledge how valuable the contribution of high-quality data and comments during public engagement are to the assessment and integrated report process.

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