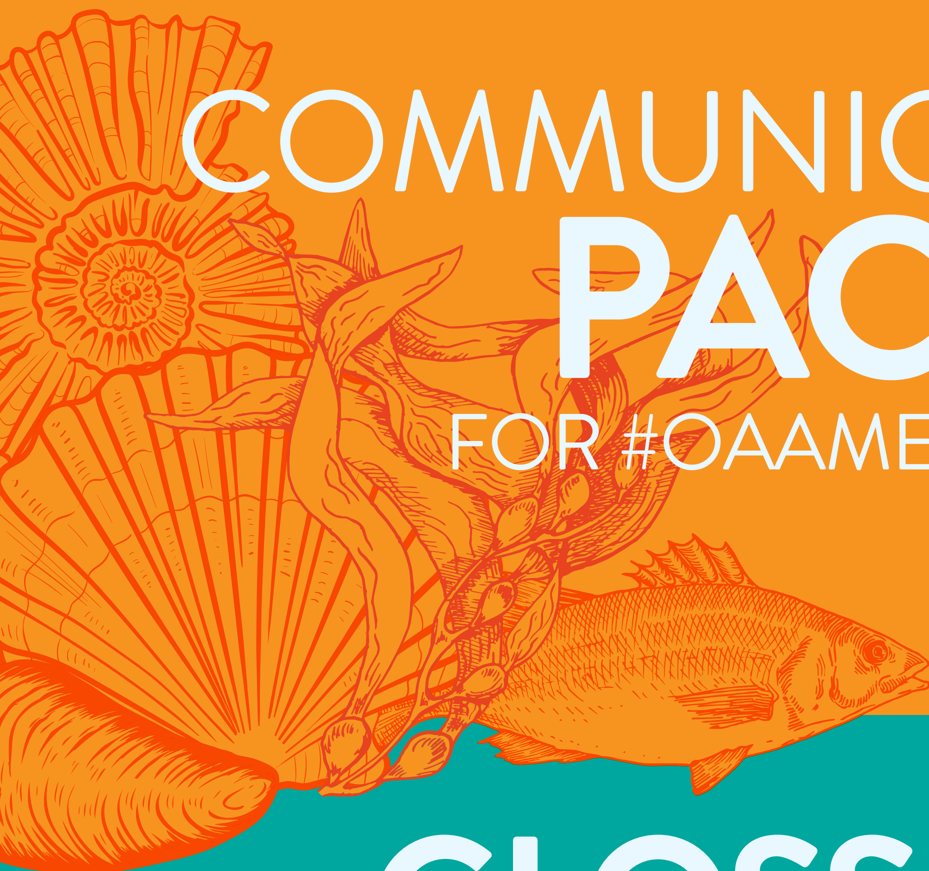
OA ALLIANCE | INTERNATIONAL ALLIANCE TO **COMBAT OCEAN ACIDIFICATION**

COMMUNICATIONS **PACK** FOR #OAAMEMBERS



GLOSSARY

Communicating ocean acidification can be challenging, especially in the context of multiple stressors and climate change.

The OA Alliance Glossary is not intended to reflect exact scientific definitions, but to support our members in communicating nuanced processes. It is meant to enhance understanding of OA related concepts and activities for users with varying levels of expertise in the field. Finally, the Glossary aims to ensure uniformity in our messaging of commonly used terms and serve as a resource for learning.

Anthropogenic carbon dioxide emissions: Atmospheric carbon emissions generated from human activities and the burning of fossil fuels.

Alkalinity: Alkalinity helps measure the ocean's ability to buffer, or withstand, acidification. Two components of alkalinity are carbonate ions and bicarbonate ions. Alkalinity measures all the negatively charged ions and molecules available in seawater to "soak up," "steal," or bond to the positively charged hydrogen ions.

Aragonite: A crystalline form of calcium carbonate that many marine animals use to build their skeletons and shells.

Aragonite Saturation State: A measure of how easily aragonite can dissolve in the water. In the context of OA, saturation state is an assumed measure of the solubility of a specific organism or species under different availabilities of calcium carbonate. Coral and most shell forming species like oysters, clams, mussels need high saturation states to keep from dissolving. OA changes the availability of calcium carbonate and therefore lowers the saturation state of seawater.

Blue carbon: Organic carbon that is captured and stored (or sequestered) in coastal and marine ecosystems such as seagrass meadows, tidal marshes, and mangrove forests. Blue carbon is usually connected to external systems for measuring and monetizing an ecosystems' potential for carbon sequestration, like a carbon market or trading scheme.

Calcium carbonate: Calcium carbonate ($CaCO_3$) is the mineral present in the shells and exoskeletons of many marine organisms for example oysters, clams, and mussels. Organisms form calcium carbonate internally and need to take up the building blocks for this process from seawater. Ocean acidification makes carbonate ions less available in seawater for these species to utilize and build their shells.

Carbon sequestration: Long-term storage of atmospheric carbon dioxide in the air or partial pressure of carbon dioxide in the seawater, isolated from exchange with the atmosphere which means it is removed from the carbon cycle.

Climate Finance: Funding (grants, loans, insurance) that is made available, under UN convention mechanisms or otherwise, to support governments in projects that help them mitigate or adapt to climate change.

Carbon Inventories: A list of carbon emission sources and the associated emissions from activities. Governments and other entities develop inventories to identify carbon emission reduction opportunities, participate in carbon emission reduction programs or carbon markets, demonstrate progress towards reducing carbon emissions. Marine, coastal, and blue carbon ecosystems can be counted within governments carbon inventories, though methodologies are still being developed.

Climate System: As an interactive system consisting of the atmosphere, the hydrosphere (water on earth) the cryosphere (frozen water on earth), the land surface and the biosphere (or ecosphere, where conditions for life exist). The climate system is naturally influenced by various external "forcing mechanisms," including the sun. Human activities, such as the burning of fossil fuels, is considered an external force on the climate system.

Climate-Ocean Change: Chemical and physical changes to our ocean caused directly by increased CO_2 and GHG emissions including ocean warming, acidification, and deoxygenation.

Climate-Ocean Impacts: The negative impacts of ocean warming, acidification and deoxygenation including weakening and reduced growth of shell forming species, impacts to species behavior and survival, changes to natural food webs, and weaker and slower growth of coral reef. Together, these impacts impair healthy coastal ecosystems, decrease food security and sovereignty, pose risks to coastal jobs, livelihoods and economies, and threaten cultural practices and traditions.

Climate-Ocean Action: Activities, policies or investments that seek to reduce carbon emissions, understand risks to marine and coastal environments, and take proactive steps to respond to risks.

Climate Planning: Government or community approaches to assessing risks posed by climate change and determining appropriate climate mitigation, adaptation, and resilience policies or investments in response.

Coral Bleaching: When waters are too warm, the colorful algae living inside coral tissue is expelled or leaves, causing the coral to turn completely white and removing its primary food source. This process is referred to as coral bleaching. Periods of coral bleaching place coral under stress and increase the likelihood of mortality. Taken together, ocean acidification (which limits the process for structural building block development) and coral bleaching significantly diminishes corals' ability to withstand cumulative climate-ocean impacts.

Dissolved Inorganic Carbon (DIC): Dissolved inorganic carbon is the total of 4 different substances (carbon dioxide, carbonic acid, bicarbonate ions, and carbonate ions) that are dissolved in seawater. They are in a chemical equilibrium, which can go out of balance if too much of one substance is added too quickly. In the case of OA, this is caused by the increase of carbon dioxide emissions being absorbed by the ocean. It forces a chemical reaction which decreases the carbon ions available for marine life and results in an increase of hydrogen ions.

Deoxygenation or Hypoxia: Lower concentration of oxygen in the open ocean or dissolved oxygen in the coastal environment caused by increasing ocean warming, stratification and/ or coastal pollution.

Harmful Algal Blooms (HABs): An overgrowth of algae or bacteria that produces toxins that are dangerous to humans and other organisms. Harmful algal blooms grow due to nutrient pollution as well as conditions like warming and stagnant waters that are increasing under climate change. HABs can grow in the ocean and in fresh water and have the potential to impact human services (like clean drinking water) and close entire fisheries.

Marine Ecosystem Services: Services humans depend on from a healthy marine ecosystem including fisheries and aquaculture, food security, economies and livelihoods, cultural practices and conditions.

Marine Carbon Dioxide Removal: Ocean or marine based strategies that aim to remove and sequester carbon dioxide from the atmosphere or within the ocean including through ocean fertilization, artificial upwelling or downwelling, ecosystem recovery through marine vegetation, seaweed cultivation, ocean alkalinity enhancements or electrochemical methods.

Management Frameworks for Addressing OA: Government frameworks for addressing aspects of climate-ocean change including climate mitigation and adaptation plans; fisheries and aquaculture management strategies, national ocean or shoreline management policies, sustainable ocean plans, marine conversation tools (Marine Protected Areas/ Marine Spatial Planning); coral reef initiatives or water quality regulations.

Nature-based Solutions to OA: Conservation actions or management practices that enhance natural processes to reduce carbon in the ocean or coastal environment or to enhance favorable conditions for marine species. Examples include co-locating seagrass or kelp near calcifying organisms absorb carbon in the water or adding shell matter (crushed up oyster or mussel shells) back into the coastal zone area to enhance the levels of carbonate available.

Land-based Pollution: Wastewater, stormwater, agricultural runoff, nitrogen, or excess nutrients that can exacerbate coastal manifestations of ocean acidification.

Ocean Acidification (short): Ocean acidification (OA) is a direct result of human-caused carbon dioxide (CO2) emissions and is altering the chemical balance of seawater that marine life depends upon for proper functioning and survival.

Ocean Acidification (long): When CO_2 combines with seawater it sets off a chemical reaction which makes seawater more acidified. We call this process "ocean acidification" or OA. The chemical reactions that occur lower the pH of seawater, increase hydrogen ions, and decrease the availability of carbonate ions, which many species like shellfish, finfish and coral need to grow, reproduce, and thrive.

Ocean Acidification Mitigation: Activities directed at reducing or sequestering atmospheric carbon dioxide emissions.

Ocean Acidification Remediation: Activities directed at reducing the presence of carbon in the ocean or coastal environment or reducing coastal pollutions that contain high concentrations of nitrogen or nutrients that exacerbate coastal acidification.

Ocean Acidification Adaptation: Activities designed to help species, ecosystems and human communities adapt to manifestations of ocean acidification.   This includes nature-based solutions, hatchery practices, species breeding techniques, updated fisheries and marine management policies, conservation measures, and alternative livelihoods.

Partial Pressure of Carbon Dioxide (pCO2): pCO_2 describes the carbon dioxide that has absorbed into a liquid, such as seawater. As anthropogenic CO_2 in our atmosphere increases, due to fossil fuel combustion, so does pCO_2 in our seawater.

Potential of Hydrogen (pH): pH is the measure of hydrogen ions in a substance, in this case seawater. pH ranges from 0-14 and values are logarithmic. As hydrogen ion concentrations increase (as a result of chemical reactions between seawater and CO_2) seawater pH decreases.