OCEAN ACIDIFICATION MONITORING

OA ALLIANCE

INTERNATIONAL ALLIANCE TO COMBAT OCEAN ACIDIFICATION

Monitoring for OA can tell us how the ocean is changing in response to climate change and how this may impact marine life, coastal communities, and local economies.

Some areas will experience more rapid change than others. Governments can increase local climate change knowledge and preparedness by incorporating ocean and coastal acidification monitoring into marine management strategies.

THE MORE WE KNOW, THE BETTER WE CAN RESPOND.

THE FOLLOWING FOUR PARAMETERS ARE INTERLINKED IN THEIR CHEMISTRY. IF WE MONITOR ANY TWO OF THEM TOGETHER WITH TEMPERATURE AND SALINITY, WE CAN GET AN UNDERSTANDING OF ACIDIFICATION.

HOW DO YOU MEASURE OA?

PARTIAL PRESSURE OF CARBON DIOXIDE (pCO_2)

pCO_2 describes the carbon dioxide (CO_2) 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 water and CO2) seawater pH decreases.

DISSOLVED INORGANIC CARBON (DIC)

DIC is the total of 4 different substances (carbon dioxide, carbonic acid, bicarbonate ions and carbonate ion) 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. For example, when increased CO_2 emissions are absorbed by the ocean, it forces a chemical reaction which decreases the carbonate ions available for marine life and results in an increase in hydrogen ions.

TOTAL ALKALINITY (TA)

Alkalinity measures all the negatively charged ions and molecules available in seawater to 'soak up' or bond to the positively charged hydrogen ions. Two components of alkalinity are carbonate ions and bicarbonate ions. Alkalinity is important because it measures the ocean's ability to buffer acidification.

ADDITIONAL MEASURES CAN HELP US BETTER UNDERSTAND MULTIPLE STRESSORS OF CLIMATE-OCEAN CHANGE:

- OCEAN TEMPERATURE
- SALINITY
- O_2 DISSOLVED OXYGEN

14 LIFE BELOW WATER

UN Sustainable Development Goal 14.3.1 calls on government, academic, and civil society "to minimize and address the impacts OA, including through enhanced scientific coordination." To accomplish this, UN SDG 14.3.1 has developed a common indicator and methodology to help measure OA. Additionally, partners can help support the UN Decade of Ocean Science for Sustainable Development by monitoring for climate-related ocean change.