Exploring Our Changing Ocean

Impacts and Response to Ocean Acidification

OA ALLIANCE | INTERNATIONAL ALLIANCE TO COMBAT OCEAN ACIDIFICATION

Aquarium Conservation Partnership

OAP NOAA OCEAN ACIDIFICATION PROGRAM

Partners

Aquarium Conservation Partnership

- The **Aquarium Conservation Partnership** (ACP) is a coalition of U.S. aquariums working to conserve our ocean and freshwater ecosystems and committed to sustainable practices.
  - Collectively, 27 members in 20 states welcome over 25 million visitors a year. ACP aquariums help advance federal and state conservation policies, mobilize thousands of visitors and online audience members to take action, and demonstrate our commitment to conservation in our business practices.

- **International Alliance to Combat Ocean Acidification (OA Alliance)** brings together governments and organizations from across the globe dedicated to taking urgent action to protect coastal communities and livelihoods from the threat of ocean acidification and other climate-ocean impacts.

- **NOAA's Ocean Acidification Program** seeks to better prepare society to respond to changing ocean conditions and resources by expanding understanding of ocean acidification, through interdisciplinary partnerships, nationally and internationally.

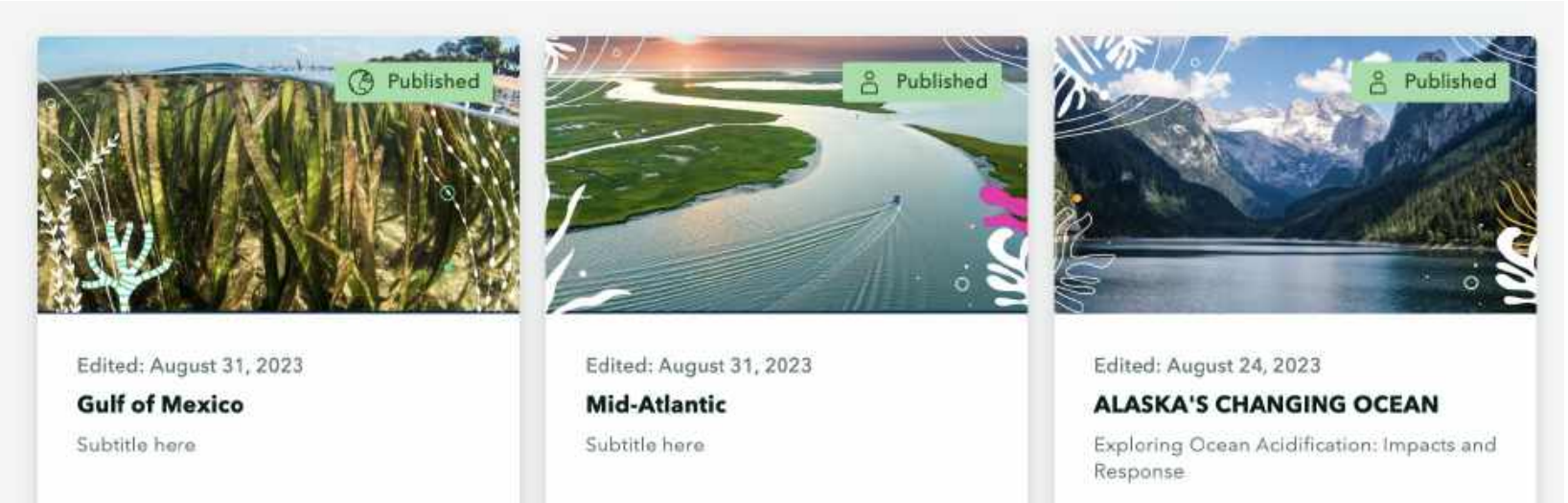
The Project

Working together, ACP, the OA Alliance and NOAA OAP are:

- Advancing communications about climate-ocean changes occurring in the U.S.
- Presenting localized information on unique impacts, responses, and calls to action taking shape across the country.
- Supporting education, outreach and calls to action that associated aquarium partners and science institutions can utilize across their larger climate change narratives and outreach efforts.

Regional StoryMaps communicating OA science, impacts, and response

- 6 interactive StoryMaps
- Showcasing relevant OA trends, science activities, stakeholder engagements and policy responses taking place across regions where NOAA supports U.S. Coastal Acidification Networks (“CANs”).
- The six regional NOAA CANs include activities in Alaska, California Current, North Eastern, Mid-Atlantic, South Eastern and the Gulf.



Each regional StoryMap includes:

- **An overview of climate-ocean change**, including the causes of ocean acidification (OA).
- **Synopsis of OA trends and potential impacts** to marine species, ecosystems, and human communities most at risk.
- **Highlight reel of activities and policies occurring within the region** to better understand and respond to OA and climate-ocean change. This includes leadership and examples from state government, seafood growers, Tribal government, Port/ municipalities, and community members.
- **Proposed "calls to action"** that can be taken by an individual.
- **An Interactive map of the United States**, indicating where relevant ACP member Aquariums are located.

StoryMap Sections

Section 1

Species Introduction: "Hello, I am a flagship species in your area!"

Section 2

Climate change and OA : "However, my home/ food source/ habitat is under threat because of climate change and ocean change. "

Section 3

***Region and Local Trends*:** "Here in X, we have seen increasing ocean warming, acidification caused by climate change and increased carbon dioxide emissions. That matters because…"

Section 4

Impact on Humans: *"Many communities throughout X are worried about the changes they are seeing in the ocean's health because it impacts them personally."*

Section 5

What is Being Done? **"**The good news is, we can take action to halt carbon emissions–the number one cause of ocean acidification– and ensure our ocean and coastal communities are resilient in the face of climate-ocean change**."**

Section 6

How Can We Help: "Here are some empowering actions that we can each take to reduce carbon emissions and address climate change."

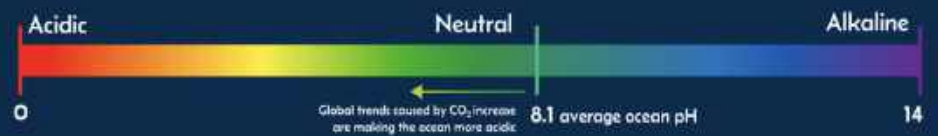
Example:
Alaska's Changing Oceans

Hello!

I'm a **horned puffin**, and I live right here in Alaska. I am very important because my feeding patterns indicate the abundance of local fish populations! I'm a migratory bird: I spend most of my life on the open ocean, but I make my way to the coast to join my family's colony every summer. You've probably seen our pufflings nesting on seaside cliffs while I dive for food near the shore.

Unfortunately, my home and food source are under threat because of climate change.

pH scale



Effect of changes in pH on animals like pteropods over time:

Ocean acidification is especially detrimental to species that rely upon calcium carbonate to make their shells and skeletons. This includes phytoplankton, which form the base of our marine food web.

In the presence of other climate stressors, ocean acidification makes it harder for species to bounce back from change and environmental harms.

Other stressors:

OCEAN WARMING

OXYGEN LOSS

NUTRIENT LOADING

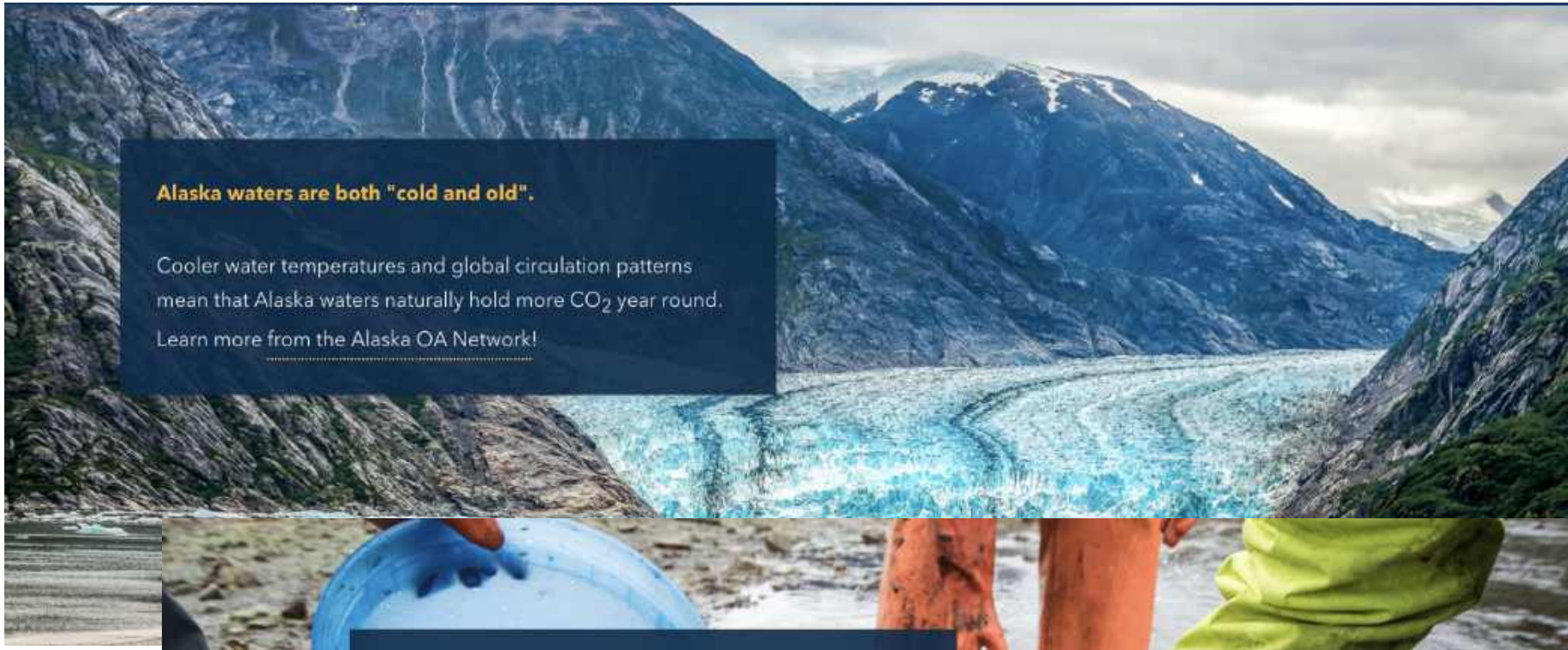
MARINE HEAT WAVES

Impacts:

HARMFUL ALGAL BLOOMS

HABITAT AVAILABILITY

SPECIES MIGRATION


Alaska waters are both "cold and old".
Cooler water temperatures and global circulation patterns mean that Alaska waters naturally hold more CO_2 year round.
Learn more from the Alaska OA Network!


Small changes can have big impacts on species.
Shellfish and other shell-building species like plankton are highly dependent on the right ocean pH conditions to build their shells and they are likely to suffer as our waters become more acidified.
These creatures are important sources of food for other Alaskan marine life like salmon, crab, whales, otters, and puffins. Disruptions in the food web can have far-reaching consequences - even for humans!

Hello! CLIMATE CHANGE OCEAN ACIDIFICATION LOCAL TRENDS IMPACT ON HUMANS WHAT IS BEING DONE? HOW CAN WE HELP?

"In Alaska, fishermen and researchers are working together to better understand ocean acidification and warming. The stakes are high and we realize it's going to take all of us." - Linda Behnken, Alaska Longline Fishermen's Association director

Alaska Ocean Acidification Network

The Alaska Ocean Acidification Network engages with scientists and stakeholders to expand the understanding of OA processes and...

Alutiiq Pride Marine Institute

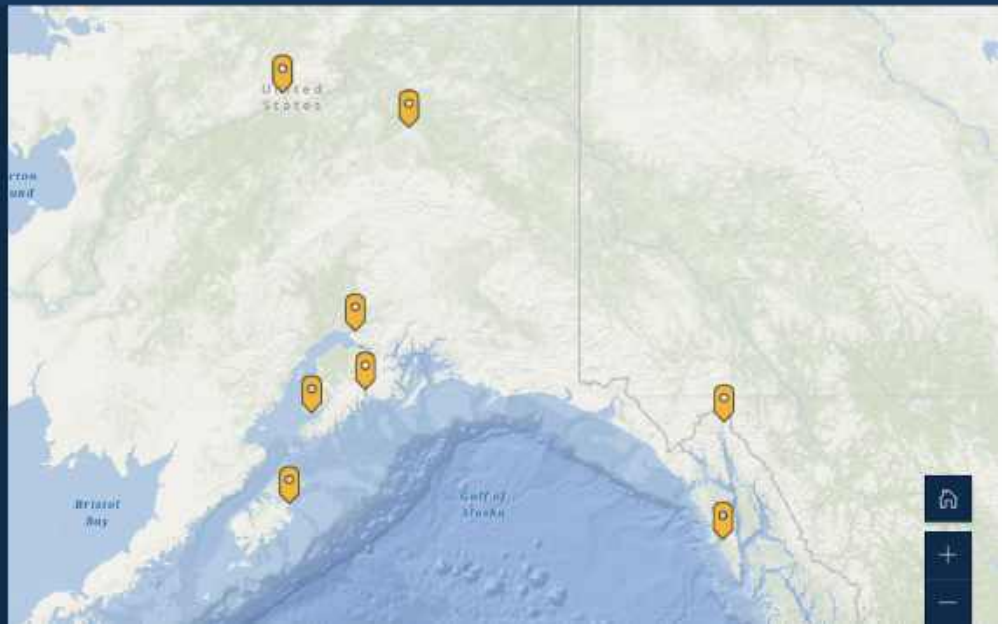
The Alutiiq Pride Marine Institute (APMI) is a tribally managed marine research facility focusing on coastal and marine ecosystem health...

University of Alaska, Fairbanks

Concerns over increasing acidity in Alaska waters and how this phenomenon will impact Alaska's Blue Economy spurred the creati...

Alaska Marine Highway

The M/V Columbia is an Alaska state ferry that conducts weekly runs between Bellingham, Washington and Alaska, the longest ferry run...

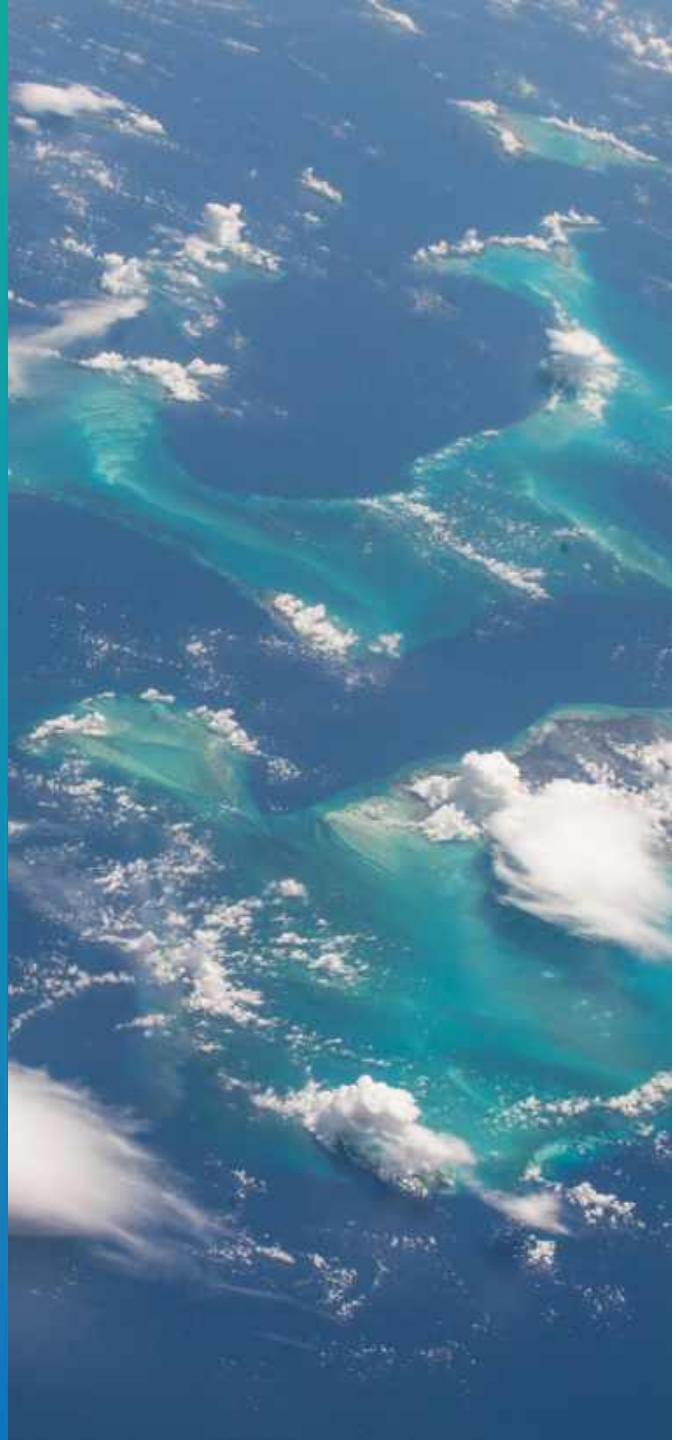


1) Use your voice!

- **Vote for the Ocean.** By exercising your right to vote – from national to local, all the way down the ballot – you can help address climate change and protect the ocean, the animals that live there, and the people who depend on it.
- **Contact your representatives!** They need to hear that voters care about reducing carbon emissions, protecting marine habitats, and adapting to the changes already in motion.

2) Wave goodbye to carbon!

- **Support policies** that transition society to large-scale clean energy production, set low-carbon fuel standards, ensure energy efficiency in buildings, hold emitters accountable, and lower emissions across our shipping and supply chains.
- **Save money. Save energy. Save the planet.** Clean energy and energy-efficient consumer choices are available now, and the U.S. government is working to make them more affordable and accessible.



What are we hoping to accomplish?

- **<u>Increase understanding about the impacts of carbon emissions on our ocean</u>**

  U.S. aquariums serve tens of millions of people every year.

  A targeted project about ocean acidification strengthens aquariums' approach to place-based storytelling about the importance of addressing climate change in communities they serve.

- **<u>Reach new audiences</u>**

  This project aims to increase the reach and impact of OA communications with visitors of U.S. Aquariums and Marine Learning Centers.

- **<u>Accelerate calls to action</u>**

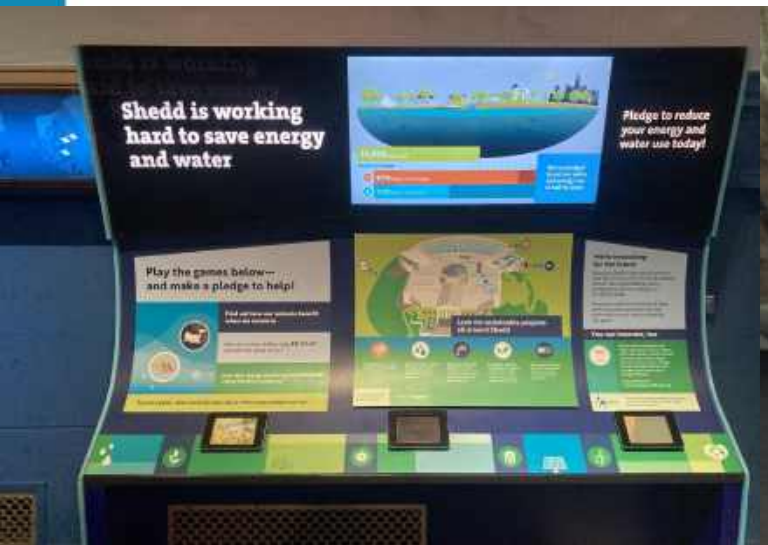
  Regional Story Maps offer detailed personal calls to action. This helps move OA activities from science to action taking.

Primary audiences

- Visitors to U.S. aquarium or marine learning centers.
- Schools and educators, community non-profit groups, conservation organizations or international climate leadership fora.
- Federal government partners, Tribal governments, city governments, and elected leaders who feel empowered to share the StoryMaps as resources for their various constituencies and partners.

Desired & intended uses

- Share the StoryMaps as displays and exhibits.
- Flyers, banners, interactive signs with scan codes or website addresses linking to the relevant StoryMap. Interactive touch screens to display and offer the StoryMap content to visitors.
- Scan codes and website addresses affixed to flyers, pamphlets or collateral created for the project or affixed to associated materials that partner institutions are distributing.
- Collection of StoryMaps will be shared on project partner websites. Encourage partners to link and share the collection or relevant regional StoryMap on their own websites or social media platforms.



Timeline

October 25, 2023

- All 6 story maps available for final CAN/ ACP review.

October 30, 2023

- Project partners will issue documents including ownership and usage rights; “How to use” guidance for ACP members and CAN partners; process for requesting changes/ individual curation permissions.

November 2023- February 2024

- Project partners will begin phase 2 roll out, including engagement with individual CAN/ ACP members on their roll-out needs (*collateral, scan codes, comms materials, display opportunities, etc*.)

Learn more at….

- https://www.oaalliance.org/exploring-our-changing-ocean