

OCEAN EXPERT EXCHANGE EDUCATOR RESOURCES

TOPIC - **Engineering Solutions for Coral Reef Research**

FEATURED EXPERT - **Nate Formel of Woods Hole Oceanographic Institution**

RELATED LEARNING STANDARDS

OCEAN LITERACY PRINCIPLES -

Principle #2: The ocean and life in the ocean shape the features of Earth

Principle #5: The ocean supports a great diversity of life and ecosystems

Principle #6: The ocean and humans are inextricably linked

NEXT GENERATION SUNSHINE STATE STANDARDS -

SC.35.CS-CS.2.2: Describe how computational thinking can be used to solve real life issues in science & engineering.

SC.6.N.1.5: Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.

SC.68.CS-CS.2.2: Solve real-life issues in science and engineering using computational thinking skills.

SC.7.L.17.3: Describe and investigate various limiting factors in the local ecosystem and their impact on native populations, including food, shelter, water, space, disease, parasitism, predation, and nesting sites.

SC.7.N.1.5: Describe the methods used in the pursuit of a scientific explanation as seen in different fields...

SC.912.E.7.9: Cite evidence that the ocean has had a significant influence on climate change by absorbing, storing, and moving heat, carbon, and water.

SC.912.L.17.4: Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

SC.912.L.17.15: Discuss the effects of technology on environmental quality.

SC.912.L.17.16: Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gasses, ozone depletion, and surface and groundwater pollution.

SC.912.L.17.17: Assess the effectiveness of innovative methods of protecting the environment.

SC.912.N.1.1: Define a problem based on a specific body of knowledge; pose questions, conduct systematic observations, examine books and other sources of information to see what is already known...

SC.912.N.1.7: Recognize the role of creativity in constructing scientific questions, methods and explanations.

SUPPLEMENTAL RESOURCES

- o Reading - ANGARI Foundation [Meet Nate Formel](#) (Grades 6-12)
- o Resource Library - NOAA [Sub-surface Auto Sampler](#) & [Ocean Acidification, Sci & Tech Lessons](#) (Grades 7-12)
- o 360 Video - ANGARI Foundation [Generation Ocean: Coral Reefs](#) (Grades 4-12)
- o Reading - Frontiers for Young Minds [How Do We Choose Tech. to Study Marine Organisms...?](#) (Grades 6-12)
- o Reading - Formlabs [How NOAA Uses SLA and SLS 3D Printers for Coral Research](#) (Grades 8-12)
- o Reading - NOAA [Coral Growth and Reef Framework Persistence of the Florida Reef Tract...](#) (Grades 9-12)
- o Video Library - NOAA [Exploring Environmental DNA: What is eDNA?](#) (Grades 7-12)
- o Resource Library - Rutgers University [Tools of Science Videos and Lessons](#) (Grades 9-12)
- o Resource Library - Encounter Edu [Coral Oceans Curriculum](#) & [Multimedia Content](#) (Grades 2-12)
- o Resource Library - NOAA Natl. Marine Sanctuaries [Coral Reef Ecosystem Resource Collection](#) (Grades 2-12)
- o Resource Library - NOAA Natl. Marine Sanctuaries [Ocean Acidification Resource Collection](#) (Grades 2-12)
- o Resource Library - NOAA Coral Health & Monitoring Program [Education Modules](#) (Grades 7-12)
- o Resource Library - NOAA Ocean Acidification Program [Education & Outreach](#) (Grades 4-12)
- o Lesson - WHOI & Ocean Carbon and Biogeochemistry Program [Ocean Acidification Lab](#) (Grades 5-12)
- o Lesson - NOAA Data in the Classroom [Understanding Ocean & Coastal Acidification](#) (Grades 9-12)
- o Lesson - Oceanography Magazine [Corals on Acid](#) (Grades 10-12)