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Curriculum Units by Fellows of the National Initiative

2022 Volume V: Floods and Fires, How a Changing Climate Is Impacting the U.S.

The Chemistry of Ocean Acidification and its Impacts on Marine Ecosystems

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by Eric Lindley

Climate change continues to have a range of negative environmental and human health impacts on different regions of the United States. This unit focuses on one of these impacts, ocean acidification, and the effects that continually decreasing pH has on marine ecosystems. Although it is written as a chemistry unit, sections of this unit can be adapted for use in physical science, biology, ecology, environmental science, or elementary school science classrooms. Through the unit, which is written to take approximately nine 90 minute class periods, students will engage with multiple laboratory activities and demonstrations in order to better understand some of the scientific principles behind ocean acidification and its effects on marine organisms including but not limited to: pH, acids and bases, combustion of fuels, formation and dissolution of marine shells, and coral reef ecosystems. This unit also has a data retrieval and analysis component to demonstrate how to access quality climate change data and to instill the importance of analyzing data to determine trends and patterns. This unit connects to the following Virginia Standards of Learning for Chemistry: CH.1 a-f, CH.5 b and d.

(Developed for Chemistry, grade 10; recommended for Chemistry, Environmental Science, and Ecology, all grades)

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