



HURRICANE PREDICTION

Share the following with students prior to watching the [COSEE Florida](#) video [Hurricane Prediction](#).



OVERVIEW

Storm damage has always been a concern for coastal communities. However, as more people and infrastructure concentrate in these areas and sea level rises it is becoming an increasing concern. Studying and predicting hurricanes provides crucial information to communities potentially threatened by hurricanes. Data collected from hurricane research allows governments and news agencies to warn residents of coastal areas before a storm approaches. Advanced hurricane warnings help to greatly reduce the total damage that may be caused during a hurricane.

Studying hurricanes can also inform scientists of trends and patterns in global climate. It can help help to predict the number of hurricanes for upcoming seasons. Yet due to the nature of hurricanes, it is challenging to study them in their environment and difficult to forecast without error. To help combat these challenges, The University of Miami's Rosenthal School of Marine & Atmospheric Science has constructed a research facility to study hurricanes and the impacts associated with wind and water damage. The research facility is capable of testing wind-wave-surge models for hurricane impacts on coastal structures. Hurricane research helps to advance the knowledge coastal communities have about hurricanes and storm preparedness.

TOPICS Science, technology, engineering, math, temperature, hurricanes

AUDIENCE AND SETTING High school students to adult learners. Possible settings include science, technology, engineering or math classrooms.

DURATION 30 minutes to watch video and complete worksheet

OBJECTIVES

- Compare the different classifications of hurricanes.
- Investigate challenges researchers encounter while predicting hurricanes.
- Analyze data to predict and track hurricanes.

GUIDING QUESTIONS

- Why is it important to study hurricanes?
- Why is it difficult to predict hurricanes?

KEY TERMS

Hurricane A tropical cyclone or severe tropical storm that forms over warm oceans near the equator.

Hurricane eye The calm, roughly circular center of a hurricane with little or no rain; the warmest part of the storm.

Hurricane eyewall The portion of a hurricane surrounding the eye. It has the most rain and strongest winds.

Air/Barometric pressure The weight of the air column that extends from the ground (or surface of water) to the top of the atmosphere; air/barometric pressure is very low in a hurricane.

KEY CONCEPTS

- Hurricanes are complex and powerful storms.
- Coastal communities rely on hurricane research and predictions to prepare for storms.

FLORIDA STANDARDS

[SC.912.E.7.5](#)

Predict future weather conditions based on present observations and conceptual models and recognize limitations and uncertainties of such predictions.

[MAFS.K12.MP.5.1](#)

Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

OCEAN LITERACY PRINCIPLES

[Ocean Literacy Principle #3](#)

The ocean is a major influence on weather and climate.

[Ocean Literacy Principle #6](#)

The ocean and humans are inextricably interconnected.

ADDITIONAL RESOURCES

UM SUSTAIN: Surge Structure Atmosphere Interaction Facility

<http://www.rsmas.miami.edu/groups/sustain/>

Study Provides New Approach to Forecast Hurricane Intensity

<https://www.rsmas.miami.edu/news-events/press-releases/2014/study-provides-new-approach-to-forecast-hurricane-intensity>

Miami's indoor Category 5 hurricane

<http://www.washingtonpost.com/blogs/capital-weather-gang/wp/2015/03/11/miamis-indoor-category-five-hurricane/>

FAQs About Hurricanes

<http://www.rsmas.miami.edu/groups/hurricane-waves/hurricane-faq/#faq8>

Introduction to Hurricanes: Science and Society

<http://www.hurricanescience.org/#/?id=0>

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