

MS. Earth's Systems

MS-ESS2-4: Develop a model to describe cycling of water through Earth's systems driven by energy from the Sun and the force of energy.

PBS Learning Media

Convective Cloud Systems

The transfer of energy between Earth's surface and the atmosphere causes all weather. Energy can be transferred through three main processes: convection, conduction, and radiation. This video adapted from the Atmospheric Radiation Program explains the differences between tropical convective cloud systems formed over land and those formed over oceans.

<https://ny.pbslearningmedia.org/resource/ess05.sci.ess.watcyc.convective/convective-cloud-systems/>

UCAR – Community Program

Introduction to Tropical Meteorology, 2nd Edition, Chapter 5: The Distribution of Moisture and Precipitation – **Requires generating a free account**

Moisture and precipitation distribution governs life in the tropics. Surplus heating and rising motion in the tropics ignites the global water and energy cycles and influences weather in the midlatitudes. This chapter presents the horizontal and vertical distribution of water vapor, tropical cloud formation and distribution, the lifecycle and precipitation characteristics of tropical mesoscale convective systems, and the variability of tropical precipitation on yearly, seasonal, and hourly time-scales.

<https://www.meted.ucar.edu/>

Science Hijinks – SciJinks – NOAA/NASA Education

What makes it rain?

The water cycle and how snow, hail, *and* sleet form by the energy from the sun. This website explains how it rains.

<http://scijinks.gov/rain/>

NOAA

El Niño

The El Niño Southern Oscillation (ENSO) is one of the most important climatic phenomena on Earth.

By influencing global temperatures and precipitation, ENSO significantly impacts Earth's ecosystems and human societies. El Niño and La Niña are opposite extremes of the ENSO, which refers to cyclical environmental conditions that occur across the Equatorial Pacific Ocean. These changes are due to natural interactions between the ocean and atmosphere. Sea surface temperature, rainfall, air pressure, atmospheric and ocean circulation all influence each other.

<http://www.noaa.gov/resource-collections/el-nino>

NOAA's Climate.gov

ENSO Blog

This is a blog about various topics of ENSO.

<https://www.climate.gov/news-features/department/8443/all>

NASA

El Niño/La Niña & PDO

El Niño and La Niña information provided by NASA

<https://sealevel.jpl.nasa.gov/science/elninopdo/>

UCAR – Center for Science Education

El Niño Teaching Box

This teaching box combines readings and activities that utilize data to build student understanding of the changes that happen to the Pacific Ocean and atmosphere during an El Niño event.

<https://scied.ucar.edu/teaching-box/el-nino-southern-oscillation>

NASA

What is El Niño anyway?

This website provides a short explanation of El Niño.

<http://spaceplace.nasa.gov/el-nino/en/>

UCAR – Community Program

The El Niño-Southern Oscillation (ENSO) Cycle – **Requires generating a free account**

This Webcast is an expert lecture by Dr. Vernon Kousky of NOAA/CPC, entitled "The El Niño-Southern Oscillation (ENSO) Cycle". The presentation covers the identification and global weather impacts associated with both phases of ENSO. This version of the presentation has enhanced graphics and has been modified to include an introduction to the newly established "Operational Niño Index" (ONI).

<https://www.meted.ucar.edu/>

NOAA

Ocean Currents

Ocean water is on the move, affecting your climate, your local ecosystem, and the seafood that you eat. Ocean currents, abiotic features of the environment, are continuous and directed movements of ocean water. These currents are on the ocean's surface and in its depths, flowing both locally and globally. This website provides a brief overview about ocean currents.

<http://www.noaa.gov/resource-collections/ocean-currents>