

Physical/Environmental Geography

- **Hazards**

- **Video** – Hurricanes 101 (2:42)
 - Hurricanes are the most powerful storms known to man. Find out when hurricane season peaks, how the storms form, and the surprising role they play in the larger global ecosystem.
 - <https://www.nationalgeographic.org/video/hurricane-101/>
- **Map** – MapMaker: Major Hurricane Tracks
 - Use this map layer to visualize large and destructive tropical cyclones that occurred between 1842 and 2015.
 - <https://www.nationalgeographic.org/maps/mapmaker-major-hurricane-tracks/>
- **Map** – 2005 Hurricane Season
 - Map traces a stormy season.
 - <https://www.nationalgeographic.org/maps/2005-hurricane-map/>
- **Map** – Hurricane Sandy
 - Map of hurricane path.
 - <https://www.nationalgeographic.org/photo/h-sandy/>
- **Activity** – Assessing Hurricane Maria Damage (≈30)
 - Use the Landsat App Explorer tool to view the damage and extent of vegetation change that occurred after Hurricane Maria made landfall on Puerto Rico in September 2017.
 - <https://www.nationalgeographic.org/activity/assessing-hurricane-maria-damage/>
- **Activity** – Hurricane Michael: Before and After Images of Destruction (≈60)
 - Hurricane Michael made landfall near Mexico Beach, Florida on October 10, 2018. Use ArcGIS Online to compare the landscape before and after the storm.
 - <https://www.nationalgeographic.org/activity/hurricane-michael-and-after-images-destruction/>
- **Video** – Life in a Volcano (3:46)
 - Follow geobiologist Jeffrey Marlow and filmmaker Sam Cossman to a lava lake in Vanuatu where they use drones to capture 3D images of the caldera. Explore the Ring of Fire, animations illustrating two types of volcanoes, and what Marlow's search for microbes in this extreme environment can teach us about the ability of life to survive.
 - <https://www.nationalgeographic.org/video/life-volcano/>
- **Video** – Supervolcanoes 101 (3:25)
 - What are supervolcanoes, and how catastrophic can they be? Learn how supervolcanoes form, where supervolcanoes are located, and how their destructive capabilities can make way for new life.
 - <https://www.nationalgeographic.org/video/supervolcanoes-101/>
- **Video** – Yellowstone Volcano Observatory (multiple segments)

- Jake Lowenstern, USGS Scientist-in-Charge of the Yellowstone Volcano Observatory, answers the following questions to explain volcanic features at Yellowstone: "How do we know Yellowstone is a volcano?", "What is a Supervolcano?", "What is a Caldera?", "Why are there geysers at Yellowstone?", and "What are the other geologic hazards in Yellowstone?"
 - <https://www.nationalgeographic.org/video/yellowstone-volcano-observatory-part-1-of-3/>
 - Jake Lowenstern, USGS Scientist-in-Charge of the Yellowstone Volcano Observatory, answers the following questions to provide a tour of the Yellowstone Volcano Observatory: "What is YVO?", "How do you monitor volcanic activity at Yellowstone?", "How are satellites used to study deformation?", "Do you monitor geysers or any other aspect of the Park?", "Are earthquakes and ground deformation common at Yellowstone?", "Why is YVO a relatively small group?", and "Where can I get more information?"
 - <https://www.nationalgeographic.org/video/yellowstone-volcano-observatory-part-2-of-3/>
 - Jake Lowenstern, USGS Scientist-in-Charge of the Yellowstone Volcano Observatory, answers the following questions to explain volcanic eruptions at Yellowstone: When was the last supereruption at Yellowstone?", "Have any eruptions occurred since the last supereruption?", "Is Yellowstone overdue for an eruption?", "What does the magma below indicate about a possible eruption?", "What else is possible?", and "Why didn't you think the Yellowstone Lake earthquake swarm would lead to an eruption?"
 - <https://www.nationalgeographic.org/video/yellowstone-volcano-observatory-part-3-of-3/>
- **Map** – MapMaker: Volcanoes
 - Explore Earth's volcanoes with MapMaker, National Geographic's classroom interactive mapping tool.
 - <https://www.nationalgeographic.org/maps/mapmaker-volcanoes/>
- **Map** – Eyjafjallajökull's Volcanic Ash
 - Eyjafjallajökull, a glacier-covered volcano in southern Iceland, erupted explosively on April 14, 2010. This dataset was created with the FIM-Chem-Ash forecasting model. The forecast starts April 15 and runs for one week.
 - <https://www.nationalgeographic.org/video/eyjafjallajokulls-volcanic-ash/>
- **Map** – MapMaker: Tectonic Plates
 - Earth's lithosphere is made up of a series of plates that "float" on the mantle. Explore them with MapMaker, National Geographic's classroom interactive mapping tool.
 - <https://www.nationalgeographic.org/maps/mapmaker-tectonic-plates/>
- **Map** – MapMaker: Tectonic Plate Boundaries

- Explore the boundaries between Earth's tectonic plates with MapMaker, National Geographic's classroom interactive mapping tool.
 - <https://www.nationalgeographic.org/maps/mapmaker-tectonic-plate-boundaries/>
- **Map** – MapMaker: Major Earthquakes
 - Explore major (magnitude of 7.0 or higher) global earthquakes between 1950-2020 filtered from the United States Geological Survey (USGS) Earthquake Catalog.
 - <https://www.nationalgeographic.org/maps/mapmaker-major-earthquakes/>
- **Map** – MapMaker: Earthquakes and Shake Intensity
 - Explore the earthquakes occurring in the last 30 days and the extent of their shaking with this map layer.
 - <https://www.nationalgeographic.org/maps/mapmaker-earthquakes-shake-intensity/>
- **Interactive** – Seismic Illumination
 - Explore the Pacific rim earthquakes as an echo of a planetary process with this Story Map from Esri.
 - <https://www.nationalgeographic.org/interactive/seismic-illumination/>
- **Video** – Tornadoes 101 (5:16)
 - Tornadoes are some of the most destructive forces of nature. Learn how tornadoes form, how they are rated, and the country where the most intense tornadoes occur.
 - <https://www.nationalgeographic.org/video/tornadoes-101/>
- **Map** – MapMaker: United States Tornadoes
 - Use this map layer to visualize large and violent tornado tracks from EF-4 and EF-5 tornadoes that occurred between 2000-2017.
 - <https://www.nationalgeographic.org/maps/mapmaker-united-states-tornadoes/>
- **Interactive** – Tornado Dashboard: Exploring Three Decades of Violent Storms
 - Although tornadoes can occur throughout the year, prime time for twisters in the United States is spring and early summer.
 - <https://www.nationalgeographic.org/interactive/tornado-dashboard-exploring-three-decades-violent-storms/>
- **Video** – Upturning Tornadoes (5:16)
 - Students watch a video of explorer Anton Seimon as he describes the work he does to interpret and share data about tornadoes. After watching the video, students collect information about tornadoes and construct a data display that reflects their own findings.
 - <https://www.nationalgeographic.org/media/upturning-tornadoes/>
- **Map** – MapMaker: Precipitation
 - Use this map layer to visualize the minimum precipitation per month (cm) around the world.
 - <https://www.nationalgeographic.org/maps/mapmaker-precipitation/>

- **Video** – Thunderstorms 101 (3:21)
 - At any moment, about 2,000 thunderstorms are occurring worldwide. Learn how thunderstorms form, what causes lightning and thunder, and how these violent phenomena help balance the planet's energy and electricity.
 - <https://www.nationalgeographic.org/video/thunderstorms-101/>
- **Video** – Tsunamis 101 (3:27)
 - Find out how a tsunami is born ... and how it destroys.
 - <https://www.nationalgeographic.org/media/tsunamis-101-wbt/>
- **Video** – Tōhoku Tsumai (3:34)
 - This video captures a first-hand perspective of the tsunami that hit Japan on March 11, 2011.
 - <https://www.nationalgeographic.org/media/rare-video-japan-tsunami/>
- **Video** – Droughts 101 (2:58)
 - Droughts can cause a variety of problems to local communities, including damage to ecosystems, crops, and a shortage of drinking water.
 - <https://www.nationalgeographic.org/video/droughts/>
- **Map** – Wildfires in San Diego
 - Blazes ravaged Southern California in 2007.
 - <https://www.nationalgeographic.org/maps/wildfires-in-san-diego/>
- **Oceans**
 - **Map** – MapMaker: Ocean Currents
 - Explore Earth's global conveyor belt with MapMaker, National Geographic's classroom interactive mapping tool.
 - <https://www.nationalgeographic.org/maps/mapmaker-ocean-currents/>
 - **Video** – The World Ocean (0:51)
 - Explorer-in-Residence Eric Sala reviews general facts about each ocean within the one world ocean.
 - <https://www.nationalgeographic.org/media/world-ocean/>
 - **Video** – The Arctic Ocean (0:58)
 - Explorer-in-Residence Eric Sala reviews general facts about the Arctic Ocean.
 - <https://www.nationalgeographic.org/media/arctic-ocean/>
 - **Map** – Arctic Ocean
 - Earth's smallest and least-explored ocean basin is in the geopolitical spotlight. Find out how with this fantastic 2009 *National Geographic* map, featuring insets with territorial claims, energy potential, and shipping significance.
 - <https://www.nationalgeographic.org/hires/arctic-ocean/>
 - **Video** – How to Care for the Ocean (6:34)
 - Watch this video with your family and friends to learn small steps that have a big impact on the well-being of our oceans.
 - <https://www.nationalgeographic.org/media/how-care-oceans/>

- **Video** – Saving Ocean Biodiversity: Coral Restoration (6:35)
 - Oceanographer and National Geographic Explorer Paola Rodriguez works to restore coral reefs in her native Mexico. Once thought impossible, Paola and her team are proving that reefs can recover from even serious damage if given a chance.
 - <https://www.nationalgeographic.org/video/saving-ocean-biodiversity-coral-restoration/>

- **Rivers**
 - **Map** – World of Rivers
 - A new chapter of river mapping reveals the true intricacies of river flow as headwaters feed consecutively larger tributaries that surrender their water to the main stream. Most rivers are now yoked with dams and reservoirs, but on this map, rivers run free.
 - <https://www.nationalgeographic.org/hires/world-rivers/>
 - **Map** – Protected Waterways
 - Map of protected rivers in the United States.
 - <https://www.nationalgeographic.org/photo/protected-waterways/>

- **Biomes**
 - **Video** – Rainforests 101 (3:25)
 - Rainforests are home to over half of the world's plant and animal species. Learn about tropical and temperate rainforests, how they contribute to the global ecosystem, and the conservation efforts to protect these biomes.
 - <https://www.nationalgeographic.org/video/rainforests-101/>
 - **Video** – Deserts 101 (3:37)
 - Deserts are diverse ecosystems that occur on all seven continents. Learn about the four major types of deserts, the surprising amount of wildlife some of them contain, and how new desert areas are beginning to form.
 - <https://www.nationalgeographic.org/video/deserts-101/>