NGSS Performance Expectations:

- **4-ESS2-1**: Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
- **5-ESS2-1**: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
- **5-ESS2-2**: Describe and graph the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.

NGSS Science Practices:

- **Planning and Carrying Out Investigations**: Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation or phenomenon.
- **Developing and Using Models**: Develop a model using an example to describe a scientific principle.
- **Using Mathematics and Computational Thinking**: Describe and graph quantities such as area and volume to address scientific questions.


- Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around.
- Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. Winds and clouds in the atmosphere interact with the land to determine patterns of weather.

**ESS2.C: The Roles of Water in Earth's Surface Processes**

- Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere.

**NGSS Crosscutting Concepts: Cause and Effect**

- Cause and effect relationships are routinely identified, tested, and used to explain change.

**Systems and System Models**

- A system can be described in terms of its components and their interactions.

**Scale, Proportion, and Quantity**

- Standard units are used to measure and describe physical quantities such as weight and volume.

**Hydrosphere Protocols**

- **Water Temperature**
- **Water Transparency**

**Atmosphere Protocols**

- **Air Temperature**
- **Clouds**
- **Precipitation**
- **Surface Temperature**

**GLOBE Data Sheets**

- Hydrology Investigation Data Sheet
- Atmosphere Investigation Clouds 1-Day Data Sheet

**GLOBE Learning Activities:**

1. **Just Passing Through for Beginners** (4-ESS2-1, 5-ESS2-1)
2. **Model a Catchment Basin** (5-ESS2-1, 5-ESS2-2)

**Elementary GLOBE Books:**

- **Discoveries at Willow Creek** (4-ESS2-1, 5-ESS2-1)
- **What in the World is Happening With Our Climate?** (4-ESS2-1, 5-ESS2-1, 5-ESS2-2)

**NASA Resources**

- **NASA Climate Change Educational Modules**: [Link](https://climate.nasa.gov/education/)
- **NASA Wavelength 3-5 List of Learning Resources**: [Link](http://nasawavelength.org/lists/2035)

**Extension Learning Activities/Resources:**

- **Daily Sea Surface Temperature (GHRSSST)**
- **Cryosphere: Monthly Snow and Ice Amount (ISCCP)**
- **Monthly Cloud Coverage (CERES)**
- **Monthly Precipitation (GPCP)**

**My NASA Data Visualization Tool: Earth System Data Explorer**

**NASA Lessons/Activities:**

- **Erosion and Landslides**
- **Earth's Water**

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