EARTH SCIENCE

Unit 7: Oceans and Climate

Big Idea (Core Concept):
Local, regional, and global climates are patterns of atmospheric circulation driven by temperature differences in water, land and the atmosphere which involves the exchange of matter and energy between the ocean and atmosphere.

Standard(s):
E2: Earth Systems
E4: Fluid Earth

Content Statement(s):
E2.1: Earth Systems Overview
E2.2: Energy in Earth Systems
E4.2: Oceans and Climate

Content Expectations: (Content Statement Clarification)
E2.1B: Analyze the interactions between the major systems (geosphere, atmosphere, hydrosphere, biosphere) that make up the Earth.

Clarification: The oceans affect atmospheric temperature and humidity, while atmospheric winds drive and direct ocean surface currents.

E2.1C: Explain, using specific examples, how a change in one system affects other Earth systems.

Clarification: The oceans affect atmospheric temperature and humidity, while atmospheric winds drive and direct ocean surface currents. Heat in the atmosphere and ocean is in part absorbed and released due to the evaporation and condensation of water.

E2.2C: Describe natural processes in which heat transfer in the Earth occurs by conduction, convection, and radiation.

Clarification: Heat energy is transferred between the ocean and the atmosphere by conduction and within the atmosphere by convection.

E2.2e: Explain how energy changes form through Earth system

Clarification: Radiation from the Sun heats the land and water of Earth which in turn heats the atmosphere. Thermal energy produces movement of matter (convection) observed in wind and ocean currents. Thermal energy also moves between the ocean and the atmosphere when water evaporates and condenses.