

Constructive & Destructive Forces on Landforms

5-3.1

S5E1: Students will identify surface features of the Earth caused by constructive and destructive processes.

a. Identify surface features caused by constructive processes.

Deposition (deltas, sand dunes, etc.)

Earthquakes

Volcanoes

Faults

b. Identify and find examples of surface features caused by destructive processes.

Erosion (water –rivers and oceans, wind)

Weathering

Impact of organisms

Earthquake

Volcano

c. Relate the role of technology and human intervention in the control of constructive and destructive processes.

seismological studies,

flood control, (dams, levees, storm drain management, etc.)

beach reclamation (Georgia coastal islands)

Enduring Understandings

- Students will understand that:
- Earth's surface features and constantly changing.
- Processes that shape the earth can be constructive, destructive or a combination of both.
- Human interaction with the earth can affect its surface features.

Research

→2 landforms in Georgia that were caused by constructive forces,

→2 landforms in Georgia that were caused by destructive forces, and

→1 landform or process that involves both constructive and destructive forces.

Two Types of Forces

- *Destructive Forces*: processes that destroy landforms.
 - 2 types: *Slow (weathering) and Fast (Erosion)*
 - Ex. landslides, volcanic eruptions, earthquakes, floods
- *Constructive forces*: forces that build up an existing landform or create a new one.
 - Caused by: *water, gravity, wind and glaciers.*
 - Ex: deposition, landslides, volcanic eruptions, floods

Weathering

Weathering Pictures

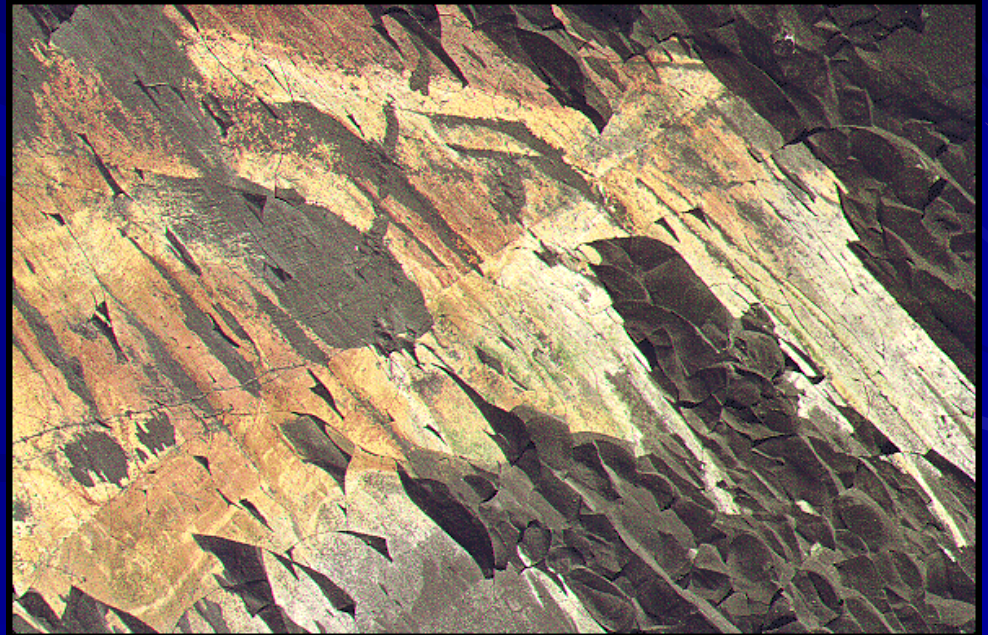
- *Weathering: a slow, destructive force* that breaks rocks into smaller pieces called sediments. Can be physical (mechanical) or chemical.
- **Keywords:**
wear down, break apart



Mechanical weathering: the breaking of rock into smaller pieces by forces due to *gravity, ice, plant roots, or other physical forces.*



Chemical Weathering: the changing of materials in a rock by chemical processes.



Erosion

- *Erosion*: the destructive movement of materials away from one place by *wind, water, ice and gravity*.

Wave Erosion- caused by water



Wind Erosion (Dust Storm)



Landslides

- *Landslides*: occur when *gravity* quickly pulls rock and dirt downhill.



Floods

- *Floods:* a great flow of water over an area that is usually dry land.



Volcanic Eruptions

- *Volcano*: an opening in the Earth's crust through which steam, lava and ashes erupt.
- Cause both destructive and constructive changes to landforms.



Mount St. Helens

[Mount St. Helens Video](#)



Saint Helen's Before



Saint Helen's After

Volcanoes can be constructive, but also destructive...



Earthquakes

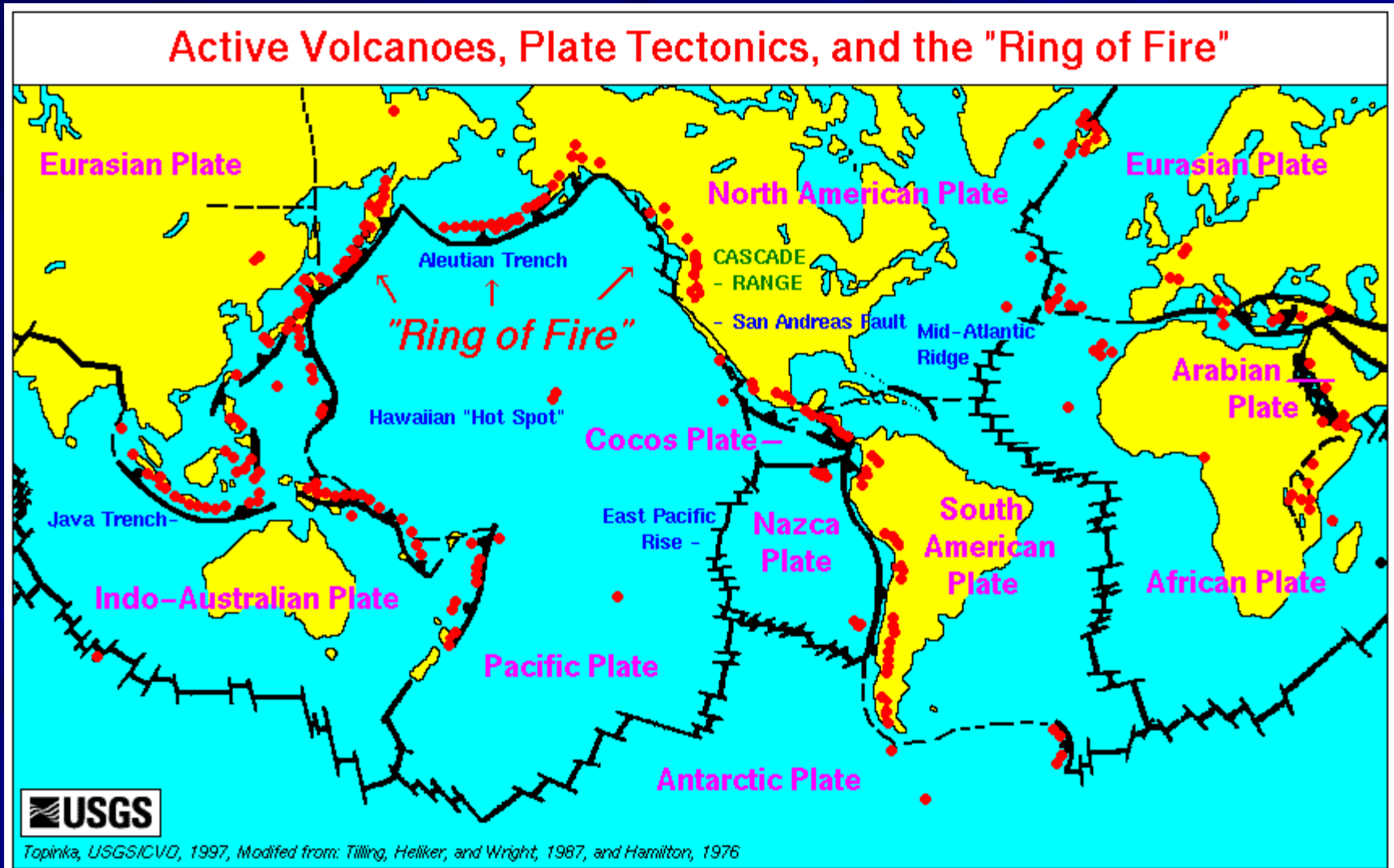
- *Earthquakes:* the shaking of Earth's surface caused by the *release of energy* along a fault.

San Andreas Fault, California



Volcanoes & Earthquakes

Tectonic Plates, Volcanoes & Earthquakes



Erosion & Deposition

- *Deposition*: the placing of materials in a new place (*constructive force*).
- Ex. Sandbars



Water Erosion & Deposition

- *River Delta-*
Deposits of sediment at the mouth of the Mississippi River creating new land called a delta.



Wind Erosion & Deposition

- *Sand Dunes*- sand is moved by *wind*

Desert Sand Dunes



Ocean Sand Dunes



Rill

- Rill erosion is the removal of soil by concentrated water running through little streamlets.
- <http://milford.nserl.purdue.edu/weppdocs/overview/rill.html>



MISCONCEPTION

Scientists can predict volcanic eruptions and sometimes earthquakes.

PROPER CONCEPTIONS

Scientists can use specialized equipment and technology to learn more about when volcanoes and earthquakes might occur, but scientists cannot make consistent and accurate predictions yet.

MISCONCEPTION

Changes to earth's surface only happen quickly.

PROPER CONCEPTIONS

Changes to the earth's surface can happen fast or slow.

MISCONCEPTION

Weathering and erosion are the same thing.

PROPER CONCEPTIONS

Weathering and erosion are both processes that change the earth's surface, but weathering involves breaking down rock into sediment while erosion is more related to wearing down earth's surface by carrying sediment away.

MISCONCEPTION

Rocks are here to stay!

PROPER CONCEPTIONS

Rocks, concrete, metal, etc. are all subject to weathering, earth's destructive forces, and the rock cycle.

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MISCONCEPTION

Humans can control earth's constructive and destructive forces.

PROPER CONCEPTIONS

Debatable –Humans can use technology, mechanical means, structures, etc. to help control earth's forces, but only temporarily –eventually these will also succumb to earth's forces.

MISCONCEPTION

Earth's forces can only destroy.

PROPER CONCEPTIONS

Earth's forces can be constructive, destructive, or a combination of both.

MISCONCEPTION

According to standard S5E1, tornadoes, hurricanes, and blizzards, among others, are powerful forces that shape the earth.

PROPER CONCEPTIONS

True to some extent, but standard S5E1's focus should be on constructive and destructive processes of the Earth and as related to earth's geology rather than on atmospheric processes.