

# Amaze Your Brain *at Home!*

ALL  
AGES

## EARTH FROM SPACE

**THE EARTH CONTINUALLY CHANGES.** Floods, droughts, wildfires, earthquakes, volcanoes, and human activity dramatically alter the surface of this planet. Satellite imagery from USGS EROS and NASA Earth Observatory offer a unique window into how this can rapidly occur.

### ABOUT

This activity introduces how satellite imagery is a powerful and recent tool to explore changes on Earth. In two different exercises, we will investigate natural events to see how they impact ecosystems and humans. In these exercises, the effects of earthquakes, volcanic eruptions, erosion, wild fires, deposition, and human activity are the focus.

**Note: Some of these events were catastrophic and people were impacted. Some of these caused the loss of human life and humans suffering. Some of the effects linger today.**

### MATERIALS

This exercise can be done with a writing utensil and a printout of this. Or it can be done on paper if using the pdf version.

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## EARTH FROM SPACE

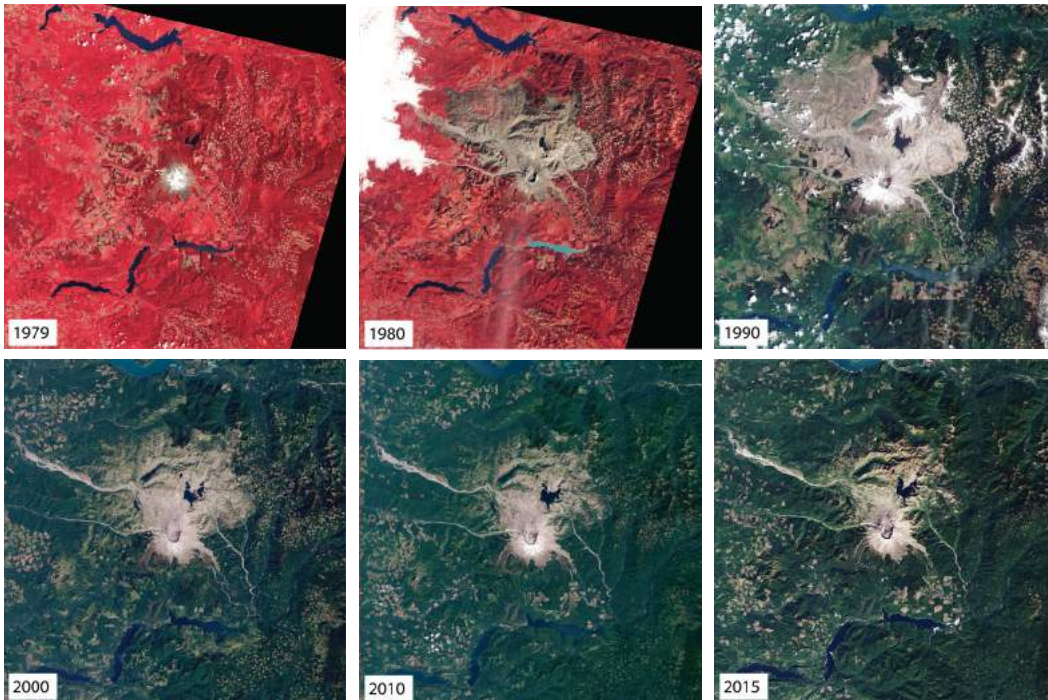
### SECTION 1. SEQUENCING EVENTS

In the space provided, write out two observations of the effects of the events in the sequence. Observations for the first one are done as an example. This exercise will also help orient us to what Earth's features and events look like in satellite view.

*Example:*

#### A. AFTER MT. ST. HELENS ERUPTION, WASHINGTON

##### Sequence



##### Observations

1. *The lake just north of Mt. St. Helens was partly filled in (with volcanic ash). Erosion since has cleared most the ash out of the lake.*
2. *The eruption caused wide spread devastation to the vegetation north of the volcano. Since that time vegetation has come back into the area covered by landslides and volcanic flows.*

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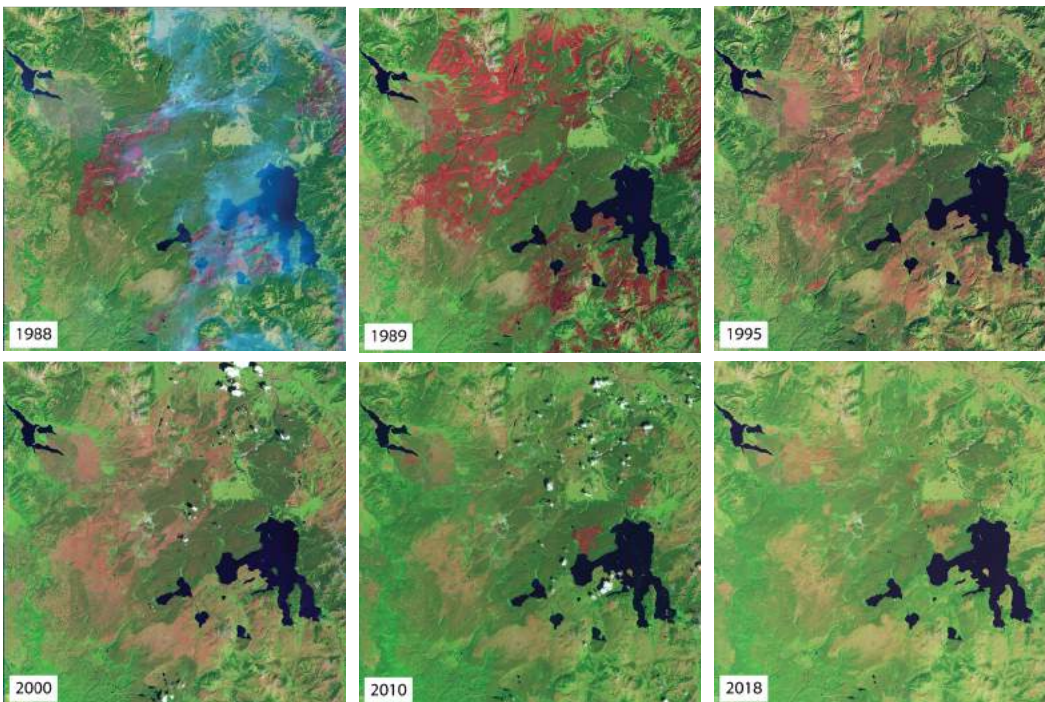


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### B. REBOUND SINCE FIRES AT YELLOWSTONE, WYOMING

#### Sequence



#### Observations

1.

2.

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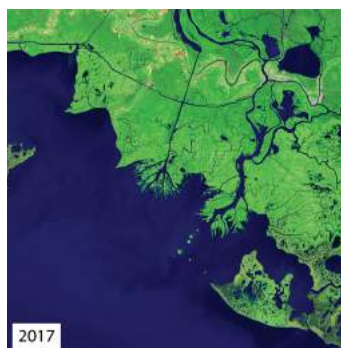
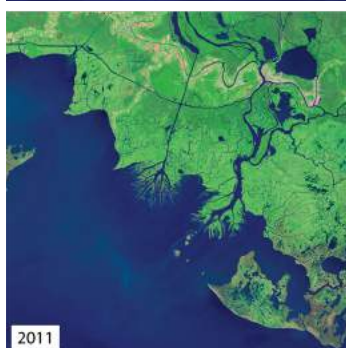
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### C. DEPOSITION FROM THE ATCHAFALAYA RIVER, LOUISIANA

#### Sequence



#### Observations

1.

2.

CONTINUED ON NEXT PAGE



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### D. COASTAL CHANGE AT CAPE COD, MASSACHUSETTS

#### Sequence



#### Observations

1.

2.

CONTINUED ON NEXT PAGE



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### E. SEDIMENT AT THE YELLOW RIVER, CHINA

#### Sequence



#### Observations

1.

2.

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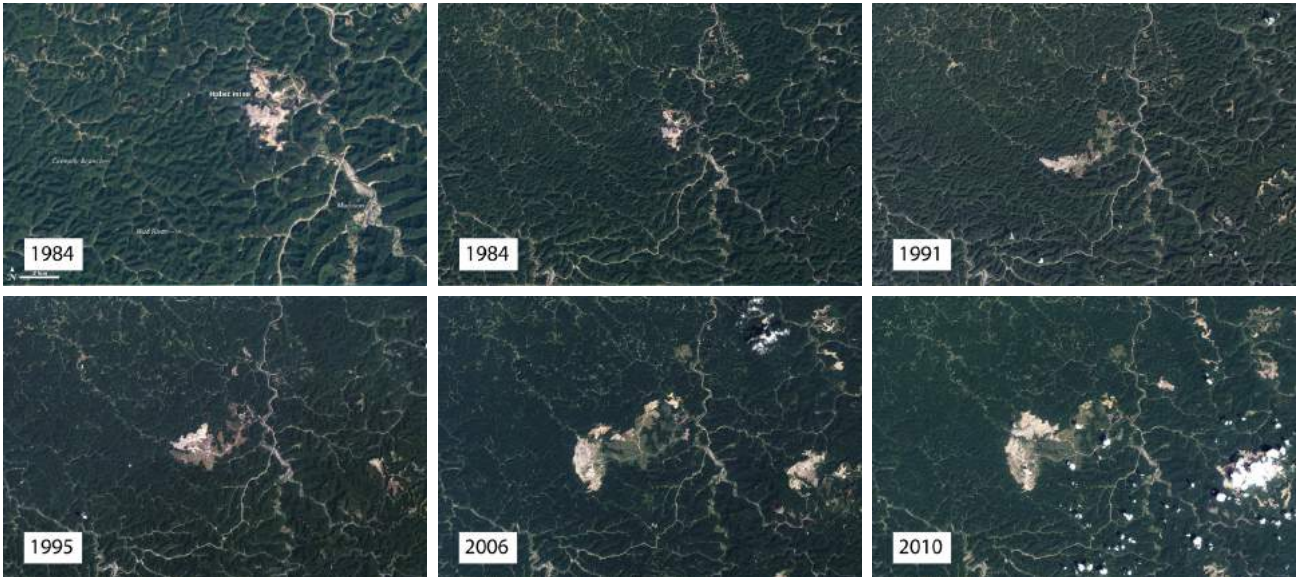
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### F. GROWTH OF A MINE IN WEST VIRGINIA

#### Sequence



#### Observations

1.

2.

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## EARTH FROM SPACE

### SECTION 2. NARRATING EVENTS *(Images and text modified from USGS EROS)*

#### PART A.

Read the descriptions of the events, and make 2 predictions of what you expect to see. The goal is to then match the description and use your predictions to the set of images.

#### 1. SNOW REFILLS RESERVOIRS

A decade long drought was eased by heavy rainfall and snow. This was confirmed by satellite images showing reservoirs refilled.

##### Predictions

a.

b.

#### 2. TORNADO DEVASTATION

An EF5 tornado with multiple vertices devastated a city, killing 161 people, destroying over 7,000 homes. One of the deadliest tornadoes in U.S. history.

##### Predictions

c.

d.

#### 3. A RIVER FLOODS

Heavy rains caused lakes and rivers to overflow, flooding rural and urban communities.

##### Predictions

e.

f.

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#### 4. AQUACULTURE CHANGES THE COAST

Rapid expansion of shrimp farms, radically transforms a coast, endangering local ecosystems.

##### Predictions

a.

b.

#### 5. ARAL SEA

One of the largest lakes in the world, shrinks and is now only 10% of its original size, after streams feeding the lake were used for irrigation and construction projects.

##### Predictions

c.

d.

#### 6. EARTHQUAKES AND LANDSLIDES

A magnitude 7.9 earthquake struck. After the initial damage, aftershocks caused numerous landslides throughout the region..

##### Predictions

e.

f.

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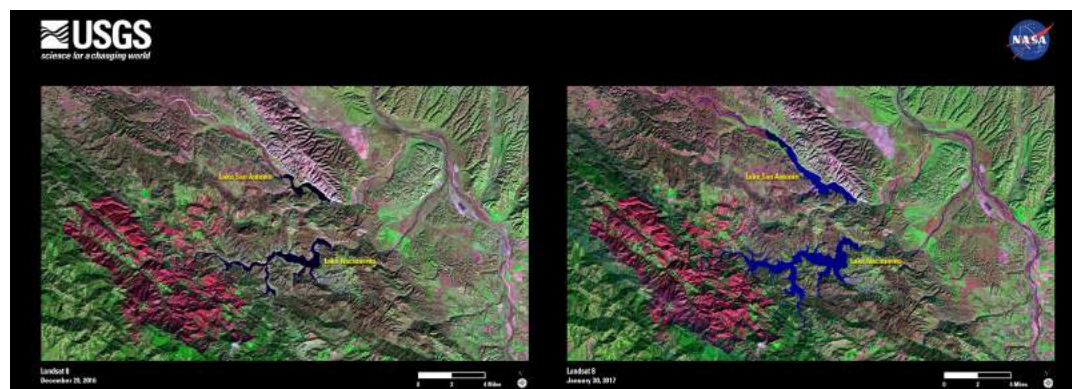
## EARTH FROM SPACE

### SECTION 2. PART A *continued...*

A.



B.



C.



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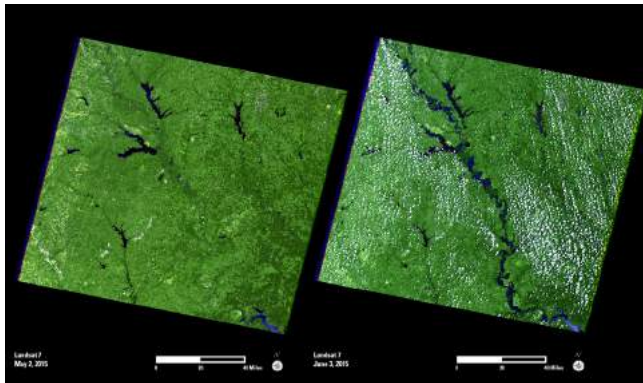
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### SECTION 2. PART A *continued...*

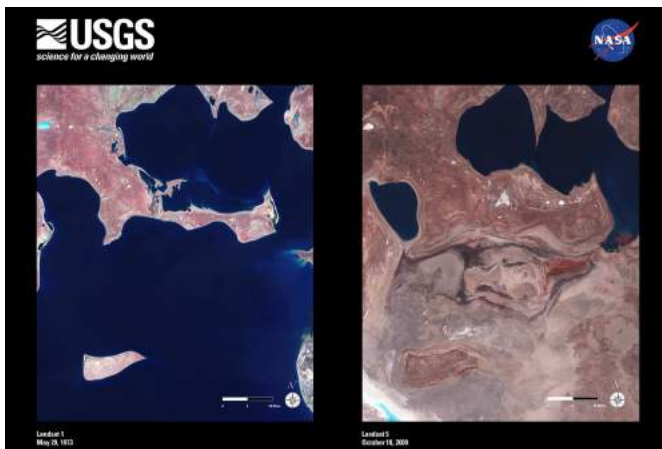
D.



E.



F.



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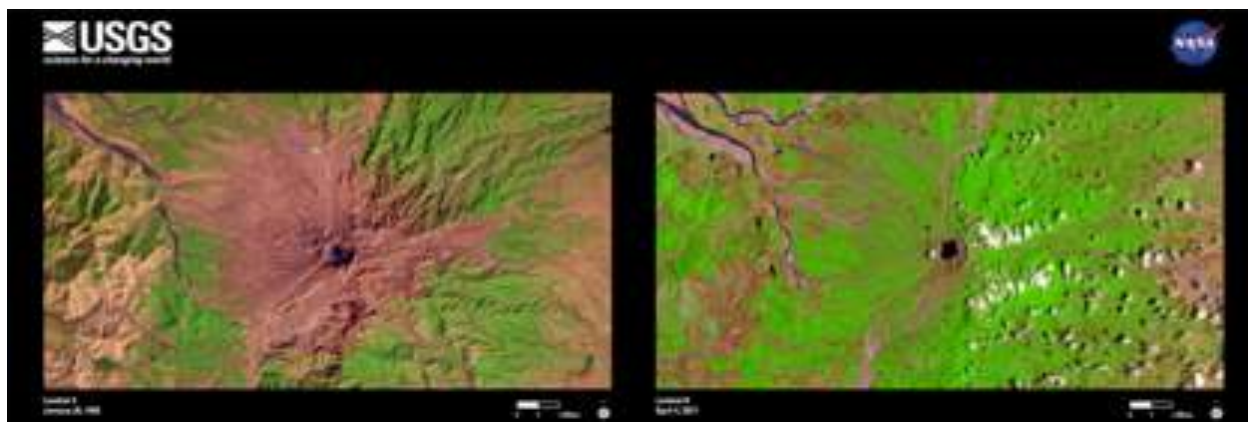
## EARTH FROM SPACE

### SECTION 2. NARRATING EVENTS *(Images and text modified from USGS EROS)*

#### PART B.

The image pair is given, but no description is given. It is up to you to identify the event, what happened, and predict how changes will unfold assuming no other events change the course.

7.



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## EARTH FROM SPACE

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#### PART B.

The image pair is given, but no description is given. It is up to you to identify the event, what happened, and predict how changes will unfold assuming no other events change the course.

8.



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## EARTH FROM SPACE

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#### PART B.

The image pair is given, but no description is given. It is up to you to identify the event, what happened, and predict how changes will unfold assuming no other events change the course.

9.



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### GOING FURTHER

The images used in these exercises came from NASA Earth Observatory (part 1) and USGS EROS Image of the Day gallery (part 2). There are numerous more examples available at these sites to go further.

More specific information can be found at the source of the images:

### SECTION 1

<https://earthobservatory.nasa.gov/world-of-change/Hobet>

<https://earthobservatory.nasa.gov/world-of-change/YellowRiver>

<https://earthobservatory.nasa.gov/world-of-change/CapeCod>

<https://earthobservatory.nasa.gov/world-of-change/WaxLake>

<https://earthobservatory.nasa.gov/world-of-change/StHelens>

<https://earthobservatory.nasa.gov/world-of-change/Yellowstone>

### SECTION 2

<https://eros.usgs.gov/image-gallery/image-of-the-week/2015-earthquake-and-landslides-nepal>

<https://eros.usgs.gov/image-gallery/image-of-the-week/trinity-river-flooding-texas>

<https://eros.usgs.gov/image-gallery/image-of-the-week/aleutian-eruption-day-and-night>

Joplin, Missouri - One Year Later, USGS EROS

Las Conchas, New Mexico, fires, USGS EROS

Aral Sea, USGS EROS

Aquaculture changes Mexican coastline, USGS EROS

<https://eros.usgs.gov/image-gallery/image-of-the-week/january-rain-snow-refills-california-reservoirs>

<https://eros.usgs.gov/image-gallery/image-of-the-week/mount-pinatubo-philippines-erupted-26-years-ago>



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