



Mount St Helens National Volcanic Monument – Teacher’s Corner 2016
Gifford Pinchot National Forest
USDA Forest Service

Reading the Landscape

Bus Activity

Teacher Information:

Time Requirement:	1 Hour
Roadway Used:	State Route 504
Locations:	Between the mile makers 29 and 52

This activity is completed while driving on state route 504, from the Hoffstadt Bluff Bridge at mile marker 29, to the Johnston Ridge Observatory at mile marker 52. Students use their observation skills, the teacher’s directions and information on their handout to identify geologic features along state route 504. Note: If students who were sitting on the left side of the bus did not successfully identify all features in route to Johnston Ridge, they can finish the activity in route back to your school.

Goals:

- 1) To increase student comprehension of the May 18, 1980 eruptive events before arriving to the visitor centers by orienting them to key eruptive features and their effects.

Objectives:

- 1) The student will be able to identify 9 landscape features related to the May 18, 1980 eruption from a bus seat.
- 2) Students will distinguish one geologic feature from another.
- 3) Students will not throw up.

Reading the Landscape

Bus Activity

Directions:

Read the questions and observe the landscape to locate the geologic features listed below. You can also use the green milepost markers along State Route 504 to help find the following geologic features:

Shattered Forest	Hilltop Hummocks	Replanted Blast Zone
Castle Lake	Ash-filled Valley floor	Crater
Hummocks	Lumpy Landslide-filled Valley	North Fork Toutle River

Mileposts 29 and 30: Look straight ahead as you cross a very long straight bridge to identify a key feature. This feature will remain visible on **both sides** of the road for several miles.

Feature 1 is: _____

Mileposts 31 and 33: As you first crest the top of the steep hill shortly after you pass the very long straight bridge, look out the **right side** of the bus into the valley below. Identify two key features on the valley floor.

Features 2 and 3 are: _____

Mileposts 40 and 41: Look out the **right side** of the bus. Identify one feature on the opposite side of the valley floor (#4) and a feature on the center of the valley floor (#5).

Feature 4 is: _____

Feature 5 is: _____

Mileposts 45 and 46: As you pass the Hummocks Trail look out **either side** of the bus and identify the mounds of rock on the valley floor.

Feature 6 is: _____

Mileposts 48 and 49: As you approach a hairpin turn at the head of a valley look **up and out the right side** of the bus and identify mound-like features on the top of Johnston Ridge.

Feature 7 is: _____

Milepost 51: As you approach Loowit Viewpoint just before look out the **right side** of the bus and identify feature in the distance.

Feature 8 is: _____

Mileposts 51: Look out the **left or right** side of the bus and identify a key feature on this ridge that was created by the lateral blast.

Feature 9 is: _____

Teacher Answer Sheet to Reading the Landscape

Bus Activity

Directions:

Read the questions and observe the landscape to locate the geologic features listed below. You can also use the green milepost markers along State Route 504 to help find the following geologic features:

Shattered Forest	Hilltop Hummocks	Replanted Blast Zone
Castle Lake	Ash-filled Valley floor	Crater
Hummocks	Lumpy Landslide-filled Valley	North Fork Toutle River

Mileposts 29 and 30: Look straight ahead as you cross a very long straight bridge to identify a key feature. This feature will remain visible on **both sides** of the road for several miles.

Feature 1 is: Reforested Blast Zone

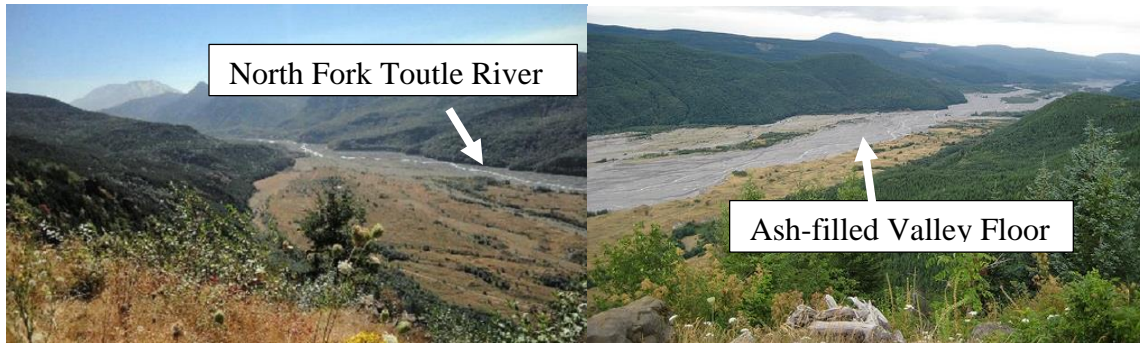
Weyerhaeuser Timber Corporation owns 68,000 acres of the 150,000-acre blast area. Weyerhaeuser logged and replanted the areas on both sides of the road between Hoffstadt Bridge and Elk Rock Viewpoint. Between Elk Rock and Coldwater Ridge, Weyerhaeuser owns land on the north (uphill side) of the road, and a little bit of land on the south side (downhill side). Evergreen greens tree planted in rows differentiate Weyerhaeuser land from the National Volcanic Monument where the landscape is being able to recovery naturally at nature's own pace.



Mileposts 31 and 33: As you first crest the top of the steep hill shortly after you pass the very long straight bridge, look out the **right side** of the bus into the valley below. Identify two key features on the valley floor.

Features 2 and 3 are: North Fork Toutle River & Ash-filled Valley floor

14 miles of the North Fork Toutle River was completely buried by the May 18, 1980 landslide. The river reformed a channel soon after the eruption.



The gray flood plain was first created by the North Fork Toutle River mudflow on May 18, 1980. Mudflows are wet-concrete like flows of water, mud, rock and debris. This mudflow eventually entered the Columbia River, changing its depth from 39 feet to 13 feet. Since the 1980 eruption, tremendous amounts of ash continue to flow down river and choke rivers with sediment.

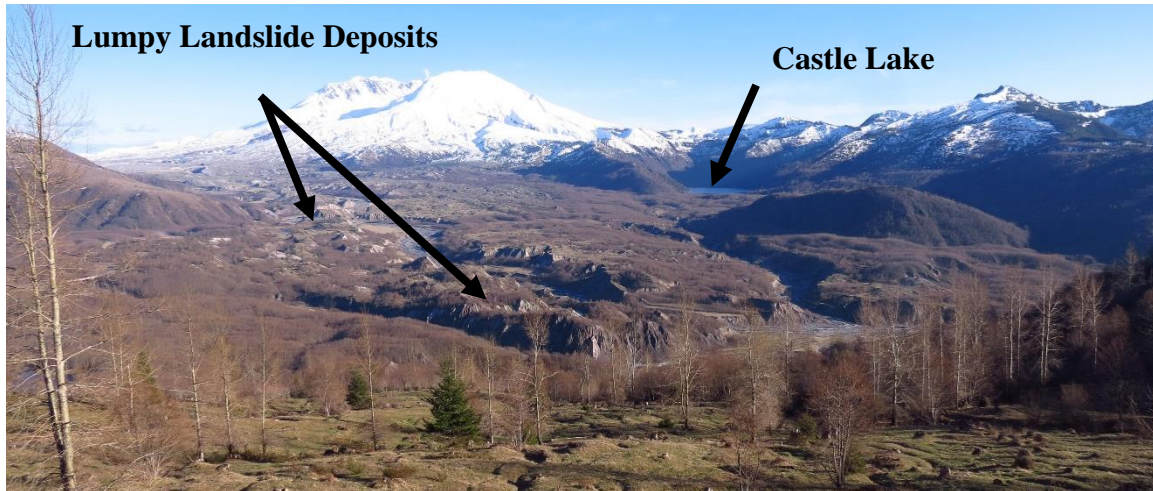
Mileposts 40 and 42: Look out the **right side** of the bus. Identify one feature on the opposite side of the valley floor (#4) and a feature on the center of the valley floor (#5).

Feature 4 is: **Castle Lake**

This lake was formed after the eruption. The landslide blocked the outlet drainage to Castle marsh, causing water to pool up behind the landslide deposit.]

Feature 5 is: **Lumpy Landslide-filled Valley**

On May 18, 1980, a gigantic landslide fell from the north face of Mount St. Helens. The landslide slammed against Johnston Ridge and was deflected down the North Fork Toutle River valley. The lumpy mounds are actually large intact chunks of the volcano that were carried down valley in the landslide.



Mileposts 45 and 46: As you pass the Hummocks Trail look out **either side** of the bus and identify the mounds of rock on the valley floor.

Feature 6 is: **Hummocks**

The small hills or mounds of rock are called hummocks. They are actually large intact chunks of the volcano that were carried down valley in the landslide on May 18, 1980.

Mileposts 48 and 49: As you approach a hairpin turn at the head of a valley look **up and out the right side** of the bus and identify mound-like features on the top of Johnston Ridge.

Feature 7 is: **Hilltop Hummocks**

Part of the May 18, 1980 landslide was able to ramp up and over Johnston Ridge. The lumpy mounds on the top of Johnston Ridge show where this happened. The landslide then flowed all the way down the valley you just drove up!

Milepost 51: As you approach Loowit Viewpoint just before look out the **right side** of the bus and identify feature in the distance.

Feature 8 is: **Crater**

Before the May 18, 1980 eruption Mount St. Helens was a perfect cone-shaped volcano. 90% of the mass lost on the volcano fell from the volcano in a gigantic landslide in the first few moments of the eruption. The lateral blast tore out another 3% of the rock lost. The horseshoe-shaped crater seen today is massive. 1313 feet were removed from the

summit alone. The distance from the crater rim to the crater floor is about 2,000 feet down. The distance from the east crater rim to the left crater rim is 1.2 miles

Mileposts 51: Look out the ***left or right*** side of the bus and identify a key feature on this ridge that was created by the lateral blast.

Feature 9: *Shattered Forest*

The blown down trees inside this section of the National Volcanic Monument can be hard to see. The lateral blast traveled at a speed of at least 300 mph. At Johnston Ridge the blast shattered the trees and carried them away. Geologists believe that the blast cloud doubled in volume the first five miles it traveled by consuming the forest that was in its pathway. In addition, large sections of land on this ridge was privately owned before the eruption and had been logged prior to the eruption—flat cut stumps reveal pre-eruption clear cuts.

Instructional Sequence for Reading the Landscape:

1. Have your students place their “Reading the Landscape” worksheets on top of their clipboards by the time your bus passes milepost 27. This will allow you about three minutes to explain the lesson plan before you reach the first feature to be identified.
2. As your bus approaches milepost 28 point to the milepost marker so students can become familiar with their appearance. If students sitting on the left side of the bus cannot see the milepost markers explain that you will announce when the bus is approaching/passing a milepost marker, or you can assign the task to a student.
3. Explain that their purpose is to find the geologic features listed in the table on the “Reading the Landscape” worksheet. Then explain that you or the designated student will alert students as they approach/pass milepost markers associated with each question. They will be identifying features between mileposts 29 and 51.
4. Encourage students to:
 - A. **Read the questions before they reach the milepost markers in order to know where to look.** Some features are only visible for short periods of time!
 - B. Read roadside signs to help identify geologic features on their worksheet. Some signs provide big clues! i.e. there are two lakes they have to identify. One is identified with a sign, but the other is not.
 - C. Write with pencils, so they can erase incorrect answers. Students may be able to identify some features through a process of elimination
5. After departing Johnston Ridge Observatory, consider reviewing the answers en route. After learning about the eruption students should be able to clearly identify the geologic features in question.