

13th annual Physical Geology poster session

Monday, November 20, noon, AS 1623

Local geology

1. Catherine Adams Gravley, North Seattle Community College

THE CREATION OF THE CHANNELED SCABLANDS OF EASTERN WASHINGTON

The Channeled Scablands of Eastern Washington were formed during a series of floods from glacial Lake Missoula, which excavated enormous channels through the swath of basaltic lava in the Columbia Plateau. Geologists theorize that the cataclysmic floods were caused by breaches of the lake's ice dams, releasing more than 20 million cubic meters of water per second. Masses of basaltic lava that survived the flow remain in a braided array of dry falls, coulees, and scoured bottomlands.

2. Chad Watts, North Seattle Community College

THE HISTORY AND CHARACTERISTICS OF THE CHUCKANUT FORMATION IN WASHINGTON STATE

There is a 50 million year old, 18,000 foot thick formation of sedimentary sandstone in northwest Washington state. Originating in the mountains near the Washington/Idaho border, deposition by an ancient river created what we know as the Chuckanut Formation. A giant swampy floodplain and riverbank basin was formed; covering most of the Pacific Northwest, and these conditions were excellent for the creation of fossils. The diversity of fossils found in this formation is in contrast with a scarcity of body fossils. Over millions of years, layers of sediment collected in this riverbank system, and with the movement of tectonic plates, the rock broke up and scattered from the Puget Sound to the North Cascades. Today, the sandstone and conglomerate that comprise this formation is in pieces that tilt and point in directions different from the horizontal layers of sediment that existed when the rock was created by the riverbank.

3. Sly Whitfield, North Seattle Community College

COAL MINING, WHATCOM COUNTY

Coal is a fossil fuel commonly used for heat and electrical generation formed from plant life that grew in swamps as long as 400 million years ago. Coal has been found in thirty-eight states. In this state there are eleven coal mines in Whatcom County near Bellingham. There are surface mines and underground mines in which coal is retrieved.

Coal mining has been and remains a dangerous and sometimes fatal job but much less than in earlier times. A cause of death universally associated with coal mining is known as black lung disease, a pulmonary disorder that builds up over years of inhaling high levels of air born dust particles.

4. Henry Lee, North Seattle Community College
MOUNT ST. HELENS ERUPTIONS: 1986 VS. 2004

The Mount St. Helens eruptions of 1986 and 2004 were signs that there could still be a major eruption like the eruption in 1980. The eruptions are very similar. Earthquakes were detected every time an eruption made the lava dome bigger. The main difference between the 1986 and 2004 eruptions is that the dome extruded by the 2004 eruption is a solid mass. The 2004 lava dome looks like a “whaleback”. Studying these eruptions helps determine when another major eruption will happen.

Catastrophes and Mass Extinctions

5. **Ian Hubert**, North Seattle Community College
POSSIBLE IMMEDIATE AND LONG TERM RESULTS OF A
REVERSAL OF THE EARTH’S MAGNETIC FIELD

The reversal periodic reversal of the Earth’s magnetic field is one of the greatest unsolved mysteries on the planet; what would happen if it switched again? Would birds be able to adapt for migration? Would it affect the weather? What type of impact would it have on humans, besides the flipping of the compass needle? Is it possible that we’re already seeing these effects?

6. Conan Storlie and Lisa Wilcox, North Seattle Community College

CHICXULUB: THE END OF AN ERA?

In the 1950s, while the Yucatan Peninsula region was being surveyed for oil, a crater approximately 145-180km in diameter was discovered. Scientists believe that 65 million years ago a meteor or asteroid roughly 10 km across struck the Earth, creating the Chicxulub crater on

the northern portion of the Yucatan Peninsula. The impact explosion was six million times that of the 1980 Mount St. Helens eruption. Immediately after impact the crater collapsed inward, and launched a central mound three times the height of Mount Everest into the sky. The subsequent shock wave, triggering magnitude-10 earthquakes, tsunamis, and a dust cloud which made photosynthesis impossible for several months, was catastrophic for much of life on Earth, and perhaps caused the extinction of the dinosaurs.

7. Stefanie Gordon, North Seattle Community College
RECENT DINOSAUR FOSSILS DISCOVERIES AND THE RELATION TO PANGEA'S
BREAKUP

In the past decade, the amounts of new dinosaur discoveries have been remarkable in aiding our knowledge of the dinosaur family. Fossils recently found have aided scientists to conclude that the continental breakup of Pangea had distinct evolutionary impact on characteristics and lineages of dinosaurs. Scientists are also inquiring into the effects of continental drift and migration, a main question asks how the breakup of Pangea affected evolution for the land based creatures. In order to answer these questions scientists look at fossils to piece together the evolution of dinosaurs. The location of dinosaurs' fossils today and determining where that species might had once lived in the world provides clues to continental breakup/land bridges and its relevance to overall evolutionary change.

Kristen Gordon: Geology, T.Furturani

The breakup of pangea in relation to dinosaurs extinction

In recent years scientist have found additional answers as to how dinosaurs became extinct. Fossils' being found does give scientists evidence that they lived but how did they die and where did they die? With recent questions still being studied it is believed that during the cretaceous period the earths plates began to shift in turn causing the breakup of the continent of Pangea. At the end of the cretaceous period is when all dinosaurs were extinct. In order to determine an answer to whether or not the breakup of pangea was the cause of mass extinction of dinosaurs scientists need to examine and find fossils in the area of the breakup.

8. Philip Del Costello, North Seattle Community College

ANTARCTICA'S TECTONIC HISTORY

Antarctica is the southernmost continent on earth and the Antarctic plate is the southernmost plate on earth. When locked into the massive land structure known as Pangaea, Antarctica bordered what is now India and Australia, much further north (parallel with the southern third of South America) than where it is now. Fossil records show that Antarctica shared the same Triassic reptiles with India and Africa, and the same plant life as India, Africa, South America, and Australia. Looking at Antarctica's and the Antarctic plate's past and present may unlock the answers to the many questions that can be raised about what lies ahead.

Uses of geological methods and materials

9. Katie Betzall and Yelena

PREHISTORIC CAVE PAINTINGS

Many types of minerals were used in the creation of prehistoric cave paintings. The paintings were made with a many different combinations of minerals, pigments, and animal fat. Some ways they may have applied the paint include using their hands, brushes made from animal fur and blowing the paint through a tube. These caves atmospheric conditions allow the paintings on the cave walls to preserve, and current dating methods allow us to date the paintings. The Chauvet-Pont-d'arc cave is in southeast France and was painted by Paleolithic artists.

10. Justin Crawford, North Seattle Community College

CLIMBING ON DIFFERENT KINDS OF ROCKS

Rock climbing is done on all kinds of rocks, in all of their formations, all over the world. However, some kinds of rocks stand out for the way that create dramatically different climbing experiences by affecting climbing style and safety factors. The crystallization of granites and gneisses, as well as the grain sizes and cementation of sandstones can affect the friction on hands and feet, the immense cracks and slabby formations of igneous rocks like basalt and granite promote long, dangerous and smooth climbs on intrusive formations like plutons, and the incredible diversity of limestone affords many various and fantastic forms around the world. The mineralogy also can affect how stable a rock is and how likely protection such as anchors, and handholds are to break away.

11. ELI SHIELDS AND WES BROCKBANK

CALCULATING NORTH KOREAS NUCLEAR CAPABILITIES THROUGH

SIEZMOLOGY.

On October 8th, 2006 North Korea conducted its first nuclear weapons test. The test site was in the No-dong province. This area of North Korea is a desolate mountainous terrain in north eastern North Korea. The use of seismology was used to calculate the underground explosion, more specifically seismology gave us an indication of the size warhead that the North Koreans have produced. The underground explosion was so large it sent out shock waves and tremors that could be measured with the same equipment that is used to measure the size of an earthquake. Even though several different countries gave their own calculations on the size of the explosion, all the countries used seismology to measure that explosion.

12. Michael Powell, North Seattle Community College
TRINITITE: WHAT IT IS AND WHERE IT CAME FROM

The "Trinity" test was the first ever test of a nuclear weapon, and thus gave scientists and observers their first look at what effects nuclear weapons can have. The test took place on July 16, 1945, less than a month before nuclear weapons were used on the Japanese cities of Hiroshima and Nagasaki, pushing an end to World War II. In the crater left at ground zero of the site, the New Mexico sand had been altered into a new mineral. The mineral, which was mildly radioactive, was termed trinitite after the name of the test that produced it. The trinitite produced by the bomb was disposed of in 1952, when the site of the test was bulldozed. It's illegal to take any minerals that may still be found at the site, but some remaining pieces of it can be found among collectors.

Hazards

13. Nick Lippert and Erin Wilson
LAHARS AND THEIR AFFECT ON THE ENVIRONMENT

Lahar is an Indonesian term that describes a hot or cold mixture of water and rock fragments flowing down the slopes of a volcano or river valleys. Lahars vary in size and speed, larger ones are far too fast for people to outrun and can do major environmental and economic damage on the affected area. Lahars are so strong that they carry large boulders and tree trunks whose force can knock over buildings and destroy anything above ground level. If things are not crushed by a lahar they can be buried under the debris it leaves behind. Being familiar with what can trigger a lahar and what to do if you are caught in the path of one is key when educating yourself. Our poster will explain the destruction lahars have on the environment and the proper ways to prepare for and escape from a lahar.

14. **Jeff Keeton and Chris Carlin**, North Seattle Community College
ACID RAIN AND ITS EFFECTS ON THE NATURAL WORLD

The Taj Mahal of Agra, India was built from 1632-1643 and is viewed as one of the most beautiful buildings in the world. It is built purely out of white marble, a metamorphic rock resulting from the metamorphism of limestone. However, this gorgeous structure is deteriorating due to the corrosive result of acid rain. Acid rain is defined as any type of precipitation that has a pH lower than 5.5. It is produced when sulfur dioxide and nitrogen oxides react with water and other chemicals in the air to form sulfuric and nitric acid. These acids then fall in the form of rain, snow, or fog causing weathering and erosion of rocks and structures worldwide. Luckily, this damage to the Taj Mahal is merely superficial, but it may only be a matter of time until acid rain causes structural damage as well.

15. Bro Berg, North Seattle Community College

Probable causes of mortality during a 8.0+ seismic event

The geologic area now covered by the city of Seattle has a history of regular earthquakes and will be hit by an 8.0+ quake at some point in the future. This poster displays the various high-mortality hazards caused by a seismic event of this magnitude. Existing data for probable landslides, soil liquefaction and tsunamis are displayed combined with the secondary hazards of probable structural failure of man-made structures. Seattle offers few safe havens but as this poster will show there are many areas that will suffer from a multitude of high mortality hazards.

Gemstones and minerals

16. Alice LaDow, North Seattle Community College

CALIFORNIA JADE

Jade, a naturally occurring gemstone, comprises two different minerals, jadeite and nephrite. Jadeite in San Benito County (CA) is found around Clear Creek in the New Idria Serpentine. Jadeite is the product of igneous metamorphic process, similar to how serpentine is formed (associated with subduction zones and thrust faults). Jewelers use jadeite for art carvings, but recently good jadeite is expensive so they use smaller pieces for rings, pendants, etc. and comes in a variety of colors depending on what elements are in contact during the formation process. The reason jade is so important because there is both artistic and geologic interest.

Simon Wei, North Seattle Community College

WHY ARE SAPPHIRES SO RARE?

At first it may seem odd that sapphires are so rare, as they are made up of aluminium and oxygen, which are among the commonest elements in our planet. Sapphires can only appear in the Earth where silicon is missing and they are found in only a few locations, from Madagascar and Kashmir to Burma and Thailand. Australia and Montana also have some sapphire deposits. They are first formed where an underground pool of magma has cooled and solidified into granite next to a deposit of marble. The gems are formed not in the marble but in the granite. To remove impurities, the limestone absorbs silicon from the magma. In pockets of the magma where the silicon is particularly scarce, the rock crystallizes to sapphires. Natural traces of titanium impart its blue colour.

18. **RAINIER POWERS**, North Seattle Community College WHAT PETRIFIED WOOD CAN REALLY TELL US

Petrified wood is created in a process similar to both fossilization and the creation of geodes. This process is faster than expected, with some petrified wood findings being only a couple thousand years old. This is because the tree's cells are significantly more permeable than a rock. Minerals such as silica invade the cells of the tree and preserve the tree rings. However, depending on mineral ratios that permeate the wood, various opalesque colorings can develop. Once a date of the tree has been determined, the preserved rings can be interpreted to give an accurate reading of the climate of the tree's habitat during its lifetime. Though any kind of tree can be petrified, big trees with hard woods are favored, conifers making up the majority of petrified trees.