THE OTHER SIDE OF NOVARUPTA

A photogeologic tour of Katmai Valley and Canyon
A presentation by

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- B.S. Aerospace Engineering, Univ. of Texas
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- Current research interests: Flood geology, origin of Palo Duro Canyon, hypoxia in the Gulf of Mexico.
What we will cover

- Why do I believe in a global cataclysm?
- Volcanism basics and how they relate to the Flood
- The June 6-8, 1912 eruption of Novarupta
- The other side of Novarupta
- Summary, Q & A
I believe

- in 6 days and a rest.
- the Earth and Universe are really old, about 6,000 years old!
- natural history research is different from testable, repeatable science.
  - It is about studying historical events, and therefore logically requires inputs from other areas like history, philosophy, and theology.
- God’s word can be used to direct scientific inquiry, and can help us understand past events.
Scripture warns us about accepting uniformitarian ideas of Earth history.

“...scoffers will come in the last days, walking according to their own lusts, and saying, ‘Where is the promise of His coming? For since the fathers fell asleep, all things continue as they were from the beginning of creation.’ For this they willfully forget: that by the word of God the heavens were of old, and the earth standing out of water and in the water, by which the world that then existed perished, being flooded with water.”

2 Peter 3: 3-6
Why do I believe in a global cataclysm?

- I believe God’s word.
- Noah and his family believed in it.
- Moses believed in it.
- Jesus Christ believed in it.
- Peter believed in it.
- The Earth is still mostly covered with water.
- Water-deposited sedimentary rock layers averaging 1-mile thick exist worldwide.
- Ocean bottoms are now mountain tops.
Flood facts

- The Flood was much more than 40 days and nights of rain (Genesis 7:4, 12).
- Climate research suggests that the atmosphere cannot hold enough water vapor to produce more than 30 feet of water.
- Genesis 7:11 describes “fountains of the deep”, where most of the water probably came from.
- After continuous rainfall ceased on Day 40, waters kept rising until Day 150.
- Earth had dried and Noah opened Ark after about 1 year and 10 days.
It is difficult for us to imagine the Flood

- Can you imagine the Earth being completely flooded?
- Can you imagine the forces that caused mountains to rise and valleys to sink (Psalm 104:8) with displacements exceeding 45,000 ft?
- Can you imagine 26,000 ft of continuous sediment deposition to form sedimentary rock layers like the Naknek formation?
- Can you imagine ice-cold megastorms that buried mammoths so quickly that, when uncovered today, still have undigested grass in their mouths?
Present-day catastrophism, not stasis, helps us think about historic events shaping Earth’s surface.

Figure 2. Comparison of stratigraphic interpretive frameworks. They include: (1) the uniformitarian stratigraphic column, (2) geologic energy vs time,20 (3) Froede’s creationist column,21 and (4) Walker’s creationist column.20 Please note that there is no specific correlation between (1) and the other columns, nor is there exact correlation between the various creationist proposals.

Volcanism basics
Volcano cross-section
Volcanoes were bigger in the past

- \( \text{VEI} = \text{Volcano Explosivity Index} \)

- Historic trend fits one of two patterns:
  - **Catastrophism**: Volcanoes were more explosive in past
  - **Uniformitarian**: More explosive volcanoes are less frequent

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**Graphical Representation:***

- **Flood**: 270 mi³
- **Post-Flood***: 136 mi³
- **Ice-Age***: 16.4 mi³
- **Last 1000 yrs**: 3 mi³
- **Last 100 yrs**: 3 mi³


Uniformitarian model: bigger eruptions less frequent, but doesn’t fit history.
Magmas form a variety of rocks

Illustration by J. Johnson
Magmas vary in flow characteristics

Classification and Flow Characteristics of Volcanic Rocks

<table>
<thead>
<tr>
<th>Classification &amp; Flow Characteristics of Volcanic Rocks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Volcanic rock name</strong></td>
</tr>
<tr>
<td>Silica (SiO₂) content</td>
</tr>
<tr>
<td>Eruption temperature</td>
</tr>
<tr>
<td>Lava color scale in °C:</td>
</tr>
<tr>
<td>Low resistance to flow (thin, buggy lava)</td>
</tr>
<tr>
<td>High resistance to flow (thick, sticky)</td>
</tr>
<tr>
<td>Decreasing mobility of lava</td>
</tr>
</tbody>
</table>

Illustration by J. Johnson
Igneous rocks are “easy” to identify!

® Basalt
Igneous rocks are “easy” to identify!

® Andesite
Igneous rocks are “easy” to identify!

**Dacite**
Igneous rocks are “easy” to identify!

- **Rhyolite**
Volcanoes release lots of $\text{H}_2\text{O}$

- Rhyolite contains 4-5% water when it crystallizes.
- As magma rises to the surface, pressure is reduced, and water (and other gases) come out of solution. This makes it difficult to determine how much water a volcano originally contained.
- Some researchers believe there is more water beneath Earth’s crust than at the surface.
  - This is supercritical water, $T=374^\circ\text{C}$, $P=218$ atm, $\rho=0.3$ g/mL. Phase changes can cause violent eruptions and earthquakes.
- Other volcanic gases include $\text{CO}_2$, $\text{HCl}$, $\text{HF}$, $\text{HNO}_3$, $\text{H}_2\text{SO}_4$, $\text{H}_2\text{S}$, $\text{SO}_2$, $\text{CH}_4$
Sulfur dioxide gas and volcanic ash reflect sunlight.

Did volcanic activity trigger the Ice Age?
Volcanic activity is an important part of Earth history

- **Creation**: Like Jesus Christ’s virgin birth, it was a miraculous event.
- **We should not pretend that the Flood can be explained by purely naturalistic mechanisms.**
- **Flood**: Fountains of deep released not just water, but other gases and solids.
- **Ice Age**: Triggered by warm seas releasing water vapor and cool atmosphere filled with ash and SO$_2$.
- **Stasis**: Reduced volcanic activity. No more flood basalts, Yellowstone-size eruptions, etc.
Novarupta

The June 6-8, 1912 eruption
Google Earth

- A good way to study Earth’s surface features.
Mt. Katmai collapsed, and two magma chambers blew out Novarupta.

Figure 6. Cartoon depicting the triggering of eruption from a stagnant shallow andesitic reservoir by dyke injection. In the Katmai case (top), the dyke drains the reservoir because the dyke magma is less dense than the reservoir magma. In the Karymsky case, the dyke causes reservoir magma to be expelled upward because the dyke magma is denser than the reservoir magma. Note that the dyke, shown in plan view, may be only a few metres thick, whereas the reservoir is likely to be a kilometre or more in extent in the direction of view. As the Katmai–Novarupta dyke crosses the former base of Falling Mountain (figure 2), its emplacement may have played a role in that dome’s collapse on the first day of eruption.
June 6-8, 1912

- Up to 700 ft. of ash deposited in 60 hours!
Novarupta lava dome, then and now

“Then” pictures from The Valley of Ten Thousand Smokes by Dr. Robert F. Griggs (1922).
The Valley of 10,000 Smokes, then and now

- “Then” pictures from The Valley of Ten Thousand Smokes by Dr. Robert F. Griggs (1922).
The extreme weather, then and now

“Then” pictures from The Valley of Ten Thousand Smokes by Dr. Robert F. Griggs (1922).

SORTING OUT THE WRECKAGE AFTER THE STORM AT BAKED MOUNTAIN

We looked and felt very much like rag-pickers on the dumps, but among the wreckage were many of our most cherished possessions.
How does Novarupta compare?

- About 30x larger than Mt. St. Helens 1980 blast
- Over 75x smaller than Yellowstone!

<table>
<thead>
<tr>
<th>Eruption</th>
<th>Year</th>
<th>Volume of Magma Ejected, km³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowstone Caldera</td>
<td>unknown</td>
<td>1000*</td>
</tr>
<tr>
<td>Krakatoa</td>
<td>1883</td>
<td>18*</td>
</tr>
<tr>
<td>Novarupta</td>
<td>1912</td>
<td>13**</td>
</tr>
<tr>
<td>Mt. St. Helens</td>
<td>1980</td>
<td>&lt;1*</td>
</tr>
</tbody>
</table>

Comparison of magma ejected from several volcanoes. *Austin, 1998; **Eichelberger and Izbekov, 2000. Mt. St. Helens photos by USGS.
Other Novarupta facts

- Generated over 100 earthquakes magnitude 5 or greater.
  - On June 7, 115 miles away in Iliamna “the earth never ceased to move for nearly 12 hours.”
- Ash cloud seen as far away as Algeria.
- Explosion heard over 750 miles away in Juneau, AK.
- Sulfuric acid rain tarnished brass as far away as Seattle.
Other Novarupta facts

- Over 1 ft of ash covered Kodiak Island, 100 miles away.
- No loss of life reported.
The other side of Novarupta

2011 Explorations
Novarupta is the most-researched place in Alaska.

- But the other side of Novarupta is a different story.
  - There is no USGS research cabin.
  - There are no man-made trails.
So why go to the other side?

- To learn more about the story of Novarupta.
- Areas that are little-known and poorly researched are great for creation researchers to study and present a better interpretation than researchers who need to stretch the evidence to fit a uniformitarian model.
- Creation researchers can “take dominion” of these places, providing a better interpretation that fits a Biblical model.
- To have a family adventure and fulfill John 10:10!
The location

Find me SPOT!

spotadventures.com/trip/view?trip_id=272260
How to get there

- Seahawk Air Service from Kodiak, AK
How to get there

- Kodiak Island looks like Hawaii
How to get there

© Dakavak Lake

§ Notice the outflow comes out as groundwater
How to get there

“Circle Lake”, a great landmark in an unmarked land.
How to get there

© The blessing of an experienced pilot
Setting up camp
First hike
First hike
First hike
First hike
First hike
First hike
First hike
First hike
First hike
Day 2

 Crossing the Katmai River
Day 2

- Rhyolite in a sea of andesite
Day 2

- Massive rocks on top of landslide material
Day 2

© Purest springs in the world
Day 2

This spring has a different bottom, smooth and darker-colored rocks.
Day 2

- Noisy glacier
Day 2

- Uplift between Mt. Katmai and Noisy Mountain
Day 2

- Evidence of lahars
Day 2

Lots of ash on top of thick snow
Day 2

Gorge at end of Noisy Glacier Creek
Day 2

- Back down into Katmai Valley
Day 2

View looking back at Noisy Glacier Creek from across the Katmai River.
Day 2

- Crossing the Katmai River has never been easy!
Day 2

Where the upper Katmai River cuts through landslide debris.
Day 2

Princess Glacier
Day 2

Princess Glacier, view from the top
Day 2

- Chased off a big grizzly
Day 3

© Stasis, then and now
Day 3

Heading to Dakavak Lake
Day 3

Following an unnamed creek
Day 3

- Pumice dunes are not easy hiking!
Day 3

Snow tunnel
Day 3

“Circle Lake” we saw from the air
Day 3

Now where?
Day 3

- Campsite in the clouds
- Chased by a grizzly!
Day 4

- It looked easier on Google Earth
Day 4

Made it with 1 hour to spare!
Day 4

® A welcome sight
Day 5

Back in civilization on Kodiak Island
Observations

- Noisy Mountain Landslide
  - Around 2 km³ of rock released from the mountainside
Observations

- Noisy Mountain Landslide
  - Around 2 km$^3$ of rock released from the mountainside
Observations

- Noisy Mountain Landslide
  - Landslides make unexpected conical mounds
Observations

- Noisy Mountain Landslide
  - Landslides make unexpected conical mounds
  - But so do ash and rock-covered glaciers
Observations

Is Noisy Mountain a tuya?

Herðubreið, Iceland

Noisy Mountain
**Observations**

- **Tuya**: A flat-topped, steep-sided volcano that forms when lava erupts beneath a thick glacier or ice sheet. Can form pillow lava, which is a type of basalt formed underwater.
Observations

- Uplift between Mt. Katmai and Noisy Mountain
  - Did Mt. Katmai side collapse and Noisy Mt. side rise?
Observations

- Uplift between Mt. Katmai and Noisy Mountain
- Evidence uplift was post-glacial. Only 1 Ice Age.
Observations

Princess Glacier, then (1917) and now
Observations

- Almost no movement of Princess Glacier
- About 7 ft of recession per year since 1951
- Ash has a high albedo, insulating the ice
- Did volcanic ash in air after the Flood trigger the Ice Age?
Observations

- High number of unconformities on maps.

1993 USGS

- 23 mya to 1912
- 50 to 34 mya
- 60 to 55 mya
Observations

- Dormant/Active pattern gets more closely-spaced with time, similar to Mt. St. Helens
- What if instead it has been relatively active since the Flood, about 4,500 years ago?

Mt. St. Helens eruption pattern, stretched to fit uniformitarian model using radiometric dating
Observations

- Dormant/Active pattern gets more closely-spaced with time, similar to Mt. St. Helens.
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Observations

- Since records were kept beginning in 1760, Alaskan volcanoes erupt on average of 2 times per year.
- Alaska has over 12,000 earthquakes per year!
- Actual historic records contradict long periods of dormancy required to fit a uniformitarian model.
Observations

- Since Novarupta, at least one volcano within sight of Novarupta has been spewing something out!
- There is no good reason to believe K/Ar radioisotopes do anything more than distinguish between different lava flows.
- There is no good reason to believe bigger eruptions are less frequent; it is a speculation used to stretch geologic models out to fit a uniformitarian time scale.
Some uniformitarian researchers complain that Dr. Steve Austin’s Mt. St. Helen’s lava dome data are unreliable because he only used one method (K/Ar) to get a radiometric age of about 3 million years for a 25-year old Mt. St. Helens lava dome, and for using a method on rocks that are too young (less than 2 million years).

But how do you know a sample’s age before it is tested?
Observations

Assumption: Radiometric dating does not work

Creation Science Issues
Radiometric Dating – A Christian Perspective
by Dr. Roger C. Wiens

Did you know that you can be a Christian and believe that the earth is billions of years old? You can even believe in evolution and be a Christian. There is no conflict between science and the Bible if one understands how to merge science and the Bible. To learn more about old earth creationism, see Old Earth Beltz, or check out the article Can You Be a Christian and Believe in an Old Earth?

However, in reality there is often a small amount of argon remaining in a rock when it hardens. This is usually trapped in the form of very tiny air bubbles in the rock. One percent of the air we breathe is argon. Any extra argon from air bubbles may need to be taken into account if it is significant relative to the amount of radiogenic argon (that is, argon produced by radioactive decay). This would most likely be the case in either young rocks that have not had time to produce much radiogenic argon, or in rocks that are low in the parent potassium. One must have a way to determine how much air-argon is in the rock. This is easily done because air-argon has a couple of other isotopes, the most abundant of which is argon-36. The ratio of argon-40 to argon-36 in air is well known, at 295. Thus, if one measures argon-36 as well as argon-40, one can calculate and subtract off the air-argon to get an accurate age.

One of the best ways of showing that an age-date is correct is to confirm it with one or more different dating method(s). Although potassium-argon is one of the simplest dating methods, there are still some cases where it does not agree with other methods. When this happens, it is usually because the gas within bubbles in the rock is not all the same age. For instance, if the rock was originally at a higher temperature, the argon would have been released and the rock would then have a lower argon content. This could lead to a younger age-date. Thus, it is important to have a thorough understanding of the process that caused the argon loss.
Observations

- Apparently, rocks from Novarupta were erroneously dated at 4 million years old.
A better interpretation

- Naknek Formation is a Flood deposit.
  - Uplifted towards end of Flood and into Ice Age.
- Mountain ranges formed post-Flood and continued through Ice Age
  - As ice melted, pressure released, allowing magma to rise and mountains to build.
- Recent uplift near Noisy Glacier is post Ice Age.
- Observations from 1760 to present give us no reason to believe in long dormant periods.
- Catastrophism, not uniformitarianism, describes landscape changes best.
A better interpretation

- God created. Man fell. He brought a Flood. The Flood caused an Ice Age. He sent His Son. And He will return. There is evidence for all of this in His word and His works.
Do you have a creation story to tell?

- You do not need to be an "expert" to do scientific research or natural history research.
- Do you have a favorite place, plant, or animal?
  - Study it for 1 or 2 years, then present your findings.
Stay tuned for.....

○ Reforming the Story of Palo Duro Canyon
Learn more at

- drshormann.wordpress.com
- spotadventures.com/trip/view?trip_id=272260