

EHaz 26 April 2007 Questions

The following questions are arranged by topic.

Risk assessment & management

MTU

Slide 17 (very good slide, by the way!): In the case of the Merapi and Mt. St. Helens crises, **how was the scientific observations/information “coded” into the decision making process for the crisis management?** How was the information for the risk analysis that came from different sources “combined” (made commensurable) and used in a real time risk assessment? Was there a specific formal approach, or was it more based on “expert criterion”? (Rüdiger)

SFU

St Helens seem to be a perfect laboratory for testing and improving active survey and risk managing. Do you think that this is enough to avoid any volcanic catastrophe in US territory in the future? (Guillaume)

UBC

Paper: JVGR 2000 Voight et al; Merapi Volcano

In the discussion section of this paper, the issue of the timing of mitigation measures is brought up. Generally speaking, how are scientists (academic & government volcanologists) striving to bridge the gap between informing/educating the community and advancing within their scientific career? (Rebecca)

Colima

How are decisions regarding risk analysis and potential mitigation procedures made using the wealth of data sets available at MSH? Are there some data sets which provide a better ‘prediction’ than others and thus are given more importance in the decision making process?

Petrology

ASU

Are there other lines of petrologic evidence for the late-stage conduit heating due to the release of latent heat? Could this conduit heating cause a change in the rate of amphibole breakdown, and if so, could this provide a false magma ascent rate as determined from the breakdown rim thicknesses?

Buffalo

Slide 103:

The speckled coloration of the mineral zonation in this slide looks fantastic. How was this accomplished? Is it a process within the software of the SEM itself or was this done later by an outside program? And, what is the name of the program that was used?

UBC

My question is regarding the magma chamber model from the powerpoint: Zoning in amphibole crystals seems to be used as evidence for a convecting magma chamber, can the pressure differences that these zones represent be explained in any other way? ie. Can they be explained by pressurization and depressurization cycles of the magma chamber? Can you differentiate between these types of events(convection vs pressurization/depressurization)? Can you see similar zoning in other minerals (specifically plag)? (Heather)

Eruption dynamics

UNAM

What factors are responsible for the minor volatile content of the magma involved in the last eruptive cycle? (Nacho)

OREGON

The system at MSH has been described as near equilibrium and has shown relatively constant effusion for the last couple of years. How near equilibrium do you think the entire system? That is, does effusion equal the crystallization and magma influx? If so, what is the primary control?

MTU

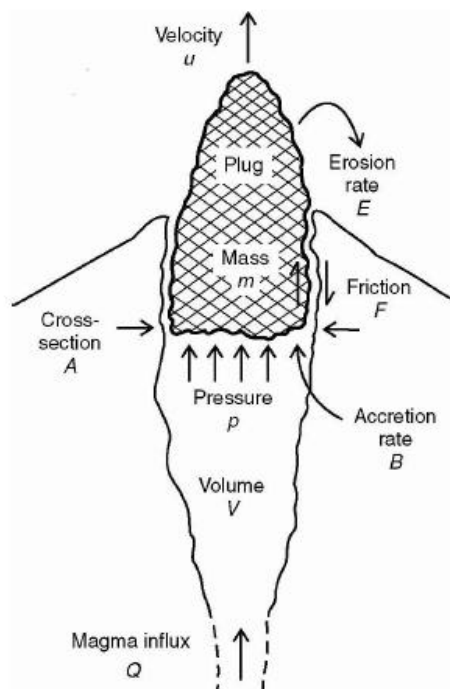
There is strong evidence supporting the idea that the primary trigger for the current activity was the large amount of rain that fell in Sept. 2004. Since the renewed activity, has MSH responded to high rainfall or increased snowmelt (especially after long “dry seasons”)? (Julie)

SFU

In the different papers we get an excellent background of the recent activity of Mt St Helens with a chronology until Spring 2006. However, can you give to us a general summary of the on going eruption? What is the eruptive rate? What is the cumulative volume of this eruption? What is the actual elevation of the summit of the new dome? At this rate of extrusion, how long will it be before the 1980 crater will be completely filled by the new dome? (Guillaume)

OREGON

If the overall system is at a relatively steady state with constant effusion and ‘drumbeat’ seismic signals, can the current state increase our abilities for prediction at MSH? i.e a change in the system at A will result in B.



Conduit factors and dome growth and collapse

Colima

A model has been proposed for the seismicity related to dome growth. Is it thought that similar growth occurred with the previous domes in the 80s? What seismicity was detected then? How applicable is this model to domes at other volcanoes? What are the most important parameters which determine the type of dome growth and its related seismicity (composition, ascent rate, volatile-contents etc.).

ASU

Do the dome extrusions at St. Helens (spines) have the same 'dimensions' (girth?) as the 'conduit'? How do the 1980-1986 dome extrusion 'dimensions' (not volume but 'girth') compare with the 2004-present activity? In the review paper, Pallister mentions that some of the lava is "thought to represent residual 1980s dacite but there is evidence that there is a new dacite mixing with 1980s dacite" (p8, top column 2) Could the residual magma be scraped from the sides of the conduit or is it more likely to be forced up from depth?

UNAM

Pallister et al., 1992 & Slide #108

Is the 2004-2006 eruption within the same conduit as the 1980 eruption? How could we know that? Was the conduit geometry changed after the earthquake and explosive events of '89 and '90 so that more rock-breaking needed to occur? (**Victor**) (& Julie MTU)

Buffalo

Why are we not getting pyroclastic flows? Does the magma not have a high enough gas content? Is it not falling far enough? Is the temperature a factor? Are we in fact getting some pyroclastic breakup but it is contained between the old dome and crater walls? What is the difference between a very dusty large rockfall and a small pyroclastic flow? If dome growth fills the crater would that change anything?

MTU

Slides 12 to 14: It seems that in the case of Merapi, the main concern was the potential collapse of a large sector (maybe the whole) of the dome. **How were the stability of the dome and potential size of such a collapse assessed?** How was this assessment updated during the crisis and what information was used to "feed" this update process? It also seems that estimating the size of the dome (i. e. the amount of available "collapsible" material) was a key element of that assessment and relied heavily on remote sensing monitoring techniques (i. e. imagery of the evolving dome). How was this monitoring done in real time? (Rüdiger)

SFU

This may be an oversimplification but if degassing or magma replenishment (or a combination) are the main drivers of dome building, in their absence what other forces are available to move the plug and grow the dome? I can't help but see a squeezing toothpaste tube as an analogy! (Terry)

UNAM

General

Could you clarify why the intrusion of lava dome through a glacier do not result in significant melting? Could we simulate that situation in a laboratory to understand the thermodynamic processes? (Natalia)

General Monitoring

Buffalo

Have you been able to correlate thermal activity with degassing or spine collapse events at MSH? Has FLIR been used at Merapi? Have new methods such as UAVs and infrasound been useful?

Colima

What monitoring is being done on the other Cascade volcanoes that pose a potential threat to populations or are showing signs of activity (e.g. Rainier and South Sister bulge)? What importance do these other volcanoes have in comparison with MSH (in terms of money allocated and monitoring attention)? Qualitatively, how much of the CVO budget at MSH is dedicated to scientific research as oppose to strictly monitoring efforts.

Edifice Stability

MTU

Back in 2004, there were some concerns about what would happen when the whaleback 'hit the wall.' We had been wondering if the edifice would start deforming; in hindsight, was that a relevant concern? (Julie)

Extra questions (if there is time)

UBC

Cava? I know- it is branching out from the science of volcanology- but I was quite intrigued reading this discussion section. (Rebecca)

SFU

Where has the gas gone from the huge shallow magma chamber? Is it still in part locked in the magma chamber? Or has it escaped in the past through the country rock? Was it incorporated in the minerals? (Guillaume)

MTU

In the Pallister et al (1992) paper: they combine probabilistic type of info (i. e. recurrence intervals) with deterministic ideas (i. e. the idealized cycles) to come up with a picture of the current (back in 1992) state of the magmatic system and its hazard implications. **How should that model be updated to take account of the observed current activity?** And I'm interested mainly on the ideas of the 1980 "left over" vs. new magma injection (and possibly mixing) question. (Rüdiger)

UBC

The difference between executing warning systems surrounding Mt.St. Helens and Merapi would be quite different, I imagine. Can we discuss ways to improve the communication between community members at-risk and volcanologists? (Rebecca)