Eliza Calder Discussion – Thursday February 21st, 2007

Lava Dome Collapses : Part II

1	SFU/UBC ASU	**Terry & Arizona:** Does the internal temperature of the dome have any effect on the observed behaviour of these different collapse events? Would a "hot & plastic" dome be more likely to generate PFs vs cold avalanches? And if so, how would you go about accurately measuring the dome temperature? What effect does the temperature of the collapsing dome have on the likelihood of surge formation?
2	UNAM	**Alejandro - (Calder, et al. 1999):** If the pyroclastic flows associated with the collapse of domes are similar in the Moon, Earth and Mars, does it implies that gravity does not play an important roll in this kind of event?
	Colima	What processes are occurring in the volcanic system, when the dome growth at Montserrat changes from endogenous to exogenous and back again? Do shear lobes grow exogenously? Or can they grow endogenously? How are their morphologies affected by topography?
3	McGill	**ppt slide 5:** What defines the end of a dome growth phase? Why is there no dome growth between phases? What starts a new dome growth phase?
4	ASU	Is there any information preserved in the pyroclastic flow deposits about the height or dynamics of the associated buoyant ash clouds?
5	MTU	**Rudiger:** Can block and ash flows be generated by both dome collapse and eruptive column collapse mechanisms (See photos)?
6	McGill UNAM	***In Calder et al. 1999:*** What are the mechanisms to transform a surge to a secondary pyroclastic flow? How a surge can decrease its dilution with the distance in order to be transformed in a pyroclastic flow without deposition of its fragments?
7	ASU	What controls when an ash cloud surge will form instead of (or in addition to) the buoyant ash cloud? What effect does the pre-collapse overpressure have on the likelihood of surge formation?
8	MTU	**Rudiger:** Do the pumice flows and the block and ash flows from the dome collapse represent end members of a continuum? Are there intermediate cases (a transition where blocks tend to be vesiculated)? What do the proximal facies of pumice flows look like? Do they include blocks?

9	SFU/UBC	**Heather - ppt slide 47:** How are the probability maps created? Do they take into consideration natural buttresses? Dome height? Are these for a particular kind of pf (i.e. dome collapse vs surge etc.)? Have buttresses been constructed anywhere with any success?
	Colima	**Ppt slide 21:** How was the map of deposit thickness calculated - fieldwork, remote sensing, or both? What precision was assumed for the calculations?
10	UNAM	**Natalia - Fig. 8 in Calder et al.,(2002):** The largest dome volume did not produce the largest collapse volume. Why do volume percentage collapse is independent of dome volume and average extrusion rate? (Natalia)
11	McGill	**In Calder et al. 1999:** Why do some pyroclastic flows have higher mobilities (i.e. surges and secondary pyroclastic flows)? Do grain size and sorting affect mobility? Have you explored this in your "sand experiments"?
12	ASU	How does the degree of fluidization affect how erosive a pyroclastic flow may be? That is, does more fluidized = less erosive? If so, than how erosive are dilute density currents which are by definition highly fluidized? Could the disaggregation of lava clasts during transport contribute to fluidization of the flow with the release of pore fluids, causing fluidization to increase with time?
13	MTU	**Adam - Calder et al, 1999, Slide 27:** How do you measure dynamic resisting stress (t) in the field? Do you calculate/infer it from measurable parameters ($?, V, H, L, A$) or is it determined from analogue experiments in the lab? If the latter, how are experimental data validated and are there scaling issues?
14	SFU/UBC	**Nathalie - (ppt slide 37):** What is the significance of the distribution pattern in the rockfall duration vs. frequency graph, i.e. what is the significance of having particular rockfall duration dominate? What can rockfall duration (proxy for magnitude) be attributed to?
	Colima	Can rockfalls from a shear lobe for example, actually increase the stability of the dome by increasing the talus apron surrounding the dome, thus acting similarly to a buttress?
15	UNAM	**Hugo Murcia - (Calder et al., 2005)** A conclusion of this work is that the seismic data produced by rockfalls are an alternative for the quantification of the extrusion rate of magma in case of no direct observations. What are the differences between these signals that come from rockfalls from the one that come from a small pyroclastic flow?

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EXTRA QUESTIONS

SFU/UBC	**Guillaume - Calder et al. 1999, slide 28/29 :** Please clarify the meaning of these graphs, specifically $A/V^{2/3}$ vs V, and its usefulness in describing/distinguishing between failure types. There seems to be no correlation in $A/V^{2/3}$ vs V compared to A vs V and lambda vs V.
MTU	**Julie:** Of the technical monitoring instruments you've used to observe and analyze dome growth and collapse, which one would you use if you could choose only one?
Colima	What is the relationship between Vulcanian explosions and dome growth and collapse? Can a collapse provoke a Vulcanian event with ballistics? How much are the dome characteristics related to the development of Vulcanian activity?
UNAM	**Ana - (Calder et al., 2005):** What are the advantages and disadvantages to fit the repose time of rockfall with the log logistic distribution?
Colima	In H/L calculations, is L as the crow flies, or does it follows the valleys?

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PHOTOGRAPHS FOR MTU QUESTION

Bread crust (bomb?) block from the June 2003 pyroclastic flow at Fuego volcano.
Size of the bottle is ~0.25 m.

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Bread crust (bomb?) block from the June 2003 pyroclastic flow at Fuego volcano.
Size of the bottle is ~0.25 m. Note the vesiculated interior.