CITIES ON VOLCANOES 5 CONFERENCE

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TOPICS

Session Summary

Session 1-1: Recent developments in volcano research

Session 1-1 on Recent Developments in Volcano Research began with a plenary talk by Dr. Bruce Houghton discussing the diversity of volcanism and the new developments regarding understanding of various volcanic processes. Oral sessions on Monday afternoon discussed tomographic analyses of seismic anomalies under individual volcanoes along the Japanese volcanic front and also across all of east Asia, interactions between basalts and granites in plutonic systems, numerical simulations of magma permeability, fluid dynamics of volcanic blasts, and petrologic insights on magma system recharge. Subsequent talks provided compelling evidence that high-temperature silicic lava domes are capable of developing seismogenic faults, discussed volcanic degassing processes and their implications with regard to hazards and hazard mitigation, and concluded with a study on experimental studies of the eruptive products from Unzen volcano. Presentations on Tuesday continue to explore the diversity of volcanism by focusing on various research on pyroclastic flows, lava flows, volcano deformation, lahars, tephra falls, and the processes and physics associated with emplacements of silicic lava domes.

Session 2-2: Impacts of volcanic activity on infrastructure and effective risk reduction strategies

Recent volcanic unrest around the world has provided many opportunities to study, mitigate, and recover from impacts of eruptions and related hazards. This session covered research on volcanic sedimentation and other hazardous processes, case studies of impacts, mitigation measures, and vulnerability and risk analyses.

Volcaniclastic sedimentation often produces lahars that alter the landscape and interfere with lifelines for many years. As the hydrologic system adjusts to the new sediment regime and material is redistributed, lahar occurrence and intensity decreases. Higher storm intensities suggest more severe lahar hazards in the future and utilization of meteorological data in real time is critical. Structural mitigation, while expensive, can be effective in minimizing lahar impacts. Ash fall impacts are often widespread and significant even in small amounts to utilities; pre-eruption evaluation of vulnerability to ash fall and preparedness planning can reduce impacts.

Hazard maps and emergency response plans must be updated following major volcanic events to account for new channel geometry. Community involvement in ongoing hazard monitoring and warning systems – especially in rural areas – can be effective. Hazard mapping and vulnerability analyses and risk assessments must be geared to the needs of local authorities, the public, and managers of utilities and other elements of infrastructure. Interagency relationships are often complex, but must be developed to ensure effective coordination and integration of scientific information into emergency planning. Warning and response systems require practice and attention to back up communication. Public education is important to dispel over-reliance on engineered structures for safety. Finally, practitioners must use care in explaining concepts of hazard and risk, and work towards a consistent terminology.

Session 2-3: Long-term land use planning that mitigates volcanic risk

A number of key themes emerged from session 2-3 about land use planning and the mitigation of volcanic risk. Peter Frenzen, the plenary speaker emphasised the need to make the most after a damaging eruption and set aside land as part of national park, rather than heavily redeveloping it again. He also emphasised the role that emergency management has to play in combination with good land-use planning. In the main 2-3 session, Thor Thordarsson spoke about how it was difficult to plan in advance on the small island of Heimaey for volcanic hazards, but that thought could be given to certain planning issues post-event. David Johnston gave three examples of how planning was or was not used in New Zealand, Washington State USA and Equador. He concluded that land-use planning was often not used as a measure to reduce volcanic risk, and while sometimes difficult, there were some measures that could be applied successfully. Kiyoshi Yamanaka described a land use revival plan that had been applied after the eruption of Mt Usu and noted the difficulties involved with getting such a plan approved and instituted. Different focuses on land-use were also given by Christina Magill who spoke about tephra impact on infrastructure; Takuro Kimura who outlined the redevelopment and creation of new land after the Unzen eruption; and Shigeki Yamanaki who emphasised the importance of re-establishing community activities after a disaster as well as reconstructing the built environment.

Session 3-1: Linkage for Reducing Volcanic Risks: Cooperation and mutual support among researchers, administrators, mass media, inhabitants, local organizations and volunteers

Because of increasing wide recognition of this subject, the Hall C was full of attendants mostly (over 95%) from overseas. Various trials toward effective communication in higher standard were reported from many countries. Cooperative linkages not only during the crises but also under the normal condition resulted in many success stories or advances such as Tungurahua in 2006. Hugo Yepes reported "the Tungrahua's success was possible because scientists worked with the community and not for the community. The concept working closely scientist and community, the continual presence of scientists in the area, and their integration into the community, plus the integration of county authorities, has generated a new model of risk management in Ecuador." The attending



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Japanese journalists pointed that this statement is equivalent to the idea of home doctor in cases of the crisis managements at Mt. Unzen in 1990-1995, Mt. Iwate in 1998 and Mt. Usu in 2000. New advances were also reported for information sharing through IT technology, such as utilization of real time web in New Zealand, an effective real time Web Journalism at Miyakejima, and U.S. Pierce County's "Intellicast system" that allows tens thousands telephone calls to each home and business in a few minutes in case of emergency. Difficult problems were also reported: difficulty of scientific terminology such as "small pyroclastic flow" during Mt. Unzen crisis, single voice vs. second opinion, and lack of key information despite of flood. The Multinational Andean Projects: Geosciences for Andean Communities (MAP-GAC) funded by Canadian International Developing Agency provided for geo-science institutions lateral linkage of "transforming science into action". We asked each speaker for 15 minutes talk instead of original 20 minutes, and over 30 minutes were spent for stimulating discussions in the audience. This session may the first to show the presence of the 3 Japanese journalists long working together with volcanologists since the 1991 Unzen disaster.

Session 3-3: Community and volcanism – Archeological, tradition and recovery 3-3 session consisted of a plenary talk and 10 further speakers covering a very wide range of subjects; from volcanoes in the mythological world to actual recovery problems from the volcanic disasters in the 21th century.

A range of myths are known to describe volcanic eruptions directly or indirectly. Two presenting groups (Japanese and NZ) demonstrated how geological studies are being used to confirm what kind of volcanic phenomena those myths might express (or not). Other groups showed that combined volcanology and archaeological studies could demonstrate aspects of recovery from volcanic catastrophes, specifically through the cases of 5~6th century eruptions of Haruna in Japan and in the AD1362 Oraefahjokull eruption in Iceland. Archeological surveys also were described to show how dreadfully volcanic eruptions damaged a community or a family in the case of the 472 Vesuvius eruption or in late Holocene eruptions affecting the present area of Managua in Nicuragua. In the cases of the 1926 Tokachi eruption and the 1943 Showa-Shinzan eruption in Hokkaido, there were two local persons who dedicated their lives to observing and educuating on the eruption and aftermath of volcanism. The last two speeches were made by sociologists, the former discussed a series of surveys in Japan (2003-05) on how people percieve of the socio-economic impact of volcanic eruptions, and the latter explained aspects of human behavior relating to evacuation from volcanism compared to other natural hazards

INFORMATION

Important!! Shuttle Bus to Nagasaki Airport on Nov. 23 and 24

Please purchase bus ticket at the general information desk (1000 yen, discounted). Normal price is 1700-1750 yen.

C-1 Unzen Volcano and new lava dome climb (Nov. 24 - 26)

Participants will be meet at the west entrance of City Hall (at 7:45) or at the north of the parking place of the ferry terminal (at 7:55, in front of the foot hot spring) in the morning of Nov. 24. Please check the detail map at the official information board. No shuttle bus is available to these meeting places.

C-4 Mt.Fuji Excursion (Nov. 23 - 27)

Participants are expected to travel from Shimabara to Haneda Airport individually in the morning of Saturday, Nov. 24. The group will assemble at Haneda Airport around 13:00. Please meet the guides who will be posted at both All Nippn Airways (ANA) and Japan Airlines (JAL) exits.

REPORT

A short report of A01 excursion: Usu and Hokkaido-Komagatake volcanoes, Southwestern Hokkaido

We focused on not only volcanic processes but also living with active volcanoes. We visit two volcanoes Usu and Hokkaido Komagatake volcano which are one of most active volcanoes and advanced areas of the prevention of volcanic disaster in Japan.

In Usu volcano, we discussed process of the historic eruptions and their disasters (a). We also investigated the disaster and craters area of latest eruption in 2000. In Hokkaido-Komagatake volcano, we discussed the eruptive history and mitigation of disaster. We visited the control room for the Natural Disasters of Mori Town Office and learned the emergency plan for the volcanic disaster and what to do in dormant stage from Town officer. (b)



