

MAGMA SYSTEM RESPONSE TO VOLCANO EDIFICE COLLAPSE: RESULTS OF THE 2005-2011 NSF-PIRE PROJECT AT BEZYMIANNY VOLCANO, KAMCHATKA

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Bezymianny volcano has been the main target of the 5-year multi-disciplinary international project investigating the unloading effect of edifice collapse on active magma system. The eruption of Bezymianny in 1956 started with the same sequence of events as the eruption of Mount St. Helens in 1980, i.e. flank collapse – directed blast – explosive activity – extrusive dome growth. Unlike Mount St. Helens, its Russian twin has remained active and continued re-building its edifice through extrusive activity punctuated by vigorous explosions one-two times a year.



Bezymianny, Kamen', and Kliuchevskoy volcanoes in July 2010 during the most recent field campaign

We use Bezymianny as a natural laboratory to investigate magma system response to edifice collapse. We have acquired seismic and deformation data sets, as well as comprehensive suites of geochemical data to characterize ongoing eruptive activity at Bezymianny. The collected data sets are being used to predict what Mount St Helens will do in the future. Of equal importance is the introduction of American graduate students to international science. We have made the research truly collaborative, with American students working directly with their Russian peers and Russian senior scientists. Each student in the project is responsible for a particular facet of the research. In most cases we have planned these research activities to dovetail with a student's existing thesis work. In several cases, the PIRE project has allowed students to apply tools developed for their primary thesis work to another volcano. This equally benefits our project and the thesis work of our students.

Our project involves 42 students (25 from US universities) and 17 faculty (6 from the US); all have some in-hand data that they have collected from Bezymianny volcano. Their levels of participation vary widely, but their cumulative contributions are impressive. Eight students from the 2006 and 2007 campaigns have already successfully defended their Ph.D. degrees and four have earned their Masters. The results of the project have been presented at special sessions dedicated to our project at the 2009 JKASP meeting in Fairbanks, AK, and at the 2010 Fall AGU meeting in San Francisco. The current list of project publications includes 10 papers in peer-reviewed journals, 11 dissertations, and 68 abstracts. There are several manuscripts in review and 16 in preparation for submission to the special issue of the *Journal of Volcanology and Geothermal Research* dedicated to this project. This talk serves merely as an introduction to 14 more talks presenting the results of the NSF-PIRE project at the 2011 JKASP meeting.