

# AOB & COE Seminar

**Lecturer: Dr. Stephen H. Kirby**

**Affiliation: U. S. Geological Survey  
Research Geophysicist**

**Title: "Global Order and Diversity of  
Arc Volcanic Vigor"**

**Date & Time: At 10:00-11:30 on Monday, Apr 18, 2005**

**Place : Conference room #1 in the annex bldg., Research Center  
for Prediction of Earthquakes and Volcanic Eruptions**

**Abstract:** The level of arc volcanic activity (arc vigor) is a difficult thing to estimate. Within the limitations of the historical and Holocene eruptive record, clear trends and exceptions to the trends are identified. The major observed trend is for warm slabs (those subducting young lithosphere converging at low rates and/or with low dip angles) tending to have low vigor. These warm-slab environments also tend to have only shallow intraslab earthquakes. This shallow depth distribution is consistent with faulting by dehydration embrittlement and with completion of dehydration by a depth of about 70 km. A good example is the Nankai subduction system where the Shikoku Basin crust is subducting at slow rates beneath SW Japan. Older, colder slabs dehydrate at such depths (100-175 km) that large water fluxes may be delivered to the asthenospheric wedge above the slab. There are many exceptions to this major warm-slab/cold-slab trend: (1) Island arcs with active back-arc spreading all have low vigor. (2) Warm-slab arcs that coincide with continental rifts tend to have high vigor. (3) All arc with opposing Wadati-Benioff zones have low vigor. These exceptions are discussed in the context of the prevailing conceptual theory of arc magmatism.

主催: 東北大学大学院理学研究科 地震・噴火予知研究観測センター

Tel: 022-225-1950 (代表)

Center HP: <http://www.aob.geophys.tohoku.ac.jp/res-edu/AOBseminer.html>

お問合せ先: [okada@aob.geophys.tohoku.ac.jp](mailto:okada@aob.geophys.tohoku.ac.jp)



Research Center for Prediction of  
Earthquakes and Volcanic Eruptions