

# AOB Seminar

**スティーブン・カービー 博士** (米国地質調査所)

Speaker: Dr. Stephen H. Kirby (Research Geophysicist U.S. Geological Survey)

**「アリューシャン地域沈み込み帯：巨大プレート間地震、プレートセグメント境界、海溝沿いの不均質構造について」**

Title: Variability in the Occurrence of Giant Subduction Earthquakes and Regional and Transoceanic Tsunamis Among Subduction Zones: the Aleutian Subduction System

**2008年10月21日 (火) 14:00-16:00**

**地震・噴火予知観測センター第一会議室**

Date & Time: 14:00-16:00 on Tuesday, October 21, 2008

Place: Lecture Room #1 (Annex of AOB)

## Abstract:

Subduction systems vary greatly in the seismic expressions of the subduction process: from the zone of bending beneath the outer rise and outer trench slope, to the zone of interplate thrust zone and forearc faulting, and to the depths of intraslab events and intra-arc events to shocks in back-arc basins. Some of this variability is evident when considering differences in plate tectonic inputs, such as plate age, seafloor spreading fabric in the incoming plate in relation to trench azimuth, relative plate motions across trenches (including the degree of obliquity of motions), and the effects of subduction of volcanic features such seamounts and volcanic ridges. For interplate thrust earthquakes, factors that most influence seismic moment release include plate age, the presence or absence of back-arc spreading and trench migration, sediment influx, and forearc structure. Subduction systems with the greatest impact on earthquake and tsunami hazard appraisal must consider the modern historical and instrumental records of large destructive earthquakes, i.e., such investigations need to go to sectors where great and giant earthquakes have occurred in this era. Of great interest are those margins that have been neglected by modern marine investigations and yet are very seismically active. Among such margins, the Aleutian arc stands out as an especially fruitful subduction sector for study. Three giant ( $M \geq 8.5$ ) interplate thrust earthquakes have occurred there in the instrumental record (1946, 1957, 1965) that raised destructive far-field tsunami waves. These were followed by great interplate thrust events in 1986 and 1996. The M8.6 Scotch Cap earthquake of 1 April 1946 raised 31 m tsunami waves on Unimak Island near the source and this event remains one of the most destructive tsunami sources in the whole Pacific Basin in the instrumental era. It is also a charter member of the enigmatic slow-rupture earthquake class, one of the most dangerous of tsunami sources. Exploratory excavation at 21 m above the mean high tide line on the Pacific coast of Sedanka Island in the Adreanof Islands revealed five tsunami sand layers laid down in the last few thousand years.