

## Special Seminar 特別セミナー2

### *Integrating Observations and Models to Advance our Understanding of The Earthquake Cycle in Subduction Zones*

Speaker : ***Prof. Kevin P Furlong***

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Date and Time: 3月7日 March 7<sup>th</sup> (Wednesday), 13:00 p.m.~

Place: 地学棟201, Room 201, Geoscience Building, Graduate School of Science

Key to anticipating and mitigating the consequences of great megathrust earthquakes is our ability to delineate the current slip deficit (potential seismic moment) as it has been accumulating along a particular plate boundary segment, and couple that with the record (as preserved in paleo-seismic and stratigraphic data) of past earthquakes, their approximate recurrence rate, and the typical extent of rupture in each event. Significant advances in both our ability to observe rates and patterns of deformation associated with the megathrust and modeling approaches to exploit those data have been made in the past decade, coinciding with several great earthquakes that provide an opportunity for advancing our framework understanding of the megathrust system. In addition to observations of current plate boundary deformation, detailed observations of the timing, vertical motions, and tsunamigenic character of previous events as preserved in the geologic record indicate the potential to better constrain the size and place of future large events, if these data can be placed in the proper context. One thing that has become particularly clear is that co-seismic displacements are not the simple inverse of the integrated interseismic displacements. Similarly, there is a growing number of paleo-seismic results relevant to the questions of spatial and temporal patterns of vertical motions, although apparent discrepancies emerge when confronting geodetic data with geological studies. We have integrated these observations with a new generation of numerical models to explore the strain accumulate and release processes within subduction zones, and to develop better tools to assess the future hazards along these plate boundaries. Although there is still a substantial amount to learn, the potential for a greatly improved understanding of the seisms-tectonics of the megathrust system is here.