

SEIZE

Strike-Parallel Variations in Clay Mineralogy and Their Impact on the Cascadia Seismogenic Zone

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Accomplishments:

- Completed a preliminary assessment of how clay content and clay mineralogy change the coefficient of internal friction for naturally occurring mudstones entering the Nankai subduction zone (with K. Brown). Our results reveal substantial strike-parallel variations in frictional properties beneath the frontal décollement. Additional lab tests are ongoing and will be an important component of NanTroSEIZE.
- Completed analyses of more than 200 piston- and gravity- core samples from throughout Cascadia Basin, plus DSDP Site 174 and ODP Site 888. Inputs to the Cascadia subduction zone show significant but erratic spatial-temporal variations in clay mineral abundance, especially in the abundance of smectite. Modeling (in progress) will show how this complicated 3-D heterogeneity changes frictional properties and effective stress at depth.
- Completed analyses of piston- and gravity- core samples from the TicoFlux expedition, Costa Rica, plus ODP Site 1040 (with Glenn Spinelli). Hemipelagic inputs to the Costa Rica subduction zone show very little compositional variability (high smectite, moderate biogenic silica). Modeling (in progress) will determine how much water is released during smectite and opal dehydration at depth.



