

Great and Giant Subduction Zone Earthquakes and their Geohazards,
Frontier Research to Gain Insights and Wisdom about Why They Occur and
Where They Occur.

GEOS F692 F05, CRN 38962, NCIS 237
MSL F692 F03 CRN 39013

Credits: 1, Pass/Fail

Meets: Tuesday and Thursday 9:45-11:45; Natural Science Facility (NCIS 237)

Prerequisites: Graduate standing or permission of instructor

Instructor: David W. Scholl; Nat. Sci 338; 474-7758
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Distance Delivery: It is anticipated that Powerpoint files may be available for some of the scheduled seminars. Attempts will be made to make these available prior to class from the SFOS web site (<http://www.sfos.uaf.edu/events/>).

Course Readings: No required readings, but each speaker will suggest 1 to 3 key papers. Attempts will be made to e-mail pdf files of these paper to the class for prior reading.

Course Description: This course is a bi-weekly seminar series examining frontier research addressing the physical processes and locations of great subduction zone earthquakes and tsunamis. Speakers will be mainly be drawn from government laboratories and university communities involved in the study of subduction zone geohazards. Topics will include the global variability of subduction zones inputs and their physical expressions, how subduction zones behave dynamically during great earthquakes, offshore drilling and geophysical studies to determine the physical nature of unstable sliding of the interplate seismogenic zone, and the geophysical and geological characteristics and settings where great subduction zones nucleate and launch destructive tsunamis.

Course Goals: To expose students to the implications of leading-edge field and modeling research attempting to unravel the physics and physical settings where great subduction zone earthquakes have happened and are most likely to again happen. Only some of the material offered has been formally published and some will describe complex field experiments to directly investigate the underlying processes and conditions of unstable (earthquake) interplate sliding.

Student Learning Outcomes: Students taking this class will be guided by research scientists to the peripheries of our knowledge about why and where great subduction geohazards occur and what some of the apparent "red flag" settings and circumstances are.

Instructional Methods: Two, weekly, two-hour seminars by visiting speakers drawn from outside the university: A preliminary schedule is below.

Lecture # and Date	Topic	Speaker
1 (March 6)	"Global Variability among Subduction Systems: Plate inputs and the Physical Expressions of Subduction, Pt 1.	Steve Kirby, USGS
2 (March 8)	"Global Variability among Subduction Systems: Plate inputs and the Physical Expressions of Subduction, Pt 2.	Steve Kirby, USGS
3 (March 20)	Seismic and IODP drilling approaches to interrogate the structure and geohazard setting of the Nankai subduction zone, SW Japan, Pt 1.	Harold Tobin, Univ Wisconsin
4 (March 22)	Seismic and IODP drilling approaches to interrogate the structure and geohazard setting of the Nankai subduction zone, SW Japan, Pt 2.	Harold Tobin, Univ. Wisconsin
5 (March 27)	The physics of how convergent margins work dynamically during great subduction zone earthquakes, Pt 1.	Kelin Wang, Pacific Geoscience Center, CAN
6 (March 29)	The physics of how convergent margins work dynamically during great subduction zone earthquakes, Pt 2.	Kelin Wang, Pacific Geoscience Center, CAN
7 (April 3)	Submerged forearc basins and the occurrence beneath them of great earthquakes and interplate slipping, Pt 1.	Ray Wells, USGS
8 (April 5)	Submerged forearc basins and the occurrence beneath them of great earthquakes and interplate slipping, Pt 2.	Ray Wells, USGS
9 (April 10)	Tectonic and structural fabric of the Yakutat Collision zone and the nucleation there of the 1964 Good Friday earthquake and tsunami, Pt 1.	Donna Eberhart-Phillips, UC Davis
10 (April 12)	Tectonic and structural fabric of the Yakutat Collision zone and the nucleation there of the 1964 Good Friday earthquake and tsunami, Pt 2.	Donna Eberhart-Phillips, UC Davis

Course Policies: This is a pass/fail class. A passing grade will be given if a student attends at least 8 lectures.

Evaluation: Course evaluation is based on attendance (see above).

Support Services: None needed for this course.

Disabilities Services: The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. UAF is committed to equal opportunity for all students. If you have a documented disability, please let me know within the first two weeks of class, and I will work with the Office of Disabilities Services to make the appropriate accommodation. If you have a specific undocumented physical, psychiatric or learning disability, you will benefit greatly by providing documentation of your disability to Disability Services in the Center for Health and Counseling, 474-7043, TTY 474-7045.