Cascadia GeoSciences: Community-Based Earth Science Research Focused on Geologic Hazard Assessment and Environmental Restoration

Todd Williams[1], Jay Patton[2], Tom Leroy[3]

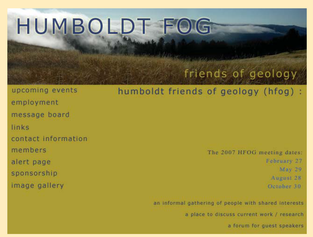
Cascadia Geosciences 561 School Rd McKinleyville CA, 95519

E-mails 1) todd@cascadiageo.org 2) jay@cascadiageo.org 3) tom@cascadiageo.org

Abstract

Cascadia GeoSciences (CG) is a membership driven corporation whose main objectives are to conduct and promote interdisciplinary community based earth science research, we are currently filing for 501 c(3) non-profit status. The primary focus of CG is on geologic hazard assessment and environmental restoration in the Western U.S. The primary geographic region of interest is Humboldt Bay, NW California, within the southern Cascadia subduction zone (SCSZ). This region is the on-land portion of the accretionary prism to the SCSZ, a unique and exciting setting with numerous hazards in an active, dynamic geologic environment. Humboldt Bay is also a region rich in history. Timber harvesting has been occurring in California's coastal forestlands for approximately 150 years. Timber products transported with ships and railroads from Mendocino and Humboldt Counties helped rebuild San Francisco after the 1906 earthquake. Historic land-use of this type now commonly requires the services of geologists, engineers, and biologists to restore road networks as well as provide safe fish passage. While Humboldt Bay is a focus of some of our individual research goals, we welcome regional scientists to utilize CG to support its mission while achieving their goals. An important function of CG is to provide student opportunities in field research. One of the planned primary charitable contributions of the organization is a student grant competition. Funds for the student grant will come from member fees and contributions, as well as a percent of all grants awarded to CG. A panel will review and select the student research proposal annually. In addition to supporting student research financially, professional members of CG will donate their time as mentors to the student researchers, promoting a student mentor program. The Humboldt Bay region is well suited to support annual student research. Thorough research like this will help unravel some of the mysteries of regional earthquake-induced land-level changes, as well as possible fault segmentation in the SCSZ. CG will also provide educational materials and resources to the public regarding environmental restoration and earthquake hazards. All research conducted through CG will be published to a publicly accessible digital archive. Education and outreach activities include the student grant program, a digital public archive (maps, reports, geospatial data, guidebooks, MS theses, etc), web-based resources, bi-yearly publications, and annual reports. We invite all types of earth scientists to help support student field research and join us in promoting collaboration, communication, and cooperation with Cascadia GeoSciences.

What we've done...



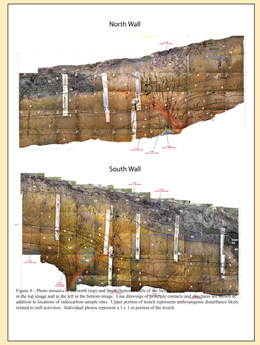
The Roots of Cascadia Geosciences are in the Humboldt Friends of Geology (HFOG). This is an informal group of earth scientists who meet in Eureka every other month to discuss earth science issues and socialize with fellow north coast scientists. The HFOG has also conducted local field trips, trenched faults, and conducted public outreach regarding geologic hazards as they relate to our community. Cascadia Geosciences is currently composed of the most driven members of the HFOG who seek to formalize the spirit of a local informal group of scientists into a non-profit entity. Cascadia Geosciences endeavours to facillitate a spirit of unselfish, interdisciplinary, collaborative scientific research and education conducted to benefit our local community.

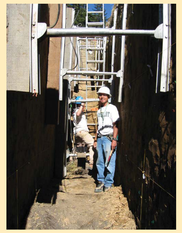
Tsunami Day

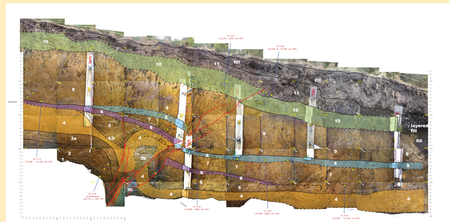
2004

Tsunami Day is an informative and entertaining event conducted yearly to remind local residents of Humboldt Countys vulnerability to earthquakes and Tsunami. Tsunami Day is attended by many local scientists who are open to discussions with members of the public in an informal setting. Typically the event focuses its educational component on simple steps families can take to prepare for hard ground shaking, and immediate and short term survival.

Earthquake Research

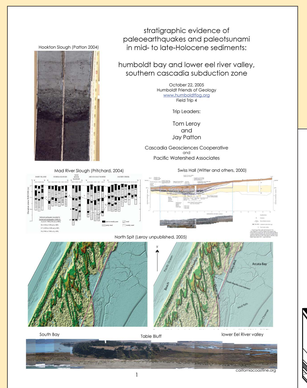






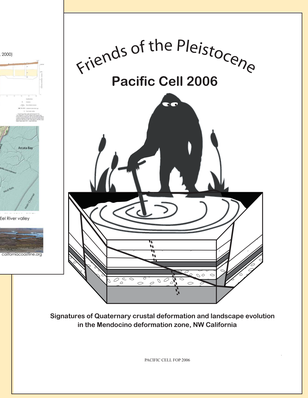
In 2005 the Humboldt Friends of Geology, spearheaded by Dr. Mark Hempill-Haley of Humboldt State University, applied for, and received a NEHRP grant to trench the Little Salmon fault. The Little Salmon fault is one of the southernmost reverse faults within the on land fold and thrust belt associated with the Cascadia subduction zone, it is considered to be a high hazard as it has been proven to have a recurrence interval measured in hundreds of years and it has been mapped dangerously close to a Junior College and an unoperational nuclear reactor. In an almost unprecedented show of unselfish community cooperation the trench was excavated, described and documented with almost all volunteer help from members of HFOG, their respective geologic consulting firms or agency, Humboldt State University, and a local timber company. An important aspect of this project was the student participation from the Humboldt State University geology department. This trench provided the students with opportunities to meet local consultants as well as provide hands on experience conducting fault trenching from Beginning to end from the logistical aspects of fault trenching to stratigraphic and fault history interpretation.

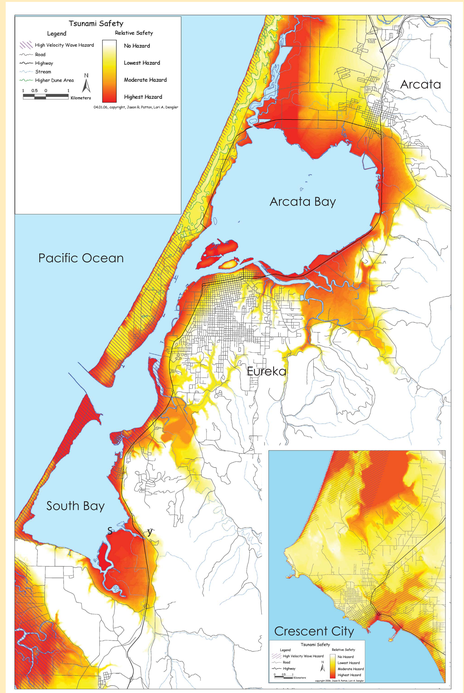
Field Trips



Members of Cascadia Geosciences have contributed to the development of multiple guidebooks describing the local geology and have compiled and summarized data from generations of earth scientists. One of our goals is to provide access to this type of literature through our web page

Guidebooks

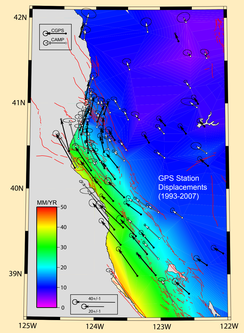




Hazard Assessment

Cascadia Geosciences has collaborated with Humboldt State University and the Redwood Coast Tsunami working Group to develop tsunami hazard maps for multiple locations on the north coast of California. These maps in are used to educate the public as to the relative safety of their residence or business and to stimulate thought and planning within the community

Monitor Plate Motion & Survey Land-Level Changes



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What we want to do...

We are currently in the final phases of applying for status as a 501 c(3) non-profit organization. Once we complete this process we will focus our efforts on developing membership and creating partnerships with other non-profits, universities, and businesses to facilitate our mission. Furthermore, we intend to continue on with, and develop new programs that promote interdisciplinary research and education that benefits our communities including:

A cooperative fault trenching program We fully intend to continue and institutionalize the fault trenching project and its cooperative and educational paradigm.

Create an entity through which local business can collaborate to conduct environmental restoration Environmental restoration is an interdisciplinary science. Cascadia Geosciences intends to provide a facility through which multiple researchers, and businesses can collaborate and operate to conduct environmental restoration from watershed to estuary.

Develop a student mentor program This program will facilitate collaboration between local scientists and students interested in earth science. The idea is to provide a forum once or twice a year for students to "pick the brains" of local scientists to help them Procure knowledge of a particular aspect of their existing project or to simply a quire suggestions for possible research projects.

Develop a small grants program. We intend to use the funding from our membership dues and fund-raising events to conduct a small grants program for students of earth science at Humboldt State University. This will be a competitive grant program conducted yearly and awarded by a sub-committee of Cascadia Geosciences.

We intend to offer members of Cascadia Geoscience benefits to participating in our organization including but not limited to

1) Each member will get the satisfaction of knowing they are contributing to an organization that promotes collaborative unselfish earth science research, community and student education, and environmental restoration.
2) We intend to publish a bi-yearly news letter containing highlights of all our activities, articles written by members regarding local earth science projects, other pertinent earths science information.
3) Our members will be allowed to conduct research and restoration through our organization
4) we will also provide personal e-mail accounts through Cascadia Geosciences, access to our blog, and access to the Cascadia Geosciences library.