

S11A-0192

Seismic Component of the STEEP Project, Alaska: Results of the Second Field Season

Ruppert, N A., Hansen, R A., Estes, S A., LaFevers, M., Sandru, J., Fowler, M., Pavlis, G., Bauer, M., Growdon, M A., Lowe, L

STEPP (SainT Elias Erosion/tectonics Project) is a five year, multi-disciplinary study that addresses evolution of the highest coastal mountain range on Earth - the St. Elias Mountains of southern Alaska and northwestern Canada. The overall goal of the project is to develop a comprehensive model for the St. Elias orogen that accounts for the interaction of regional plate tectonic processes, structural development, and rapid erosion. The seismic component of this project includes a passive seismic experiment utilizing the IRIS PASSCAL Program instruments. A total of 22 new, broadband, seismic stations have been installed in the St. Elias region. All use Freewave IP radios to provide telemetry to a DSL, a DDS or one of three VSAT, connections that provide continuous data transmission to Fairbanks. The data are also recorded local disk storage using Quanterra packet balers. The telemetry data are recorded in real time and used in standard data processing at the Alaska Earthquake Information Center. The network is proving clear improvements in detection and location capabilities for events in the St. Elias region. Processing of teleseismic data is ongoing for estimates of crustal thickness using receiver functions and mantle anisotropy with shear wave splitting. Since the beginning of the new STEEP network installations in July, 2005, the AEIC has located over 400 events in the area, the largest having a magnitude of 3.7. Majority of the events have shallow crustal depths. The deepest events (down to 64 km) are located in the northwestern part of the project area near Wrangell volcanoes. The newly recorded earthquakes follow the pattern of the long term seismicity trend. They mostly cluster in the Icy Bay-Yakutat Bay area, along the central part of the Chugach-St. Elias fault system, and near the Duke River fault. A number of glacial quakes have also been located with the newly installed network. These events primarily concentrate in the Icy Bay area.