



# USGS NSF GRIP, GSP Opportunity

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● <b>USGS Center:</b>	Geologic Hazards Science Center
● <b>Project Title:</b>	Extending subduction zone earthquake hazard assessments to risk
● <b>Summary:</b>	Subduction zone earthquakes, like “The Really Big One” described in a 2015 issue of The New Yorker magazine, can generate ground shaking that lasts several minutes. Typical earthquake risk assessments do not account for such long-duration ground shaking. Earthquake engineers and scientists at the USGS and elsewhere are collaborating to change this.
● <b>Project Hypothesis or Objectives:</b>	Subduction zone earthquakes, like “The Really Big One” in the U.S. Pacific Northwest that is described in a 2015 issue of The New Yorker magazine, generate ground shaking of long duration. Such ground shaking is not accounted for in typical approaches to earthquake risk assessment, which are predominantly based on shallow crustal earthquakes such as those along the San Andreas Fault in California. However, recent research demonstrates that long-duration ground shaking can cause significantly more damage. The goal of this proposed project is to explore alternative approaches to accounting for the duration of ground shaking in risk assessments, which can inform a consensus approach. Ultimately such risk assessments will serve as a basis for improved mitigation (e.g., building codes and insurance) in regions prone to subduction zone earthquakes.
● <b>Duration:</b>	Up to 12 months
● <b>Internship Location:</b>	Golden, CO
● <b>Field(s) of Study:</b>	Engineering, Geoscience
● <b>Applicable NSF Division:</b>	EAR Earth Sciences, CMMI Civil, Mechanical & Manufacturing Innovation
● <b>Intern Type Preference:</b>	Either Type of Intern

- Keywords:** Seismic hazard and risk; subduction zone earthquakes; long-duration ground shaking.
  - Expected Outcome:** The project will demonstrate alternative approaches to accounting for long-duration ground shaking in earthquake risk assessment. In doing so, the intern will have the benefit of first-hand experience with the USGS National Seismic Hazard Model and research of the USGS Engineering Risk Assessment Project. The project will contribute to these USGS efforts and the USGS subduction zone science initiative.
  - Special skills/training Required:** Expertise in probabilistic seismic hazard and risk assessment, nonlinear response history analysis of structures, and statistical regression.
  - Duties/Responsibilities:** The intern will use the products of the USGS National Seismic Hazard Model, incorporate ground shaking duration into their underlying software, and gather and/or develop structural fragility/vulnerability models that account for duration. All work will be carried out with earthquake engineers and scientists at the USGS and its collaborators.
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