

The SZ4D Initiative: Developing a Comprehensive Approach to Subduction Hazard Geoscience

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Subduction zones are the main source of seismic, volcanic, and landslide hazards on the planet, yet we lack fundamental understanding of how their faults work or volcanoes erupt. The outcome of the major U.S. NSF-sponsored Subduction Zone Observatory workshop in 2016 was a consensus that the time is ripe for a Subduction Zone Initiative (SZ4D) to coordinate, integrate, and cross-pollinate U.S. and international partner research effort into the fundamental processes governing subduction hazards in space and over time (4D). Primary goals will be to capture and model emergent phenomena over earthquake, tsunami, landslide, and volcanic cycles. In order to plan for this ambitious effort, the SZ4D Vision document (the main workshop report) identified three key components of an integrated new decadal research program: an interdisciplinary scientific research effort, a modeling collaboratory, and a community instrumentation infrastructure program.

A range of specific activities are now being organized and/or proposed under the SZ4D initiative. An umbrella Steering Committee (SC) has now been organized to focus and develop this multi-faceted effort. The SC has now proposed an SZ4D Research Coordination Network (RCN) which seeks to: (a) build network ties among the disparate groups working on these themes, shaping implementation plans through thematically-focused working groups, and (b) act as a central communication channel for the burgeoning activities of the various thematic teams, PI groups, agencies (USGS, NOAA, NASA, NSF) and international partners involved in or linked to SZ4D. RCN goals include coordinating efforts already underway to build modeling collaboratories, develop new seafloor deformation and volcano observational capabilities, conduct community experiments, and plan for rapid event response. Through the working groups overseen by the Steering Committee, we aim to sharpen and prioritize science and technical challenges, with the three-year goal of producing a complete SZ4D Implementation Plan.