A Foundation for Innovation: Grand Challenges in Geodesy
Proposal To NSF For Support Of
SEISMOLOGICAL FACILITIES
FOR THE
ADVANCEMENT OF
GEOSCIENCE AND
EARTHSCOPE

October 1, 2013 – September 30, 2018

VOLUME 1:
Project Description and Scientific Justification

SAGE
Seismological Facilities for the Advancement of Geoscience and EarthScope

additional funding
OBSIP
Polar
GLISN
CEUSN
EarthCube
International Development
SAGE - Grand Challenges

Thermo-chemical internal dynamics and volatile distribution
How do Earth’s temperature, composition, and internal boundaries control mantle and core dynamics and the changing morphology of our living environment? How do the lithosphere and plate boundary systems evolve over Earth history?

Faulting and deformation processes
What is the relationship among stress, strain, and deformation as expressed in earthquakes, slow slip, volcanic eruptions, and movement of fluids within the crust?

Change and interactions among climate, hydrology, surface processes, and tectonics
How do Earth dynamics and structure relate to the distribution of freshwater and energy resources? How do the coupled systems respond to natural and anthropogenic forcing?
Science Advisory Committees

to ensure alignment of facilities and service with science goals

Thermo-chemical internal dynamics and volatile distribution
Ed Garnero (Co-Chair) Arizona State University
Greg Hirth (Co-Chair) Brown University
Jeroen Ritsema (Board Liaison) University of Michigan

Faulting and deformation processes
John Vidale (Co-Chair) University of Washington
Roland Burgmann (Co-Chair) University of California, Berkeley
Jeff McGuire (Board Liaison) Woods Hole Oceanographic Institution

Change and interactions among climate, hydrology, surface processes, and tectonics
Sean Gullick (Co-Chair) University of Texas, Austin
Eric Kirby (Co-Chair) Oregon State University
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