

## **Earthquakes, Mountain Building, and Ancient Rivers in Western North America: Unraveling the Mystery of the Music Mountain Formation**

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The plate boundary zone between the Pacific and North American plates is an active boundary zone with earthquakes. This plate boundary zone has undergone a fascinating evolution over the past 70 million years, influencing the emplacement of rich mineral deposits, along with the development of topography and drainage systems. There is evidence of a great mountain chain that once covered the regions of southern Arizona, Nevada, Eastern California, and northern Mexico. Furthermore, a large river system may have flowed northeast out of this mountain range all the way into northern Canada. Some evidence for this river system can be found in the Music Mountain Formation (MuMF). The MuMF is found today south of the Grand Canyon and it contains far-traveled cobbles and boulders that originated from the highlands to the south or west. These sediments were deposited before the Grand Canyon formed and may hold key information about the complex tectonic evolution from subduction, mountain building and uplift, followed by extensional collapse of these highlands and Grand Canyon cutting. I will cover new findings about the source of the MuMF boulders and present a tectonic model that addresses the last 70 million years of tectonic evolution of the Southwestern US.

William Holt is a Professor in the Department of Geosciences, Stony Brook University. His interests include seismology and active tectonics. Professor Holt uses observations from seismology, space-geodesy, and geology to constrain the forces operating in the lithosphere that are responsible for producing earthquakes, plate tectonics, and mountain building. Professor Holt is a Fellow of the American Geophysical Union, an NSF early CAREER awardee, and was given an Alumni Achievement award from the University of Arizona. Professor Holt was on the founding Board of Directors for the UNAVCO, which is a non-profit university-governed consortium that facilitates research and education in geodesy. Holt later served on the UNVACO board again in the period of 2009 – 2013 and was chair during the period of 2010 – 2012.