

## Introduction of neotectonics and crustal extension in the Wasatch active fault zone, Utah: Review

OGAWA, Yujiro<sup>1\*</sup>, Ron Harris<sup>2</sup>

<sup>1</sup>none, <sup>2</sup>Brigham Young University

The Basin and Range province (BRP) in the western USA extends north-south, occupying between the Coastal Range and Colorado Plateau, and is characterized by a wide range of east-west extension since the Miocene. The total tectonics from the Colorado Plateau to BRP is similar to Japan as the Cretaceous horizontal shortening and Miocene to the present stretching. The easternmost part of BRP is consistent with the Wasatch Mountains, where the Wasatch active fault zone demarcates in its western margin, eventually in the eastern boundary of the Salt Lake and Utah Valleys as well. The ten segments of the fault zone, each 30 to 70 km long, have 1200 to 1500 years recurrence time within the respective segments, and on average one segment moves at least once every 300 years. Because the last motion > M7.0 moved in 17th century, this fault zone is one of the most dangerous seismic hazardous areas in the U.S. The GPS displacement velocity averages 2-3 mm/yr, relative to the easterly stable continent, suggesting the zone coincides with the strain concentration. The cause and effect between such stretching have been discussed either as the plume first or extension first, but there are no common understandings. The basis of the tectonics is the same of the origin of core complex, and the stretching stress and strain history, tectonics, after Cretaceous-Paleogene convergent tectonics for BRP has not yet reached the definite conclusion. One of the interesting figures is that the magma intrusion is complementary with the active fault movement as the area of intrusion has scarce active faulting, suggesting the strain of stretching is diverted by magma intrusion. There are at least four mechanisms for the stretching that likely all contribute at amounts that are debated. These consist of gravitational collapse of the Laramide orogenic plateau, roll back due to subduction of the Farallon-Pacific spreading ridge, hot spot weakening and doming and plate boundary reorganization associated with NW slip of the Pacific Plate along the San Andreas Fault.

Keywords: Wasatch active fault system, Utah, stretching tectonics, strain concentration, core complex, magma intrusion