# Plateau growth around the Changma Basin in NE Tibet

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The Qilian Mountains form one of the most actively uplifting regions of the northeastern Tibetan Plateau and provide an opportunity to study the ongoing, intermediate stages of plateau growth. The crust of the Qilian Mountains consists of an orogenic collage of mid-Proterozoic to mid-Palaeozoic island arc terranes accreted to the North China Craton during the Palaeozoic. NE-directed compression related to the Indo-Asian collision began in the Early Neogene, uplifting fold-thrust mountain ranges which splay south-eastwards from the sinistral northeast-trending Altyn Tagh Fault (ATF). In this study, we investigate the post-Oligocene tectonic evolution of the northern margin of the Tibetan Plateau around the Changma Basin, at the very northeast corner of the Plateau, where the ATF forms a triple junction with the frontal Qilian Shan thrust. Our research involves synthesis of previous geological and geophysical data, remote sensing analysis and field mapping of structures along key transects.

The Changma Basin (Fig. 1) is a relatively low intra-montane basin in the northeast Tibetan Plateau that is receiving alluvial infill from surrounding ranges, but is also being drained by the Su Le River, one of the largest river systems in the northeast Tibetan Plateau. The basin is also internally deforming and inverting along fault and fold zones, as well as being overthrust along some of its margins. Where older basement trends are parallel to neotectonic faults, some reactivation is inferred and locally documented through field observations. Otherwise, the post-Oligocene thrust and oblique-slip faults which are responsible for uplifting various basement blocks and inverting the Changma Basin appear discordant to nearby basement trends. Range-bounding thrust faults with the greatest along-strike continuity and relief generation are assumed to have the largest displacements, whereas other intra-range thrusts that bound uplifted limestone blocks are assumed to have lower amounts of displacement. Structural transects reveal a lack of intra-range reactivation of inherited structures or fabrics, concentrating uplift on the lithologically-controlled intra-range thrust faults and the major range-bounding thrust and oblique-slip faults. Northeast of the Changma Basin, in the Qilian Shan foreland, an east-trending belt of low folds and faulted ridges along the ATF marks the structural continuation of the Yumen Shan range. We find that uplift and growth of northeastern Tibet is complex with local variations in structural vergence, degree of strain partitioning, fault reactivation and basin inversion. This complexity reflects both the buttressing effect of the rigid Archaean basement directly to the north and the variation in the structural trends and lithologies of the Qilian basement, as well as the competition between uplift and erosion in the region.

Cite as: Vernon, R., Cunningham, W.D., Zhang, J. and England, R., 2014, Plateau growth around the Changma Basin in NE Tibet, in Montomoli C., et al., eds., proceedings for the 29th Himalaya-Karakoram-Tibet Workshop, Lucca, Italy.

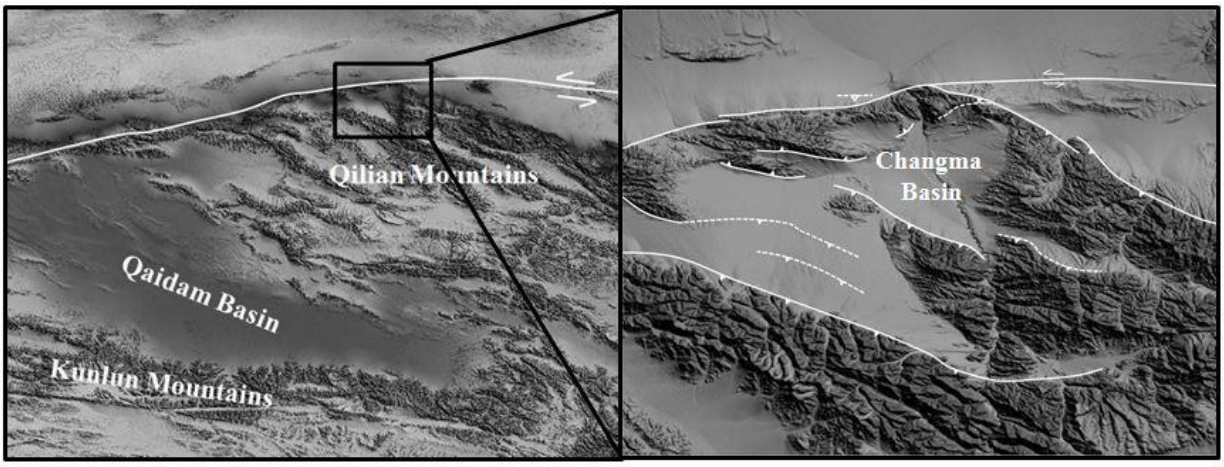


**Figure 1.** DTM showing the field area location and the major faults surrounding the Changma Basin.