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A Preliminary View of the Tethyan Thrust Belt, South Tibet

The Himalayan thrust belt is divided into the well-studied southern Himalayan thrust belt and a sparsely studied northern Himalayan thrust belt containing Tethyan Himalaya rocks, called the Tethyan thrust belt. Located north of the high Himalayan peaks in southern Tibet, the Tethyan thrust belt is difficult to access. Several local studies have documented the Tethyan Himalaya stratigraphy, but no existing studies include detailed structural data across the thrust belt. For 30 years, researchers have used generalized cross sections based on regional maps from the Tethyan thrust belt with minimum shortening estimates <200 km. Up to now, the largest amount of minimum shortening across the Himalayan thrust belt is ~1000 km, which can be considered the minimum size of Greater India. The size of Greater India is an important constraint for tectonic models of India-Asia collision; however, there is a wide range of estimates. Some studies suggest that Greater India was 2500-3500 km wide. If true, then more shortening should be found in the geologic record. The Tethyan thrust belt is an ideal location to find the “missing shortening”.

We present preliminary data from a new study in south Tibet focused on determining shortening in the Tethyan thrust belt, concentrating on intraformational folding and thrusting. Three transects were completed to correlate the structure and stratigraphy along- and across-strike. We show the intraformational deformation, particularly in the Mesozoic strata. Although the regional map patterns indicate modest shortening, we document pervasive, complex mesoscale folding and local faulting. Folds are generally upright to south-verging, and smaller north-verging kink folds are common. The preliminary data document shortening in the Tethyan thrust belt that has previously not been included in shortening estimates.