

# **SEDIMENT INFLUX TO SUBDUCTION ZONE AND GREAT MAGNITUDE EARTHQUAKES: AN OBSERVATIONAL APPRAISAL**

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## **Abstract**

It is now widely recognized that the largest of subduction zone thrust earthquake are apparently linked or at least associated with trenches where the thickness of sediment, in particular turbidite deposits, entering the subduction zone is  $> \sim 1.5\text{-}2.0$  km. Example trenches are the Aleutian, Alaska, Cascadia, central Chile and northern Sumatra. A plot of EQ  $M_w$  vs trench sediment thickness reveals no linking trend where the thickness is less than  $\sim 1\text{-}1.5$  km.

The empirical observation that great magnitude thrust earthquake are associated with the ingestion of exceptionally thick sedimentary sequences needs to be confirmed and challenged by an improved compilation of earthquake magnitude and thickness of sediment for specific sectors of trenches rather than for general trench systems. Also, with respect to magnitude, consideration must be paid to the lateral continuity of trench fill rather than just thickness itself. Great magnitude thrust earthquakes appear to be observationally associated only with trenches along which the lateral continuity of a thick axis fill is many hundreds of km or much longer.