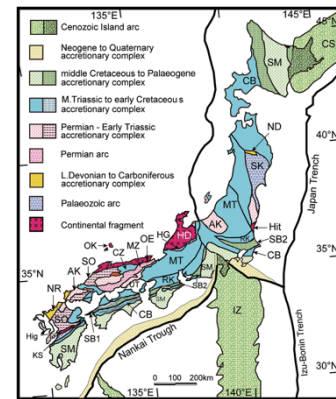


## Geology of an island arc and accretionary complexes in Japan, and the deformations related to earthquakes along subduction plate interfaces

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Japan is an island arc located along subduction zones in East Asia. The arc consists of volcanic rocks and accretionary complexes as its basement, both of which are closely related to the subduction of oceanic plates. Generally, accretionary complexes become younger toward the ocean, though there are exceptions that remain geological enigmas. Major tectonic lines run through the middle and southwestern parts of Japan, complicating tectonic interpretations. Japan is separated from Asia by a back-arc basin, and another back-arc basin exists in the Philippine Sea plate, which is subducting beneath Southwest Japan. A brief overview of Japan's geological and tectonic background will be presented.



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I will also introduce the geology of earthquakes in exhumed accretionary complexes, given Japan's constant risk of large earthquakes. A significant focus in Japanese geology is understanding the mechanisms of earthquakes along subduction plate interfaces.



Tectonic mélanges observed in exhumed accretionary complexes are believed to represent deformed rocks along subduction plate boundaries within a seismogenic zone, as determined by paleo-thermal analyses. Finally, a undergraduate student discovered pseudotachylite in a fault within a tectonic mélange unit about 20 years ago, indicating that the seismic fault is located in a specific area at the top of the underplating unit. These mélange units provide valuable opportunities to study the mechanics of subduction plate boundaries.

Our current research aims to clarify the relationship between regular and slow earthquakes, exploring how variations in slip velocity, from slow to fast, are accommodated along subduction plate interfaces. Rheological heterogeneity is considered a key factor in explaining these variations, with mélange units serving as an expression of this heterogeneity. Our approach combines geophysical and geological observations with modeling to understand the heterogeneous behavior of subduction plate interfaces.