



## Geodynamic environments of ultra-slow spreading

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Ultra-slow spreading is clearly distinguished as an outstanding type of crustal accretion by recent studies. Spreading ridges with ultra-slow velocities of extension are studied rather well. But ultra-slow spreading is characteristic feature of not only spreading ridges, it can be observed also on convergent and transform plate boundaries.

Ultra-slow spreading is observed now or could have been observed in the past in the following geodynamic environments on divergent plate boundaries: 1. On spreading ridges with ultra-slow spreading, both modern (f.e. Gakkel, South-West Indian, Aden spreading center) and ceased (Labrador spreading center, Aegir ridge); 2. During transition from continental rifting to early stages of oceanic spreading (all spreading ridges during incipient stages of their formation); 3. During incipient stages of formation of spreading ridges on oceanic crust as a result of ridge jumps and reorganization of plate boundaries (f.e. Mathematicians rise and East Pacific rise); 4. During propagation of spreading ridge into the continental crust under influence of hotspot (Aden spreading center and Afar triple junction), under presence of strike-slip faults preceding propagation (possibly, rift zone of California Bay).

Ultra-slow spreading is observed now or could have been observed in the past in the following geodynamic environments on transform plate boundaries: 1. In transit zones between two “typical” spreading ridges (f.e. Knipovich ridge); 2. In semi strike-slip/extension zones on the oceanic crust (f.e. American-Antarctic ridge); 3. In the zones of local extension in regional strike-slip areas in pull-apart basins along transform boundaries (Cayman trough, pull-apart basins of the southern border of Scotia plate).

Ultra-slow spreading is observed now or could have been observed in the past in the following geodynamic environments on convergent plate boundaries: 1. During back-arc rifting on the stage of transition into back-arc spreading (central part of Bransfield rift); 2. During back-arc inter-subduction spreading (Ayu trough, northern Fiji basin), 3. During diffuse back-arc spreading (area on the south-eastern border of Scotia sea), 4. During back-arc spreading under splitting of island arc (northern extremity of Mariana trough).

Each of the geodynamic environments is characterized by peculiar topographic, geological and geophysical features forming under the same spreading velocities. Development of ultra-slow spreading in each of these environments results in formation of peculiar extension sedimentary basins.