

Proposed Research Topics II

1. The geological nucleus of the Asian continent is the Siberian Craton, sometimes called the Angaran Craton. A major geologic debate has centered on the Precambrian tectonic configuration of the Siberian Craton just prior to the breakup of the supercontinent Rodinia. Compare and contrast at least three of the published models regarding the Siberian Craton as part of Rodinia and make the case for what you view as the best of these models.
2. The large sedimentary basins of western China, including the Tarim, Junggar, and Turpan basins contain substantial reserves of coal, first made known to the western world through the writings of Marco Polo. Characterize these coal deposits in terms of their geologic attributes and describe the paleo-environmental conditions that led to their formation.
3. The uplift of the Tibetan Plateau has profoundly influenced Asia's climate. Investigate the geologic evolution of the Tibetan Plateau as a consequence of the India-Asia collision and the role that the evolving plateau has played on the Cenozoic climate as recorded in geologic data sets from the oceans and continents.
4. The India-Asia collision is the quintessential example of an ongoing near-orthogonal collision between two continents. Discuss the geology associated with the tectonic boundary between India and Asia, and describe the major structures formed further away from the boundary and their relationship to the physiography of central Asia.
5. Diamond-bearing rocks in the Dabie Shan of China and the Ural Mountains of Russia both are interpreted to reflect extreme levels of unroofing associated with former continent-continent collisions. Describe these collisions and the inferred geologic history that led to vertical transport of diamonds to the surface.
6. Most of the super-giant oil fields of Russia and the nearby central Asian Republics occur in Paleozoic limestone reefs. Describe the physical attributes of these oil fields, the geologic conditions that led to their formation, and their history of development by humans.
7. Much of central Asia consists of a rich tectonic amalgamation of volcanic arcs, ophiolites, collapsed ocean basins, and subduction-accretion complexes. The long history of tectonic growth of the Asian continent has deformed many of these tectonic elements into very large folds called oroclines. Investigate the occurrence of these oroclines and evaluate the published hypotheses regarding their origin.
8. The recurring formation of large interior lakes in Asia appears to be a long-lived attribute of the continent's geologic history and has led directly to the formation of substantial petroleum resources. Investigate the geological conditions that resulted in the establishment of long-lived lake systems over the past 300 million years in at least one major sedimentary basin in central Asia and discuss these in the context of that basin's petroleum resources.
9. Devastating earthquakes have occurred frequently in Asia during historic timeframes. Many appear to be associated with the large network of faults made active by the ongoing India-Asia collisional orogen. Describe the evidence of paleoseismicity and the geologic setting of at least one of these major faults and investigate the societal consequences of at least one major historic earthquakes from the same region.
10. Describe the geology behind the Three Gorges Dam project in China, the history of flooding of the Yangtze River above and below the dam, and the anticipated environmental consequences of the massive project.