THE BARENTS SEA-EURASIA-PHILIPPINE SEA TRANSECT --THE LONGEST, RICHEST, AND VARIED TRANSECT IN THE WORLD

1XUECHENG,Y.,2EGOROV,A.S.,3GRIFFIN,B.,3O'Reilly,S.,1GSC, Beijing, China; 2VSEGEI, St.Petersburg, Russia; 3GEMOC, Macquarie University, Sydney, Australia.

The Transect starts from the Barents Sea, crosses the Baltic Shield, the East European Platform, the West Siberian Basin and the Central Asian Orogenic Belt, a region of significant Paleozoic crustal growth. It transects zones of continent-continent collision in the Urals and the Qinghai-Tibetan plateau, the reactivated South China block and the zone of arc-continent collision in Taiwan. The transect is multidiciplinary, including geological, geophysical (seismic, magnetotelluric, heat flow, gravity, and aeromagnetic surveys),and geochemical (mantle-derived xenoliths and xenocrysts) studies. Crossing both space and time, the Transect provides a four-dimensional view of lithosphere structure across more than 20% of the Earth's circumference. The transect reveals the lithospheric structure of the Eurasian continent, and gives evidence that the crust and the underlying lithospheric mantle have formed contemporaneously, and in general have remained linked for long periods. Archean mantle (and to a lesser degree Proterozoic mantle) is strongly depleted in basaltic components, making it both buoyant and highly refractory, and resulting in high seismic velocities; this type of mantle is preserved beneath the European Platform and parts of the Central Asian Orogenic Belt (microcontinents). Phanerozoic mantle is relatively undepleted and dense, and has lower seismic velocities, especially at elevated temperatures. Areas with Phanerozoic crust along the transect are generally underlain by thin Phanerozoic mantle with elevated geotherms.