# Interpretation of Bathymetric and Magnetic data from the Easternmost Segment of Australian-Antarctic Ridge, 156°-161°E

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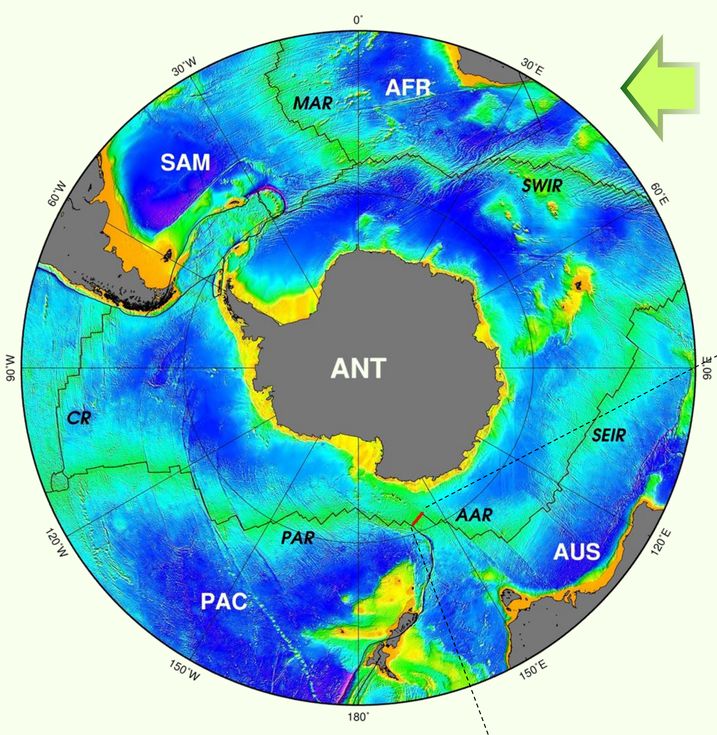
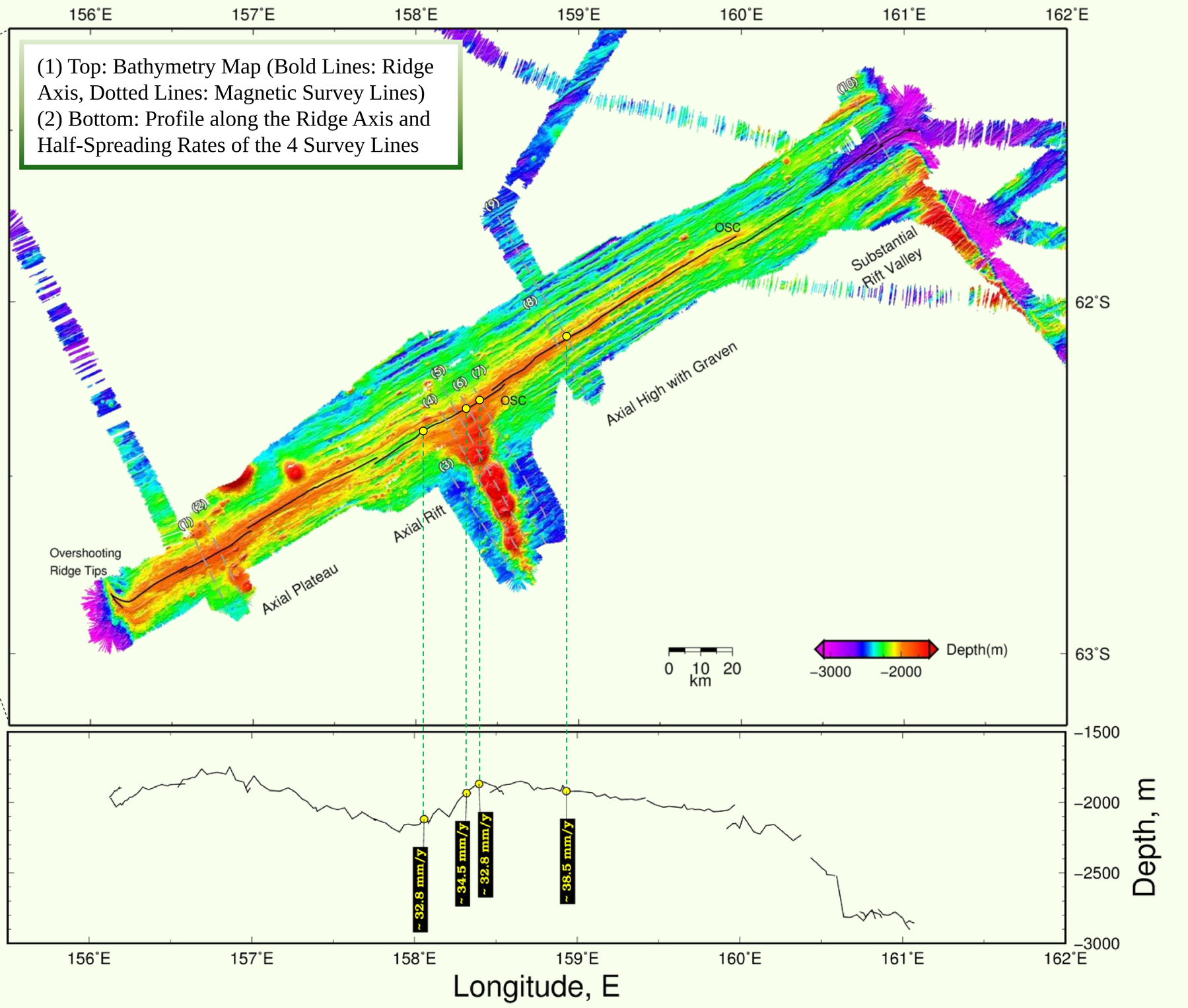
From 2011 to 2013, Korea Polar Research Institute (KOPRI) conducted a series of geophysical and geochemical expeditions on the longest and easternmost segment of Australian-Antarctic Ridge, located at 61°-63°S, and 156°-161°E. This super-segment plays an important role in constraining the tectonics of the Antarctic plate. Using IBRV *ARAON*, the detailed bathymetric data and eleven total magnetic profiles were collected. The studied ridge has spread NNW-SSE direction and tends to be shallower to the west and deeper to the east. The western side of the ridge (156°-157.50°E) shows a broad axial high and a plenty of seamounts as an indicative of massive volcanism. Near the center of the ridge (158°-159°E), a seamount chain is formed stretching toward the south from the ridge. Also, the symmetric seafloor fabric is clearly observed at the eastern portion (158.50°-160°E) of the seamount chain. From the topographic change along the ridge axis, the western part of the ridge appears to have a sufficient magma supply. On the contrary, the eastern side of the ridge (160°-161°E) is characterized by axial valley and relatively deeper depth. Nevertheless, the observed total magnetic field anomalies exhibit symmetric patterns across the ridge axis. Although there have not been enough magnetic survey lines, the spreading rates of the ridge are estimated as the half-spreading rate of 32.8 mm/y and 34.5 mm/y for the western portion of the ridge and 38.5 mm/y for the eastern portion. The studied ridge can be categorized as an intermediate spreading ridge, confirming previous studies based on the spreading rate of global ridge system. Here we will present the preliminary results on bathymetric changes along the ridge axis and its relationship with melt supply distribution, and detailed magnetic properties of the super-segment constrained by the observed total field anomalies.

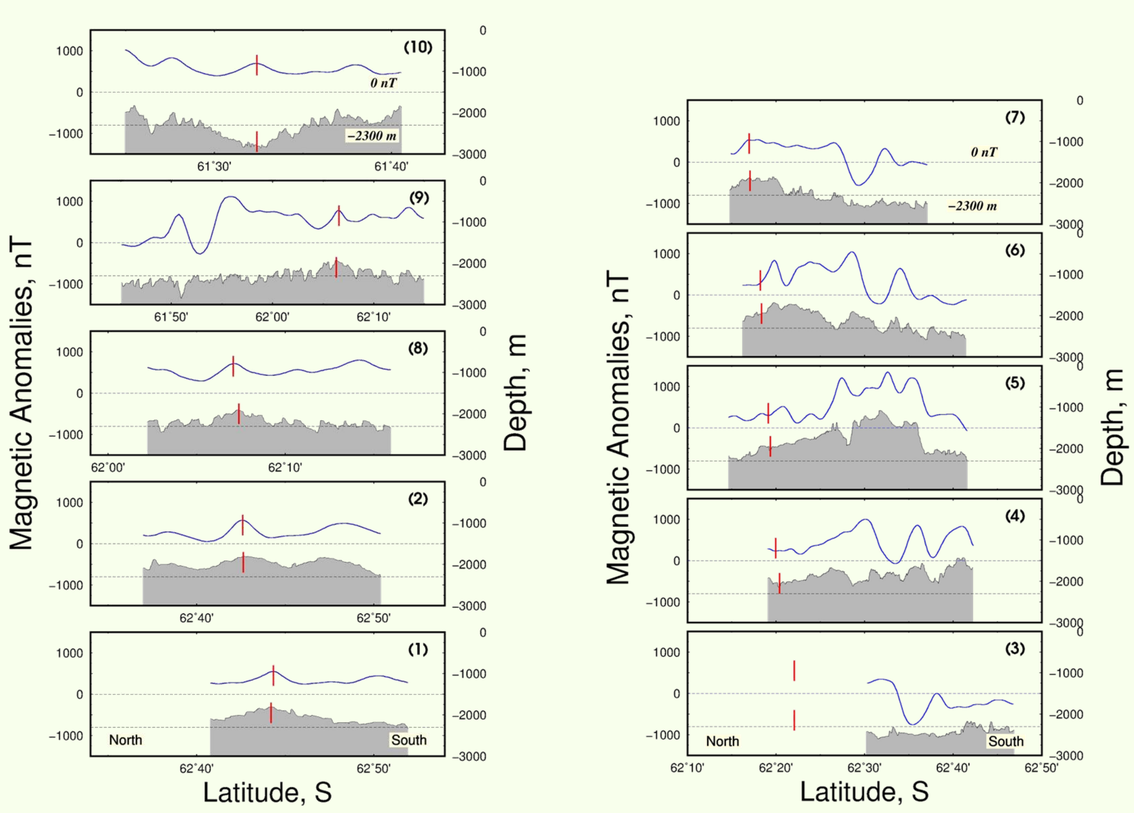



Locations of Tectonic Plates and Global Mid-Ocean Ridges around Antarctic Plate: Study Area is showed by red bar

ANT: Antarctic Plate / PAC: Pacific Plate / SAM: South American Plate / AFR: African Plate / AUS: Australian Plate
PAR: Pacific Antarctic Ridge / CR: Chile Rise / MAR: Mid Atlantic Ridge / SWIR: Southwest Indian Ridge / SEIR: Southeast Indian Ridge / AAR: Australian Antarctic Ridge

(1) Top: Bathymetry Map (Bold Lines: Ridge Axis, Dotted Lines: Magnetic Survey Lines)
(2) Bottom: Profile along the Ridge Axis and Half-Spreading Rates of the 4 Survey Lines




Magnetic Anomalies compared with Bathymetry

## CONCLUSION

Bathymetric data obtained from the super-segment of the Australian-Antarctic Ridge (AAR) show that its axial depths tend to be deeper eastward. A broad magmatic region is formed in the western part of the ridge. In addition, the bathymetry represents well defined seafloor fabric and it has seamount chains extending southward from the middle of the super-segment. According to the magnetic data, this ridge has the half-spreading rates of 32~39 mm/y on average. The result indicates that the ridge has intermediate spreading rates and confirms the spreading rate of the ridge inferred from the global tectonic models.