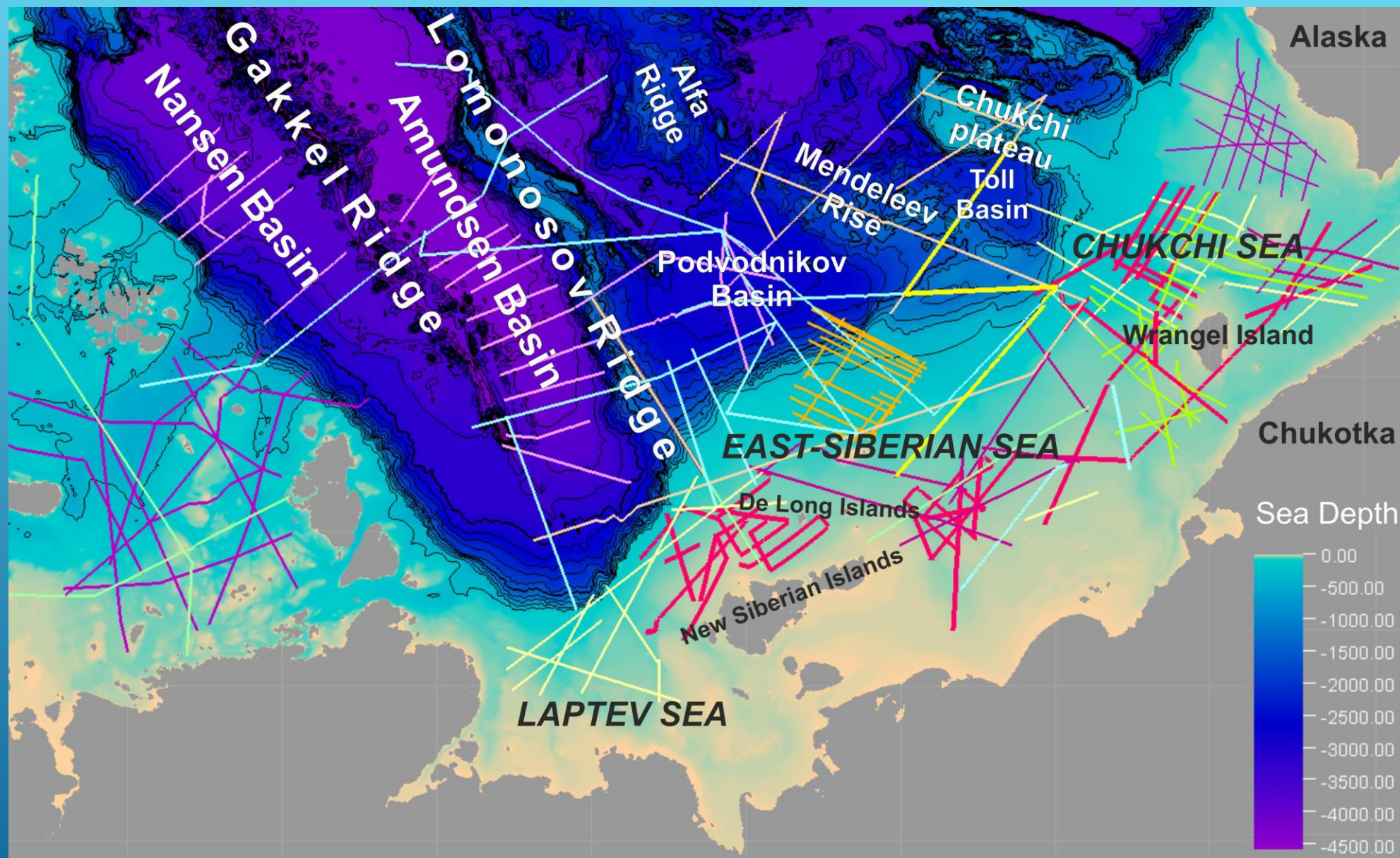


SEISMIC STRATIGRAPHY OF THE EAST-SIBERIAN AND CHUKCHI SEAS AS A KEY TO THE AMERASIA BASIN STRATIGRAPHY AND EVOLUTION

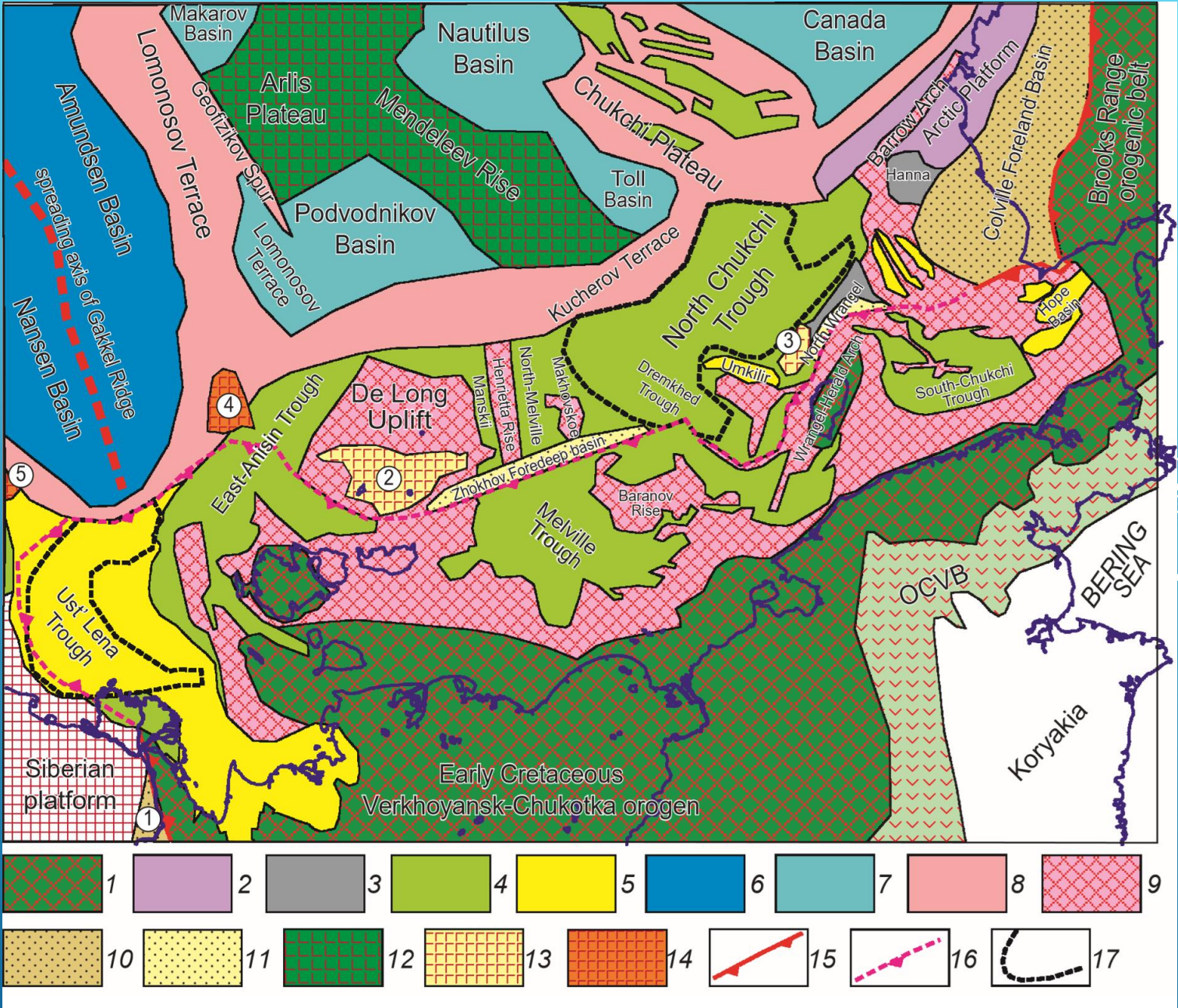
by Kseniia Startseva¹ (kfstartseva@gmail.com)
and Anatoly Nikishin¹

¹ Lomonosov Moscow State University, Geological Faculty,
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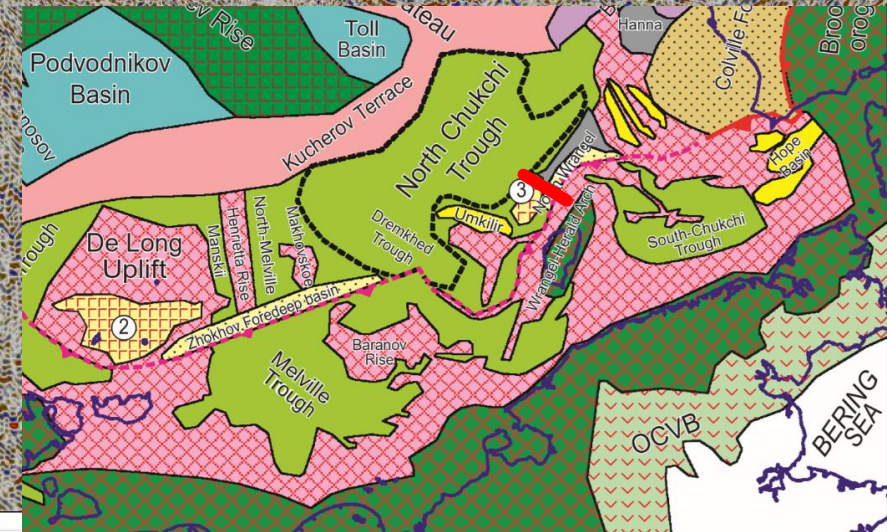
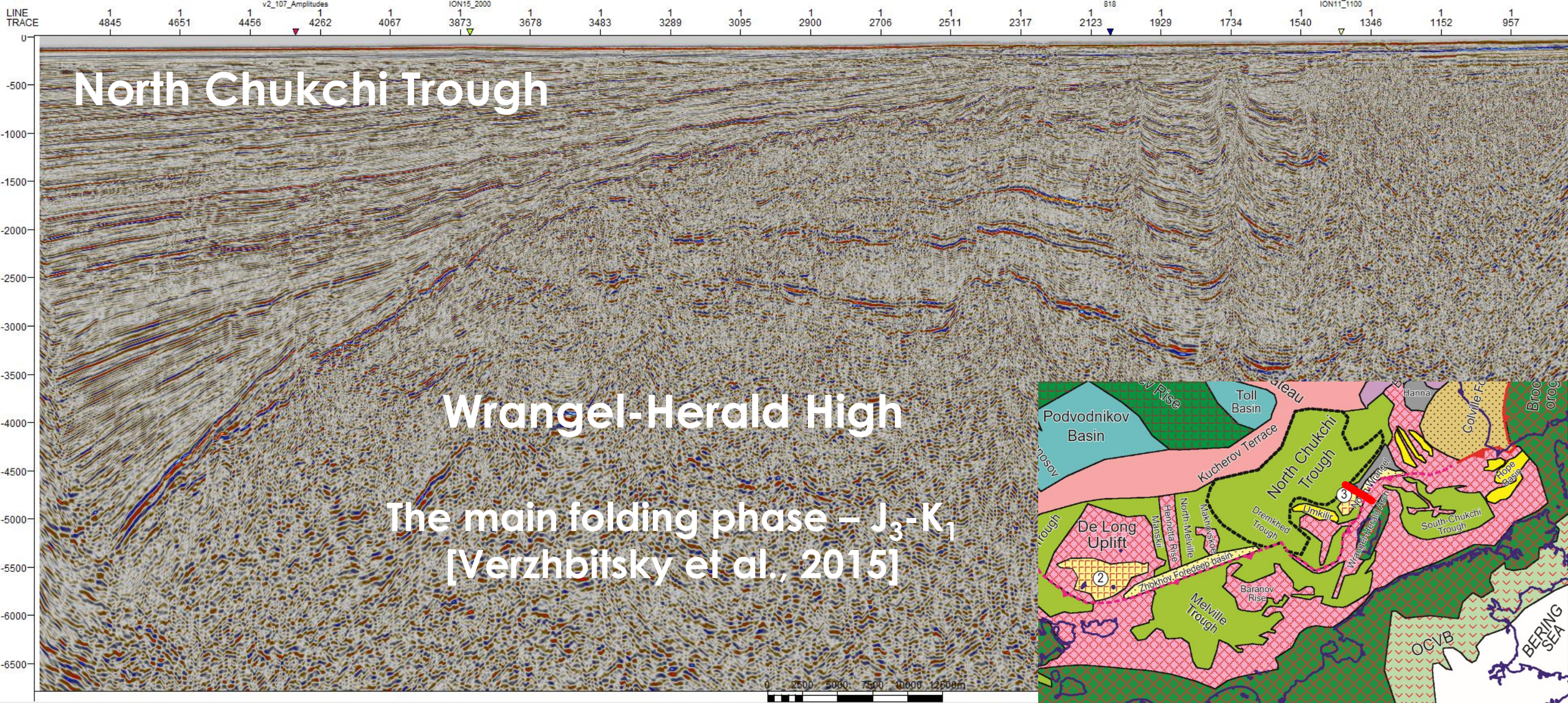
MAP OF AVAILABLE SEISMIC DATA

Designations (numbers in circles):
 1, Pre-Verkhoyansk foredeep; 2, De-Long traps; 3, North-Chukchi traps; 4, Anisin-Lomonosov traps; 5, Faddei traps.
 OCVB, Cretaceous Okhotsk-Chukotka volcanic belt.
 1, Cretaceous orogens; 2, poorly defined sedimentary basins; 3–5, sedimentary basins with rifting: 3, Carboniferous; 4, Aptian-Albian; 5 – Cenozoic; 6, Eurasian basin with oceanic crust; 7, basins with hyperextended continental crust; 8, passive continental margins and continental terraces; 9, relative rises overlaid by a sedimentary cover; 10–11, foredeeps: 10, Mesozoic; 11, Zhokhov Late-Jurassic Neocomian; overlaid by younger sediments; 12, Cretaceous rift-volcanic structure of the Mendelev Rise; 13–14, probable traps beneath younger sediments: 13, Aptian-Albian; 14, Paleocene-Eocene; 15–16, thrust belt in front of the front: 15, mesozoid; 16, mesozoid overlaid by younger sediments; 17, the deepest areas of sedimentary basins with strongly thinned crust.

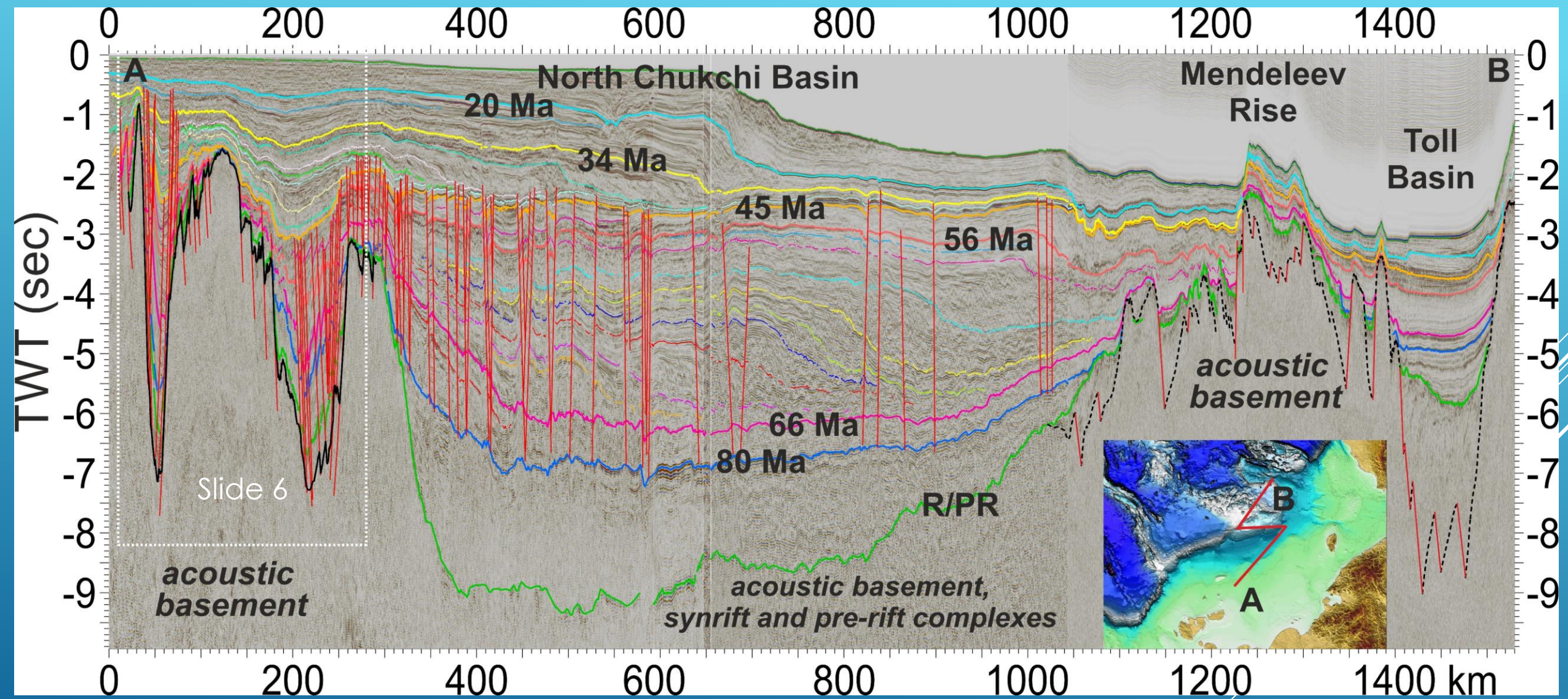


TECTONIC SCHEME

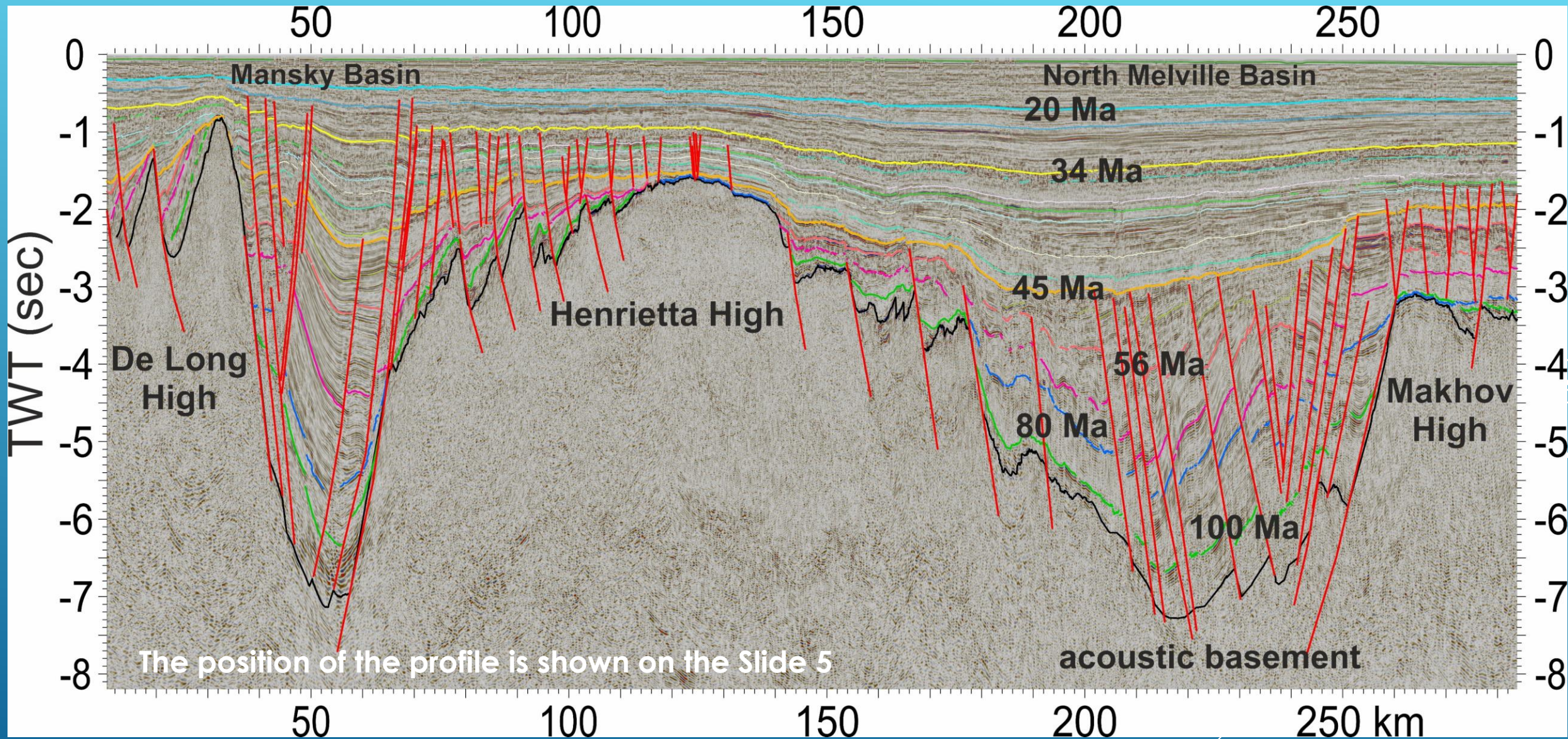
[Nikishin et al., 2019]



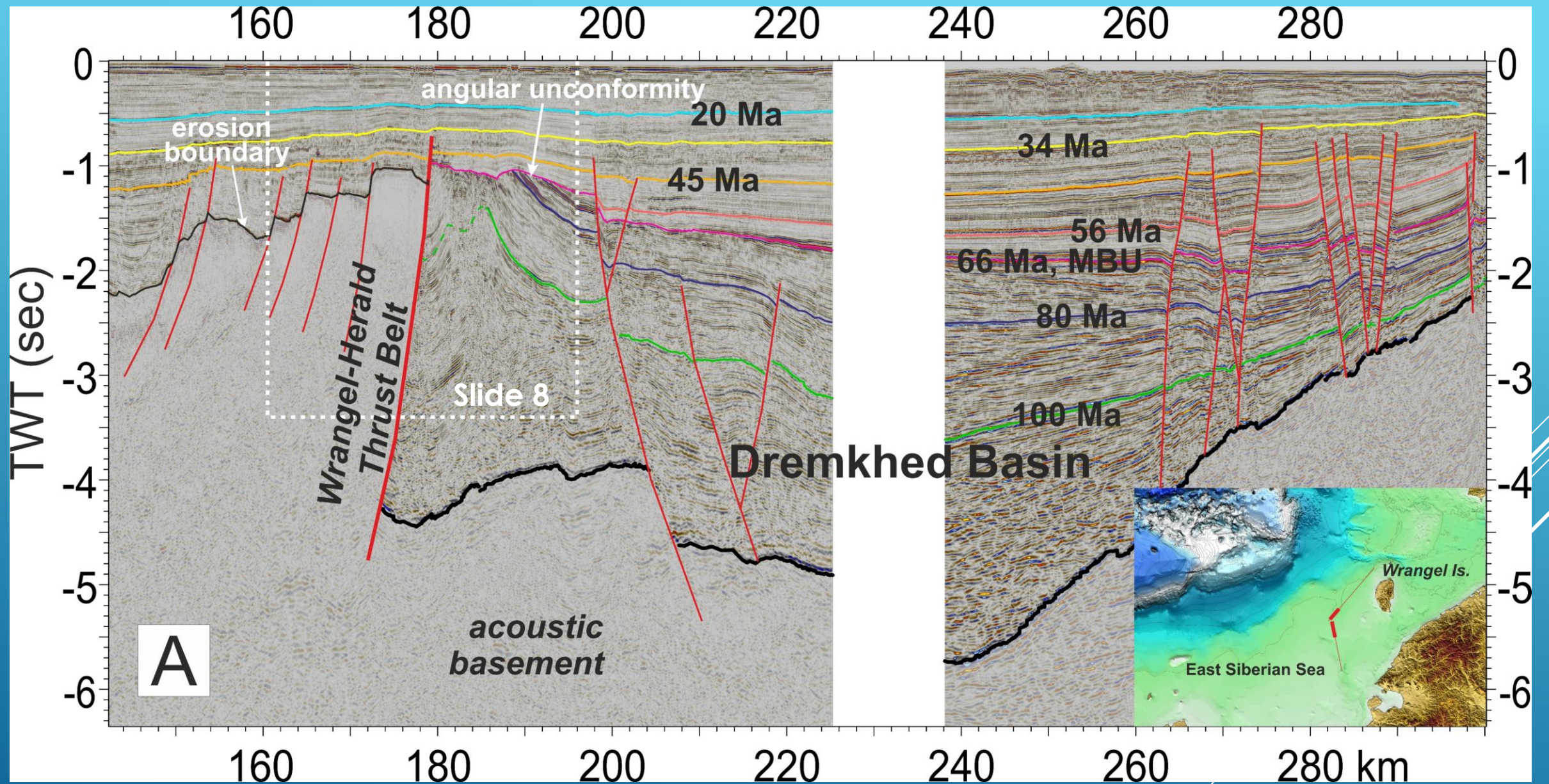
RELATION OF SEISMIC COMPLEXES IN THE NORTH CHUKCHI TROUGH



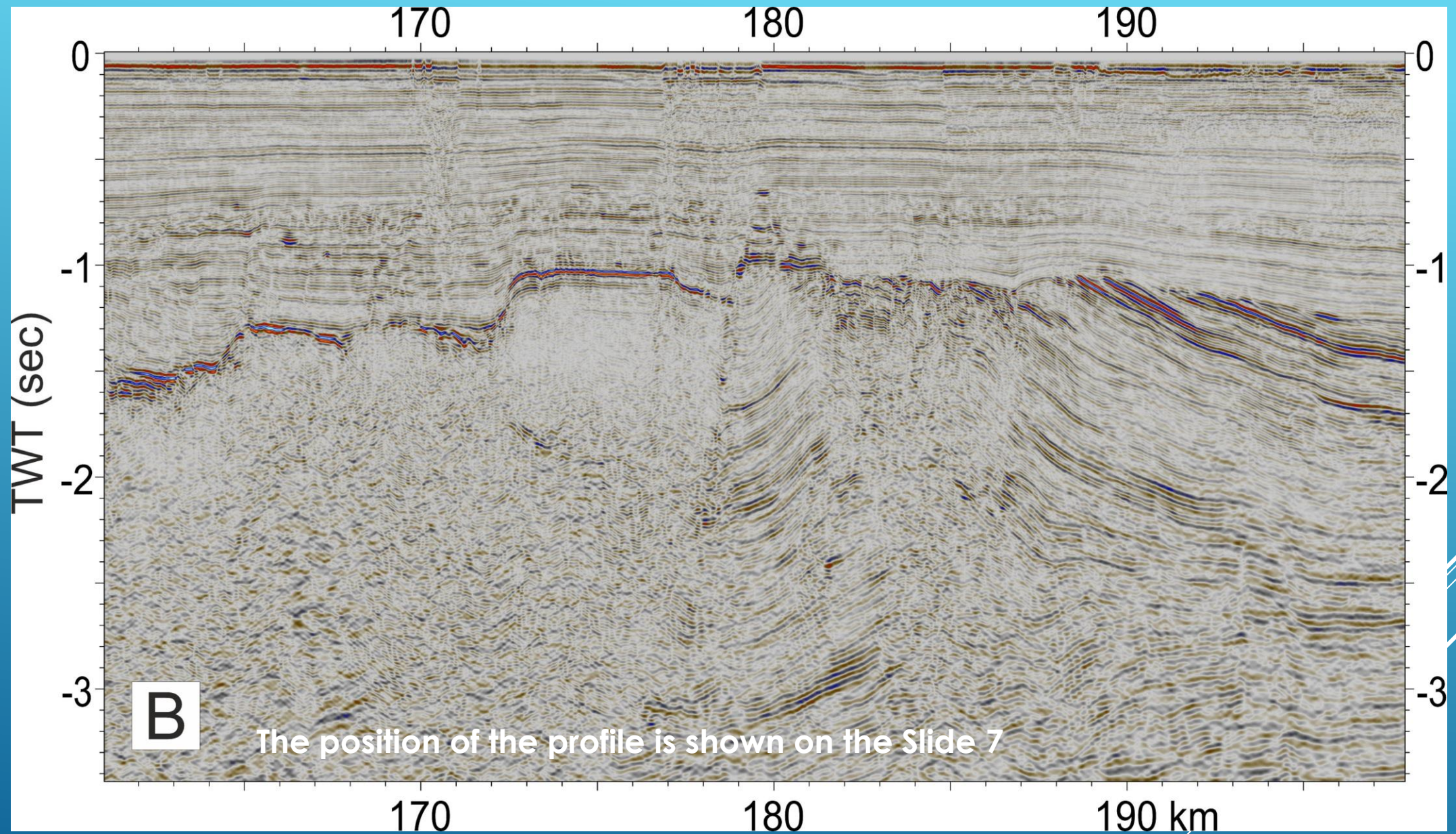
COMPOSITE PROFILE



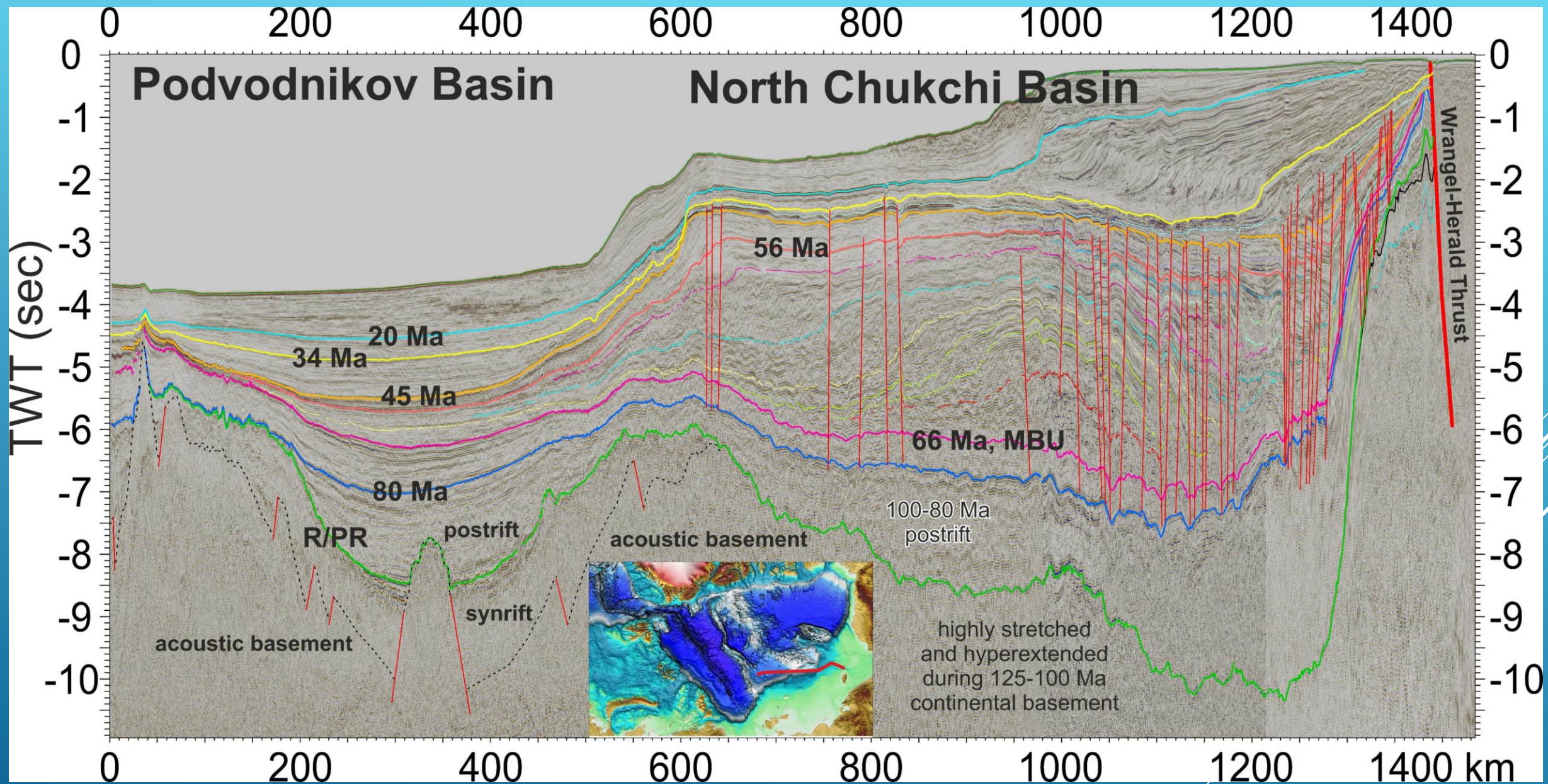
RIFT BASINS IN THE EAST-SIBERIAN SEA



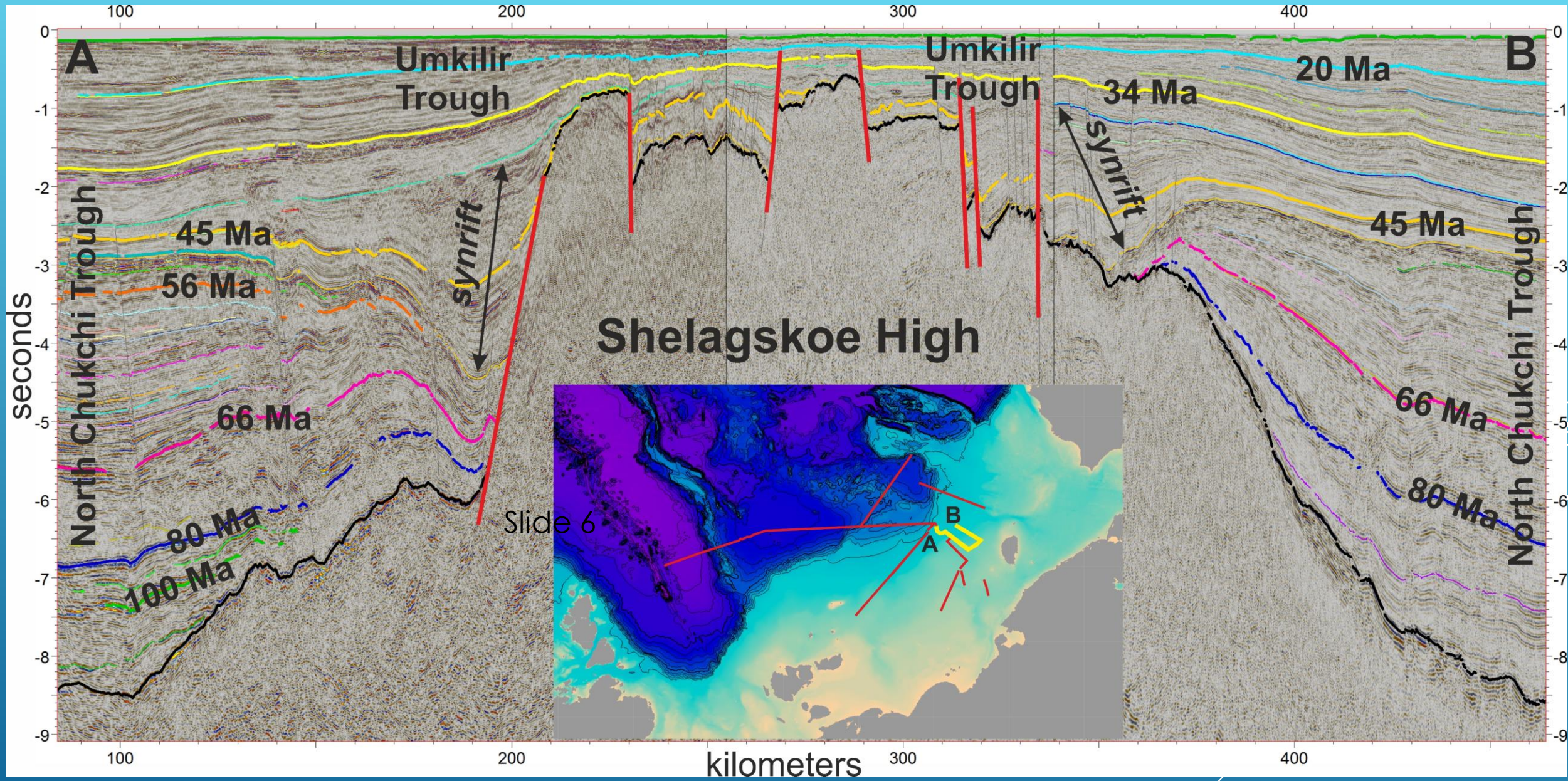
WRANGEL-HERALD THRUST



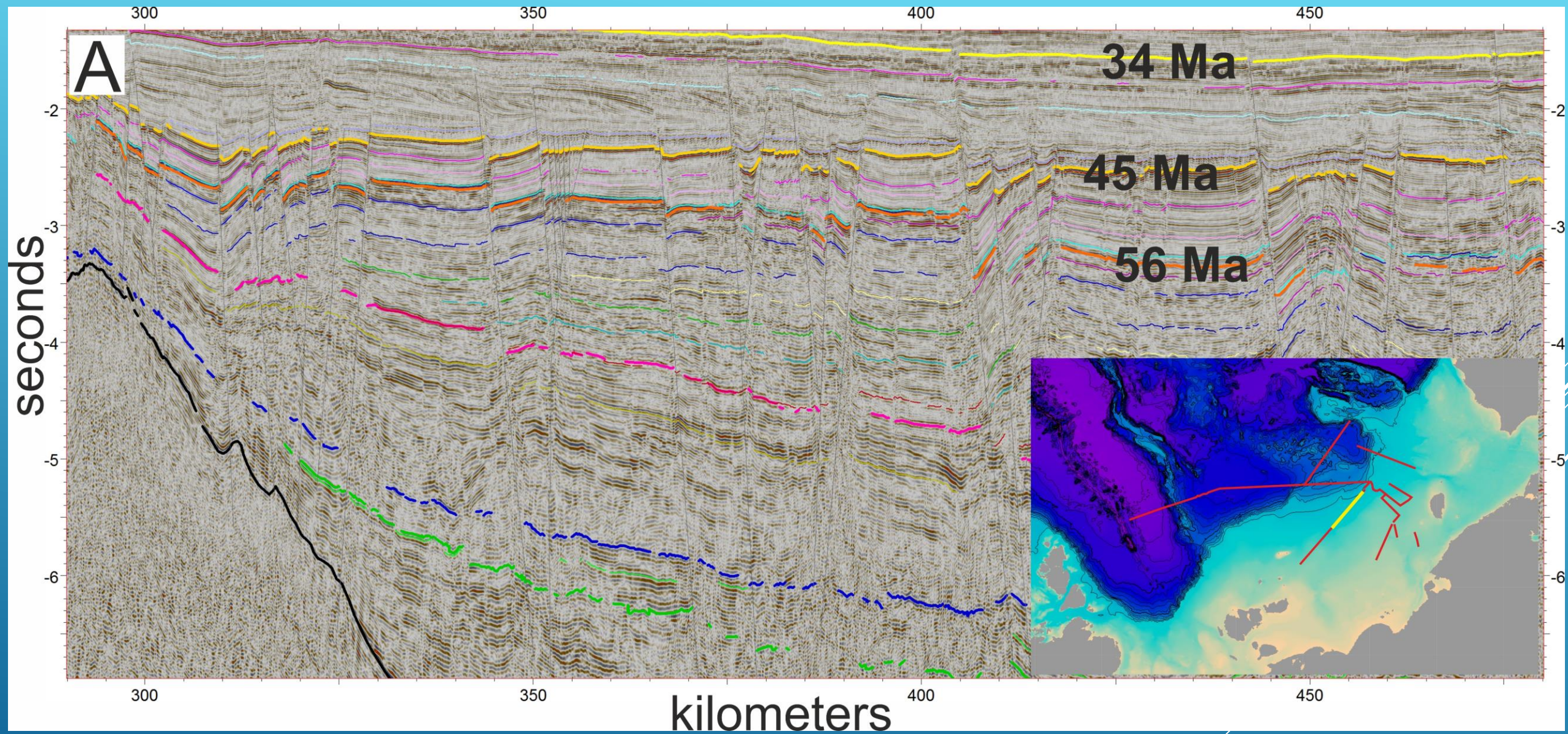
WRANGEL-HERALD THRUST



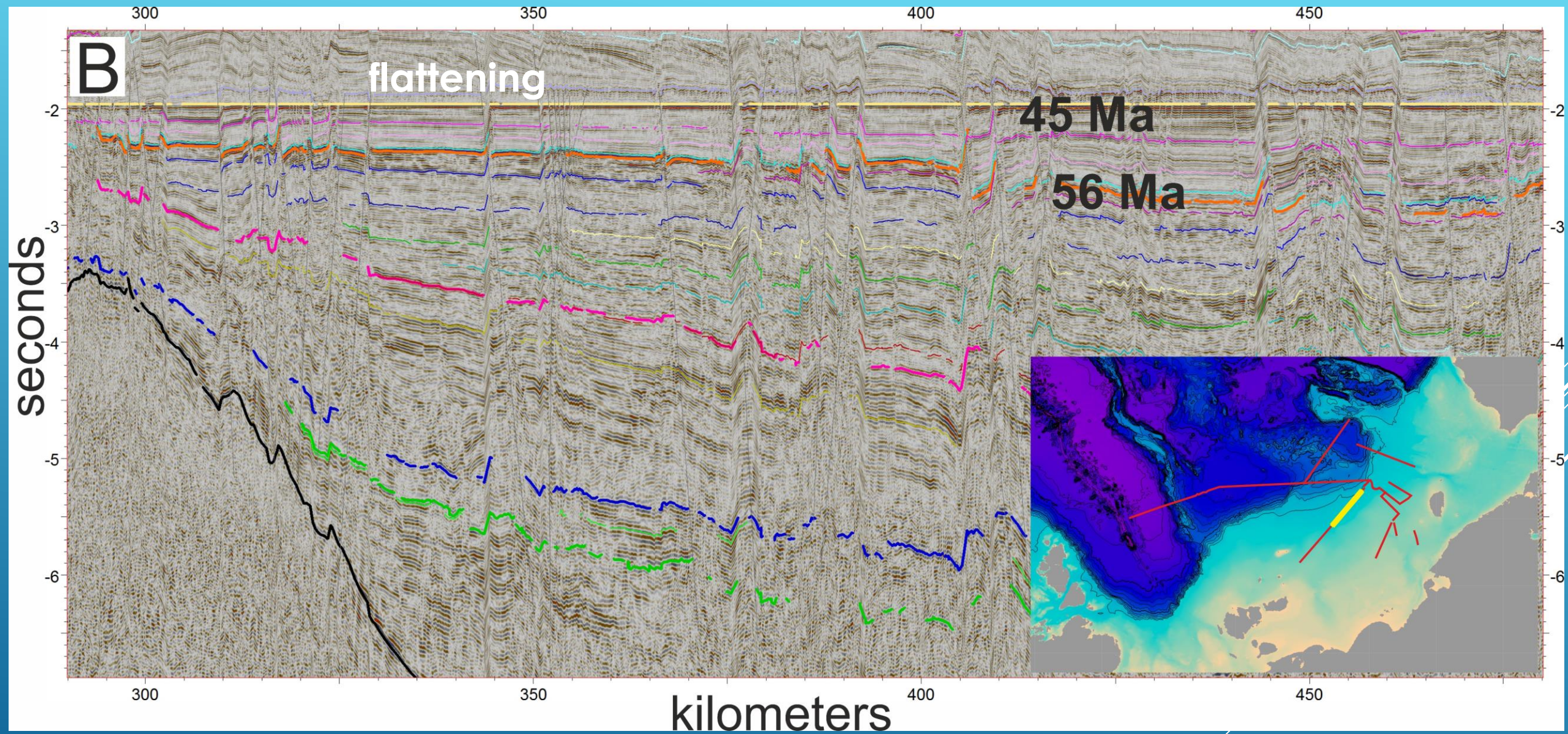
WRANGEL-HERALD THRUST



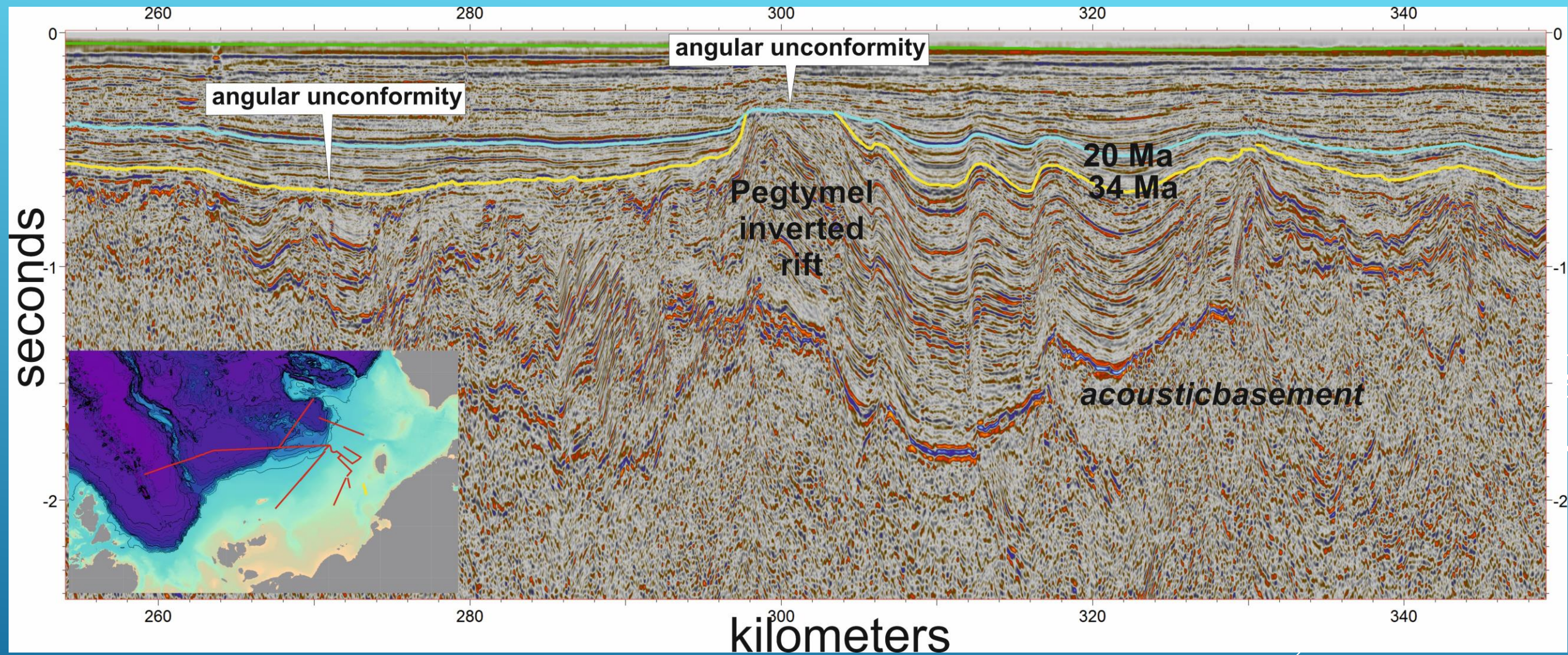
RIFTING ABOUT 45 MA IN THE NORTH CHUKCHI SEA 10



RIFTING ABOUT 45 MA IN THE NORTH CHUKCHI SEA ¹¹



RIFTING ABOUT 45 MA IN THE NORTH CHUKCHI SEA ¹²



OLIGOCENE INVERSION IN THE NORTH CHUKCHI SEA

Based on new seismic survey, offshore drilling and geological structure of the adjacent onshore a new model of geological evolution of sedimentary basins of the East-Siberian and Chukchi seas since the Mesozoic has been constructed. The main stages of their tectonic history are highlighted: 1) forming of the foreland basin in Jurassic – Early Cretaceous time; 2) synrift extension in Aptian-Albian time; 3) start of postrift subsidence in Later Cretaceous; 4) uplift and deformations at the turn of Cretaceous and Paleogene, start of forming of the thick (up to 4-6 km) clinoform complex; 5) episode of synrift extension in Middle-Later Eocene, forming of the system of multiple low-amplitude normal faults; 6) inversion deformations in Oligocene-Miocene; 7) relatively calm tectonic conditions in Neogene-Quaternary time. Boundaries of the interpreted seismic complexes corresponding to these stages has been extended to the entire Amerasia basin with regards to the ages of magnetic anomalies in the Gakkel Ridge and sea-bottom sampling on the Mendeleev Rise. Volcanic areas of the De Long Islands and the North Wrangel High has been traced on the seismic profiles toward Mendeleev Rise and Podvodnikov Basin and dated as ± 125 Ma. According to the seismic interpretation, the age of the Podvodnikov and Toll basins is not older than Aptian. The reported study was funded by RFBR and NSFB, project number 18-05-70011, 18-05-00495 and 18-35-00133.

THANK YOU FOR ATTENTION!



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- ▶ Nikishin, A.M., Startseva, K.F., Verzhbitsky, V.E., Cloetingh, S., Malyshev, N.A., Petrov, E.I., Posamentier, H., Freiman, S.I., Lineva, M.D., Zhukov, N.N., 2019. Sedimentary Basins of the East Siberian Sea and the Chukchi Sea and the Adjacent Area of the Amerasia Basin: Seismic Stratigraphy and Stages of Geological History. *Geotectonics* 53, 635–657. <https://doi.org/10.1134/S0016852119060104>
- ▶ Verzhbitsky, V.E., Sokolov, S.D., Tuchkova, M.I., 2015. Present-day structure and stages of tectonic evolution of Wrangel Island, Russian eastern Arctic Region. *Geotectonics* 49, 165–192. <https://doi.org/10.1134/S001685211503005X>