The Kucherov Terrace is a prominent flat platform lies on a depth about 1200 meters below sea level between shelf area of the Chukchi Sea and deep-water area of Podvodnikov Basin and Mendeleev Rise. Due to location between main tectonic features of the East Arctic basin this territory carries some important insights to the tectonic history of the Arctic. By available seismic data and regional seismic correlation, we outlined series of the key moments of the geological history and estimated ancient geomorphological features of the territory.

Based on our interpretation we suppose main rifting event took place on the territory in Aptian-Albian ages. After the rifting stage thermal subsidence lead to increasing of water depth and infilling of the basin by sediments from the Siberia territory. Two main stages of sedimentary history of the area were identified: Late Cretaceous-Paleocene and Eocene-Recent.

By presence of obvious clinoform sequences in a sedimentary cover of the Kucherov terrace, we interpret the terrace itself as submerged ancient shelf was formed not later than end of Paleocene. Using clinoform geometry we calculated paleodepth of the Podvodnikov and Toll basins as around 800-1000 meters below sea level in Paleocene. At the same time adjacent to the shelf area seamounts of the Mendeleev Rise already existed in this time and played a role of a natural barrier to the prograding shallow-marine clastic wedges. By shelf-edge position of a clinoform sets we estimated mean subsidence rates as 15-22 meters/myr in an area with preceding sediment loading less than 3 km. The obtained estimates can be used as good constraints during further subsidence modelling.

During Eocene-Recent stage existence of flat platform led to a peculiar pattern of a sedimentation in a Chukchi shelf. Shallow-marine circumstances led to a very fast descending profile with less or absence of basin-floor fans. Formation of the mass wasting deposits starts in this area only in the Miocene unlike adjacent territories.

The study was funded by RFBR ‑ projects № 18-05-70011 and 18-05-00495.