

# Lithospheric flexures creating the mariana trenches research paper samples

[Environment](#), [Water](#)



## **Introduction**

This project is concerned with the study of the Mariana trench, the deepest part of the oceans discovered yet. The papers considered in this review provide crucial information that helps in understanding the trench. From the forces that create the trench, to the physical conditions present in the trench, this review seeks to put bare as much information on the subject as its scope allows.

Bodine, J. H., & Watts, A. B. (1979). On lithospheric flexure seaward of the Bonin and Mariana trenches. *Earth and Planetary Science Letters*. doi: 10.1016/0012-821X(79)90162-6

## **Tectonic activity and the history of the Mariana trench**

D. Hussong, Hawaii Institute of Geophysics, University of Hawaii, Honolulu, Hawaii and Seiya Uyeda, Earthquake Research Institute, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan (1981). *Tectonic Processes and the History of the Mariana Arc: A Synthesis of the Results of Deep Sea Drilling project leg 60*.

This paper bases its findings from the DSDP (deep sea drilling project), which collects data obtained from 10 deep-sea drilling sites. The data collected from these sites suggest that a continuous process of rifting causes the Mariana trench formation. The Mariana trough, according to Karig, 1971, forms because of a rift in the active volcanic arc that resulted in the formation of back ark basin now called the Mariana trough. The paper further provides data on the features on the trench describing it as often over 8600

meters deep, and with slopes as great as  $9^\circ$ . Further samples collected from the wall of the trenches showed no sign of sediment collection, with the first clearly defined sediment samples collected west of the trench slope break. The findings of this papers indicated that there was no thrusting, folding or any other compression feature on the fore arc. The only features found were tensional throughout the region.

## **Bathymetry of the Mariana Trench Arc System**

Gvartzman, Z., & Stern, R. J. (2004). Bathymetry of Mariana Trench-Arc System and Formation of the Challenger Deep as a Consequence of Weak Plate Coupling. *Tectonics*. doi: 10. 1029/2003TC001581

This paper concerns itself with the attempted task explaining the extraordinary depth of the challenger deep, the deepest known section of the Mariana trench. The author proposes that an unusually narrow plate coupling causes the challenger deep depths. The theory explains that the trench form by a heavy descending slab hangs nearly wholly on the oceanic plate. The attachment to the upper plate is very weak which results in the descending slab sinking barely hindered. The result is an unusually deep trench, the Mariana trench. The bathymetry of thee Mariana region examined as a whole, with the Mariana region described as one of the roughest places on the surface of the earth. The trench, therefore, is a part of a common occurrence in the Mariana region, being an area with evident topological peculiarities.

**Works cited:**

Bodine, J. H., & Watts, A. B. (1979). On lithospheric flexure seaward of the Bonin and Mariana trenches. *Earth and Planetary Science Letters*. doi: 10.1016/0012-821X(79)90162-6

D. Hussong, Hawaii Institute of Geophysics, University of Hawaii, Honolulu, Hawaii and Seiya Uyeda, Earthquake Research Institute, University of Tokyo, Bunkyo-ku, Tokyo 113, Japan (1981). *Tectonic Processes and the History of the Mariana Arc: A Synthesis of the Results of Deep Sea Drilling project leg 60*.

Gvirtzman, Z., & Stern, R. J. (2004). Bathymetry of Mariana Trench-Arc System and Formation of the Challenger Deep as a Consequence of Weak Plate Coupling. *Tectonics*. doi: 10.1029/2003TC001581