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Marie Tharp: Seafloor mapping and ocean plate tectonics

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The pioneering seafloor mapping by Marie Tharp played a key role in the acceptance of the plate tectonic theory. Her physiographic maps, published with Bruce Heezen, covered the Earth's oceans and revealed with astonishing accuracy the submarine landscape. She exposed the full extent of the global mid-ocean ridge system, documented features such as seamounts and volcanic chains, trenches, and transform faults. Marie Tharp co-authored the first papers describing the major fracture zones in the Central Atlantic (Chain, Romanche, Vema). In 1952, she also discovered that the Atlantic ridge has a central valley (the axial valley), and convinced her colleague Bruce Heezen that it, which corresponds to sustained seismicity (highlighted by other researchers at the same time thanks to the worldwide networking of seismological stations), is a rift that separates the eastern and western provinces of the Atlantic Ocean. Tharp and Heezen were not yet talking about plate tectonics at this time. But when, at the beginning of the 1960s, the first magnetic anomaly maps showed that the oceans were "young", and that the age of the seabed increased with the distance from the ridges, their physiographic map became an essential element in understanding the role that these ridges play, as well as the distribution of the main current terrestrial plates. In this poster, we present original maps and sketches that document this key contribution to the understanding of the Earth's tectonics.