

The island of Barbados is the only exposed section (above sea level) of the Barbados Accretionary Prism (BAP). The prism itself is a result of the off-scraping of sediment from the subduction processes of the Americas Plate onto the Caribbean Plate.

Barbados is located on the spine of the Barbados ridge and is probably the most structurally complex portion of the prism due to the substantial uplift. Geological evidence lead to the belief that the Scotland sediments were sourced from a Paleo-Orinoco river system and were deposited deep offshore. Due to plate tectonics, these deep-water sediments were transported north-west, riding on the top of the Americas plate which was being subducted into the Tobago trough. The sediments were scraped off the top of the downward moving plate and an accumulation of sediments formed into what is now the Barbados accretionary prism.

PICTURE

The Barbados ridge experienced uplift late in the Miocene, as evidenced by a regional unconformity observed on seismic lines. Quartz clastics from the basal Complex were eroded and transported to adjacent low areas, such as the eastern Tobago Trough. It is thought that isolated basins of various sizes developed on the surface of the Basal Complex and eroded sediments accumulated in these areas, giving rise to a prism cover, the Intermediate unit.

The Oceanic formation was deposited contemporaneously with the accretionary accumulation of the Scotland Formation as evidenced by paleontological studies and fieldwork. It was emplaced above the Intermediate Unit and the Scotland formation by a series of low angle thrust faults providing a suitable cap rock for the oil reservoirs of both the Intermediates and Scotlands (Poole and Barker, 1980).

The BAP is the most studied prism in the world due to the fact that it is anomalous in many aspects; these include:

- It is the widest prism, up to 300km
- it is among the thickest, estimated at 20 km or more
- it is associated with extremely slow plate convergence rates
- Its association with proven oil prone source rock as opposed to highly gas prone like most other prisms
- it has a high quartz content, due to its South America derived sediments

Accretionary prisms may grow in the arcward direction by translation of the prism mass toward the arc. Virtually all known prisms where there is good seismic control show evidence of arcward translation, although the global uniformity of its tectonic character is yet so far unclear (Speed 1987). In Barbados, the western side of the prism is marked by one or more major thrust anticlines, with westward vergence direction. This trend is referred to as the Inner Deformation Front (IDF). The IDF is probably composed of deformed strata of the eastern forearc Tobago basin.