

## **Plate Tectonic Setting and Structural Characterisation of the Barbados Accretionary Prism**

**Sonia Scarselli, Fernando Rodriguez, Bradley Nuse, Caroline Burke, Dave Widdoes, and William Crane**

*BHP Billiton*

### **Abstract**

The tectonic evolution of the Barbados accretionary prism is characterised by a complex interaction between the Caribbean plate and the pre-existing underlying fabrics of the subducting Atlantic plate. According to the “Pacific Origin model” the Caribbean plate originated in the Pacific and was thickened by the Galapagos hotspot during the Cretaceous. Eastward plate motion was associated with initial eastward dipping subduction, which eventually flipped polarity to westward dipping subduction, as observed on present day tomography and seismicity. Better characterisation of the relationship and interactions between the Caribbean upper plate and the Atlantic lower plate is needed to understand their impact on the development and the geometry of the Barbados accretionary prism. The spatio-temporal evolution of the Barbados accretionary prism has a primary control on the petroleum system distribution of the area. A compilation of public and multidisciplinary proprietary data has been used to produce an integrated characterisation of the tectonic and structural domains that define the Barbados accretionary prism. Preliminary results show that the complex geometry and evolution of the Barbados accretionary prism is influenced by the crustal architecture and type of crust of the subducting Jurassic and Cretaceous Atlantic plate. Further analysis indicates that the main structural changes observed in the accretionary prism are aligned and related to regional tectonic elements observed at lithospheric scale. These observations seem to correlate well with the working petroleum system.