

Source Rock Study in the East Coast Province, New Zealand: Toward Petroleum System Understanding

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ABSTRACT

The East Coast Province of New Zealand contains over 300 oil and gas seeps and shows, and has seen petroleum exploration interest for more than a century. Despite this, understanding of petroleum systems in the frontier offshore Raukumara, East Coast, and Pegasus basins remains incredibly limited. Source rocks are inferred to be the Waipawa and Whangai formations of Late Cretaceous through Paleocene age, but to date no oil-prone organofacies has been discovered for the Whangai. However, some oil seeps onshore share characteristics with the Whangai Formation. Given this gap in understanding and large amount of uncertainty surrounding possible source rocks, the objective of this study is to constrain understanding of East Coast Province petroleum systems through the study and assessment of onshore oil seeps and onshore source rock analogues. This project will consist of a sampling campaign in order to obtain oil seep samples and source rock analogue samples from the Whangai and Waipawa formations. Lab analysis will be conducted in order to characterize TOC, HI, and biomarkers of source rocks and biomarkers of oil, allowing for oil-source rock correlation. These results will be critical to understanding what source rock(s) may be present in New Zealand's frontier basins. Biomarker work will also be vital to characterizing depositional environments and organic matter input to source rocks, as well as assessing thermal maturity of source rocks, which will be critical to assessing petroleum prospectivity and exploration potential of New Zealand's frontier East Coast and Pegasus basins.