

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

Assessment of undiscovered conventionally recoverable petroleum  
resources of New Zealand

By

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Open-File Report 84-158

This report is preliminary and has not been reviewed for conformity with  
U.S. Geological Survey editorial standards and stratigraphic nomenclature.

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ASSESSMENT OF ENERGY RESOURCES

This report was prepared as part of the World Energy Resources Program of the U.S. Geological Survey (USGS). The objective of the study is to assess the undiscovered conventionally recoverable resources within petroleum producing provinces. The study utilizes geological and petroleum engineering data, in conjunction with statistical techniques, to estimate undiscovered resources by a process involving a team of geologists and statisticians. The estimates represent the views of the U.S. Geological Survey estimation team and should not be regarded as an official Department of the Interior position.

Other U.S. Geological Survey reports relating to the assessment of undiscovered conventionally recoverable petroleum resources include the following:

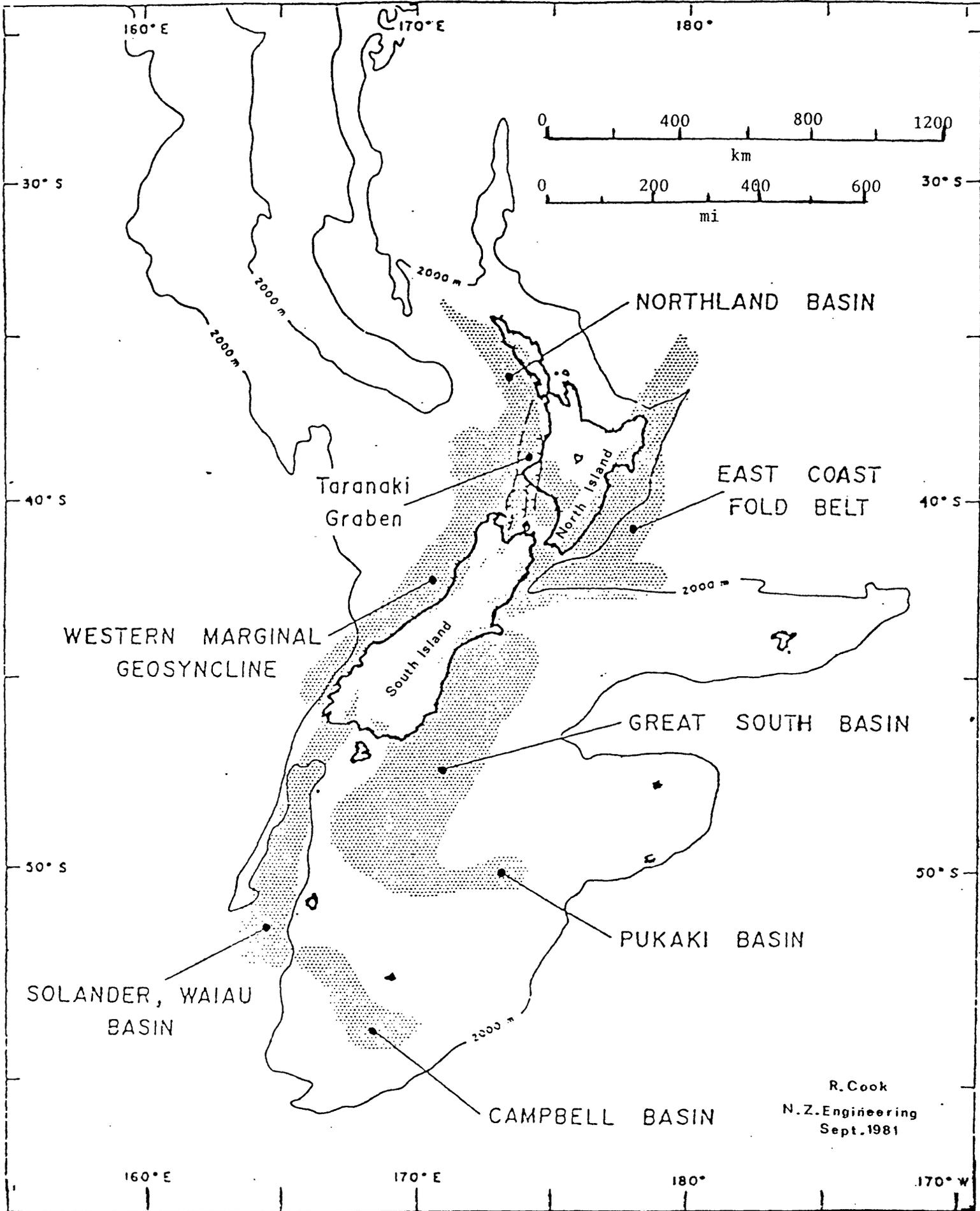
Open File Reports 81-0986 - Persian Gulf Basin and Zagros fold belt  
(Arabian-Iranian Basin)  
81-1027 - Volga-Ural Basin  
81-1142 - Indonesia  
81-1143 - Northeastern Mexico  
81-1144 - Southeastern Mexico, northern Guatemala, and Belize  
81-1145 - Trinidad  
81-1146 - Venezuela  
81-1147 - West Siberian and Kara Sea Basins  
82-0296 - Middle Caspian Basin  
82-1027 - East Siberian Basin, U.S.S.R.  
82-1056 - North Africa  
82-1057 - Timan-Pechora Basin, U.S.S.R.; Barents-northern  
Kara shelf  
83-0598 - Northwestern, Central, and Northeastern Africa  
83-0801 - Onshore China

ACKNOWLEDGMENTS

The resource assessment for this report was prepared in collaboration with the Resource Appraisal Group of the Branch of Oil and Gas Resources.

INTRODUCTION

The location of the petroleum prospective basins of New Zealand is shown in figure 1. Unconditional estimates by the USGS of oil and gas resources in these basins are given in table 1 and figures 2 and 3. Data supporting these estimates are shown in table 2.



R. Cook  
 N.Z. Engineering  
 Sept. 1981

Figure 1.--Petroleum prospective basins of New Zealand -



— 2,000 m — Water depth in meters

Table 1.--Assessment of undiscovered conventionally recoverable petroleum resources of New Zealand.

Unconditional resource assessment by USGS as of February 15, 1983; see also figures 2 and 3.

Probability of occurrence	Crude Oil in Billions of Barrels (BB)			Natural Gas in Trillions of Cubic Feet (Tcf) and Billions of Barrels of Oil equivalent (BBOE) to 6,000 cf/bbl.		
	<u>95%</u>	<u>5%</u>	<u>Mean</u>	<u>95%</u>	<u>5%</u>	<u>Mean</u>
	0.05	0.50	0.23	2.25	20.00	8.71
				BBOE 0.38	3.33	1.45

NEW ZEALAND  
 RECOVERABLE OIL ASSESSMENT DATE : FEB 15, 1983

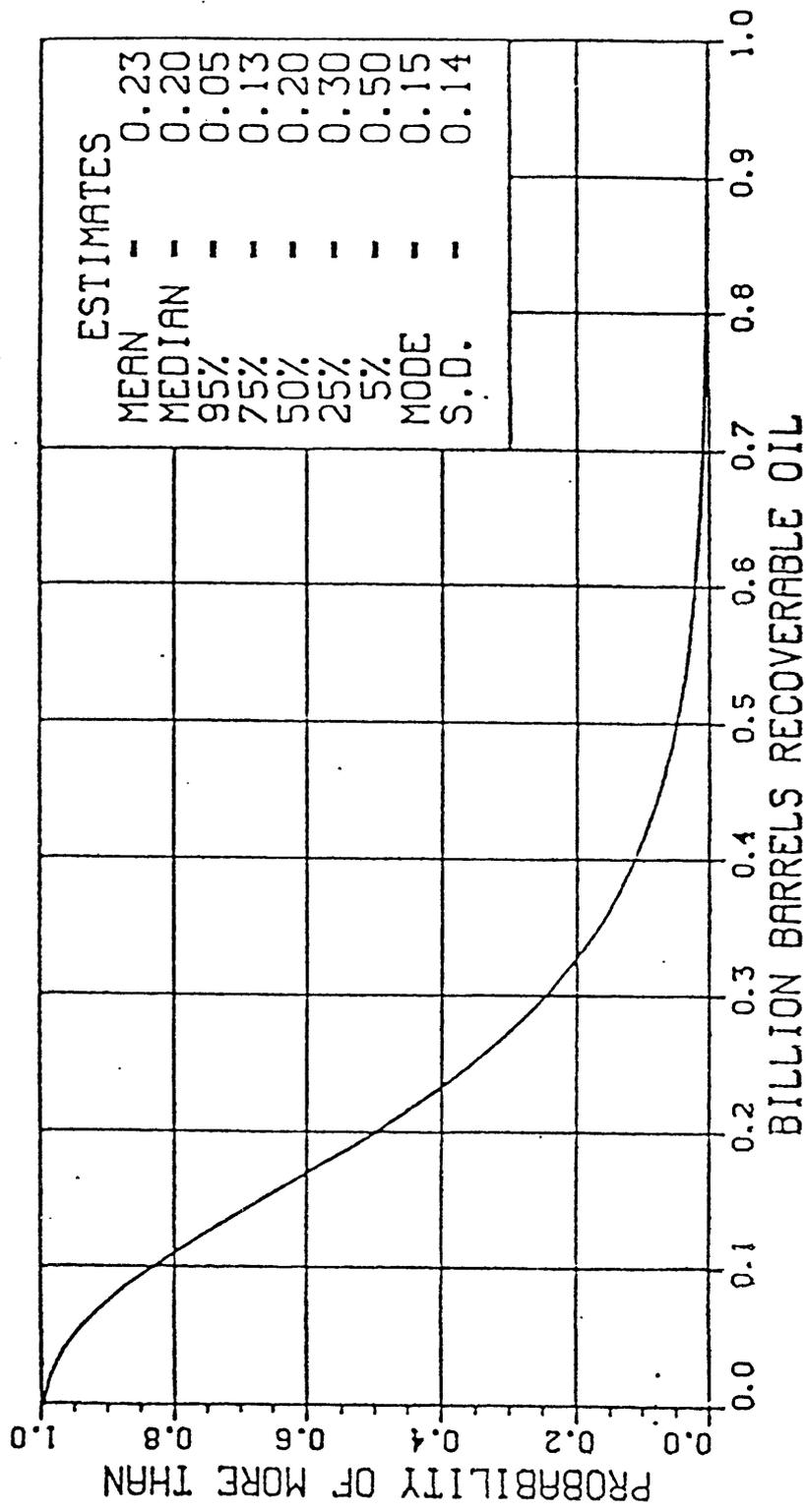


Figure 2.--New Zealand undiscovered conventionally recoverable oil.

NEW ZEALAND  
RECOVERABLE TOTAL GAS      ASSESSMENT DATE : FEB 15, 1983

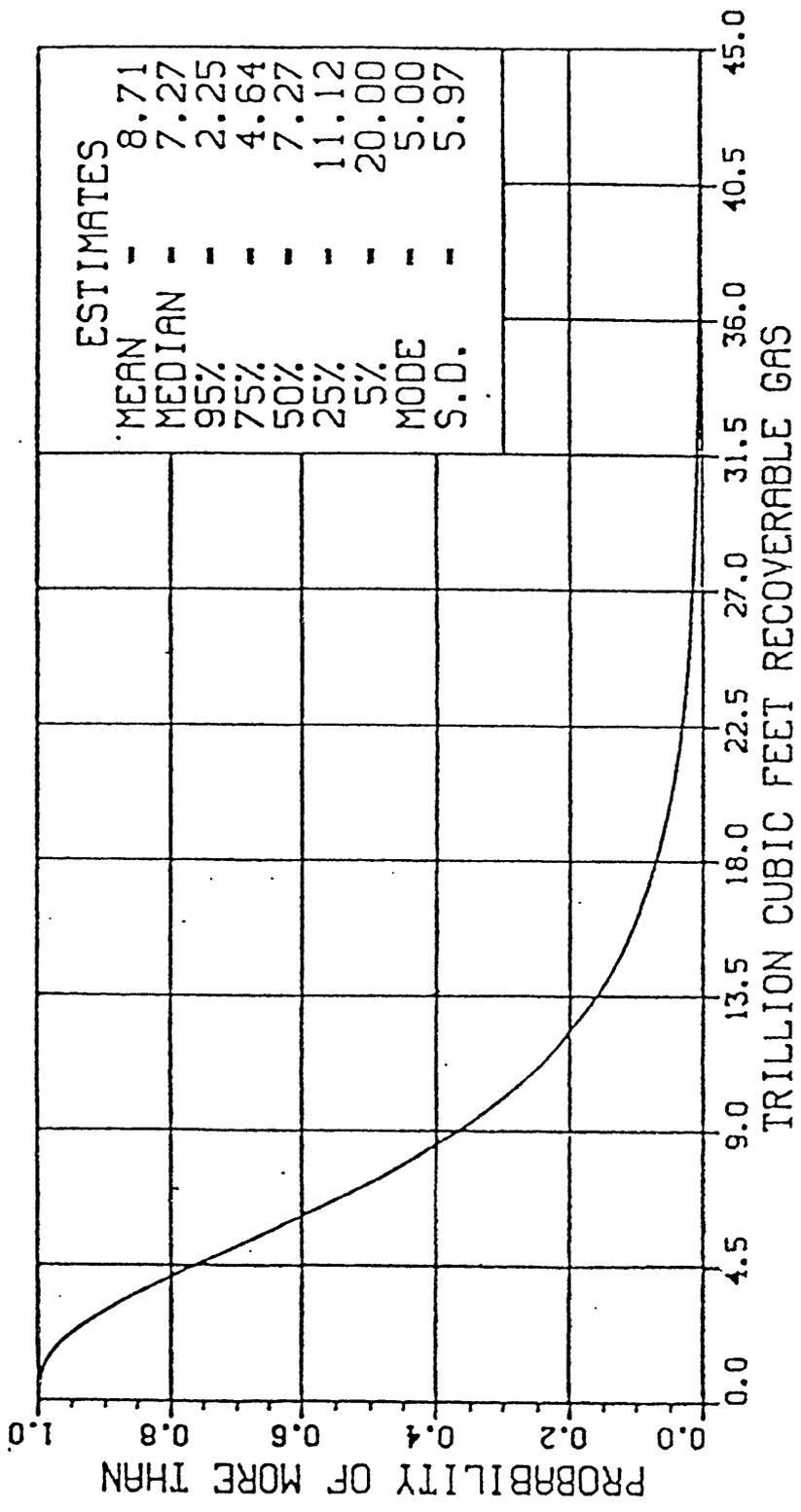


Figure 3.--New Zealand undiscovered conventionally recoverable total gas.

Table 2.--Supplementary and comparative data supporting this resource assessment of New Zealand.

	<u>Crude Oil</u> (BB)	<u>Natural Gas</u> (Tcf)
Cumulative production	0.0003	0.412
Identified Reserves <sup>1/</sup>		
Demonstrated	0.018	5.570
Inferred	-	0.330
Undiscovered Resources (mean)	<u>0.023</u>	<u>8.710</u>
Total (or Original Resources)	0.04	15.02
		BBOE = 2.5

Total Oil and Gas = 2.54 BBOE

<sup>1/</sup> Follows terminology outlined in USGS Circular 860. Demonstrated is equivalent to API Proved plus Indicated Additional. Inferred represents anticipated reserves growth in existing fields.

## COMMENTS

- All basins shown on figure 1 have been drilled, both onshore and offshore, with the exceptions of the Pukaki and Campbell Basins to the south of the South Island.
- Four fields have been discovered to date. A major gas field, Maui, is located offshore the North Island within the Western Marginal Geosyncline near the boundary of the Taranaki Graben. Two minor oil fields and one gas field are located onshore within the Taranaki Graben.
- A substantial gas-show was encountered in the Great South Basin but was considered to be noncommercial due to water depth and very harsh weather conditions.
- All prospective basins were established following an early Cretaceous orogeny. In most areas, pre-Cretaceous formations are considered to be economic basement.