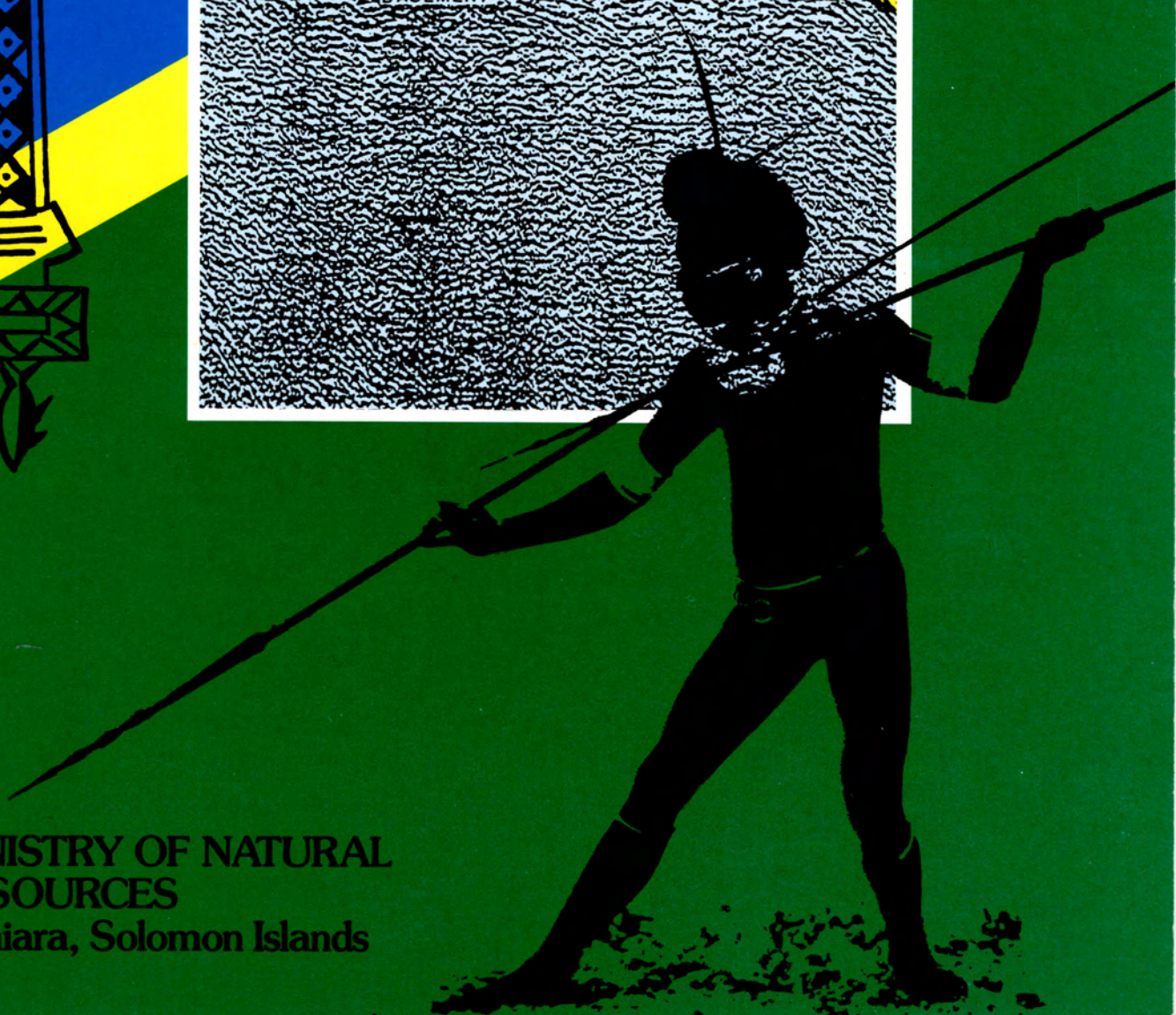
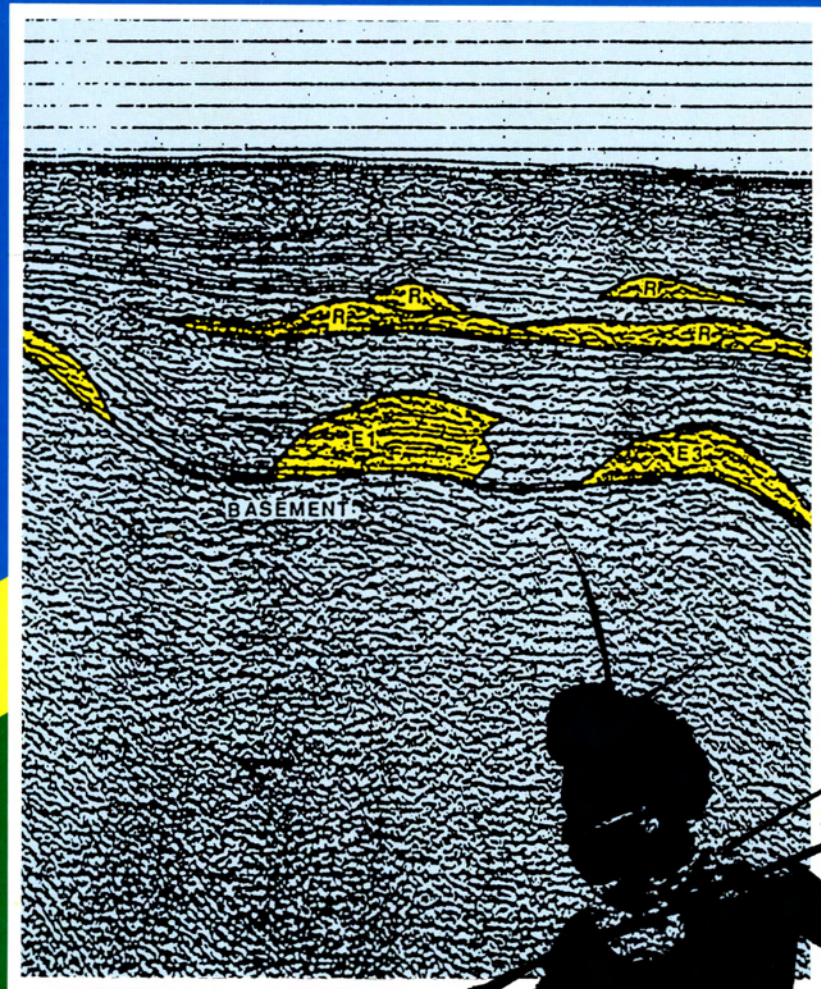
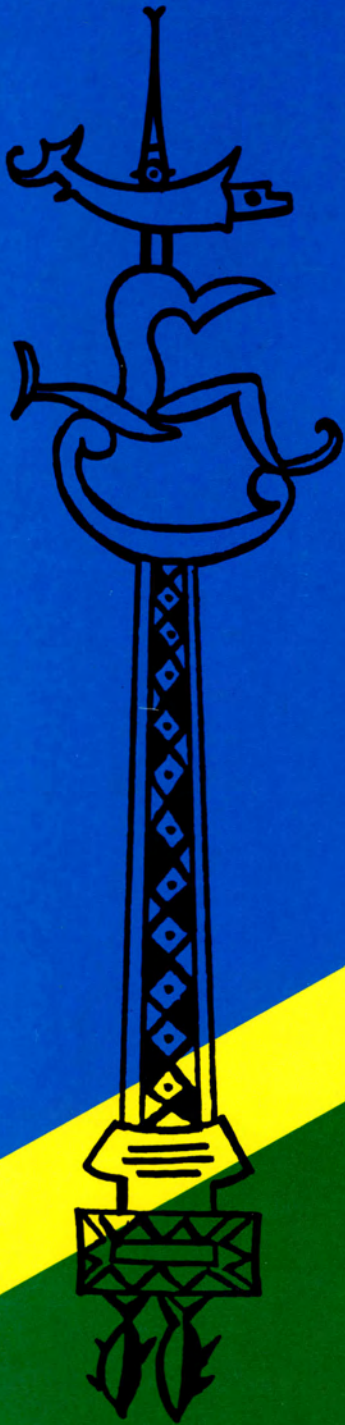


PETROLEUM POTENTIAL OF SOLOMON ISLANDS, SW PACIFIC



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MINISTRY OF NATURAL
RESOURCES
Honiara, Solomon Islands

PETROLEUM POTENTIAL OF SOLOMON ISLANDS

A REVIEW OF OPPORTUNITIES
FOR EXPLORATION

Patrick J. Coleman

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Assistance Bureau, 1989.

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Cover: Solomon flag colours
about a seismic profile with
fossil reef mounds.

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Petroleum potential of Solomon Islands

This review gives an introductory assessment of the petroleum prospects in Solomon Islands, especially the offshore areas. It is based on data from geological land surveys and, especially, on data from many thousands of kilometres of marine geophysical profiling in Solomon Island waters by private companies, the United Nations-sponsored Committee for Co-ordination of Offshore Prospecting in South Pacific Offshore Areas (CCOP/SOPAC), and by the United States Geological Survey, as part of the Tripartite Program of Marine Geoscientific Research (Australia, New Zealand and United States of America). It aims to provide a background that will urge company geologists to study these original data and to convince them that Solomon Island waters are intrinsically attractive as targets for petroleum exploration.

ALLAN PAUL
Minister
Natural Resources
Honiara, Solomon Islands.

December, 1989





Reefs, New Georgia.

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Ministry of Natural Resources,
Honiara, Solomon Islands

The Tripartite Programme of
Marine Geoscientific Research
(Australia - New Zealand - USA)

CCOP/SOPAC - Committee
for Co-ordination of Offshore
Prospecting in South Pacific
Offshore Areas

Prepared and written by P.J. Coleman, University of Western Australia, with the cooperation and assistance of Dr Rodney Walshaw, Principal Geologist, Solomon Islands Geological Survey; Dr Terry Bruns, United States Geological Survey, Menlo Park, California; Mr James Colwell and Dr Neville Exon, Bureau of Mineral Resources, Canberra; and Dr Kenneth Havard, CCOP/SOPAC, Suva, Fiji. Funded by the Australian International Development Assistance Bureau, Canberra.

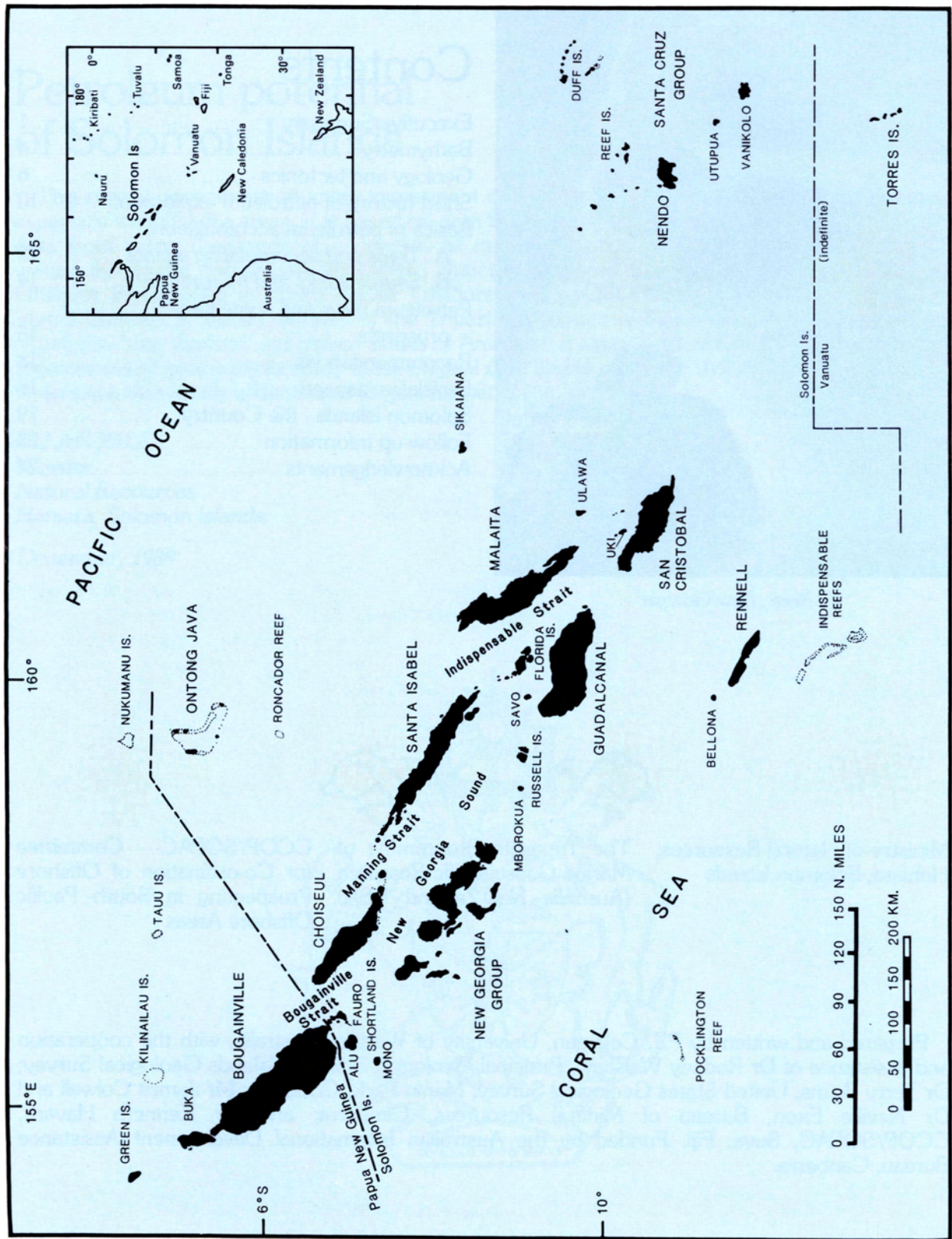


Figure 1. Solomon Islands — SW Pacific.

Executive Summary

The nation, **Solomon Islands**, occupies most of the Solomon arc system, from the Shortland Islands, just east of Bougainville (part of Papua New Guinea) to San Cristobal and southeast to the Santa Cruz Group, which is the northernmost part of the New Hebrides arc system. Solomon Islands consists of eleven island groups or large islands (see Figure 1), nine in the central group, extending over about 800 km and aligned roughly NW - SE. It also includes two distant island groups - Rennell-Bellona to the south and Santa Cruz to the east - and two large atolls, Sikaiana and Ontong Java, to the north. The total land area is about 24,000 sq km; New Georgia Sound, the great internal waterway, occupies about 39,000 sq km. Because of the country's dispersed nature, the adjacent sea areas covered by the Exclusive Economic Zone run to 1,290,000 square kilometres.

The geographic Solomon Islands are the exposed high points of an uplifted, fractured, elongate slab of arc crust, extending from New Ireland in the northwest to San Cristobal in the southeast. As an island arc system, the Solomon Islands is no older than Late Cretaceous and was built up mainly in the Cainozoic as the result of the continued

interaction along the convergent boundary between the Indo-Australian and Pacific Plates. The Solomon arc has an igneous basement of arc tholeiites and basalts, mostly of early Tertiary age, with matching intrusives, and above this, a varied sedimentary and volcanic section extending through the Holocene.

Except for the areas marginal to the Pacific Basin, the sedimentary section is almost entirely younger than Late Oligocene. At the close of the Tertiary, subduction "flipped" from a southwesterly-dipping subduction zone to a northeasterly-dipping one, now defined by the New Britain/San Cristobal Trenches (Figure 2). The Pacific Plate now overrides the Indo-Australian Plate. A new volcanic front was formed, represented mostly by the New Georgia group of islands. The New Georgia Group also forms the southwestern flank of a great central trough - the Central Solomons Trough (lying beneath New Georgia Sound) - between Choiseul-Santa Isabel-Florida-Malaita (on the northeastern flank) and New Georgia-Guadalcanal-San Cristobal (southwest flank - see Figure 2). This trough is divisible into three major basins - Shortland, Russell and Iron Bottom. There are three other peripheral basins - Indispensable, Mbokokimbo/Nudha and Mborokua Basins. As with other arc systems, the basins are the major sediment sinks - on the islands themselves the thicker

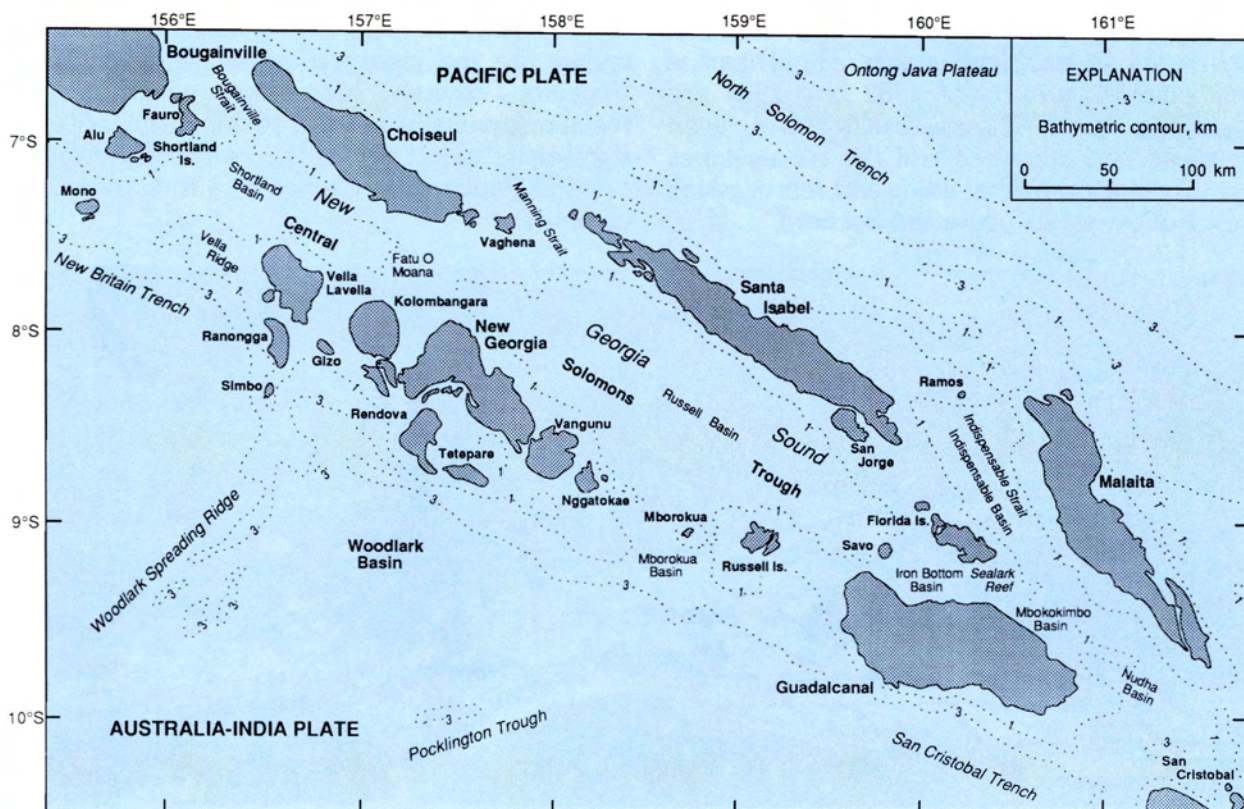


Figure 2. Central and western Solomon Islands, with place names.

sedimentary sections are about half that in the basins, usually less. In the central Russell Basin, for example, sediment is over five kilometres thick, and ranges in probable age from Late Oligocene through Holocene.

In the central areas, the dominant sedimentary rocks are volcanoclastic, commonly lithic, and with a high labile content, ranging from olistostromes to wackes to turbidites and shales. But carbonates are also present, especially algal reefal carbonates. These bulk large in the stratigraphic column at times of relative tectonic calm - latest Oligocene/earliest Miocene, late Early Miocene, Late Miocene, Late Pliocene/Holocene. Along with antiforms, reef structures around the edges of the central basins, in water depths to 250 m, offer the best chances of petroleum discovery. This area of promise is more than 20,000 sq km. As well, large areas of deeper water, to 800 m, contain anticlinal structures, and very likely, more buried reefs. The volcanic New Georgia area deserves consideration; perhaps also the northern part of the Santa Cruz or Vanikolo Basin, a part of the New Hebrides arc, but Solomon Islands territory. On the northeastern flank of the Solomon Islands, basinal troughs are present, but the sediment pile is dominated by pelagites as old as mid-Cretaceous. Here, the petroleum possibilities are thought to be low.

About 25,000 km of marine survey have been traversed in Solomon territory, of which half is fair to excellent quality. The Tripartite multichannel surveys of 1982 and 1984 are especially good. Their results have been analysed and published and the survey tapes are available for further study and reprocessing (see **Follow-up Information** Section).

Potential prospects. In anticipation of what follows, here are the major conclusions:

A. The basic requirements to generate and trap petroleum in Solomon Islands territory appear to be met in several areas. They include the following shallow-water areas, with reefal targets a high priority:

- (1) Mbokokimbo Basin and marine extensions, eastern Guadalcanal;
- (2) flanks of Iron Bottom Basin, north of Honiara and between Guadalcanal and Florida;
- (3) southwestern flank of the high between Florida and San Jorge Island (Santa Isabel) and, possibly, the northeastern flank also;
- (4) Manning Strait area between Santa Isabel and Choiseul; and
- (5) parts of the shelf and upper slope area, Choiseul to Shortland Islands.

B. All these areas require additional seismic reflection surveying, before a full evaluation of their petroleum potential can be made. For some areas the work required is minimal.

C. The logistics of exploring and testing these prospects can be rated, in terms of increasing difficulty, especially accessibility, in roughly the order given under 'A'.

D. The target areas presented here all appear to be of a size that could contain economic volumes of hydrocarbons.

Island arc systems elsewhere in the world have been, and are, petroleum producers, and there is no intrinsic reason why the Solomons area should not be. Of significance to this review are the great producing fields of the Vogelkop, western Irian Jaya, which have reefal reservoirs in a similar tectonic style. Also significant, and closer, is the recent discovery of oil in Papua New Guinea in a foreland/arc complex.



Honiara from the air.

Geological Survey. The Geological Survey, a part of the Ministry of Natural Resources, has been active since 1948. It has an extensive map library, sets of publications on the geology and geophysics of the Solomons region, including its own publications, a comprehensive specimen collection, and extensive experience in dealing with outside visitors and both academic and exploration institutions. The Survey can offer valuable advice on most aspects of life in the country and especially on fieldwork. It is not equipped to offer labour or equipment, vehicles or ships.

Communications from interested parties should be addressed in the first instance to:
The Permanent Secretary, The Ministry of Natural Resources, P.O. Box G24, Honiara, Solomon Islands.

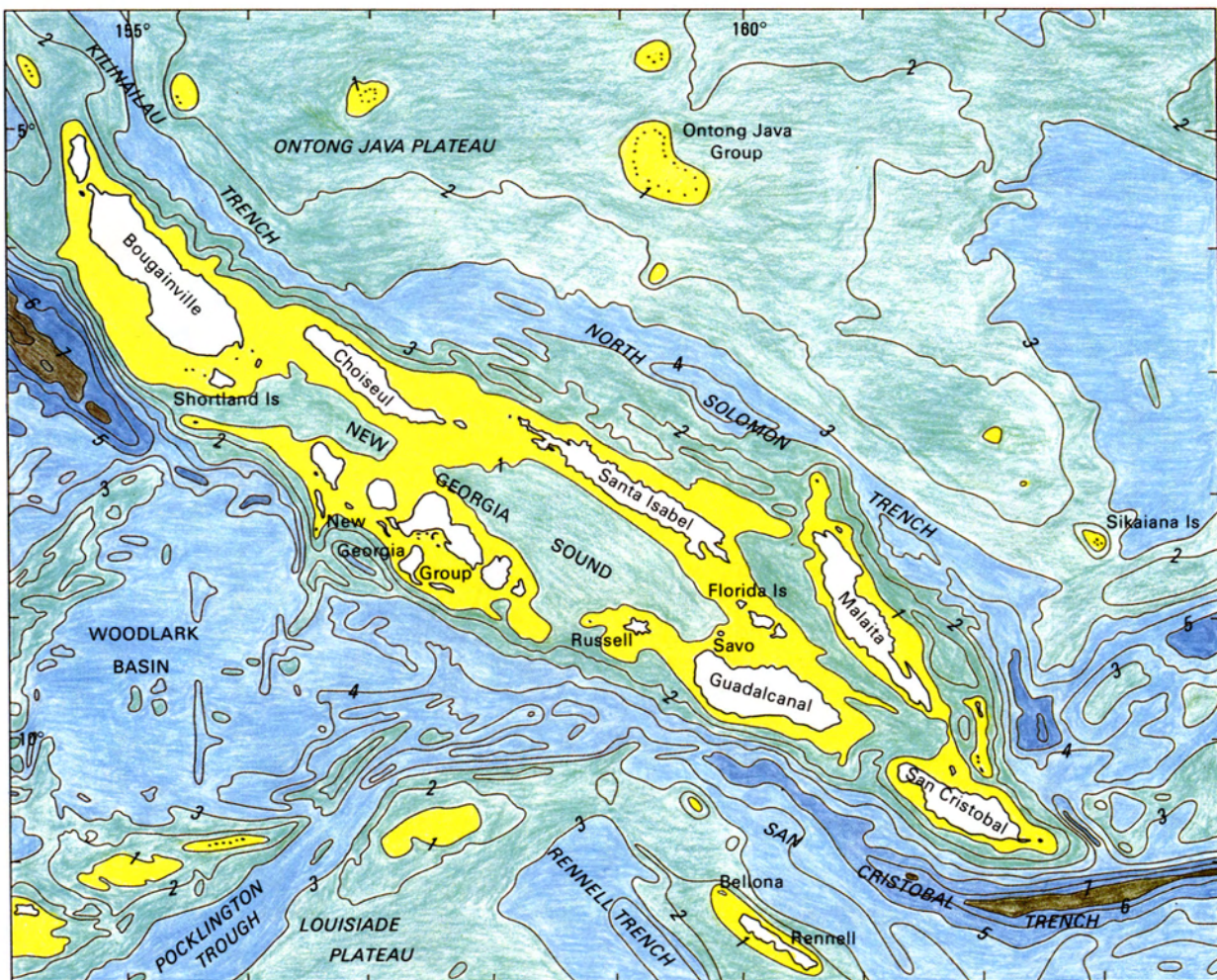


Figure 3. Seafloor morphology of Solomon Islands area, contoured in kilometres. The arcuate Solomon High extends from Bougainville through the Shortland Islands, Choiseul, Santa Isabel, Florida, to Guadalcanal.

Bathymetry

The bathymetry of the Solomons region (Figure 3 and Ref. 5) reflects the activity of great regional faults, products of the tectonics of the region. Geographically, it shows as a series of fault-bounded islands flanked by troughs and with a central array of deep structural basins (largely filled with sedimentary rocks). The whole complex, beginning with San Cristobal (but excluding the Santa Cruz group) forms a broken, lenticular slab. The eastern end rises abruptly from bathyal depths; the western end tapers off sharply after Bougainville and ends against the southeastern boundary of the New Ireland Basin. Trenches define both the northeastern and southwestern flanks. The northeastern one is the Kilinailau-North Solomon Trench. It marks the locus of the early Tertiary subduction zone. The southern one is made up of the New Britain Trench in the northwest and the San Cristobal Trench in the southeast, and marks the present subduction zone. Water depths over the deepest parts of the central Solomon region are more than 1500 metres. But more than 25,000 sq km of shelf and moderate to shallow-water areas lie adjacent to the islands.

In detail, the most obvious feature of the bathymetry is a dislocated, basement-structural high herein called the "Solomon High." The High begins with Bougainville/Shortlands, is offset to Choiseul, offset to Santa Isabel, abuts Guadalcanal then, with modification, continues through to San Cristobal (Figures 2, 3, 4). The Solomon High thus forms a great arc, open to the southwest. The New Georgia Group partly spans this arc; Malaita flanks it to the northeast. Water depths over the High, between the islands, are typically less than 100 m, except for a narrow channel (440m deep) between the Florida Group and central Guadalcanal. Between eastern Guadalcanal and San Cristobal there is a more pronounced break with water depths over 1500 m. From west to east, the shallow-water inter-island passages are: Bougainville Strait between Bougainville and Choiseul; Manning Strait between Choiseul and Santa Isabel; and the Florida Group "high" that connects Santa Isabel and Guadalcanal.

The Central Solomons Trough, made up of Shortland, Russell and Iron Bottom basins, separates the New Georgia Group from Choiseul and Santa Isabel (Figure 2): its seafloor expression is New Georgia Sound. Although partly obstructed by Savo Volcano,

the trough ends as a graben abutting the high between the Florida Group and central Guadalcanal. Between the Solomon High and Malaita there is an E-W trending spur that almost links northeastern south Santa Isabel and northern Malaita. The Indispensable Basin separates the Guadalcanal-Florida-Santa Isabel part of the basement high from Malaita. The northwest end of the basin narrows to a channel that is partly blocked by a basement ridge extending north from central San Cristobal.

The Shortland Basin is about 140 x 150 km in area with water depths that range to a maximum of 1400 m. The Russell Basin is about 300 x 70 km with water depths to 1800 m. The Iron Bottom Basin is about 50 x 30 km, with a maximum water depth of 1000 m; it shoals from northwest to southeast.

The Indispensable Basin is different in structural style from the basins of the Central Solomons Trough. It is asymmetric, long and narrow, and separates the Guadalcanal/Florida/Santa Isabel part of the Solomon High from Malaita. It extends for about 200 km and is less than 35 km wide. Water depth in the central part is about 1900 m.



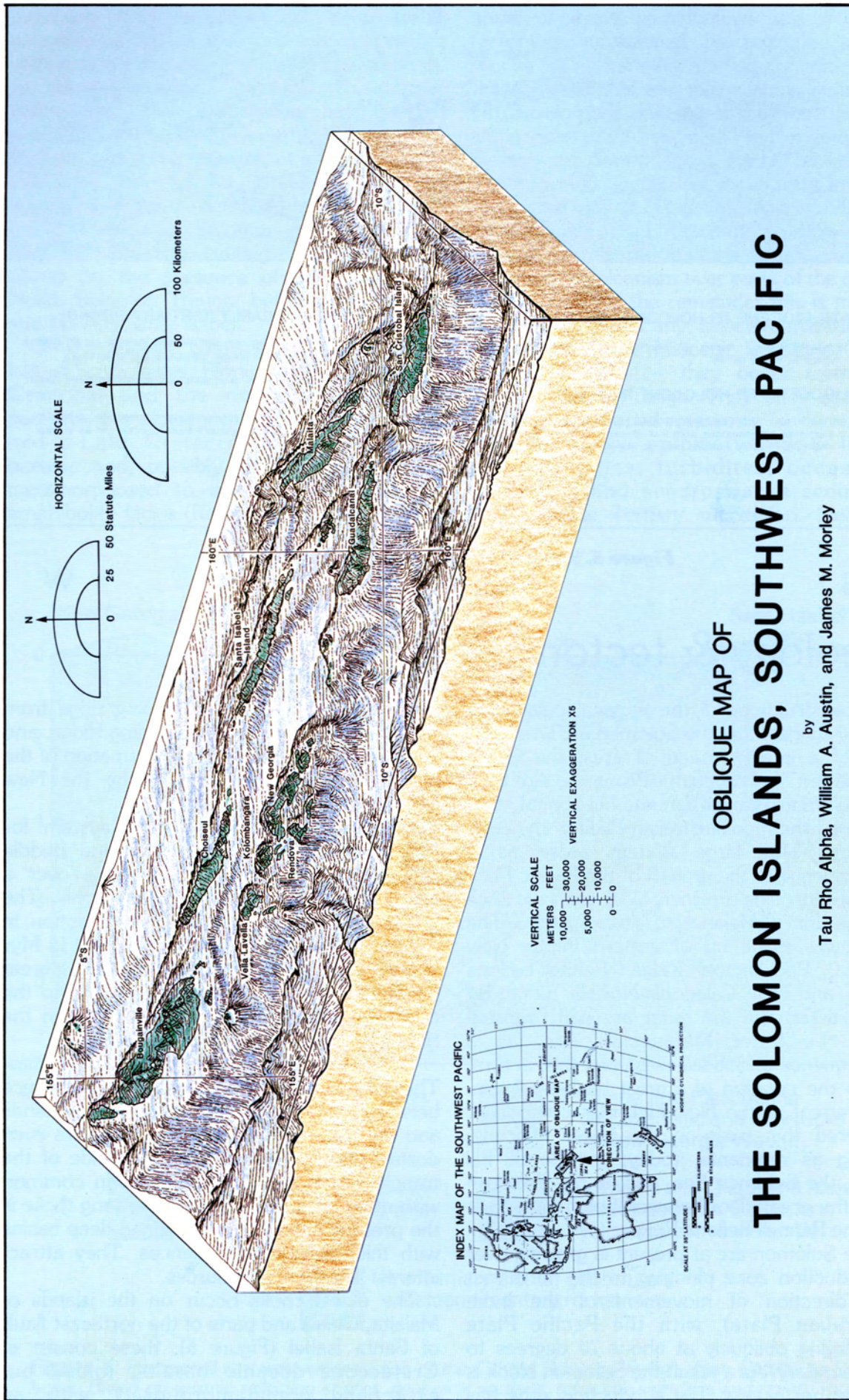


Figure 4. This diagram shows the Solomon Islands as a set of steep-sided slabs - the islands - separated by angular basins, and with a trench bordering it to the southwest, a minor trench to the northeast.

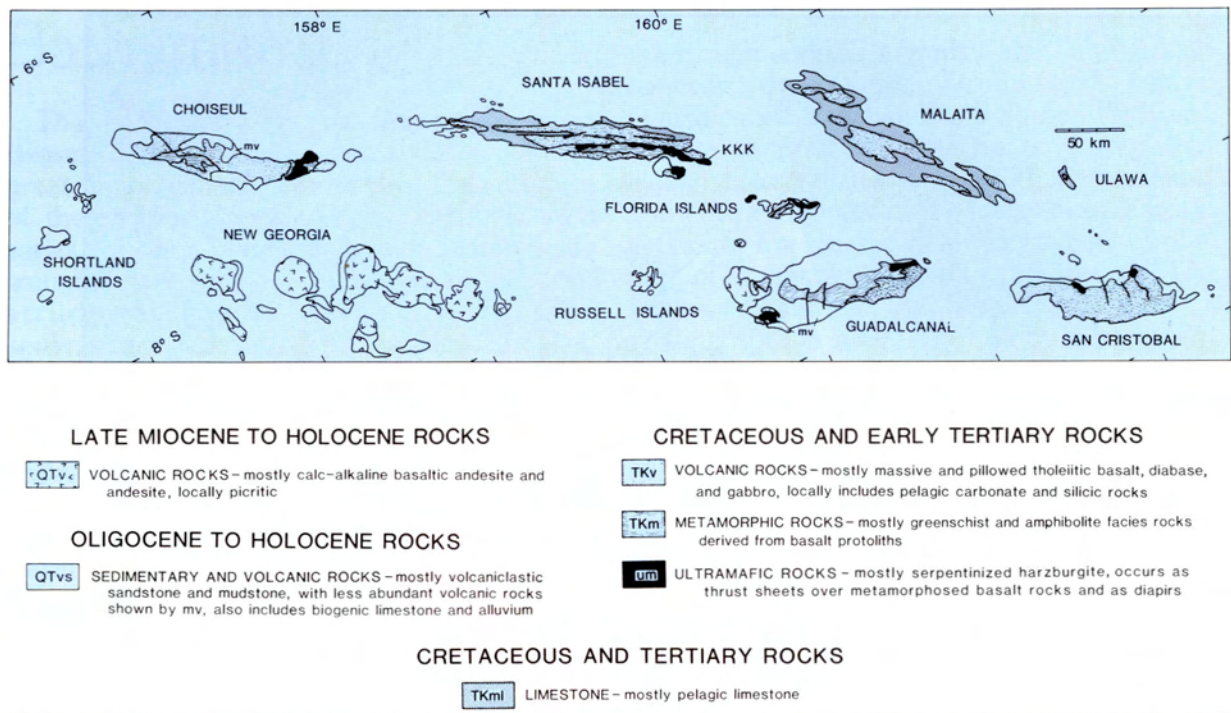


Figure 5. Simplified geological map of Solomon Islands.

Geology & tectonics

Reconstructions of the regional palaeogeography suggest that the Solomon arc was but a part of a larger spread of arcs, the Outer Melanesian Arc System (Bismarck Archipelago-Solomon Islands-Vanuatu-Fiji-Tonga), that bordered the Indo-Australian Plate in the early Tertiary. This large system arose as a consequence of the growth of the Pacific Plate and lay alongside an inner, older orogenic zone – the Inner Melanesian Arc System. The latter was made up of eastern Papua New Guinea, Pocklington Ridge, Rennell-Bellona Ridge, and New Caledonia-Norfolk Ridge. By the mid-Tertiary, the outer arc had migrated from the Inner Melanesian Arc, as a consequence of slab fall-away, and this, in turn, led to the creation of a great back-arc basin. The retreat of the New Hebrides component sundered this basin in the latest Miocene, leaving as remnants, today, the South Fiji Basin, the Solomon Sea, and, in the Solomon area, the ocean floor between Solomon Islands and the Rennell-Bellona Ridge.

The Solomon arc at present is growing over a subduction zone plunging to the north-east (the direction of movement of the Indo-Australian Plate), with the Pacific Plate converging obliquely at about 70 degrees to the boundary. As a result the Solomon block is moving north-west. The subduction zone has

been ingesting a minor spreading ridge from the south, the Woodlark Spreading Ridge, and this has greatly influenced the formation of the new volcanic front, instanced by the New Georgia Group.

The Solomon arc is a “flipped” system: for most of its existence – early and middle Tertiary – the Solomon arc grew over a southwesterly-dipping subduction zone. The reversal was probably caused by interaction, in the Early to Middle Miocene (about 20-15 Myr ago) between the Ontong Java Plateau, a great submarine plateau on the Pacific Plate to the north, and the growing Solomon arc, on the rim of the Indo-Australian Plate.

The Solomon arc has its particular oddities. These include the anomalously small distance between the trench to the south of the islands and the volcanic front or axis. There are even dormant volcanoes on the ocean side of the trench. But it has many features in common with other arcs, and important among these is the presence of large, well-defined deep basins with thick sediment sequences. They attract interest as petroleum sources.

The oldest rocks occur on the islands of Malaita, Ulawa and parts of the northeast flank of Santa Isabel (Figure 5); these consist of Cretaceous oceanic basalts, folded but essentially unmetamorphosed, with an

overlying thick sequence of deep water pelagites as old as mid-Cretaceous together with minor intrusions; this gives way gradually to more terrigenous, Neogene, fine-grained carbonates. This succession has decided similarities with the neighbouring Ontong Java Plateau, and some regard it as a ramped-up or 'obducted' flake of the plateau. But it could equally well be a detached marginal sliver, partly thrust over Solomon crust proper by way of strike-slip faulting. This alternative allows for the presence of the trough, the North Solomon Trench, between the plateau and Malaita/Santa Isabel.

On Bougainville, Choiseul, the southwestern half of Santa Isabel, Florida, Guadalcanal, San Cristobal and the drowned connecting portions, the oldest exposed rocks consist of mid-to-Late Cretaceous-earliest Tertiary oceanic and, possibly, arc basalts, in parts metamorphosed to zeolite, greenschist and amphibolite facies (Ref. 6). On Choiseul, large

areas of these amphibolites appear to be tectonites, occasioned by regional faulting. Blocks of ultramafic rocks are emplaced, usually associated with major faults. Some may be diapiric pods, located at dilatational points along great fractures, e.g. Kia-Korigole Fault System on Santa Isabel. Early Tertiary arc volcanics and hypabyssal rocks were intruded into and over this basement. Latest Oligocene/Early Miocene shallow-water algal/foram reefal calcarenites mark the cessation of volcanism over parts of the central islands but over the remainder this is marked by younger late Early Miocene/mid-Miocene limestones. These Miocene limestones are a regional feature — they occur from new Guinea east to Tonga. They offer attractive possibilities as buried reservoirs.

High-energy epiclastics and lesser volcanoclastics, turbidites, occasional limestones and sundry wacke sediments complete the Tertiary succession. Piedmont

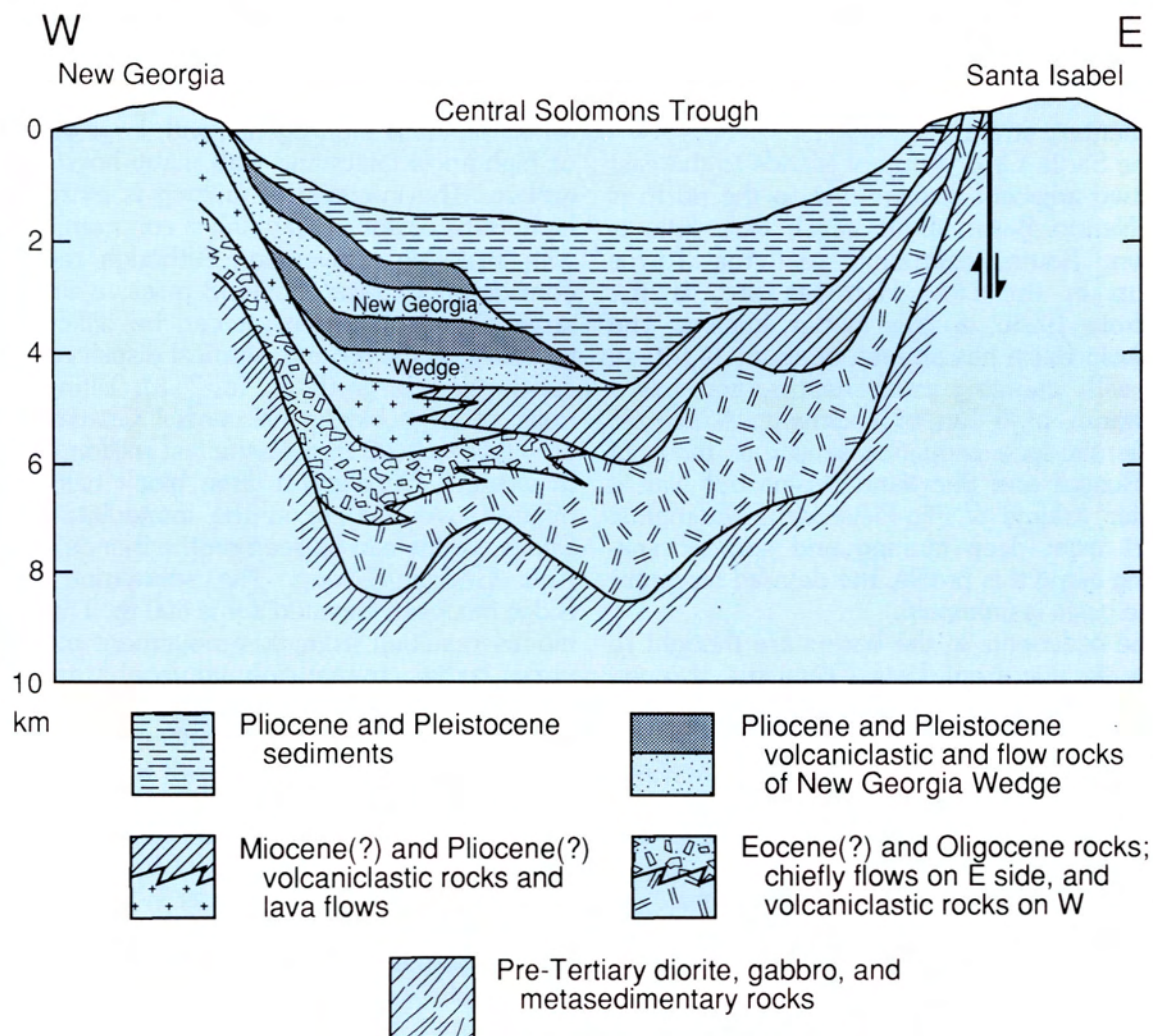


Figure 6. Interpreted east-west cross-section of the Central Solomon Trough, New Georgia to Santa Isabel. Based on seismic reflection studies, geological sections, refraction velocities and gravity models — see Reference 2, pp. 154 and 284.

sediments and uplifted reefal limestone are the dominant Quaternary sediments.

In the central basins of the Central Solomons Trough, the essentials of the same Tertiary succession appear to be present. The Russell Basin is the largest, is rhomboidal and contains about 5 km of sediment (Figures 6, 7), most of it derived from the developing New Georgia Group but perhaps a third is as old as early Tertiary. The smaller Shortlands Basin contains more than 7 km of sedimentary strata in less than one-third the area of the Russell Basin. The two are separated by the New Georgia Wedge (Figure 6), a high that formed a structural sill between the subsiding basins on either side. At the eastern end of the Central Solomons Trough, Iron Bottom Basin is relatively small but with about 4.5 km of sedimentary fill. Further east the Mbokokimbo Basin and its subsidiary Nudha Basin contained up to 4 km of sedimentary rock. The Mbokokimbo is the only basin that clearly outcrops on land. The Nudha merges east into the Indispensable Basin, a narrow basin that separates the Guadalcanal-Florida-Isabel part of the Solomon High from Malaita. The Indispensable Basin contains about 4.5 km of sedimentary strata.

The Santa Cruz group of islands to the east has two adjacent basins. Just to the north is the Nendo Basin about which very little is known. South, extending past the Torres Group in the New Hebrides arc, is the Vanikolo Basin, a little better known. The Vanikolo Basin has an area of about 14,000 sq km, with daunting water depths, and has a maximum of 6 km of sediment. A seismic profile shows a sequence similar to those of the Russell and Shortland Basins but with a smaller volume of Plio-Pleistocene sediments. Apart from deep faulting and some drape-folding along this profile, the detailed structure of the basin is unknown.

The sediments in the basins are thought to range in age from Late Oligocene through Pleistocene/Holocene; about half or there are Plio-Pleistocene. These ages are based largely on indirect evidence, with some seafloor sampling in support of the younger ages (see Ref. 7). The volume of sediment is large for the areas involved, and questions as to its provenance still remain partly unanswered.

Young volcanoes extend in an arc from northwestern Guadalcanal northwest through the Russells, New Georgia Group and Shortlands. They are fairly evenly spaced (roughly 70 km), younger than latest Miocene (possibly 6 Myr), and spread over a width of about 80 km. In some instances the volcanic

piles and their aprons coalesce to form larger islands, e.g. New Georgia Island. Volcanics, subsidiary dikes and an occasional dioritic or gabbroic plug compose these piles, which are extensively faulted. The lavas range in type and composition, from picrites to basaltic andesites to standard calcalkaline andesites. Active volcanism is anomalously close to the trench. A few volcanoes are sited on the subducting side of the trench, possibly because of the subduction of the Woodlark spreading ridge. As well, several large Quaternary-Pliocene volcanoes on Choiseul have an uncertain origin.

This volcanic front may have accumulated on oceanic floor but it is more likely that the basement is made up of early and middle Tertiary igneous rocks and sediments that correlate with those on Choiseul and Santa Isabel; that is, that the volcanic piles sit on the southern edge of the Russell Basin.

Solomon Islands land structure is dominated by faulting. Folding on a large scale is confined to the Pacific marginal islands, especially Malaita, but even there some folds may be drape folds or bruchfallen (formed over rising horsts). The structural and tectonic style of the other islands is taphrogenic, with large vertical or high angle faults and with many horsts and graben. The intensity of faulting is extremely high. Riffle or shutter faulting is common, often with strike-slip movement. Although regional considerations often demand massive sinistral strike-slip displacement, it can be difficult to measure on the ground. Vertical displacements can be very large (Refs. 1a, 7, 8). Tilting and uplift of large blocks on central Guadalcanal amounts to 2000 m over the last million years. In western Choiseul, a large block has been uplifted over 600 m in the immediate past. Similar uplifts can be seen on the islands of the New Georgia Group. The submarine Vella Ridge has been elevated some 800 m. The fault blocks resulting from this movement may be very large, measuring several tens of kilometres.

Structures in the basins include not only major faulting but also significant folding, some of the folds being related to fractures.

The major faults tend to be oriented parallel to the Solomons long axis (NW-SE), with a second set, quite numerous, at WSW-ENE. A subsidiary set trends at right angles to the plates' boundary; although less numerous, these faults can be very large (e.g. the fault that delimits northwestern Guadalcanal) and stand out on satellite imagery.

The tectonism within the Solomon arc mirrors its complex history and demonstrates

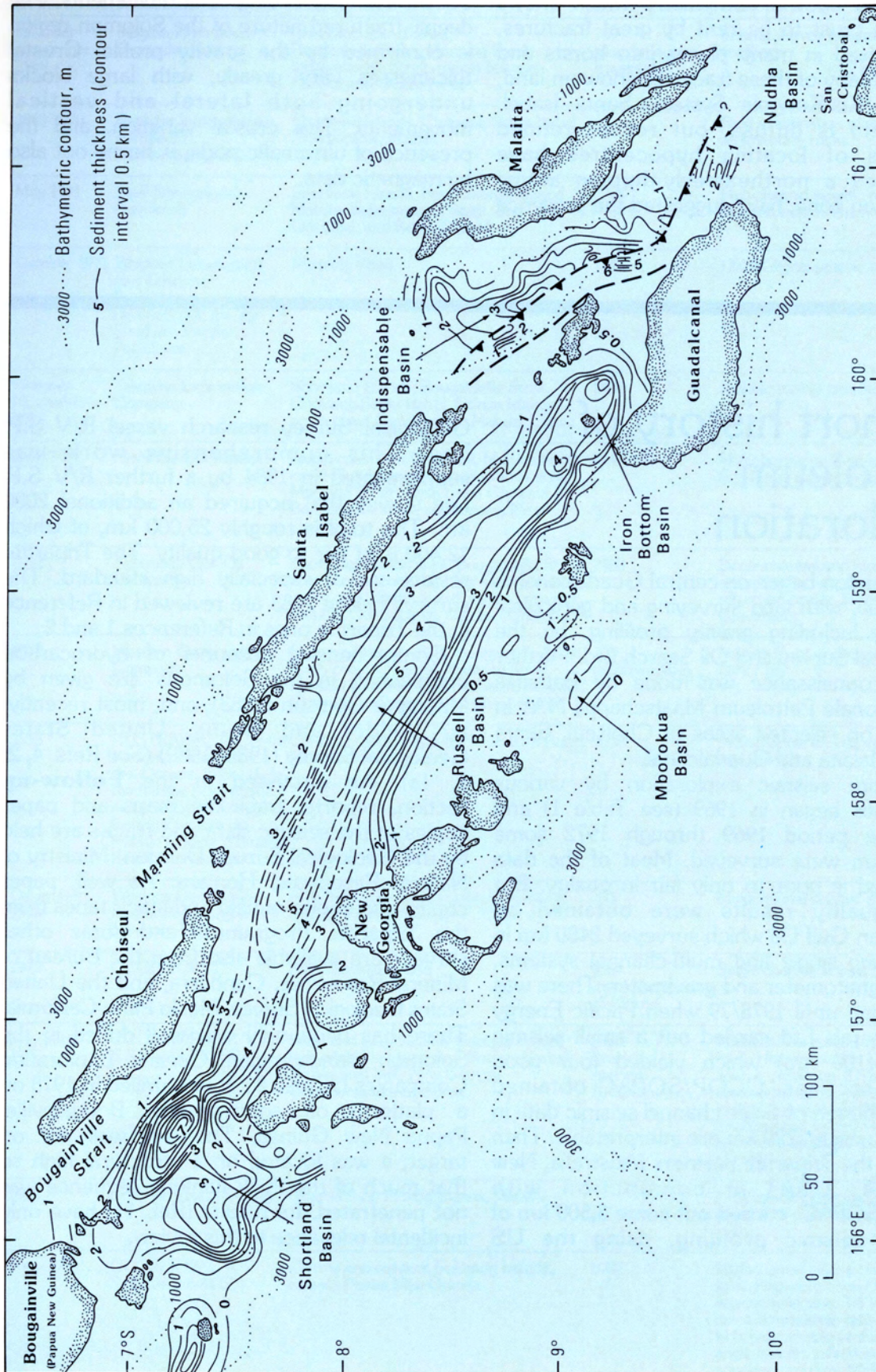


Figure 7. Isopach map of sediment thicknesses above acoustic basement in the Solomon Islands region. Solid lines derived from multi-channel seismic reflection profiling; dashed lines based on seismic refraction data. See reference 1a.

the consequences of strongly oblique convergence (Refs. 9, 10). This is most clearly manifested by the bathymetry which shows Solomon crust to be rent by great fractures, systematised in many places into horsts and graben. Many of these fractures show on land, e.g. the Kia-Korigole System, Santa Isabel. Seismicity is diffuse, but recent refined methods of locating hypocentres have confirmed a northeasterly-dipping active subduction zone, have suggested the presence

of remnants of a previous southerly dipping slab (and its possible reactivation), and bear out the intensity of deep-fault movements. The deeply-fractured nature of the Solomon region is confirmed by the gravity profile. Crustal thicknesses vary greatly, with large blocks undergoing both lateral and vertical movements. This crustal variation, and the presence of ultramafic pods, is borne out also by magnetic data.

A short history of petroleum exploration

Exploration began on central Guadalcanal in early 1960, with land surveying and geological mapping including gravity profiling, by the Geological Survey and Oil Search Ltd. Further land reconnaissance was done by Bataafse Internationale Petroleum Maatschappij N.V. in 1969/70 on selected areas of Choiseul, Santa Isabel, Malaita and Guadalcanal.

Offshore seismic exploration by various companies began in 1969 (see Table 1) and over the period 1969 through 1972 some 13,000 km were surveyed. Most of the data recovered is poor to only fair in quality. But good quality results were obtained by Australian Gulf Oil which surveyed 2480 km in 1972 using single and multi-channel systems, plus magnetometer and gravimeter. There was then a gap until 1978/79 when Pacific Energy and Minerals Ltd carried out a small seismic survey (100 km) which yielded four good quality sections. CCOP/SOPAC obtained some 4060 km of single-channel seismic data in 1979, of which 2220 km are interpretable. Then in 1982, the Tripartite partners (Australia, New Zealand, USA) in conjunction with CCOP/SOPAC, carried out some 5,500 km of 24-fold seismic profiling, using the US

Geological Survey research vessel R/V S.P. Lee. This comprehensive work was supplemented in 1984 by a further R/V S.P. Lee survey that acquired an additional 2000 km. The total is roughly 25,000 km, of which 12,400 is of fair to good quality. The Tripartite results are of especially high standard. The surveys before 1983 are reviewed in Reference 4; the Tripartite ones in References 1 and 2.

Comprehensive accounts of hydrocarbon prospecting in the Solomons are given by Maung & Coulson (1983), and, most recently, by Vedder and Bruns, United States Geological Survey (1986, 1989) (See Refs. 4, 2, 1, 1a). As discussed in the **Follow-up** section, reports, track-line maps and paper copies of the seismic data and tracks are held by the Geological Survey Division, Ministry of Natural Resources, Honiara. As well, paper copies and copies of field and stack tapes from the Tripartite Programme and some other surveys are available also from the Bureau of Mineral Resources, Canberra, and the United States Geological Survey, Menlo Park, California. There has been only one well drilled in the Solomon Islands region, Oceanic Exploration Company's L'Etoile #1. It was drilled in 1975 on a platform off southwestern Bougainville, Papua New Guinea. The well was not on target; it was located on a structural high so that much of the thick flanking sequence was not penetrated. Its results (Ref. 11) have only incidental relevance to this review.

Table 1. Summary of Exploration for Petroleum Resources in the Central and Western Solomon Islands and the Bougainville Area, Papua New Guinea, 1969-1984.

DATE	SURVEYED BY	SURVEY LOCATION	LENGTH (KM)	DESCRIPTION
October-November 1969	Magellan Petroleum (Australia), Ltd.	Shortland Islands shelf, Bougainville Strait, Manning Strait, Indispensable Strait, region between Malaita and Guadalcanal.	769 (discontinuous traverses)	Seismic survey (airgun and sparker).
1969-1970	Bataafse Internationale Petroleum Maatschappij N.V.	Shortland Islands, Choiseul, Santa Isabel, Guadalcanal, Malaita.		Field examination of exposed sedimentary rocks.
May 1971	Shell International Petroleum	Shortland Islands, New Georgia Sound, Malaita, Indispensable Strait, San Cristobal, and Rennell Island.	2764	Multichannel seismic reflection. Magnetometer. Gravimeter.
October 1971	Western Geophysical and Teledyne Exploration International, Inc. for Southern Pacific Petroleum	Manning Strait	141	12-fold digital seismic reflection
October-November 1971	Teledyne Exploration Company	Shortland Islands, Bougainville Strait, Choiseul, Santa Isabel, Florida Islands, north coast Guadalcanal, Malaita, Ulawa	2458	Seismic survey (sparker)
June 1972	Mobil Oil Corporation	North coast San Cristobal, Malaita, north coast Guadalcanal, Russell Islands area, Manning Strait, north coast Choiseul, Bougainville Strait, south coast New Georgia	4447	Multichannel seismic reflection. Sonobuoy seismic refraction.
1972	Australian Gulf Oil Company	Shortland Islands shelf, Bougainville Strait, north coast Choiseul, New Georgia Sound, south coast Santa Isabel, region between Malaita, Guadalcanal, and San Cristobal.	2480	Single-channel and multichannel seismic reflection. Sonobuoy refraction profile. Magnetometer. Gravimeter.
1973	Western Geophysical Company	Shortland Islands shelf, Bougainville Strait, north coast Choiseul, Manning Strait, Russell basin, Iron Bottom basin, Sealark Channel, and area east of Guadalcanal.	100 (approximate)	Multichannel seismic reflection. Other (?).
1975	AUSTRADDEC III Centre National d'Exploitation des Oceans, Office de la Recherche Scientifique et Technique Outre-Mer, Institut Francais du Petrole Comite d'Etudes Petrolieres Marines	Central Solomon Islands, Woodlark Basin, 5000 New Ireland forearc.		Multichannel seismic reflection (12- and 24-fold).
December 1978	Western Geophysical for Pacific Energy and Minerals, Ltd.	Area between Guadalcanal, Savo Island and the Florida Islands	100	Multichannel seismic reflection.
1979	CCOP/SOPAC	New Georgia Sound	4064 (trackline spacing 15-25 km)	Single-channel seismic reflection.
May-June 1982	CCOP/SOPAC R/V S.P. Lee (L7-82-SP)	Shortland Islands, New Georgia Sound, Indispensable Strait, Iron Bottom Sound, Malaita fold belt, New Georgia-Guadalcanal forearc area	5500 (trackline spacing 10-30 km)	Multichannel seismic reflection (24-fold). High-resolution Uni-boom seismic reflection. 3.5 kHz high-resolution seismic reflection. 12 kHz bathymetric profiles. Wide-angle seismic reflection/refraction sonobuoy profiles. Magnetometer. Gravimeter.
1982	U.S. Geological Survey	Guadalcanal, Florida Islands, Malaita		Field examination and laboratory analysis of outcrop samples and cores.
June 1984	CCOP/SOPAC R/V S.P. Lee (L6-84-SP)	Central and western Solomon Islands, eastern Papua New Guinea	2000	Multichannel seismic reflection (24-fold). High-resolution Uni-boom seismic reflection. 3.5 kHz high-resolution seismic reflection. 12 kHz bathymetric profiles. Wide-angle seismic reflection/refraction sonobuoy profiles. Magnetometer. Gravimeter.

Basics of petroleum accumulation, Solomon Islands

As to the three basics — trapping mechanisms, source materials, adequate maturation history — certain Solomon Islands areas measure up well. They are discussed under two headings.

(A). *TRAPS and RESERVOIRS*: Potential traps are quite common. The dominant sedimentary types in Solomon Islands Pliocene-Pleistocene sections is volcanoclastic. Its labile content is high and so too the clay content, especially in the more-weathered epiclastic varieties. Porosity and permeability values are usually low. Such rocks do not favour the presence of sediment-traps or the migration of petroleum. But they make excellent cover or sealing agents over traps.

Apart from their sealing action as a draped cover, they tend also to act as self-sealing agents if the sequence, with its traps, is faulted; that is, their presence increases the potential of fault traps.

Three main types of potential traps occur in Solomon Islands areas - reefal bodies, antiforms and fault traps.

Except on the Malaita/Santa Isabel flank, anticlines are rare on land in the central islands and New Georgia Group, and where present are often insubstantial drape-flexures over fault blocks. But anticlines and antiforms are fairly common within the offshore sequences. Reflection seismic surveys show what appear to be compressional folds, gravitational antiforms and large folds, with perhaps a thousand metres of sediment developed and draped over horsts several kilometres wide. They appear on many seismic lines (Refs. 1a, 4, 12).

In the Shortland Basin, several antiforms

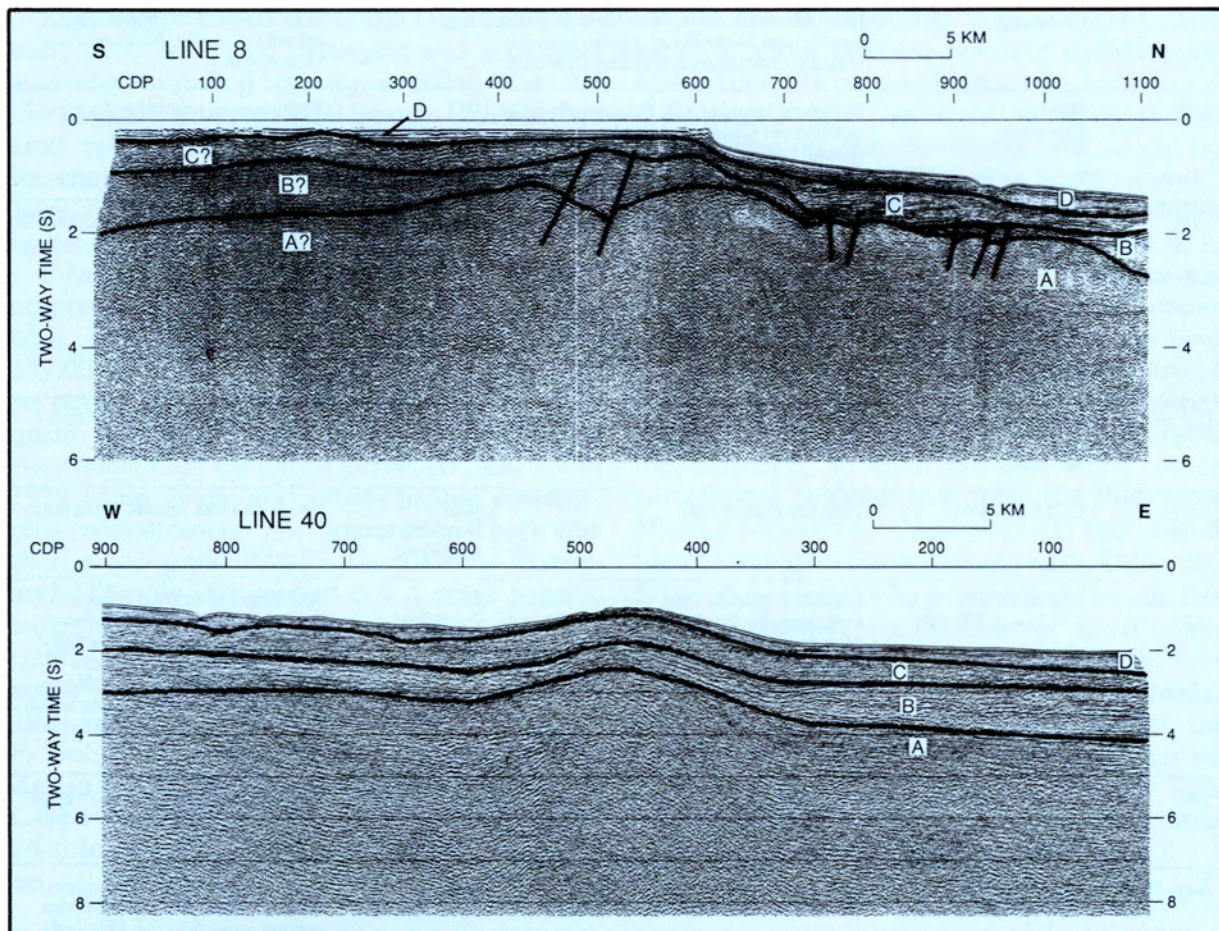


Figure 8. Top. Seismic reflection profile NNW of Fauro, Shortland Islands (from Ref 12). Seismic stratigraphic units are: A — Oligocene and older, mostly igneous; B — ?mid-Miocene through Early Pliocene, layered, discontinuous, hummocky; C/D — Pliocene through Quarternary, well-bedded, laterally continuous.

Bottom. Line 40, Russell Basin, shows anticline with trend to Manning Strait, between eastern Choiseul and western Santa Isabel. These and most of the other seismic lines can be found in Reference 12.

occur in an area of water depths 675 to 1520 m. An anticlinal trend extends E-W for over 30 km over a width of 5-8 km (eg. lines 49 and 50 in Ref. 12). Nearby in the Manning Strait area, there are two anticlines in an area with about 200 m water depth; Line 40 (Figure 8) trends towards Manning Strait. The last are attractive because of the shallow-water location. Anticlinal structures in a shallow water area of the Shortland Islands, as exemplified by Line 8 of Figure 8, are also present.

Several promising anticlinal structures were delineated in the Russell Basin, in water depths ranging from shelf to 800 m (Ref. 4). Line 30, figured in Figure 12, is typical.

North of the Solomon High, anticlinal structures are present in the Indispensable Basin and the Ndai area (north of Malaita).

The delineation of offshore combined stratigraphic-structural traps would require further detailed work so their possible presence is not discussed here.

Reefal traps and faulted traps have been determined in good-quality regional seismic imagery. Unfortunately, only a few survey lines (those of Iron Bottom Sound, near Guadalcanal) have been run across areas on which reefs were most likely to be found. These showed at least seven mound structures

on the flanks of the part of the Solomon High connecting Guadalcanal and the Florida Group (Ref. 4). They are considered to be reefs of probable Late Miocene-Pliocene age, at least several square kilometres in area and from 200 to 600 m thick. Two, possibly three, horizons show these mounds. They compare well with those in producing areas e.g. the Salawati Basin, Vogelkop, western Irian Jaya. The onshore equivalents include the reefal limestones encountered in the Poha River, western Guadalcanal, and the younger reef terraces behind Honiara; the Mbonege and Betilonga Limestone of west and central Guadalcanal are older equivalents (Early through mid-Miocene). The water depths where these mounds occur range from 300 to 600 m. Their stacked relationship fits the notion of reefs growing in episodic fashion on fault scarp crowns that were part of the developing flank of the Solomon High.

The Iron Bottom structures, shown in Figure 9, are a minimum sample. Large parts of the Solomon High — both flanks but especially the southwestern flank — can be expected to show similar occurrences in future seismic profiles.

Unlike the buried reefs, the presence of adequate supplies of source rocks with a

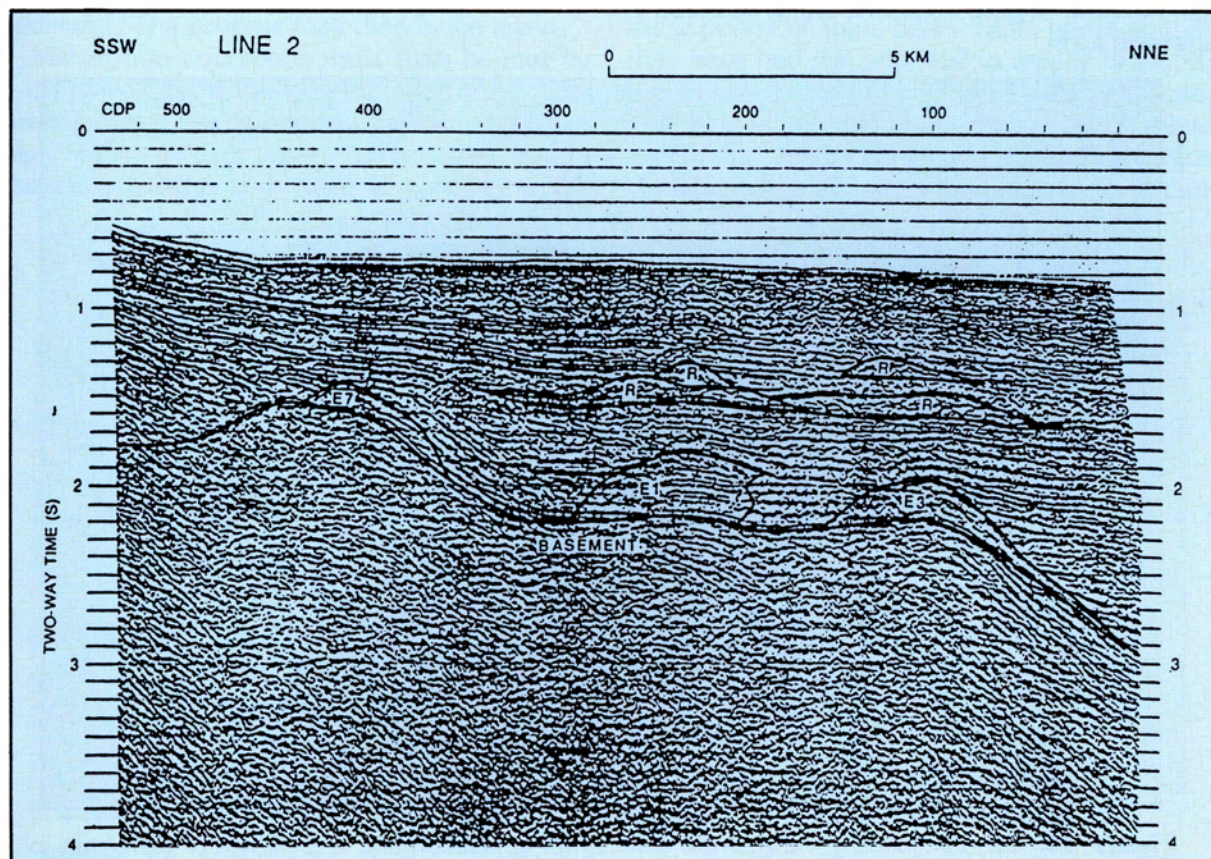


Figure 9. Profile of fossil reef mounds subsurface Iron Bottom Sound, about 20km north-northeast of Honiara.

history that favoured maturation of the original organic content is less certain.

(B) SOURCE ROCKS and MATURATION.

In assessing Solomon Islands petroleum potential, the presence, abundance and maturity of source rocks is the crucial issue.

In tropical and subtropical island chains such as the Solomons, marginal marine areas are the most productive organically, far more than the well-dramatised rainforest, and more than offshore reefs, which tend to be closed systems. These marginal environments have an immense, annual, oil-prone, organic harvest that can be "spun-off" at interval into adjacent sedimentary basins. In Solomon Islands, the Tertiary sediment succession shows ample evidence of the existence of piedmont sediments, fringing reef, lagoon and delta areas. These marginal marine areas are subject to being swept clean periodically by local great floods and waves generated by, for example, hurricanes and earthquakes (tsunamis). The "organic-rich" sedimentary sweepings may become components of turbidites, or be distributed by longshore currents for further reworking, or be trapped in deeper parts of the forearc or draped against offshore barrier reefs. The last is an ideal situation, the reef body acting as a future reservoir adjacent to an oil 'kitchen.' Figure 10 shows these features in cartoon form.

Solomon sediments have not so far been adequately sampled for organic content (Ref. 13). In particular, there are very few analyses of the most pertinent sediments, those associated with anticlines, or stratigraphic/structural traps such as reefs.

Are the source sediments likely to be mature? The limited heatflow data available give an ambiguous picture of the present-day thermal structure of the region, and the relative maturity of even young sediments, say, Pliocene (Ref. 14). They do not apply to the early and middle Tertiary section. For target prospects focussed primarily on Early and mid-Miocene traps, it seems likely from geological considerations that thermal maturation has been achieved (Ref. 1a). These sediments are thick and they are buried. As well, their equivalents on the islands often contain thick vegetation mats that are partly converted to lignitic material e.g. Miocene Mboli Formation, western Choiseul. For younger sediments, the areas close to the volcanic axis can be viewed optimistically, especially if it be true that the volcanism took place upon a floor of sediments that correlate with the Tertiary of the main central islands. A final point is that hydrothermal activity, not apparently related to present-day volcanism, is widespread on Guadalcanal and Choiseul.

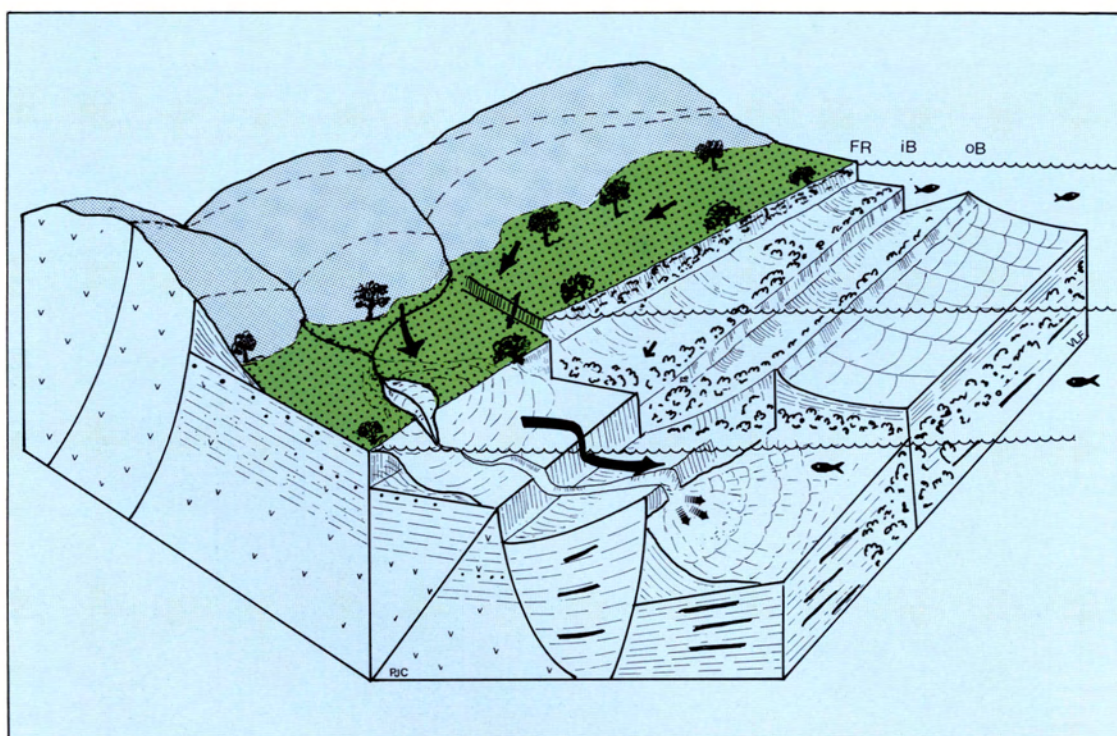


Figure 10. Cartoon showing the essential features for generation and reef-storage of petroleum in productive marginal marine environment. FR — fringing reef; IB — inner barrier reef; OB — outer barrier; — Solid bars suggest generation of petroleum adjacent to reef. Reef structures are not isolated bodies but form an interconnecting mass, the result of growth on and over tectonically active fault blocks.

Petroleum plays and some target prospects

As just described, a play for Solomon Islands involves a number of key features: highly productive marginal marine areas adjacent to persistent topographic highs and regular harvesting of the organic content, the presence of fringing and outer reefs high in algae, submarine canyons that cut the reefs, and shallow — and medium — depth sediment sequences. This is an environment that embraces alluvial plains, swamps, mangrove, lagoons, barred basins, deltas, fringing reefs, nearshore and offshore lagoons, and outer barrier reefs. The original sediments may include nearshore lagoonal sludges, reef debris and coarse - to medium-depth turbidites that are channelled into deeper water by submarine canyons and accumulate offshore from the reef barriers, adjacent to receptive reef bodies; again, see Figure 10. The general locale may be either inner forearc or backarc.

Episodic tectonicism complements this productive picture: at sufficient intervals (half a million years?) vigorous tectonicism, with or without volcanism, provides a flood of capping sediment. The process may then begin again.

Maturation conditions must then be met by a combination of heat, depth, and time. The process may be enhanced by the shallower high temperatures that accompany hydrothermal activity and nearby volcanism, for

example, in areas closer to the volcanic axis, such as the New Georgia Group.

Solomon Islands have provided variations on this play at several intervals since the Late Oligocene. These intervals roughly define the times of substantial reefal carbonate build-up (times of relative stability) but allow for occasional vigorous tectonic pulses. They include the latest Oligocene/earliest Miocene interval (approximately 23-21 Ma (Myr ago) the latest Early Miocene/Middle Miocene (17-14 Ma), mid-Late Miocene (7 Ma) and Late Pliocene/the Present (3.0 Ma). The reef bodies are most commonly algal, a favourable feature from aspects both of source and void-space. Given the great thickness of sediment in the Solomon basins, maturation and petroleum generation could well have been achieved for all but the youngest part of the section.

Selected Target Prospects.

The main potential prospect areas, for the sorts of play envisaged above, are in relatively shallow water, to 300 m, on the southwesterly flank of the structural high, the Solomon High, from the Shortland Islands through Santa Isabel and the Florida Islands to northern Guadalcanal. This general area, of course, can be extended west from Guadalcanal at least as far as Mborokua, past the Russells. In effect, these potential areas define basin edges so that they have had the potential to tap, or draw on, the deeper parts of the basin further offshore. This is an important consideration, even allowing for the likely dominance of volcanoclastics in the sequences, and their reluctance to per-

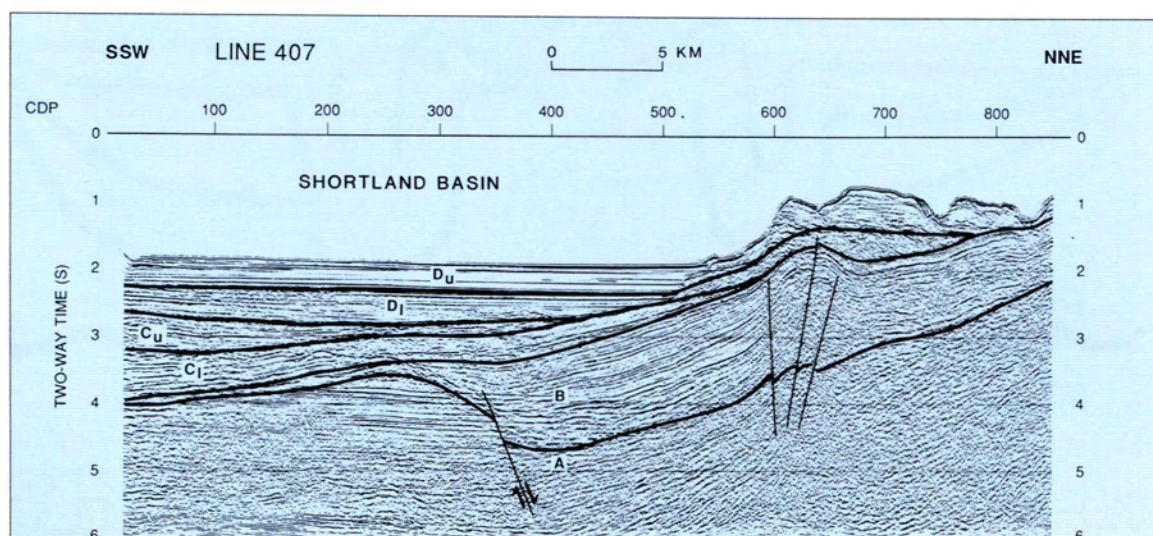


Figure 11. Multichannel seismic — reflection profile, line 407, Shortland Islands area. Seismic stratigraphic units are: A — Oligocene and older, mostly igneous; B — ?mid — Miocene through Early Pliocene, layered, discontinuous, hummocky; C/D — Pliocene through Quaternary, well-embedded, laterally continuous.

mit the passage of oil.

Within this large overall entity, certain specific areas can be further targeted. The first is made up of the flanks and border areas of Iron Bottom Basin — from Savo to west of the Florida Group; the area north of Honiara has proven reef mounds (as already mentioned). Further evaluation of this prospect would consist essentially of detailed seismic reflection surveys.

A second prospect is the continuation of the first; it runs from Florida Island northwest to a little beyond San Jorge, eastern Santa Isabel. Both sides of this part of the ridge have prospects and warrant shallow seismic investigation. In particular, several antiformal structures, possibly fault-induced, occur near the shelf margins southeast of San Jorge.

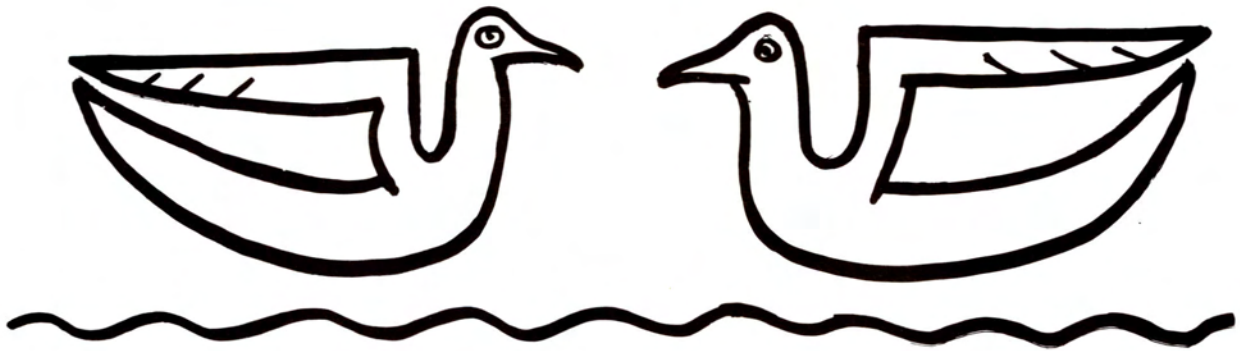
A third potential prospect is the large area from western Santa Isabel across Manning Strait to eastern Choiseul. Apart from the reefal play, at least two well-defined, large, antiformal structures are present below the shallow Manning Strait (Figure 8 and Refs. 1a, 12). As with other prospects, seismic lines could be chosen with the emphasis on drilling access in reasonably shallow water.

A fourth prospect is the Shortlands area, between Shortland Islands and western Choiseul. Maturation may have been enhanced by a

higher level of heat that accompanied volcanism in this area (of which the Fauro caldera is a remnant). Wedge-outs and antiforms occur in quantity south-east of Fauro (see Figure 11).

A fifth prospect in this area made up of the shallower areas (less than 300 m) over both flanks, north and south, of the high that connects western Guadalcanal, the Russells and Mborokua (e.g. Cheetah Shoals, western Guadalcanal; Russell bank, south of the Russells). This might be extended to the Brougham Shoals, south of Getukao, New Georgia Group.

Finally, and importantly, the Mbokokimbo Basin (partly onshore, northeastern Guadalcanal; Figure 12) that connects with the offshore Nudha Basin and, probably, Indispensable Basin, appears to have good prospects. Future seismic profiles immediately offshore, at roughly right angles to the coast, should show a stepped basement to this basin, with the strong possibility of reef mounds on the fault steps. Each trap has the potential to draw on large volumes of sediments making up the Nudha and adjoining parts of Indispensable Basin (at least 6 km of Miocene and younger strata). Drilling sites would be in relatively shallow water, or on an island of the Rua Sura group, or even on the Guadalcanal shoreline.



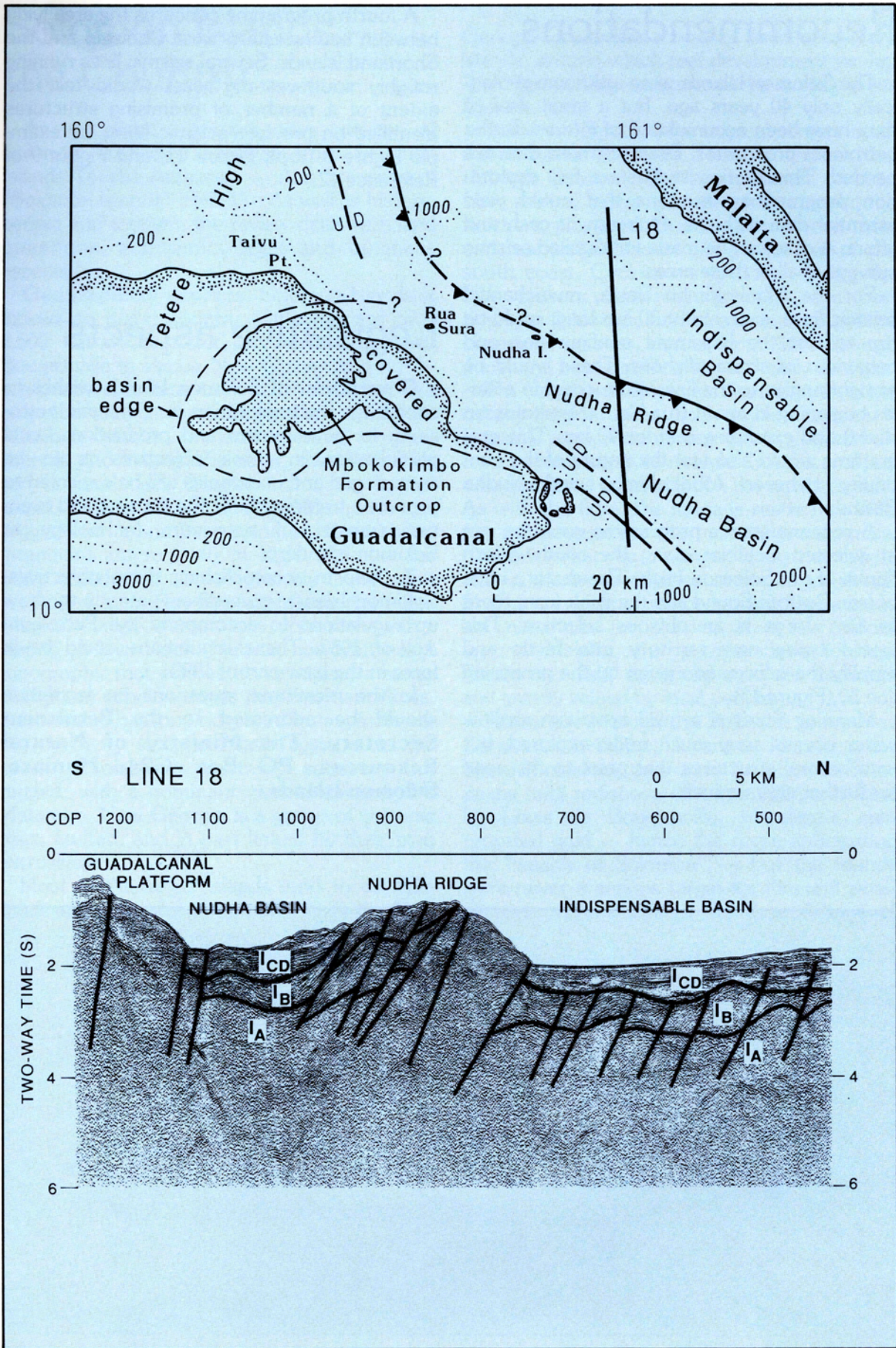


Figure 12. Northeastern Guadalcanal and the land expression of the Mbokokimbo Basin. As indicated in the profile (line 18), this basin connects with the Nudha Basin and this in turn connects with part of the Indispensable Basin.

Recommendations

The Solomon Islands were unknown geologically only 40 years ago, but a great deal of data have been accumulated of interest to the petroleum prospector. Even so, more data are needed. This section suggests a few exploration programmes in areas that could yield essential data with the minimum of cash and effort. A case can be made for detailed seismic surveys of all of these areas.

For the Mbokokimbo Basin, multichannel seismic lines, each about 30 km long, could be run to test the basement configuration and behaviour of strata offshore. These would be at right angles to the line of the coast in a series beginning at about Rua Vatu (Mbokokimbo River) and extending east for 70 km. This programme would also test the nature of the continuity between Mbokokimbo and Nudha Basins.

A reconnaissance programme could be run at selected localities along the southwestern flanks of the Solomon High. The eastern edge of Iron Bottom Sound and the flank from there to San Jorge is an obvious selection. This would bring new territory into focus and amplify the information given by the promising line 30 (Figure 13).

Manning Strait is a third area with shallow water access, very much under-explored, but with several structures that point to the need for further seismic lines.

A fourth programme concerns the area lying between southwestern west Choiseul and the Shortland Islands. Several seismic lines running roughly southwest-northeast would test the extent of a number of promising structures identified on previous seismic lines, for example Figure 8 (top), Figure 11, and Figure 9 of Reference 12.

Legislative aspects

Government of Solomon Islands wishes to encourage the exploration for domestic petroleum, its development and production. Local participation in these objectives is to be encouraged and companies will be expected to provide a framework for the training and eventual transfer of petroleum technology to Solomon Islanders.

To help in accomplishing these objectives, Solomon Islands government intends to draw up regulations to accompany the Petroleum Act of 1987. These regulations could be in force in the later part of 1990.

In the meantime, questions on legislation should be addressed to the **Permanent Secretary, The Ministry of Natural Resources, PO Box G24, Honiara, Solomon Islands.**

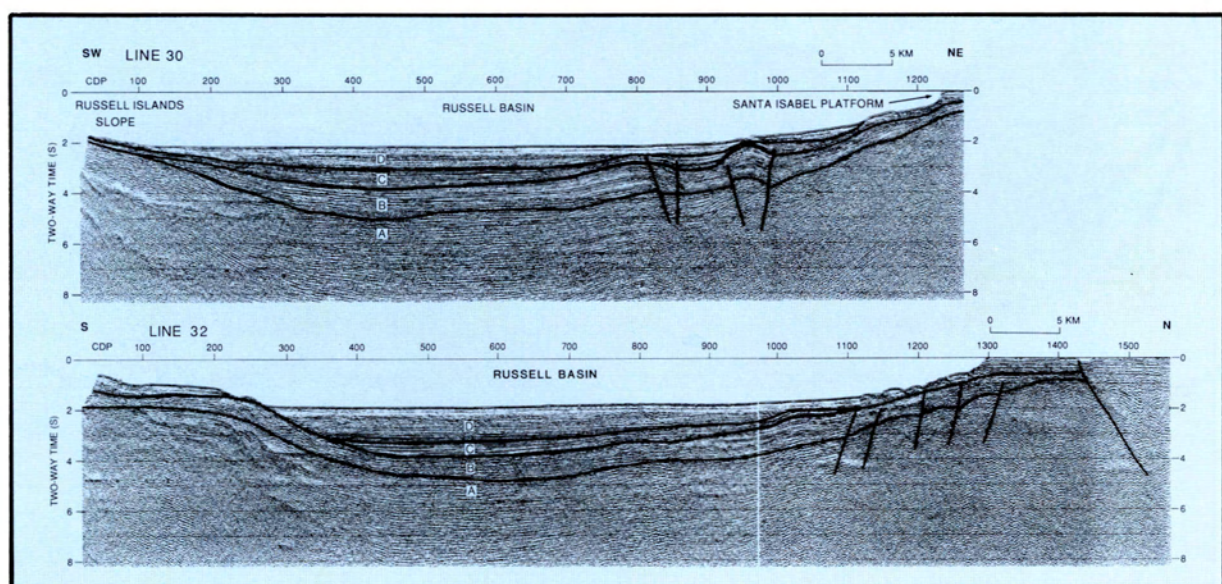


Figure 13. Seismic sections 30 and 32, from the Russell basin. Seismic stratigraphic units are: A — Oligocene and older, mostly igneous; B — ? mid — Miocene through Early Pliocene, layered, discontinuous, hummocky; C/D — Pliocene through Quarternary, well-bedded, laterally continuous. Prospective formations B and C are accessible from shallow water.

Solomon Islands — the Country

An excellent, comprehensive review of Solomon Islands is available from Solomon Islands Tourist Authority — Ann Stevenson's "Solomon Islands" (Ref. 15). As well as history, people and tourism, the review deals with land questions, economic, legal and business aspects.

Geographical aspects. Solomon Islands is indeed an island country - it comprises over 2,500 islands scattered in clusters between Bougainville in Papua New Guinea and northern Vanuatu, a distance of nearly 1900 km. But only six have an area larger than 3000 km. Although similar in their general tropical aspects and insular character, the big islands vary a good deal. Guadalcanal is the largest island, with an area of about 5600 sq km. It is rugged with a southern spine of block-faulted mountains up to 2440 m high. Most of the other islands are also extensively faulted, but are not so high; San Cristobal tends to be flat-lying with large swamp areas, consistent with a planed-off lava block. Malaita, however, has a topography that echoes its structure, a series of high, en echelon ridges that mark anticlines. Santa Isabel has long ridges, reflecting folds, on the northerly side, and fault systems to the south. Choiseul is relatively subdued, but rugged, with a dominant central volcano, Mt Matambe. New Georgia is a group of volcanic piles, faulted, and in part linked by their own extrusives.

Most of the larger islands tend to be slab-sided, with few offshore islands. Only the New

Georgia Group has a host of small subsidiary islands, around which reef development peaks. The Marovo Lagoon is one of the world's great lagoons.

Solomon Islands has a tropical climate dominated by the SE trades. These blow from May through October. The larger islands tend to have several 'micro' climates; for example, the northern plains on Guadalcanal have a drier and markedly different climate to that of the south coast. Cyclones may occur during the NW season. Generally speaking, the best times for fieldwork, land or sea, are around the change of seasons, that is, from April through June, and between October and early January.

The vegetation is not as diverse as in other nearby tropical areas, such as New Guinea. It is mainly tropical rainforest with big-leaved buttressed trees up to 45 m high. Guadalcanal has a large coastal grass plain on the northern side. As with the flora, the fauna is restricted. Wild pig and possum are the main large mammals. Crocodiles can be a danger along the coasts and in the lower courses of the larger rivers. Sharks are another minor hazard. Some areas are notorious for sharks; at a few places around Malaita, the people claim kinship. Freshwater fish, especially eels, are common and greatly valued by local people.

History. Although the Solomon group was discovered in 1568 by Alvaro de Mendana, the Spanish mariner, they were then lost to Europeans until rediscovered some 200 years later by Louis de Bougainville. Mendana's men reported gold — hence the name anticipating the "wealth of Solomon" — but the islands were never a serious target for itinerant prospectors: as a result of the depredations of



Marovo lagoon, New Georgia.

“blackbirders” (a euphemism for a sort of slaver), the inhabitants were justifiably hostile to outsiders.

As part of the expansion of European activities in the Pacific, traders, coconut planters and, especially, Christian missionaries, began serious contact with Solomon Islanders in the last few decades of the last century. Their activities led to demands for government involvement and since Germany had claimed some of the western islands and the French were showing interest, the British, somewhat reluctantly, declared a Protectorate in 1893 over New Georgia, Florida, Guadalcanal, San Cristobal and Malaita. The Protectorate was governed from Fiji as part of the Western Pacific High Commission. In 1899, the Germans transferred interest in the Shortlands, Choiseul and Santa Isabel in return for the dropping of British claims in Samoa.

Following administration of Solomon Islands by the British as a Protectorate, for some 85 years after 1893, the people gained independence in 1978 and set up a new country with the name — “**Solomon Islands.**” The campaigns fought in Solomon territory during World War II had hastened this process. Solomon Islanders who remember those war days, agree that the sudden presence of thousands of foreigners, and especially the thousands of Americans and American black servicemen, with their immense quantities of material goods, had a traumatic effect on all Solomon societies. In particular, Solomon Islanders became impatient for improvements in their living conditions and for involvement in the civil service and government. The war gave rise to various embryonic independence movements. Although suppressed or stifled by the colonial government, these resulted in greater attention being given to the needs of the people to conduct their own affairs and to a growing desire for full independence.

People. In 1986, Solomon Islands population was 285,170, nearly all of them Melanesian. The Melanesians came from SE Asia and drifted along the island archipelagos arriving in the Solomon Islands via New Guinea probably about 6000 years ago — a time corresponding to a lowered sea level. There does not seem to have been much to and fro contact over much of the subsequent time. A great many clan societies evolved each with its own language and social structure. As with other Melanesians, therefore, Solomon Islands people possess a rich diversity of culture, background, language and religion. In day-to-day matters that require serious decisions, action is decided less by fiat than by lengthy discussion with the



Malaitan man with shell money.

aim of eventual consensus approaching unanimity. Many of the old indigenous languages are still in active use, but English is the official language, and its use is growing in the community at large. But a version of Pigin English is the common language of most of the people. In pre-European days, only those people who were skilled seafarers lived on the coasts; because of widespread sea-raiding, many people preferred mountain villages. With the coming of the British and the Pax Britannica, most inland people flocked to the coasts (although Malaita still has a large proportion of people living inland). The population is unevenly distributed. Malaita, Guadalcanal and the New Georgia Group are the most populous. Over the last ten or so years, there has been an urban drift, mostly to the Honiara area (population 30,500). The population is growing at a rate of about 3 per cent each year. Christianity is by far the dominant religion.

The primary school system is widespread and literacy is growing rapidly, although nearly half the population have had little or no formal education. Education to high school and higher trade levels is concentrated in the Honiara area. A growing number of Solomon Islanders attend universities overseas. A greater number

(in the hundreds) undertake overseas courses each year. Employment opportunities, outside government, for the better-educated young person are fairly limited in scope. Most Solomon Islanders work in agriculture, about 46%, and most of these as small-holders.

As with other Melanesians, the notion of **land** is of the utmost importance in Solomon Islands' society. Most of the land — about 88% — is custom land. This is land owned and used according to tradition, to unwritten law, that varies across the country. The remainder is registered land. Registered land has a more restricted ownership and boundaries that are recorded in a government land registry. Government owns about 8% of Solomon land and 60% of this is natural forest. Only Solomon Islanders may own registered land in perpetuity. Foreigners who wish to use custom land must go through a complicated and lengthy process of approval involving not only the central government but also local government and individual landowners.

Government. Solomon Islands is a member of the British Commonwealth. The machinery of government is modelled to a degree on the Westminster system with a constitution, a single, central legislative chamber, elected by universal suffrage, and a Prime Minister elected by Parliament. The National Parliament can consist of up to 50 members including the Prime Minister and his Cabinet of 15 Ministers. The parliament meets three times a year. General elections are ordinarily held every four years. As well, there are seven Provincial Assemblies plus the Honiara Town Council. They have considerable powers provided by the Constitution.

The judiciary includes the High Court, with Chief Justice and visiting puisne judges, the Court of Appeal, backed by principal magistrates, district magistrates and customary land and local courts serviced by the Ministry of Police and Justice.

Economy. Subsistence economy amounts to over one-third of the gross domestic product and includes houses, canoes, services, as well as basic foods. Natural resources, especially fisheries, timber, palm oil, cocoa and copra, make up most of the remainder. Of these, fisheries and timber account for well over half the total export income (in 1987, about 89 million Solomon Islands dollars of a total of about \$128 million). Tourism is a relatively minor industry. Foreign aid contributes significantly to the economy and allows Solomon Islands to balance its budget. Government has national self-reliance as a major ultimate goal.

Infrastructure. As a new and developing country, changes in Solomon Islands infrastructure occur month by month, and, of course, services and facilities often differ from those of long-established countries. The information given here is not exhaustive, nor intended to be so, but aims at giving a broad picture.

Communications: Honiara, the capital, has an adequate harbour with most facilities, including container handling. It will handle ships of up to 15,000 tonnes. There is a ship-hoist for small vessels. All bulk fuel imports are handled through Honiara.

Nearby, at Tulagi in the Florida Group, there is an excellent natural harbour (a drowned graben) with limited facilities. Noro, southern New Georgia, is being developed as a major port. Over much of the Solomons generally, good harbours are scarce and even when present, as in New Georgia, tend to have reefal approaches. Navigational aids are extensive and are frequently improved. There is an air/sea rescue system.

To and from Australia (Sydney), ship service can take several weeks. Local shipping is trade-directed, e.g. copra collection, but with a cargo and commuter service between the islands. At most island ports outside Honiara, very large cargo items, of several tonnes, would have to be specially catered for, and off-loading could require previous installation of landing facilities. Small ships with limited capacity, say 80 tonnes, can be chartered. A landing barge service is available on private hire.

Of World War II fame, Henderson Field, near Honiara, is the only airfield that can handle large jet aircraft such as the Boeing 737 (but not the 747). There are airfields on the other islands that serve the internal air system (with aircraft capacity up to two tonne). A helicopter service operates small machines. Air communications with other nearby countries are good. Honiara connects directly with Australia, Papua New Guinea, Vanuatu and Fiji. Flight frequency is two or three times a week. Airmail service is good but surface mail is slow.

Telecommunications are sound, especially access to the international network. A full range of telephone, telegraphy and telex services is available 24 hours a day, seven days a week. New connections are made fairly promptly. The inter-island telephone service is somewhat overloaded but an inter-island satellite communication system is in the offing. A full range of postal services is available. Solomon Islands time is 11 hours ahead of GMT.

The road system is poorly developed, limited to coastal roads on Guadalcanal, Malaita and New Georgia. There are car and truck hire services. An International Driving Licence is accepted for short periods.

Consumer and service industry. The capital is the main centre for trading and consumer goods and offers quite a wide range of everyday items and of many hardware goods such as small engines, pumps, alternators and the like. Machine servicing, fabrication and light engineering facilities are available.

The Central Bank of Solomon Islands officially regulates banking business and provides advice to Government on monetary matters in general. There are four commercial banks, including the National Bank of Solomon Islands, a joint venture between the Government and the Commonwealth Trading Bank of Australia, Australian and New Zealand Banking Group, Hongkong and Shanghai Banking Corporation and Westpac Banking Corporation. The unit of currency is the Solomon Islands dollar (in early 1989, roughly two SID to the US dollar).

Honiara and larger urban centres have a reliable water supply, and mains electricity at 240 volts, 50 cycles.

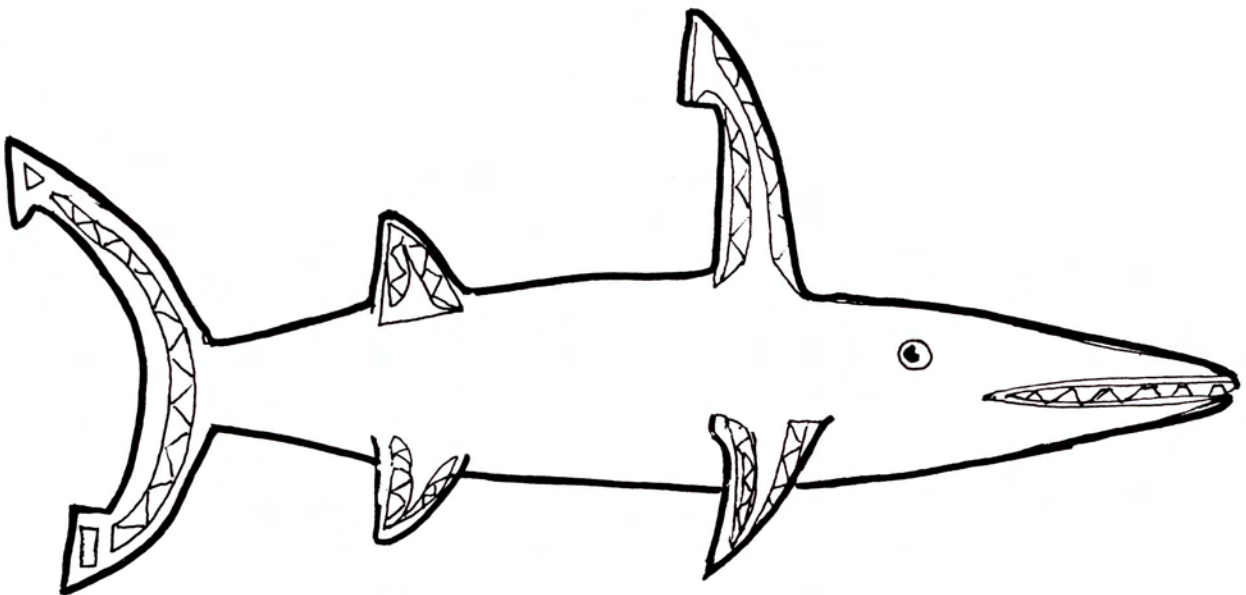
Accommodations of tourist standard are confined mainly to Honiara where there is one large, and several smaller, hotels and other minor centres such as guest-houses. Accom-

modation is rather limited outside Honiara, except for a few tourist centres.

Fieldwork. Bushwork requires forward planning. Without helicopter support, supplies must be carried; loads are limited to 20 kg. Porters have to be organised ahead of time, and paid, at reasonable rates, in local currency. Most items need waterproof containers. Elaborate tents are unnecessary — large lightweight tarpaulins give quite sufficient shelter, even in high-rainfall areas. All food must be carried, for it can rarely be obtained in the bush; most people live on the coast, and inland villages are rare.

Large-scale operations should aim at being self-sufficient in nearly all respects.

Health. Maintaining good health is no problem if certain simple precautions are taken. A malarial prophylactic is required even for short visits. The choice of the correct type is mandatory (physicians in foreign countries are often ignorant of the current recommendation). Small scratches and lesions should be treated and not left to become tropical ulcers. In unpopulated areas the country water is excellent. In the larger centres, routine boiling of drinking water is suggested. The Central Hospital, Honiara, is the major referral hospital; other major centres, e.g. Gizo in the west, and Auki on Malaita, have smaller hospitals and clinics with in-patient facilities. Dental services are available in Honiara and Gizo.



Follow-up Information

Much relevant geological information for Solomon Islands, including geophysical records and track maps, is held by the Ministry of Natural Resources, Honiara, Solomon Islands, but some tapes for the shipboard work carried out before 1982 are held by Bureau of Mineral Resources, Canberra, Australia. Data tapes for the Tripartite Programme and some other surveys are held at the Bureau of Mineral Resources, Canberra, and the US Geological Survey at Menlo Park, California (addresses below).

Geological data: The Geological survey holds various reports and bulletins of the Geological Survey; maps; bibliographies such as Reference 4; journal articles by many past workers in the Solomon Islands. A list is available on request.

Geophysical data: Records of airborne gravity and magnetic data obtained during a UNDP programme in the 1970's and, especially, the more recent shipboard data, obtained from traverses totalling 25,000 km, as presented in the table in this brochure, are available for inspection as detailed below.

Data Accessibility

The geological and geophysical data held by Solomon Islands Geological Survey are available for examination by appointment. A limited number of copies of the prime references are for sale. Other publications available for sale are listed in Reference 16. Paper copy of much of the marine data is also held at the offices of CCOP/SOPAC, Suva, and the Bureau of Mineral Resources, Canberra.

For an appointment to examine the data please contact:

The Permanent Secretary,
Ministry of Natural Resources,
P.O. Box G24,
Honiara, Solomon Islands.
Telex SOLNAT HQ 66306
Telephone 677 22944
FAX 677 21245

OR

Technical Secretariat,
CCOP/SOPAC,
C/- Mineral Resources Department,
Private Bag, Suva, Fiji.
Telex 2330 SOPAC PROFJ
Telephone 679 381139/381377
FAX 679 321040

For copies of the later data, including tapes, contact:

Copy Service, Bureau of Mineral Resources,
P.O. Box 378, Canberra, ACT 2601, Australia.

R/V S. P. Lee seismic data are also available from:

National Geophysical Data Center, NOAA
Code E/GC3, 325 Broadway, Boulder, Colorado 80303-3328, USA.

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