



SPC Geoscience Division

Presentation to: Global Geothermal Alliance Forum

Location: Windsor Golf Club, Nairobi, Kenya

Date: 15-16 June 2015

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- **Secretariat of the Pacific Community (SPC)**
- **Geoscience Division (GSD)**
- **Opportunities and Challenges of Geothermal Development in the Pacific Island Countries (PICs)**



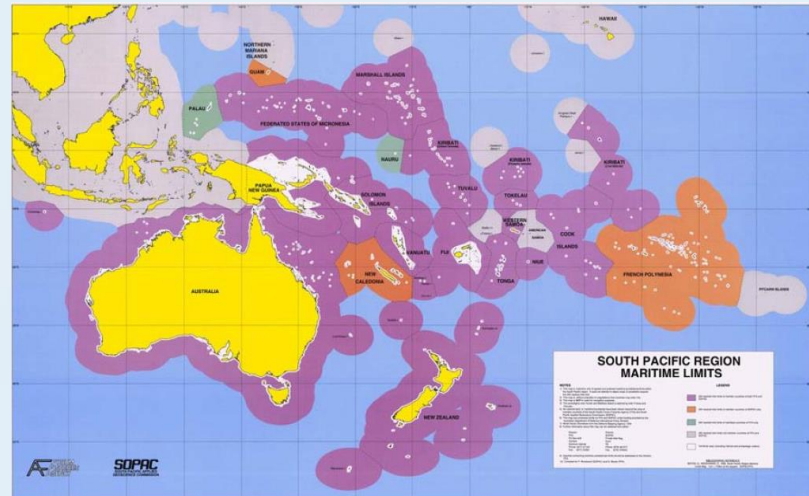
Basic Facts about SPC

- **SPC was founded in 1947 (Canberra Agreement) by UK, Australia, France, Netherlands, New Zealand, UK and USA (it is now 68 years old).**
- **There are 26 member countries and territories:**
American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna, Australia, France, New Zealand and USA.
- **SPC is an international non-political organisation.**
- **It primarily works with Governments and also with Industry, Regional & International Organisations and Civil Society.**
- **A development-focused organisation that spans science and technology, education and training, human rights, and policy development.**

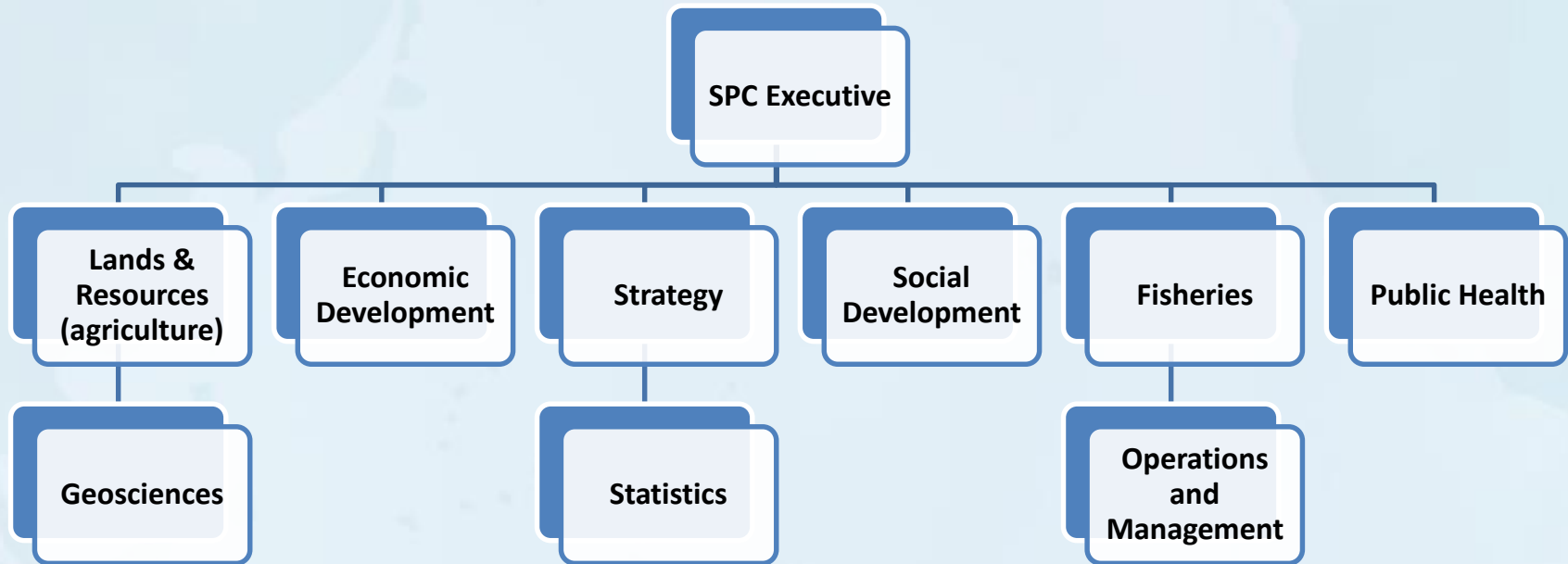


Some Facts about PICs and Territories

- PICs and Territories have a total area of 38.5 million km² of EEZ and around 550,000 km² of land area (a ratio of 70:1).
- Total projected population (2014) is around 10 million (PNG ~7.5 million and Niue ~1,600).
- Land area of PNG is 462,800 km² and that of Nauru is 21 km².
- Limited opportunities for wealth creation: mainly fish, agriculture, natural resources, tourism.
- Limited human resources and loss of skilled people to migration.
- Economies dependent on development assistance.



The Structure of SPC



Over 600 staff based in Noumea, New Caledonia (HQ); Suva, Fiji (RO), Pohnpei, FSM & Honiara, Solomon Islands

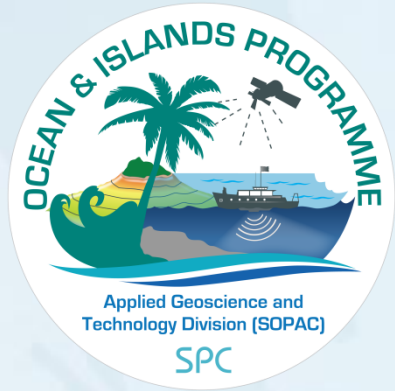
Geoscience Division (GSD)

“to apply geoscience and technology to realise new opportunities for improving livelihoods of the Pacific communities”

Geoscience Division Programmes & Activities



Hydrology & hydrogeology, water resource assessment, water quality, sanitation, waste water, data & information, policy & governance.



Marine surveys & geophysics, sea level monitoring, hydrography, island vulnerability, environmental/Climate change & adaptation, policy & governance, ocean current & wave modelling, maritime boundaries, deep seabed minerals, aggregates, geothermal energy, ocean thermal energy.

Geoscience for Development



Training and awareness, regional coordination for risk management, strategic policy, economic analysis of disaster, scientific & technical information management and dissemination, integrating climate change with risk.

Deep Seabed Minerals Project

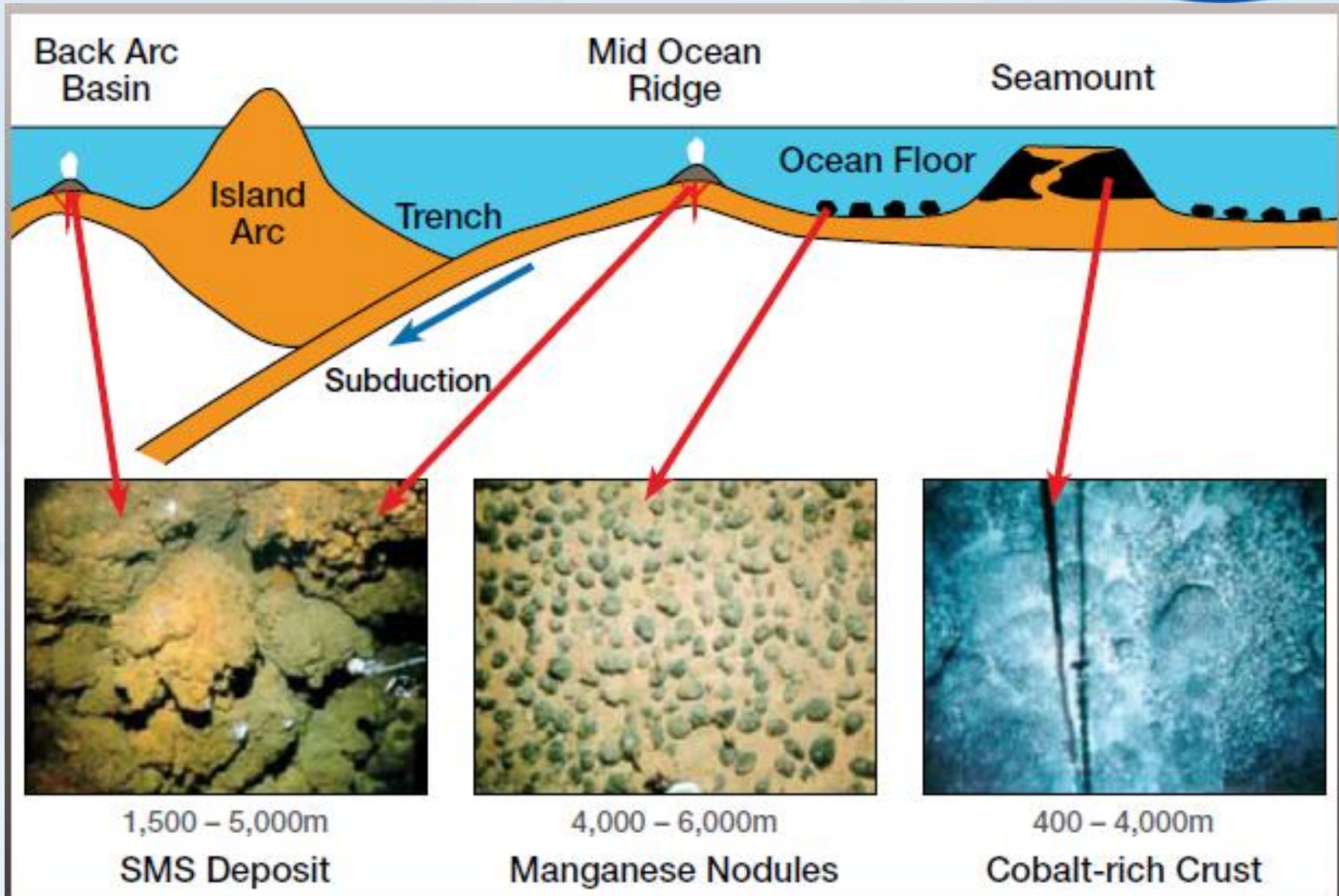


Figure 2. A map of the seafloor showing different geological environment in which Manganese Nodules, Cobalt-rich Crust and Seafloor Massive Sulphides occur.

Geothermal Resource Potential in Southwest Pacific Island Countries



Table 1: Summary of the geothermal resource potential of nations and territories in the southwest Pacific

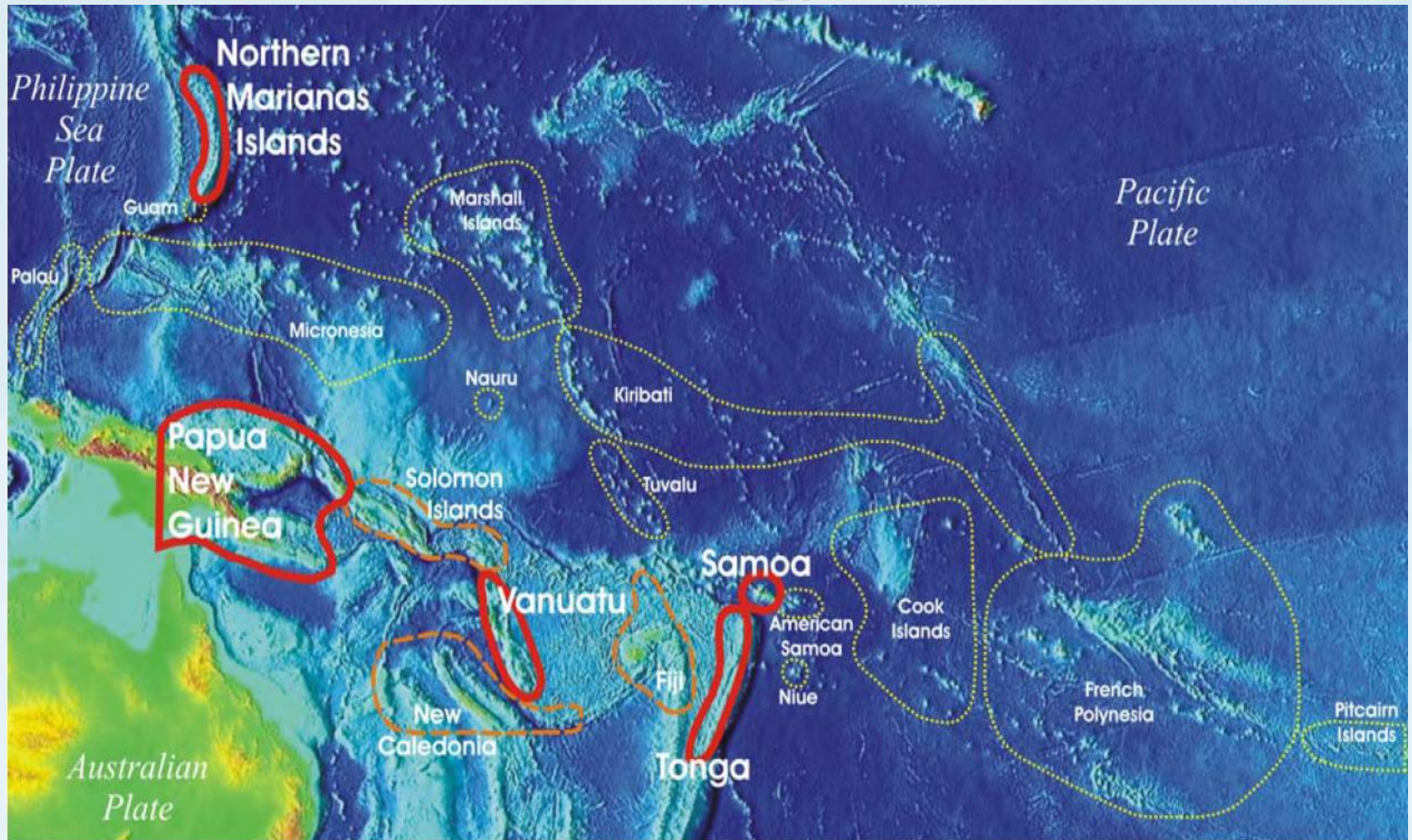
	Youngest Volcanism ¹	Heat Source	Geothermal Locations	Geothermal Surveys	Temp. Range ²	Power Demand ³	Renewable Energy ⁴	Development Barriers	Development Potential
Papua New Guinea	Active	Excellent	41 thermal areas	Development	36-101	2674	46%	Rugged Terrain	High
Vanuatu	Active	Good	20 thermal areas	Reconnaissance	30-78	40	19%	Active Volcanism	High to Moderate
Samoa	Active	Good	Prospective Rift Valley	None	-	101	42%	-	Moderate
Tonga	Active	Good	Hot springs	None	-	43	0%	Distance to population	Moderate
N. Marianas Islands	Active	Excellent	Submarine only	Reconnaissance	-	4	50%	Active Volcanism	High to Moderate

Fiji	Recent	Excellent	53 thermal areas	Detailed	31-102	970	82%	-	High
Solomon Islands	Active	Good	8 thermal areas	Reconnaissance	57-99	70	0%	-	High to Moderate
New Caledonia	Unknown	Unknown	2 thermal areas	Reconnaissance	22-43	1490	24%	-	Moderate

French Polynesia	Recent	Possible	Submarine?	None	-	442	39%	-	Low to Moderate
American Samoa	~1 Ma	Possible	None	None	-	167	0%	-	Low
Cook Islands	1.5 Ma	Possible	None	None	-	28	10%	-	Low
Pitcairn	0.45 Ma	Possible	None	None	-	< 0.5	0%	-	Low
Palau	~20 Ma	None	None	None	-	122	0%	-	Extremely Low
Guam	~32 Ma	None	None	None	-	1664	0%	-	Extremely Low
Niue	> 20 Ma	None	None	None	-	4	0%	-	Extremely Low
Kiribati	~80 Ma	None	None	None	-	9	0%	-	Extremely Low
Marshall Islands	~80 Ma	None	None	None	-	100	1%	-	Extremely Low
Micronesia	Unknown	None	None	None	-	179	0%	-	Extremely Low
Nauru	Unknown	None	None	None	-	29	0%	-	Extremely Low
Tuvalu	Unknown	None	None	None	-	Unknown	0%	-	Extremely Low

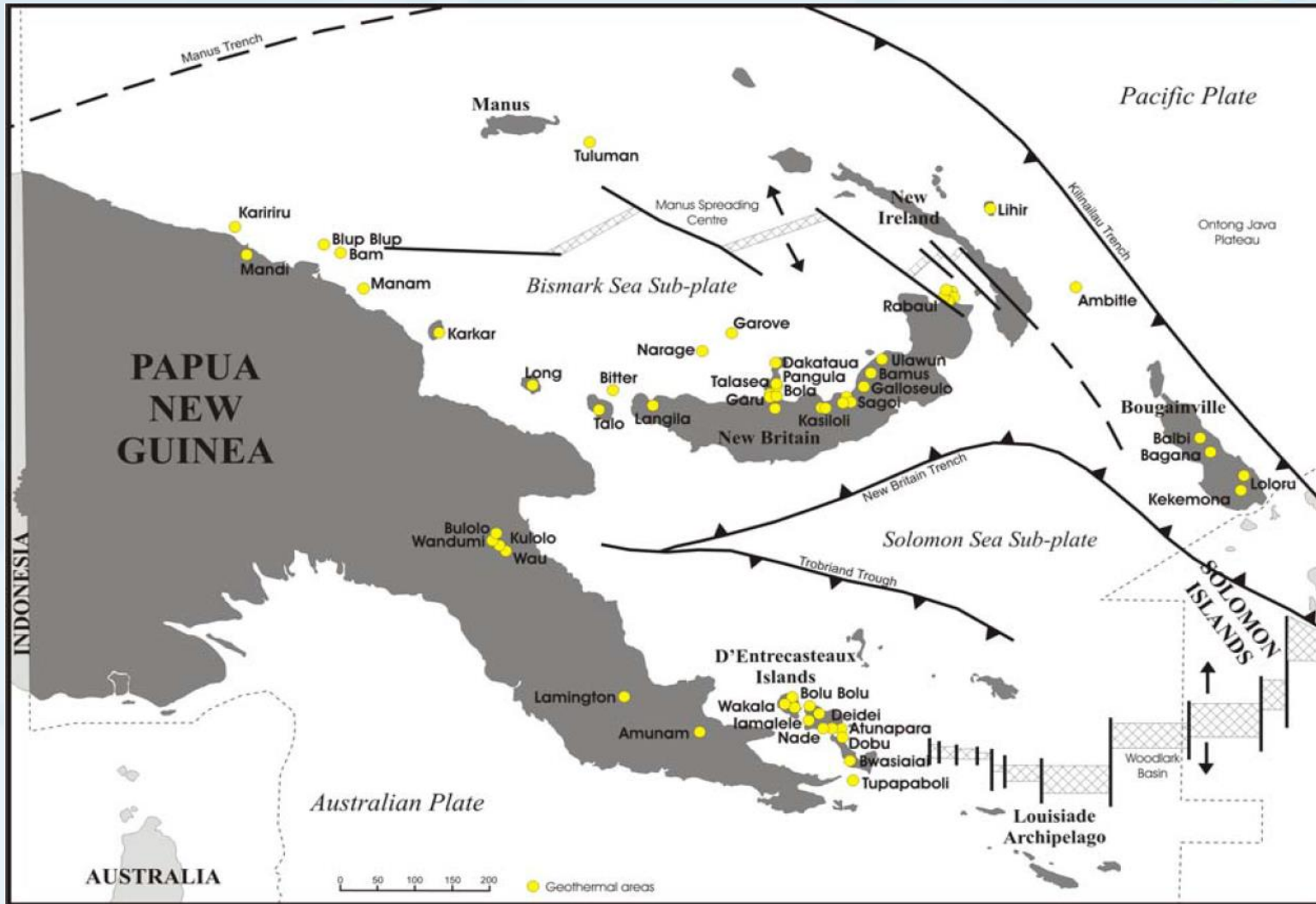
1) Active: volcanism in the last 500 years; recent: volcanism in the last 50 ka. 2) Observed hot spring temperatures in °C. 3) Annual power consumption in M kWh. 4) Renewable energy refers to the percentage of power generated from sources other than fossil fuels. Electricity demand and generation sources are taken from Energy Information Agency (2009).

Southwest Pacific Countries with Potential Geothermal Energy Resources



Red = Nations reviewed in detail; **Orange** = Nations with high to moderate temperature geothermal potential; **Yellow** = Nations with low to extremely low temperature geothermal potential

Map of PNG Showing Locations of Thermal Features



Map of Papua New Guinea showing the locations of known geothermal areas from Mosusu (2008) and Heming (1966). The plate/micro-plate are modified from Williamson and Hancock (2005) by McCoy-West et al. (2012).

Source: 36th WSGRE, USA, 2012



- **Climate change**
- **No legislation/policy**
- **Land issues**
- **Limited human resources**
- **Lack of awareness on geothermal**
- **Dependence on development assistance**

Thank You