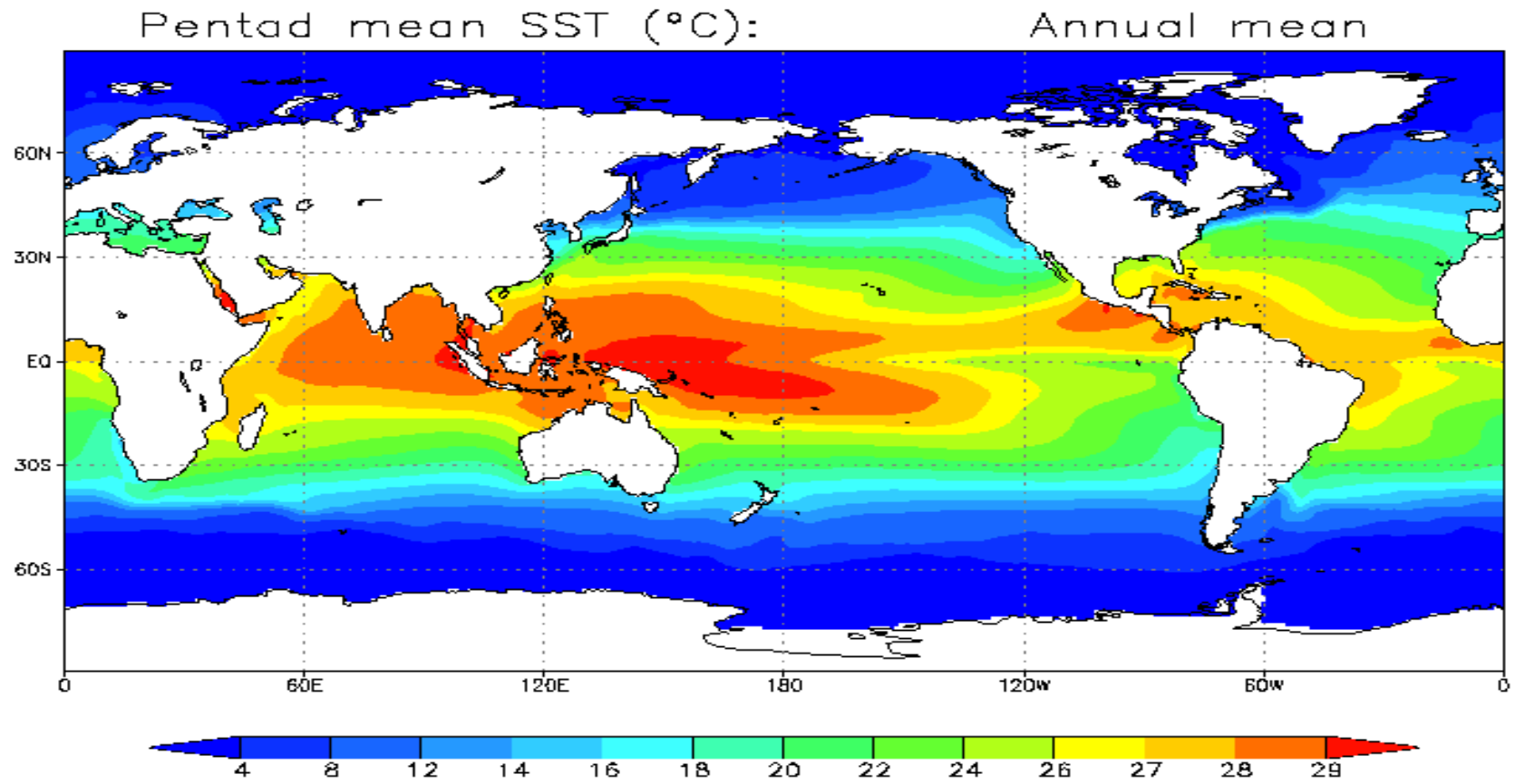


International Science Council in SAMOA October 2023



Challenges of Implementing Science in the Pacific/SIDS

**Professor Chalapan Kaluwin
University of Papua New Guinea
Papua New Guinea**

Topics to be covered

- **A: Introduction**
- **B: Challenges of doing Science in the Pacific/PNG : Terrestrial, Atmosphere, Marine/oceans and Land Base, in Offshore Policy for Sustainable Development Approaches**
- **A WAY FORWARD- In Science Implementation Framework for Pacific and SIDS.**

PACIFIC SIDS VISION 2050- Roll Out

- **Ocean & Island Sustainability Strategy**
- **LNG and Mining/Petroleum Sector Impact – \$8 billion Yearly**
- GDP- \$35-40billion
- GNP (\$2-10 Billion)
- Sovereign Wealth Fund
- SIDS/PACIFIC Budget

CHALLENGES OF IMPLEMENTING SCIENCE IN THE PACIFIC/SIDS

**Challenges of integrating Science
Approaches into our PACIFIC/SIDS
Sustainable Policies/Governance**

A: INTRODUCTION



PACIFIC WAY- SUSTAINABLE DEVELOPMENT PILLARS / PRINCIPLES

Quality of Life / Social Pillars / Principles

- ❖ Health, Education
- ❖ Human rights
- ❖ Equal Opportunity
- ❖ Housing, Security
- ❖ Family, Villages, Clan
- ❖ Cultural traditions

Economic Pillars / Principles

- ❖ **GDP**
- ❖ Population
- ❖ Exports
- ❖ Employment
- ❖ New Company
- ❖ Patents issued
- ❖ **Energy**
- ❖ Forestry
- ❖ Fisheries
- ❖ Agriculture

Environmental Pillars / Principles

- ❖ Water Quality
- ❖ Waste recycle
- ❖ Forest Renewal
- ❖ Biodiversity / Species
- ❖ Marine / Terrestrial
- ❖ Atmosphere
- ❖ **OCEAN**

**PACIFIC THE BEST LITTLE
COUNTRY IN THE
WORLD**

Governance Pillars / Principles

- ❖ Landowner
- ❖ LLG
- ❖ Government
- ❖ Sector

B: Challenges in SIDS Oceans, Coastal & Islands

- **RESEARCH INFRASTRUCTURE**
- **LAND BASE**
- **POLLUTION**
- **LNG, MINING & PETROLEUM**
- **BIODIVERSITY**
- **CLIMATE CHANGE & VARIABILITY**
- **GOVERNANCE-POLICIES**



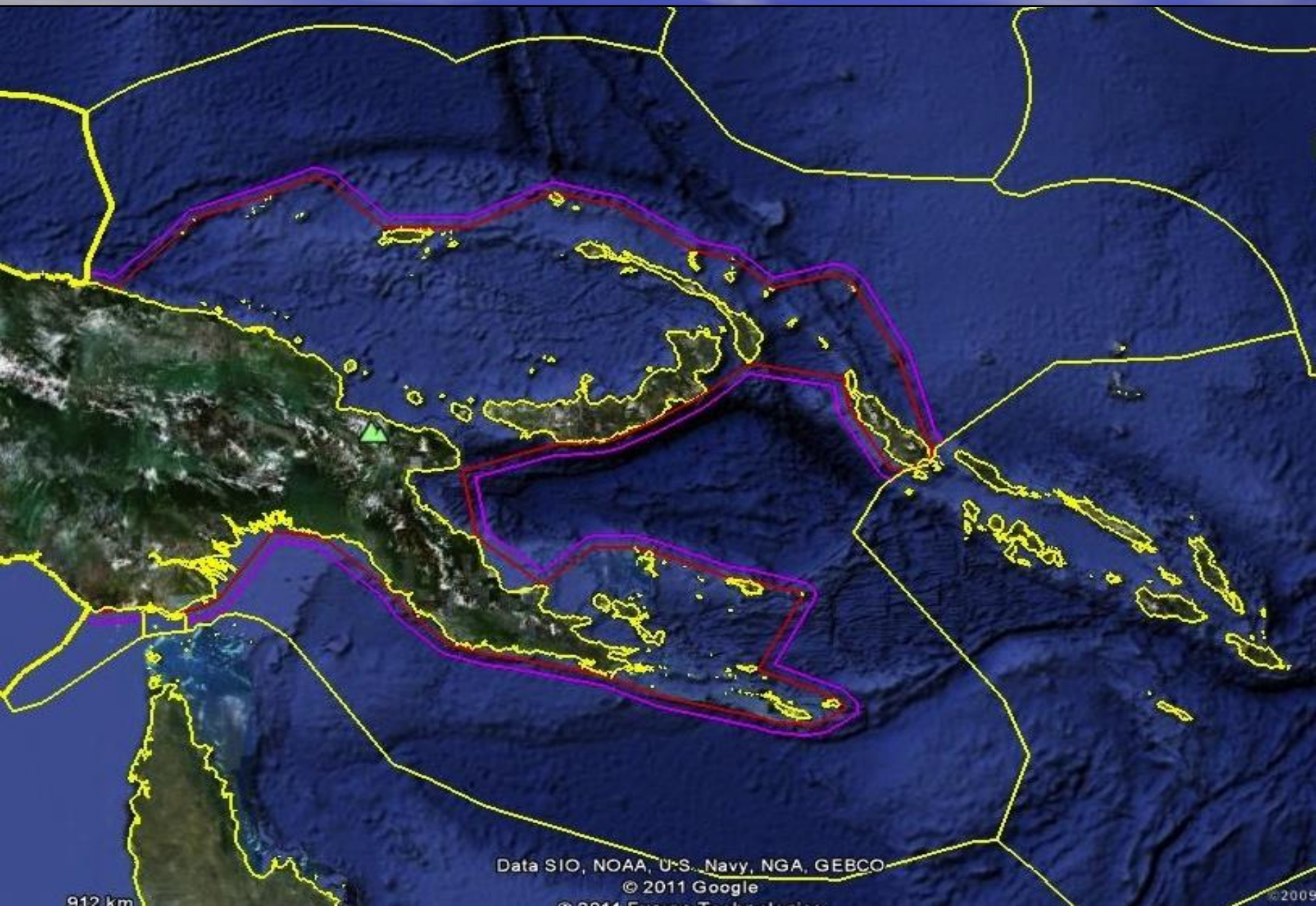
LAND BASE CONTRIBUTION



LNG/ PETROLEUM/OIL in the Pacific



PNG EEZ BOUNDARY



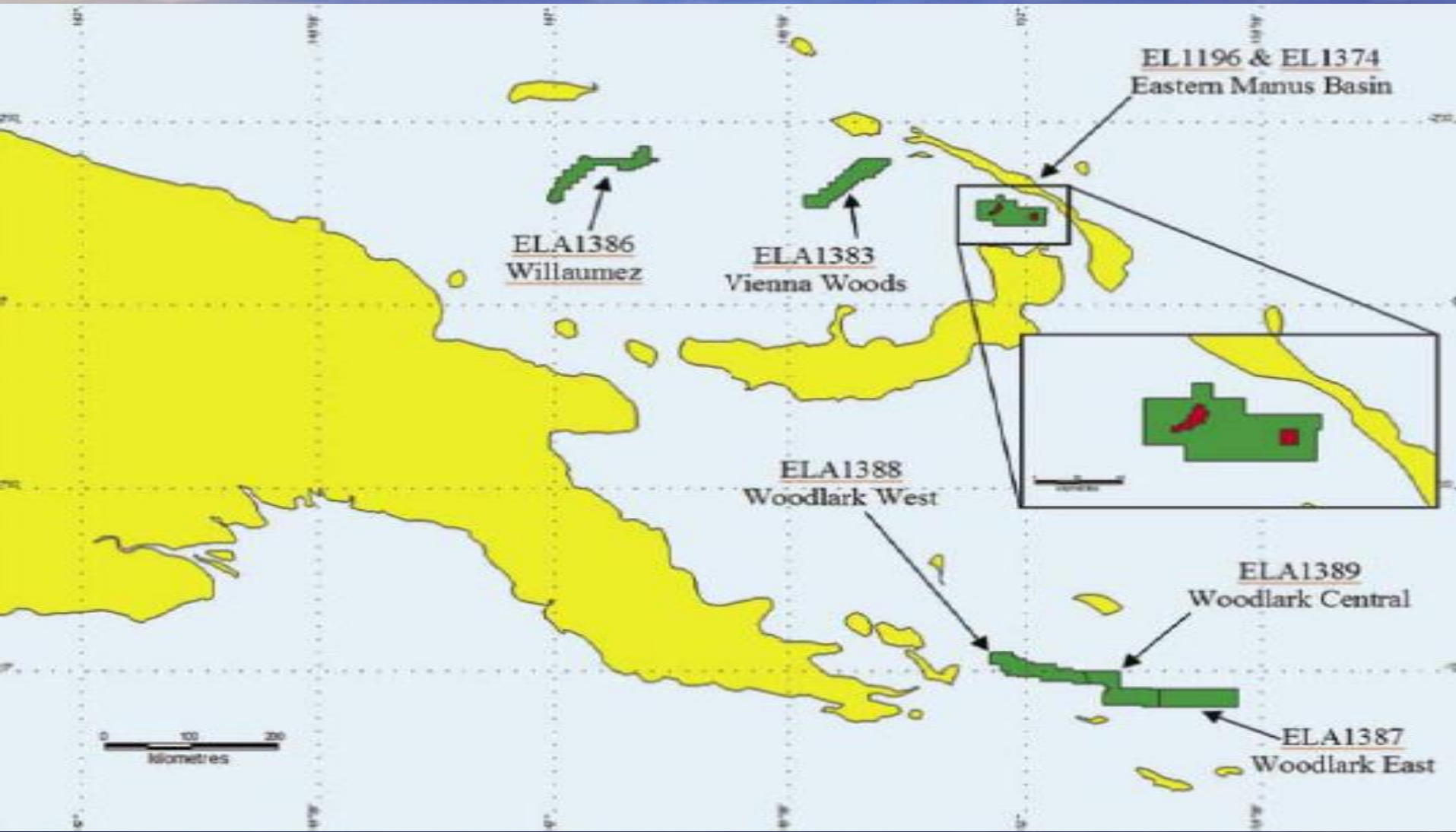
912 km

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2011 Google

© 2014 Europa Technology

© 2009

Submarine Mining Leases





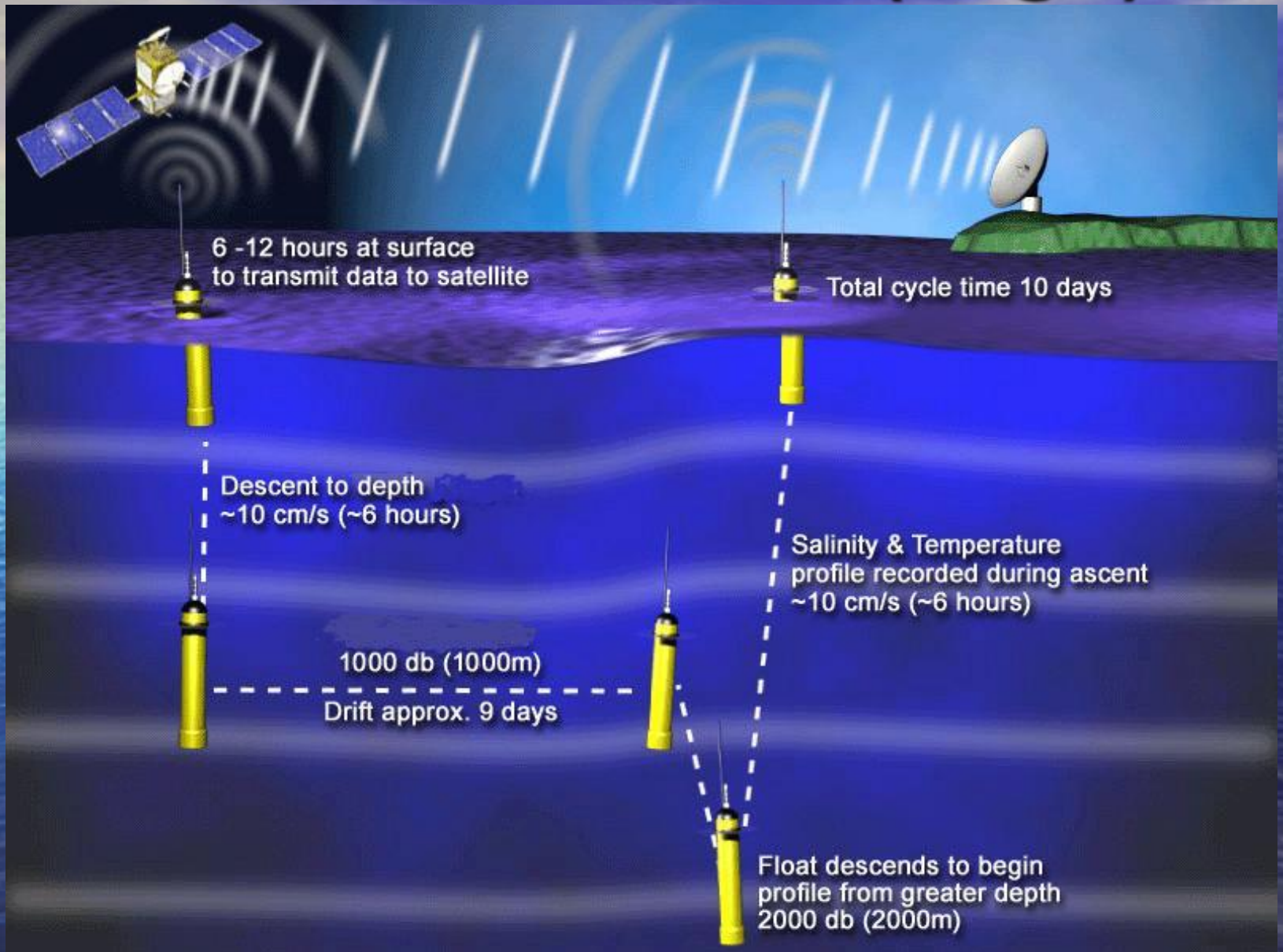
**OCEAN, CLIMATE CHANGE AND
VARIABILITY- Technology**



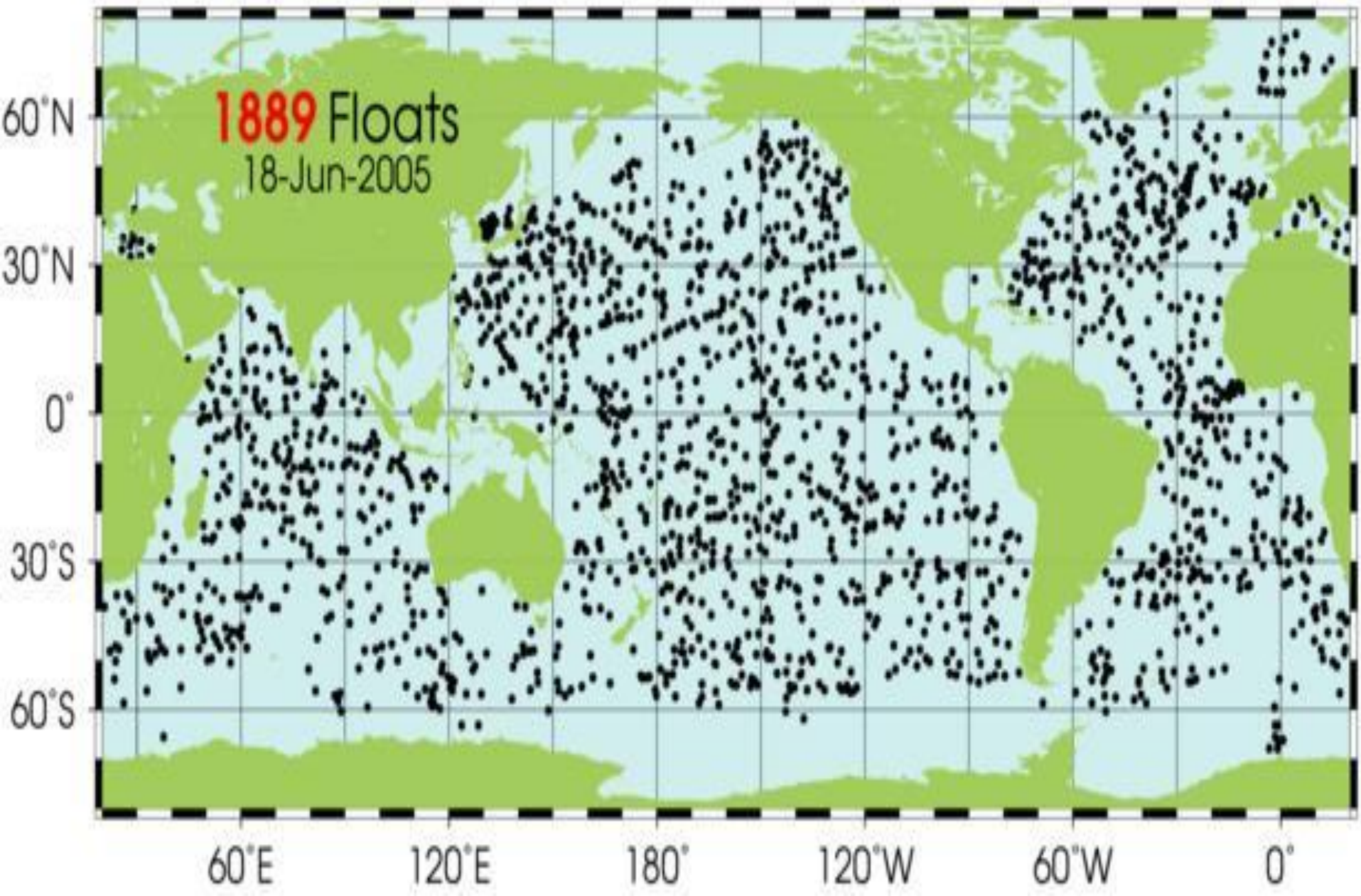
PRESSURE SENSOR- PIES



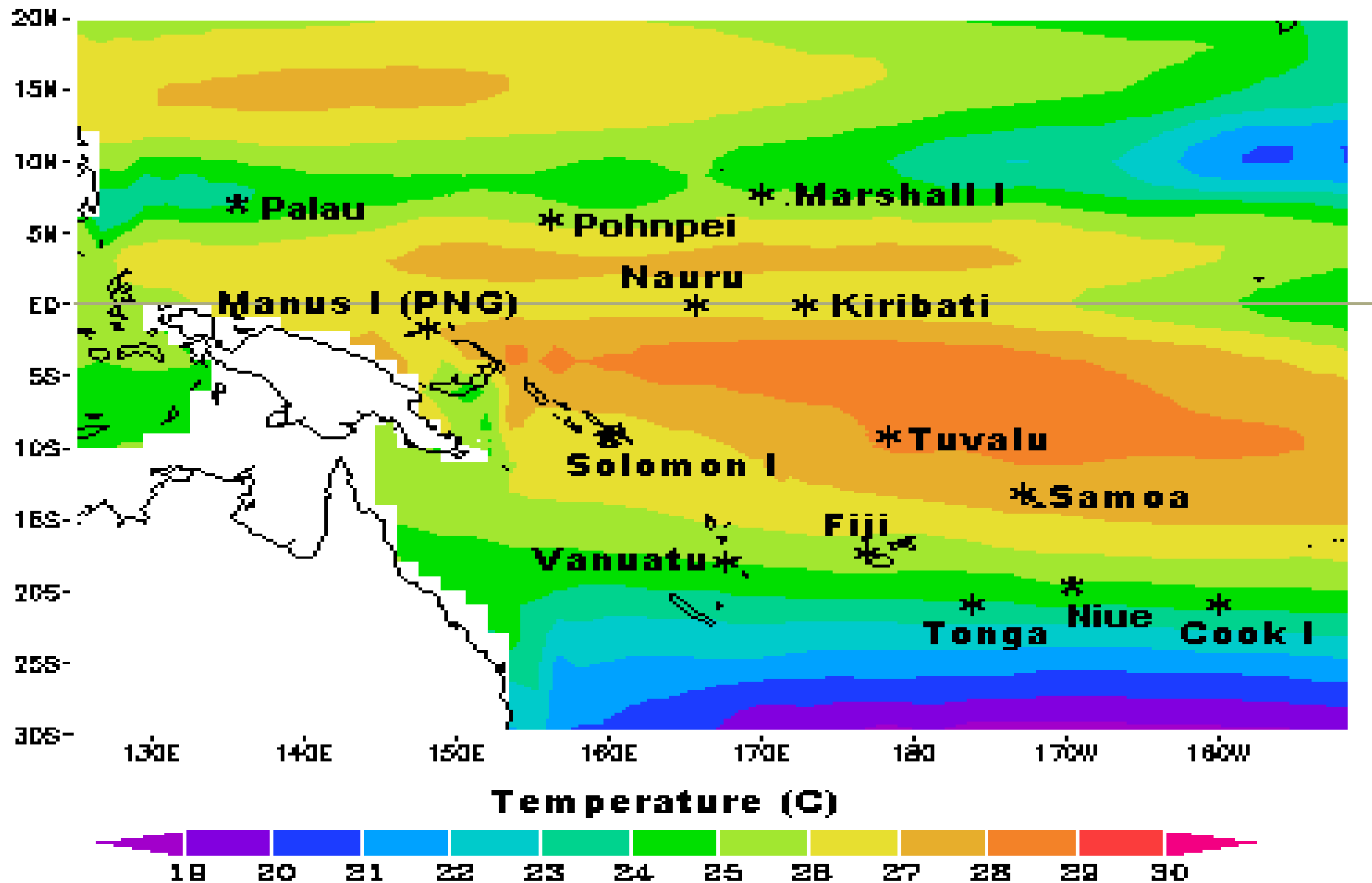
Subsurface Float (Argo)



Argo

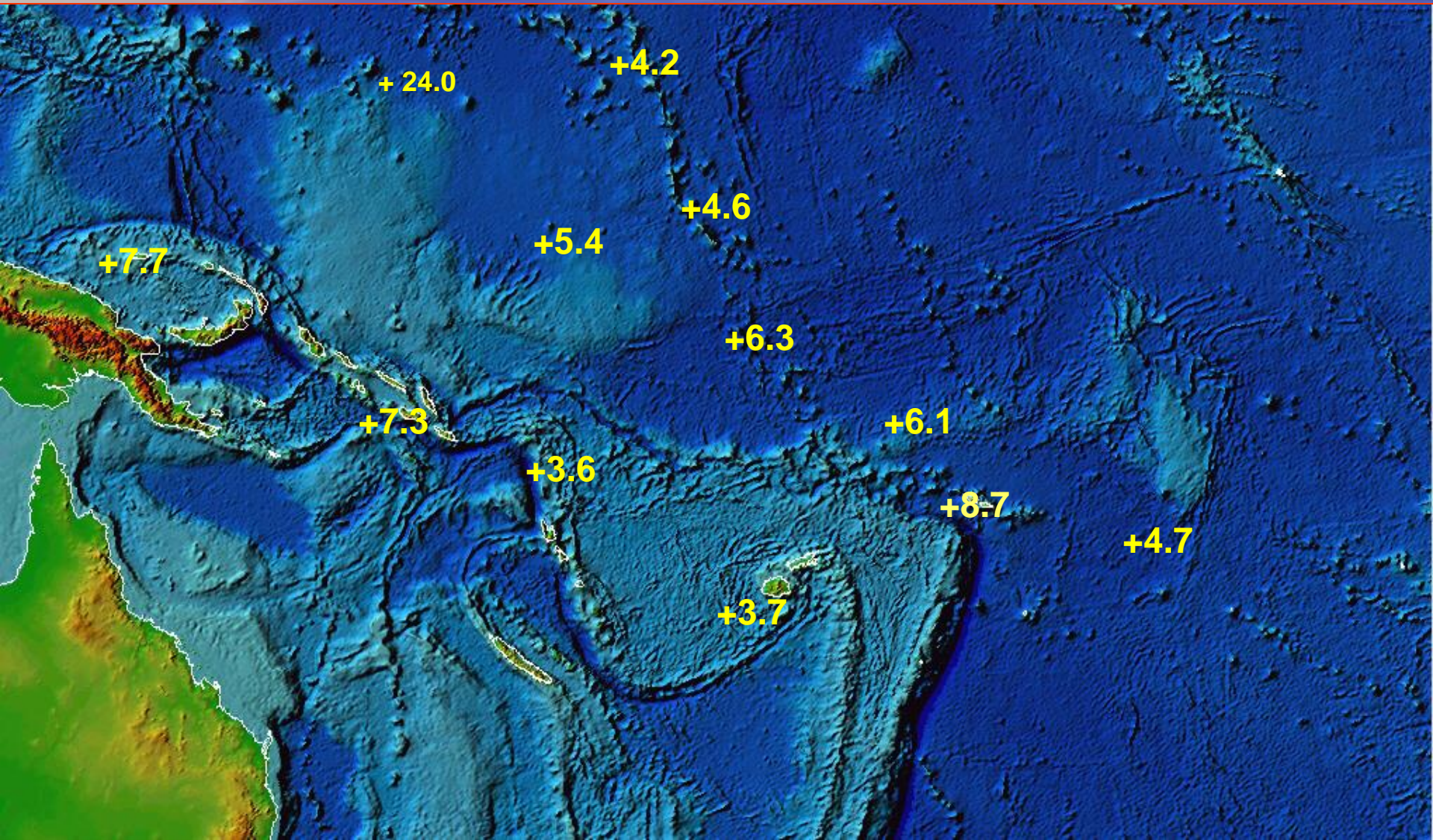


THE South Pacific Convergence Zone- Influence in the Pacific.

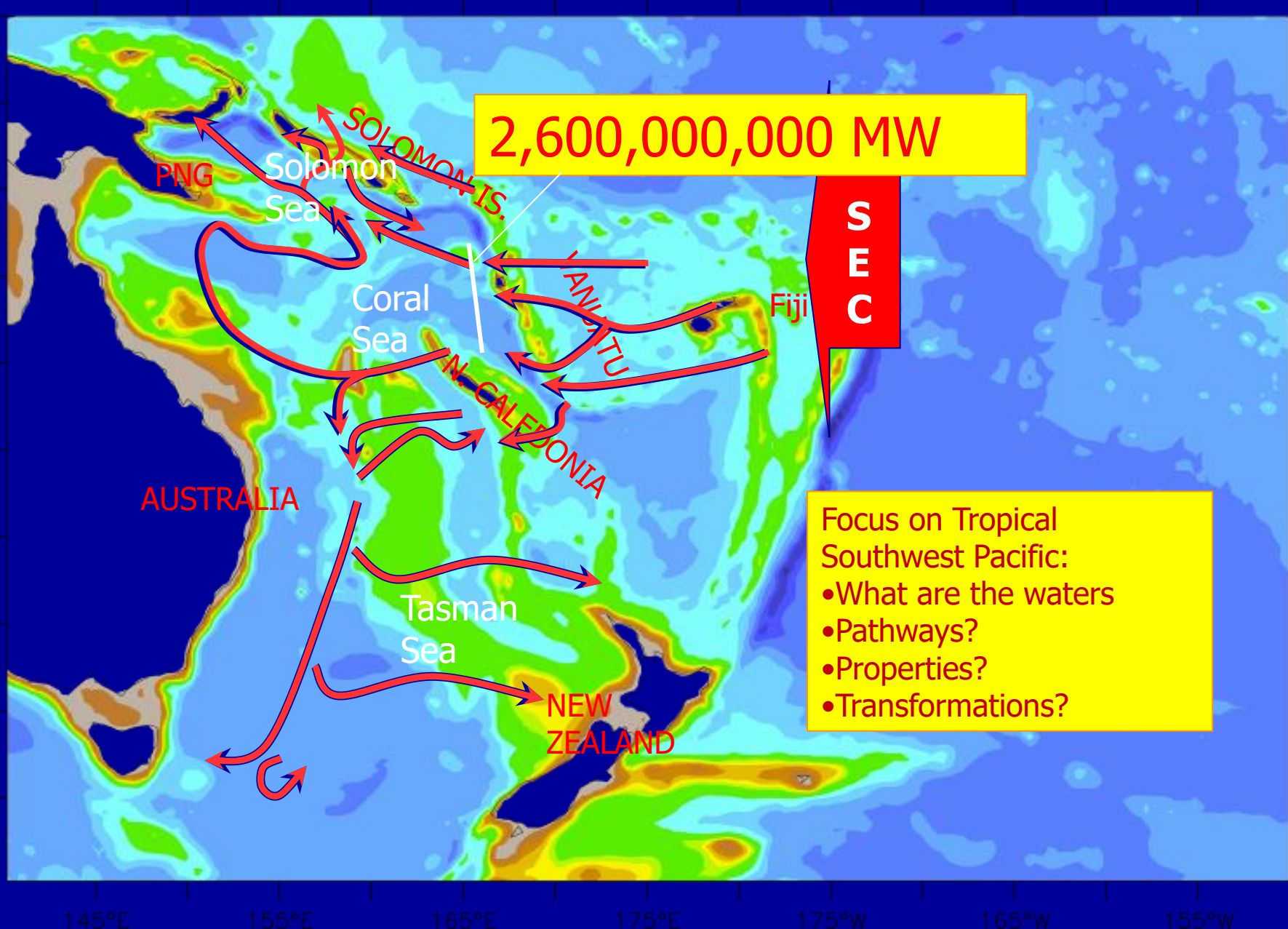


Sea Level Rise Monitoring for 20 years

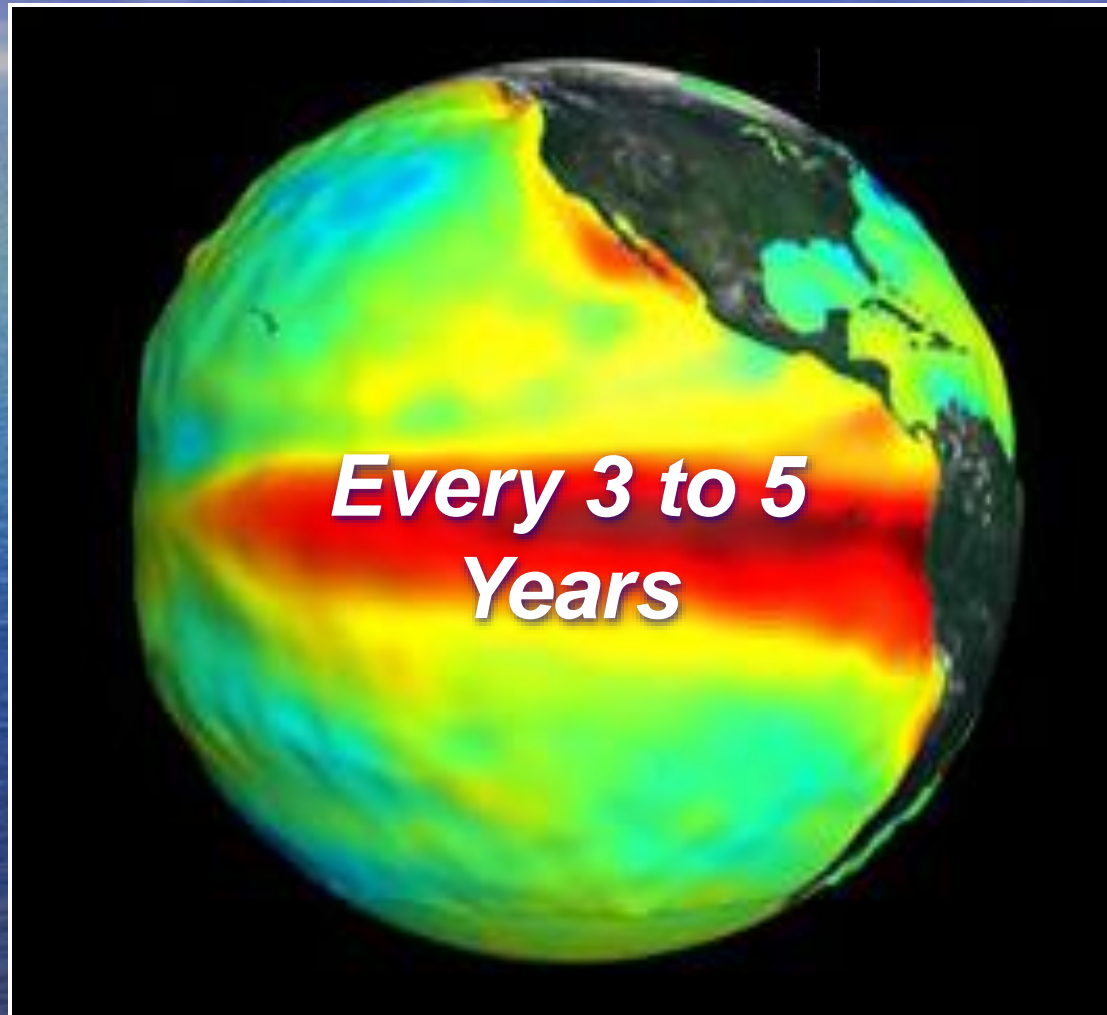
Net relative sea level rise (mm/year 1991-2023)



Fate of the in coming warm water



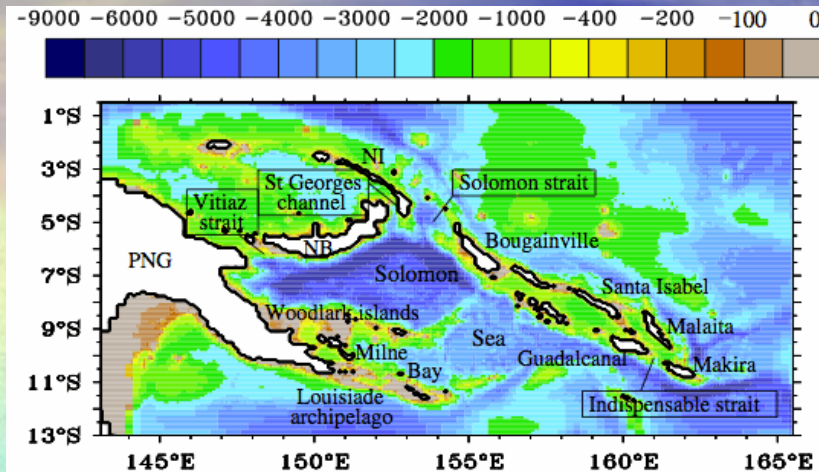
El Niño





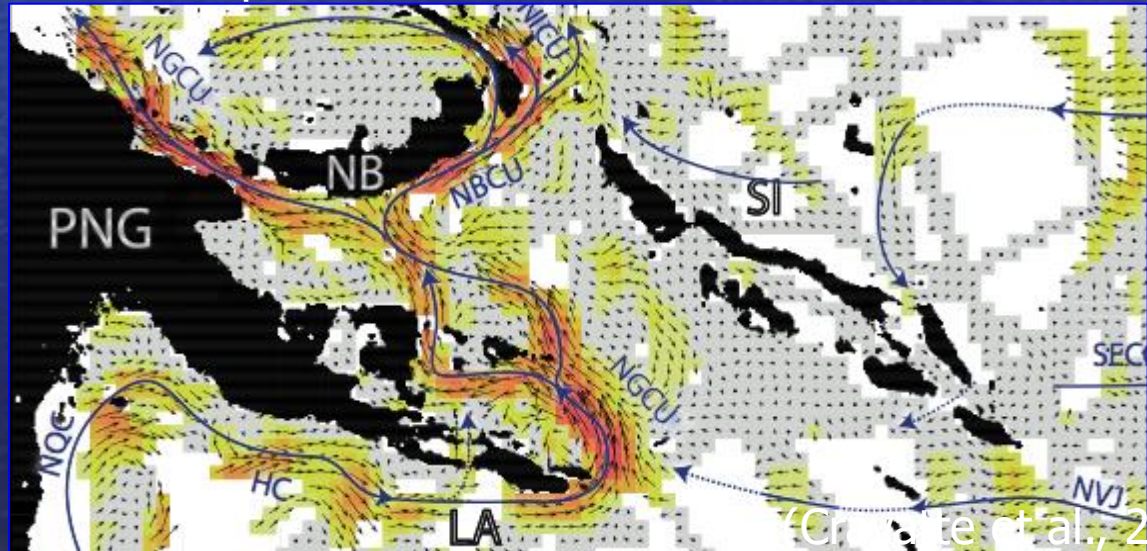
Circulation in the Solomon Sea

www.solomonseaoceanography.org



Three narrow straits
Currents are deep and narrow
Water mass mixing is high
Probable iron input from the margins (fertilizer to biology)

Compilation of surface current observations 198



Numerical modeling is challenging
Very little oceanographic observations
IPCC models have no islands and no straits

Oceanography in the Solomon Sea

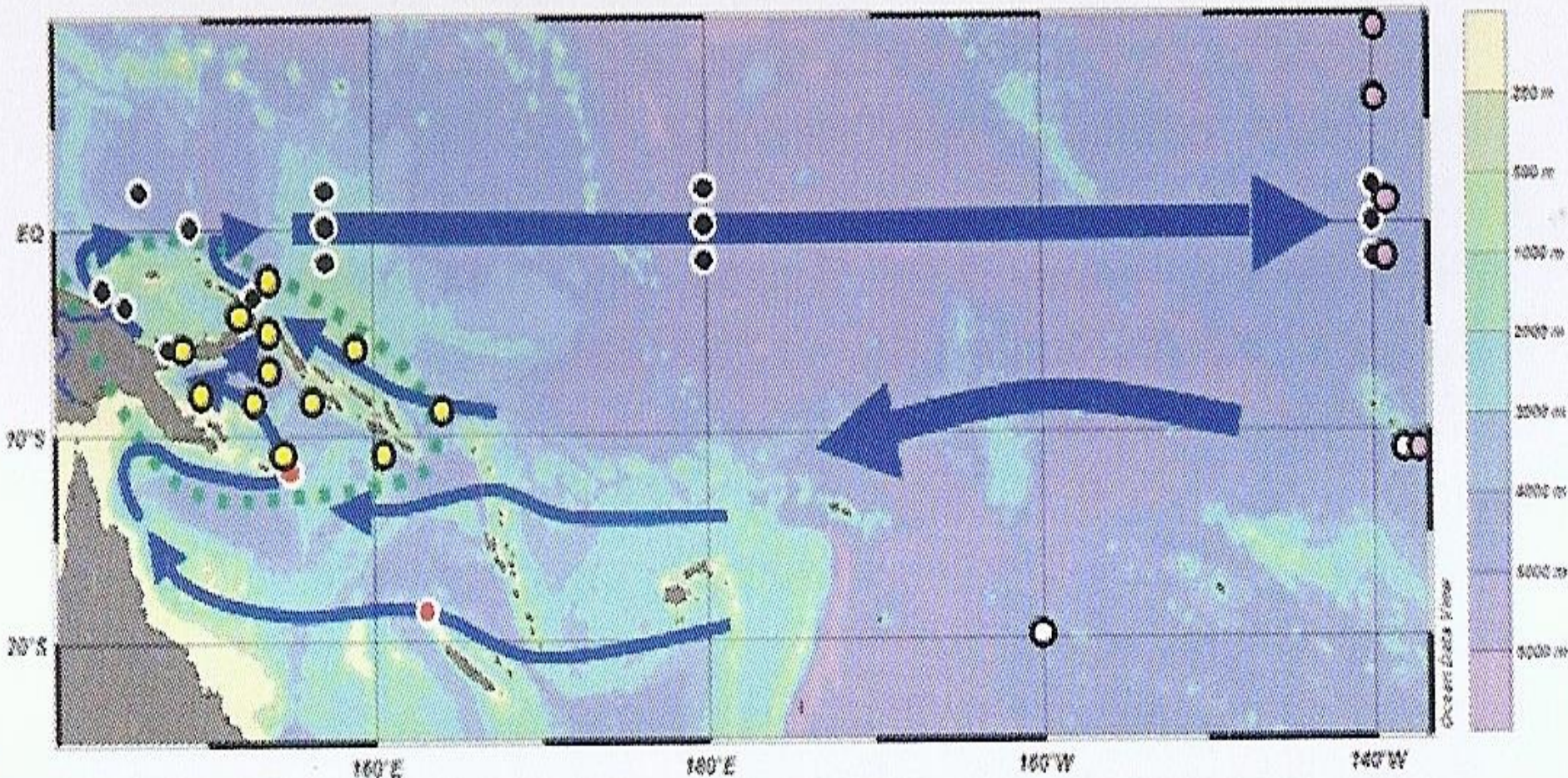
October 24, 2023

UPNG

Technology and Education



GEO-CHEMICAL ANALYSIS IN PNG OCEANS



● Fe and Nd isotopes EUCFe/ISOFERIX 2006

○ Ra isotopes

--- Iron source area



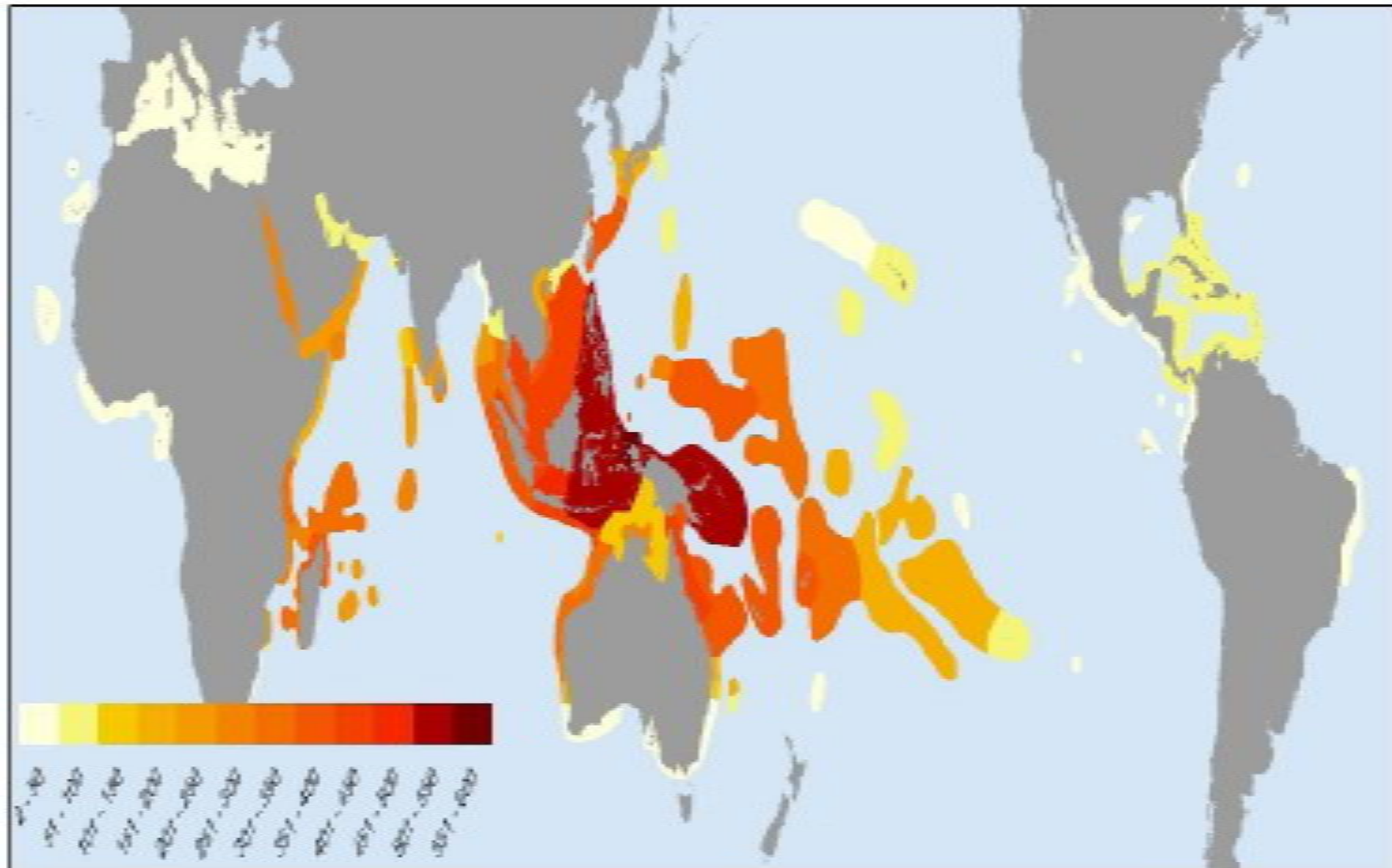
© P.A. Brandl

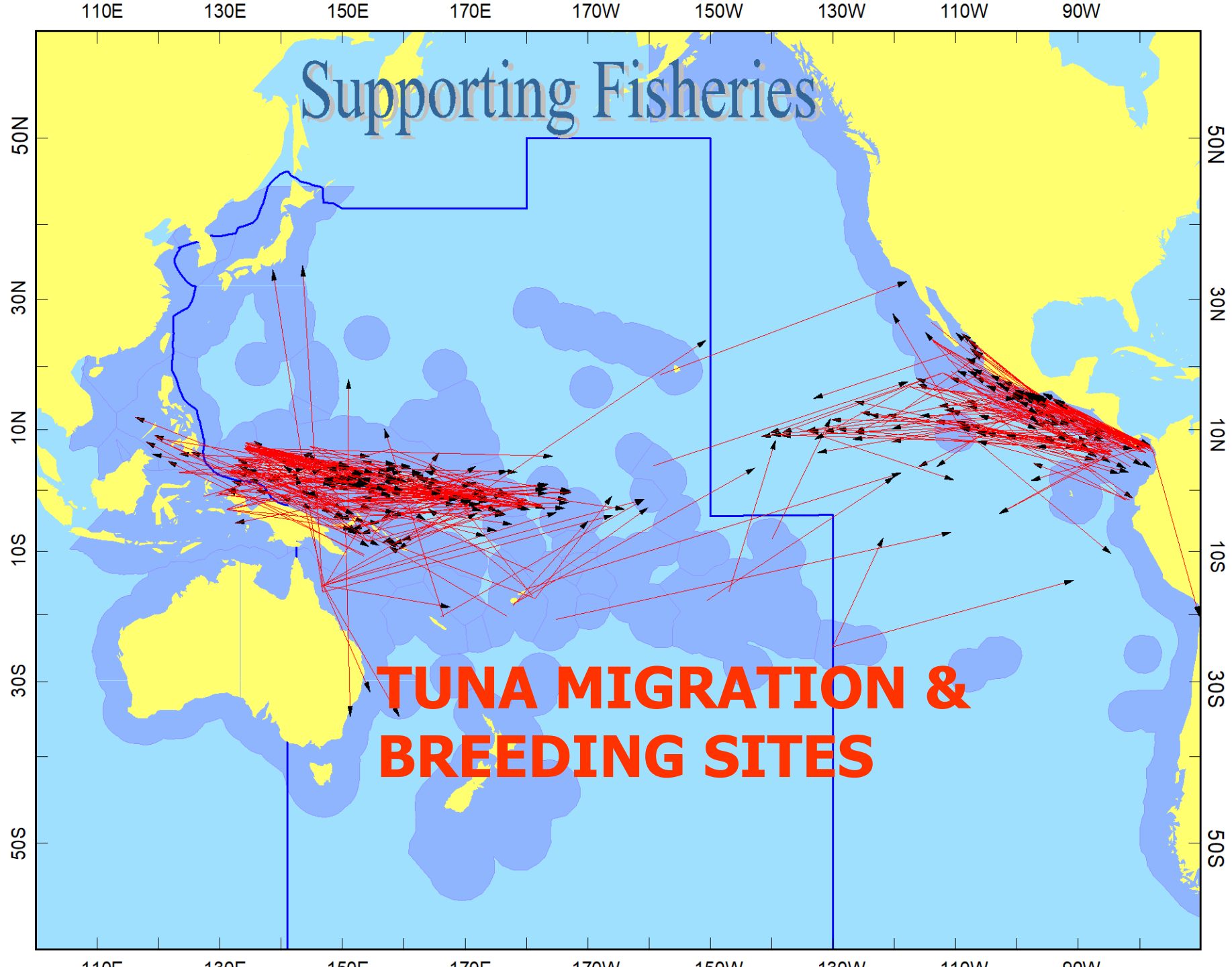


© Christoph Beier



CORAL REEF – FORESTRY OF OCEANS





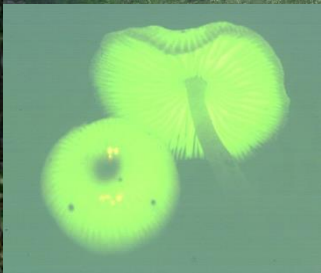
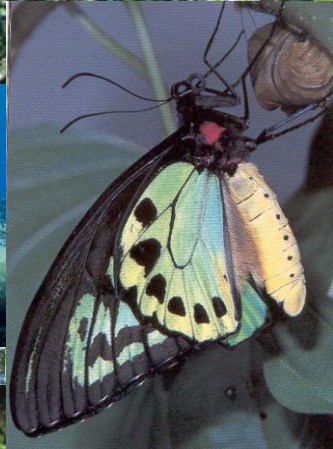
Supporting Fisheries

TUNA MIGRATION & BREEDING SITES




**MANGROVES SPECIES & Economic
Initiatives?**

Loss of Biodiversity





Unique Island Biodiversity Protected

An aerial photograph of a vast, dense tropical forest. The trees are a mix of various shades of green, from deep forest green to lighter, sunlit greens. The forest extends to the horizon under a pale, overcast sky. The text is overlaid on the upper portion of the image.

**Reducing emissions from
deforestation in developing
countries (REDD): Approaches to
Research**



THE UNIVERSITY OF PAPUA NEW GUINEA

RESEARCH IN THE BLUE CARBON SPACE IN PAPUA NEW GUINEA Identify Existing Research That Can Be Aligned To A Blue Carbon Policy

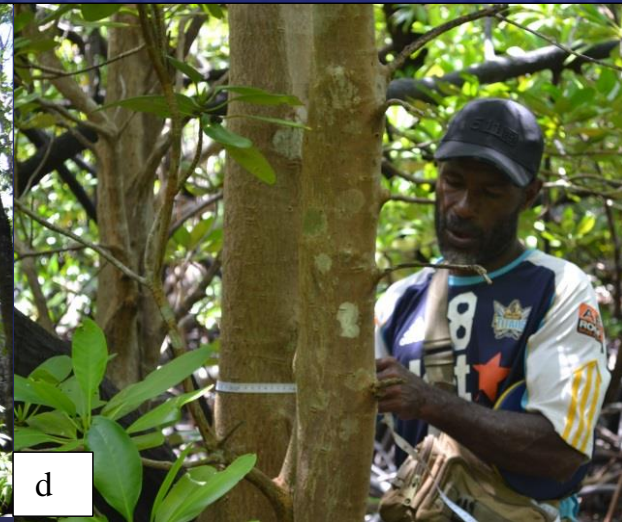


CURRENT RESEARCH / PROJECTS OF BLUE CARBON UNDERTAKEN

- **DHERST - PNGSTC & Universities (SLOSS & Economic)**
- **Blue Carbon Methodology in PNG - Testing**
- **Blue Carbon Initiatives / Projects (Selected)**
 - ❑ **USAID MARSH Project – Training & Academic Degrees**
 - ❑ **Manus Provincial Government - Rapatona Rural LLG, Manus Province (CSIRO Regional Blue Carbon (Gulf Provincial Government – Carbon Nitrogen Analyzer (**
 - ❑ **Central Provincial Government – coastal agrobiodiversity**
 - ❑ **PNGSTC Blue Carbon Proposal (UNDP SGP to CESMER (national NGO) for Rigo Coastal Rural LLG, Central Province – MICADI: MPAs- Fisheries+Blue Carbon**
- **Key Take Aways**
 - ❑ **Blue Carbon and Blue Economy – National Oceans Policy (Customary Marine Tenure Regimes: ownership, access and benefits > blue carbon compensation, investments and trade**



Rapid Biodiversity & Blue Carbon Stock Survey Findings





CORAL REEF PROTECTION & SOCIAL CHALLENGES

A photograph showing a flooded residential area. In the foreground, two men are standing in knee-deep water. The man on the left is wearing a dark polo shirt and shorts, while the man on the right is wearing a green t-shirt. Behind them, a two-story house with a corrugated metal roof is partially submerged. A staircase leads from the ground level to the second floor. To the right, there are several large, spiky-leafed trees, possibly Pandanus, with their roots exposed in the water. The background shows a body of water and a clear sky. The overall scene suggests a coastal area affected by flooding or sea-level rise.

LE MIGRATING & RESETTLEMENT??

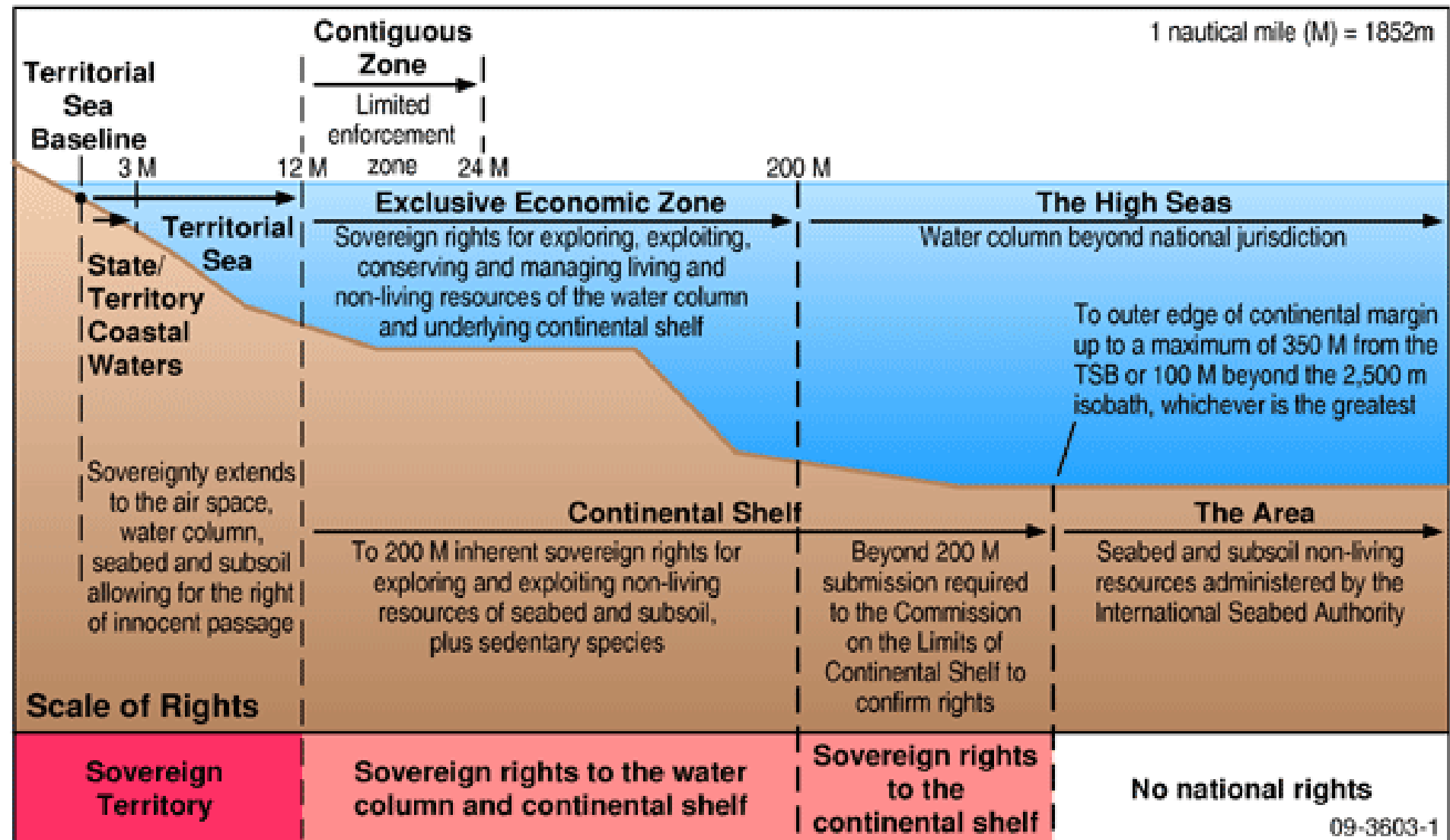
C: Applying Science into Policies/treaties

- UNCLOS (1982) – Law of the Sea
- IMO
- UNFCCC & UN Biodiversity

- **SPREP/Noumea**
- **FFA**
- **Waigani**

- **Law of the Sea-International**
- **IMO-MARPOL**
- **NOUMEA /SPREP Treaty**
- **Environmental Act 2000**
- **National Disaster Act**
- **NMSA- Marine Pollution**
- **Fisheries Act**
- **Torres Strait Treaty**

zones claimable under LOSC. In the case of Archipelagic States like PNG, Archipelagic Waters are also claimable to landward of the Baseline



Application of Science in the Pacific/SIDS



PACIFIC Ocean Policy Management Framework

- **5 PRINCIPLES**

1. Improve governance of coasts and the ocean

- **National and Provincial Policies**
- **Access and Benefit sharing**
- **Illegal Activities**

2. Adopt an integrated approach to the sustainable development and management of coasts and the ocean

- **Cultural/livelihoods, Environment & Economic Considered**
- **Marine Pollution**
- **Precautionary measures**
-

3. To build capacity of PACIFIC communities for sustainable development and management

- **Capacity Building and Training**
- **Data/information to support Policy Decision**
- **Monitoring, Compliance & Surveillance**

4. Foster alliances for securing a healthy ocean

- **Attitudes & Behavior Changed**
- **Gain recognition by all-international**
- **Maximize Ocean issues**

5. Establish high-level leadership on ocean issues and commitment to effective management of oceans resources

- Develop advocates among national politicians, policy makers and heads of Provincial Govts.**



OFFICE OF OCEAN AFFAIRS



PAPUA NEW GUINEA MARINE SCIENTIFIC RESEARCH GUIDELINES 2021



Marine Scientific Research Committee
OFFICE OF OCEANS AFFAIRS
Department of Justice & Attorney General
Waigani, National Capital District
Papua New Guinea



PACIFIC WAY- SUSTAINABLE DEVELOPMENT PILLARS /

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- ❖ Sector

The FUTURE- A NO-REGRETS OPTION



A tropical island with a white sandy beach and a cluster of palm trees, viewed from the water. The sky is blue with some light clouds. The water in the foreground is a vibrant turquoise color with gentle ripples.

TENK YU TUMAS