
APEC CLIMATE SYMPOSIUM 2018
21-23 August 2018
Port Moresby, Papua New Guinea

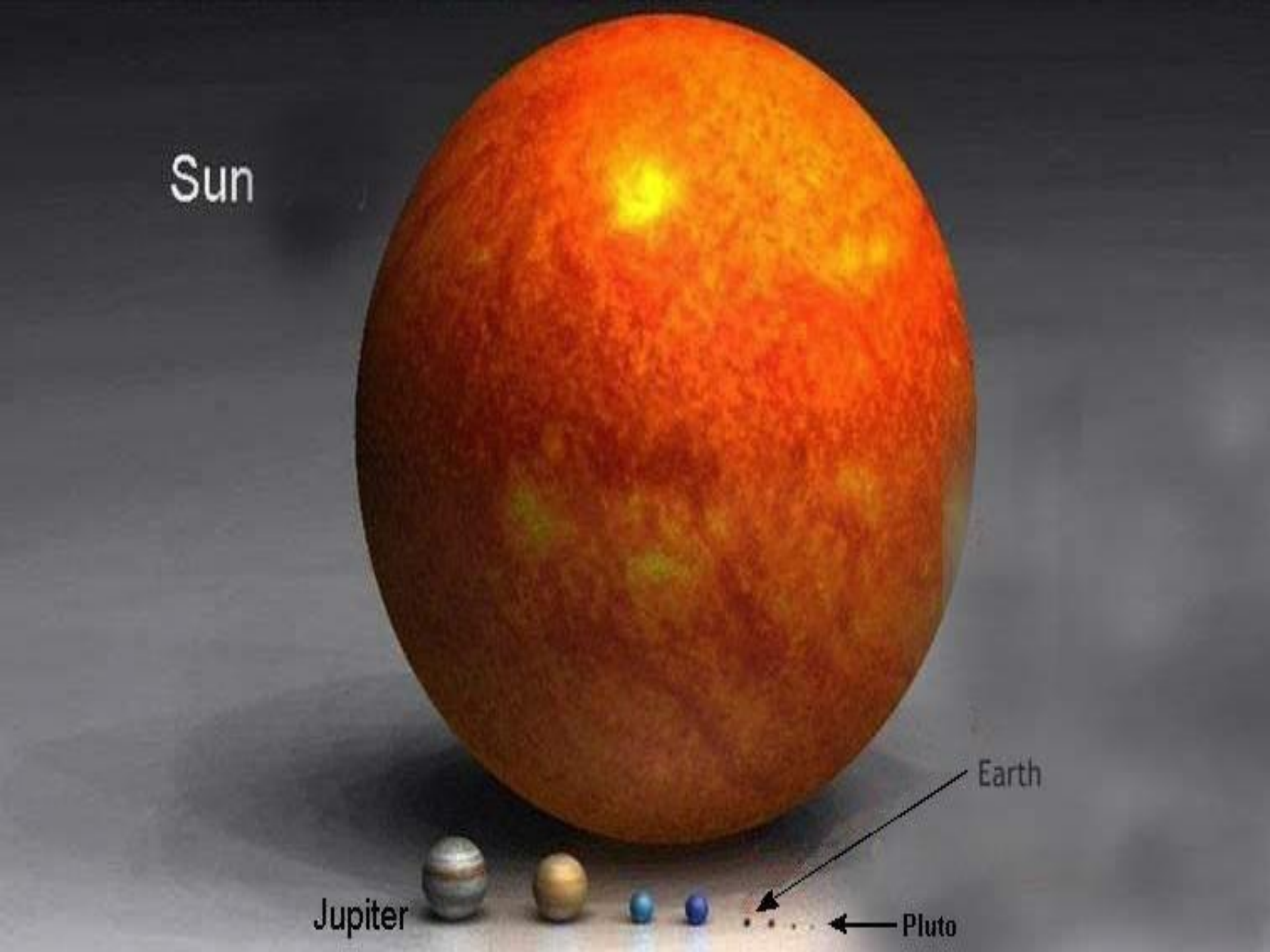
APEC CLIMATE SYMPOSIUM

August 21-23 August 18
Port Moresby, Papua New Guinea

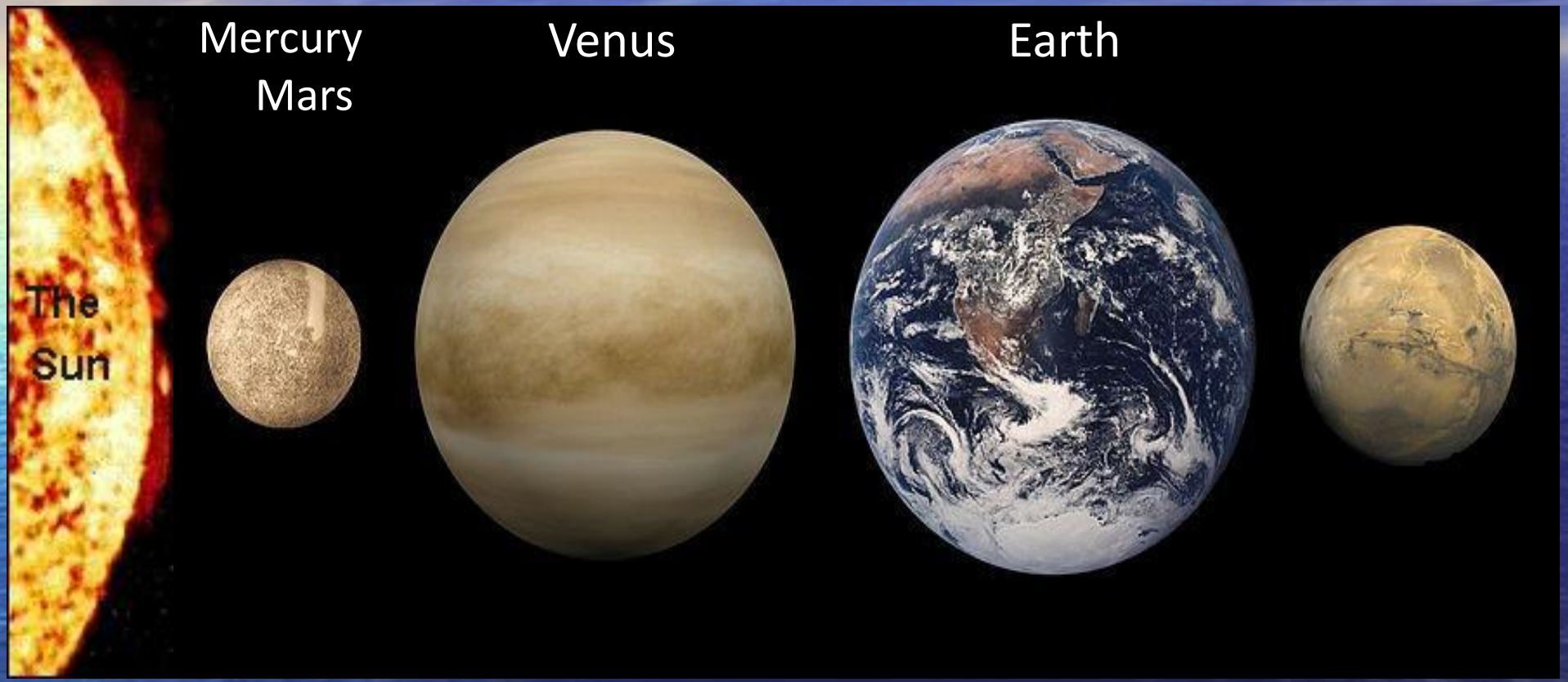
- **Prof Chalapan Kaluwin**
- **University of Papua New Guinea**

Presentation

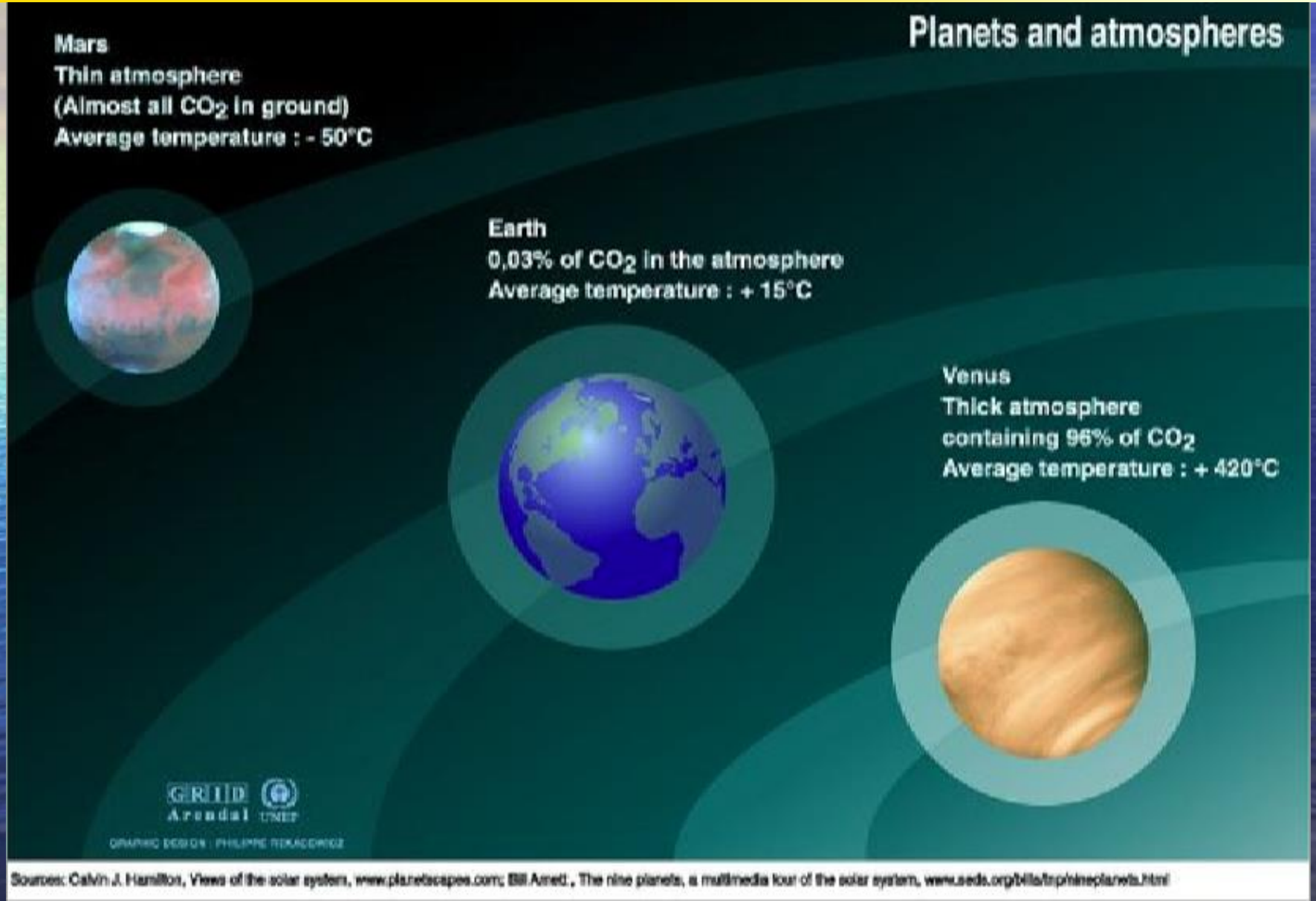
- Introduction
- Science of Climate Change Variability and Sea level Rise
- Risks and Management Approaches
- Conclusion


Sun
Earth
Jupiter
Pluto

Which planet is the warmest?



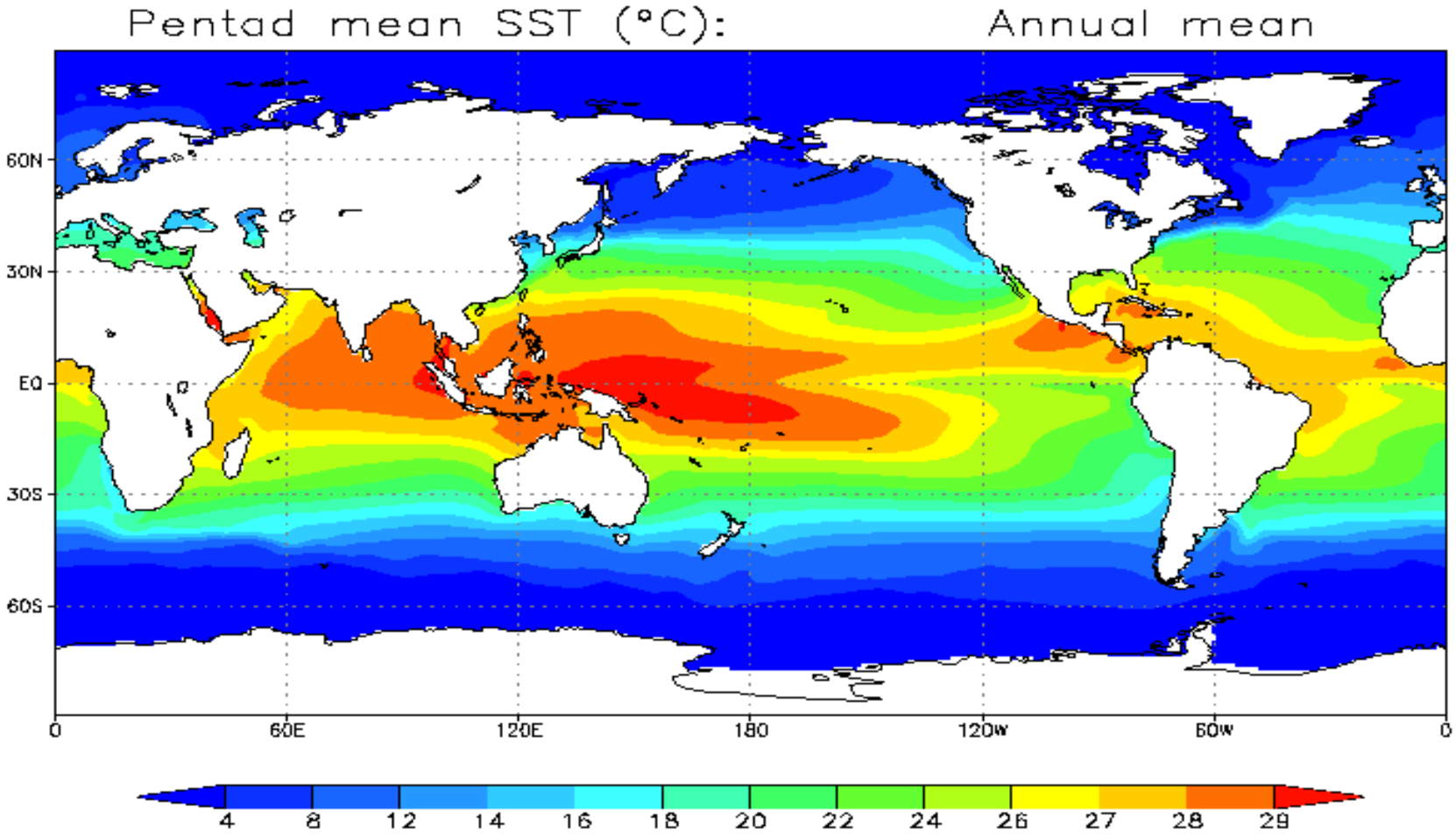
Answer to the exercise



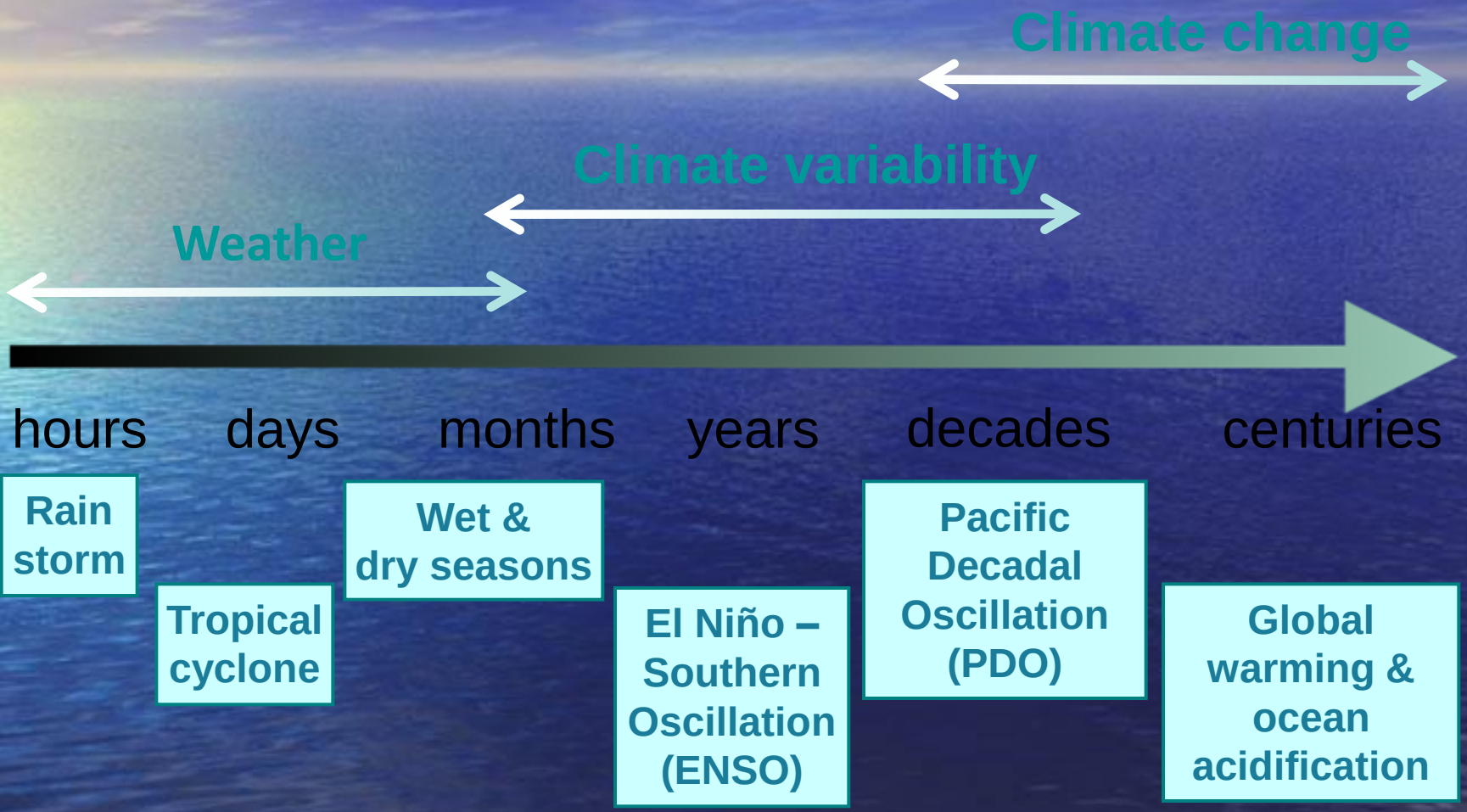

The earth is warming!!!!-
The Greatest challenge to Man-kind


FUCK
THE
PLANET
I'll be dead
soon anyway.

GLOBAL MEAN SEA SURFACE TEMPERATURE

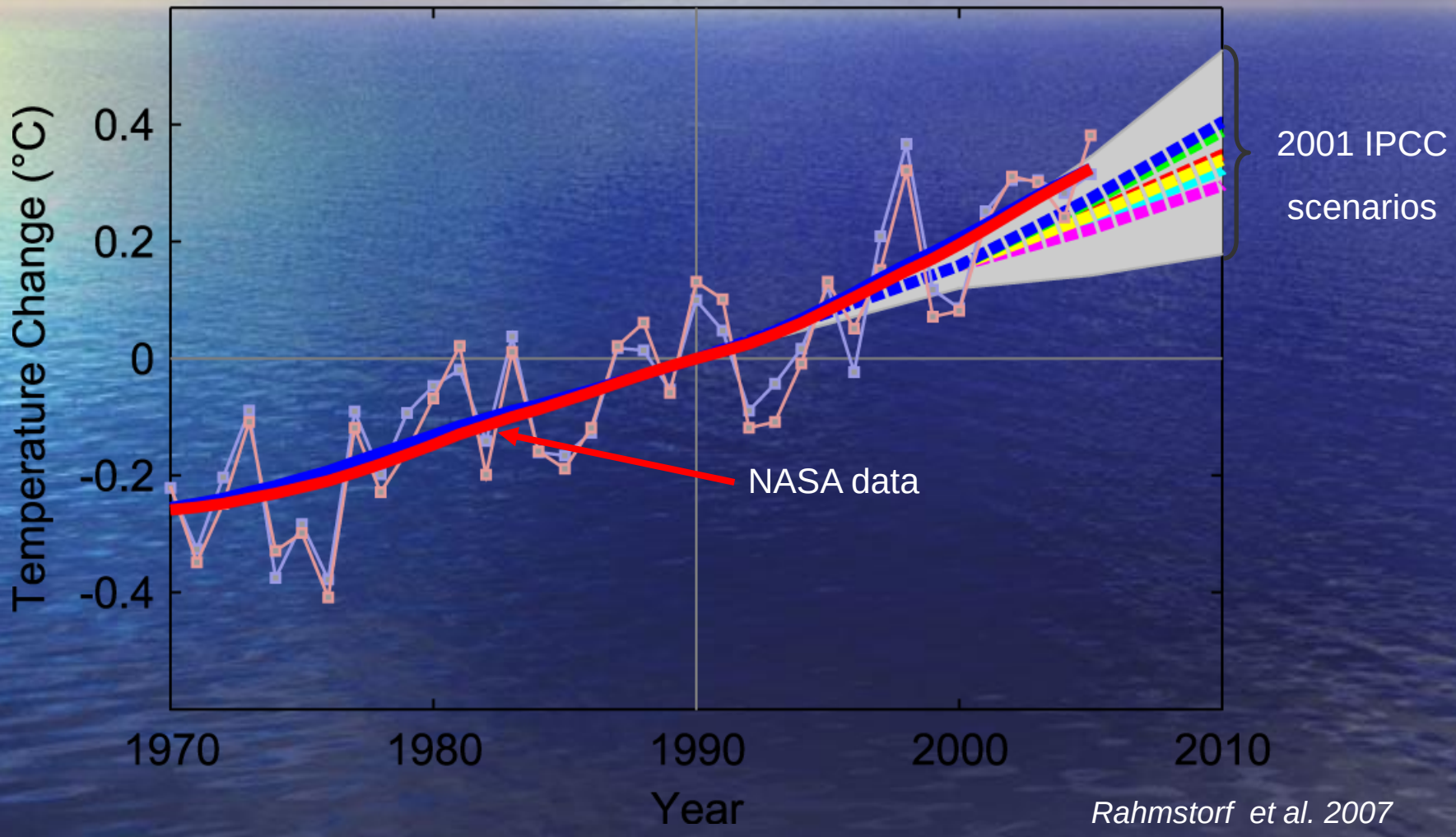


Weather and climate Time scales

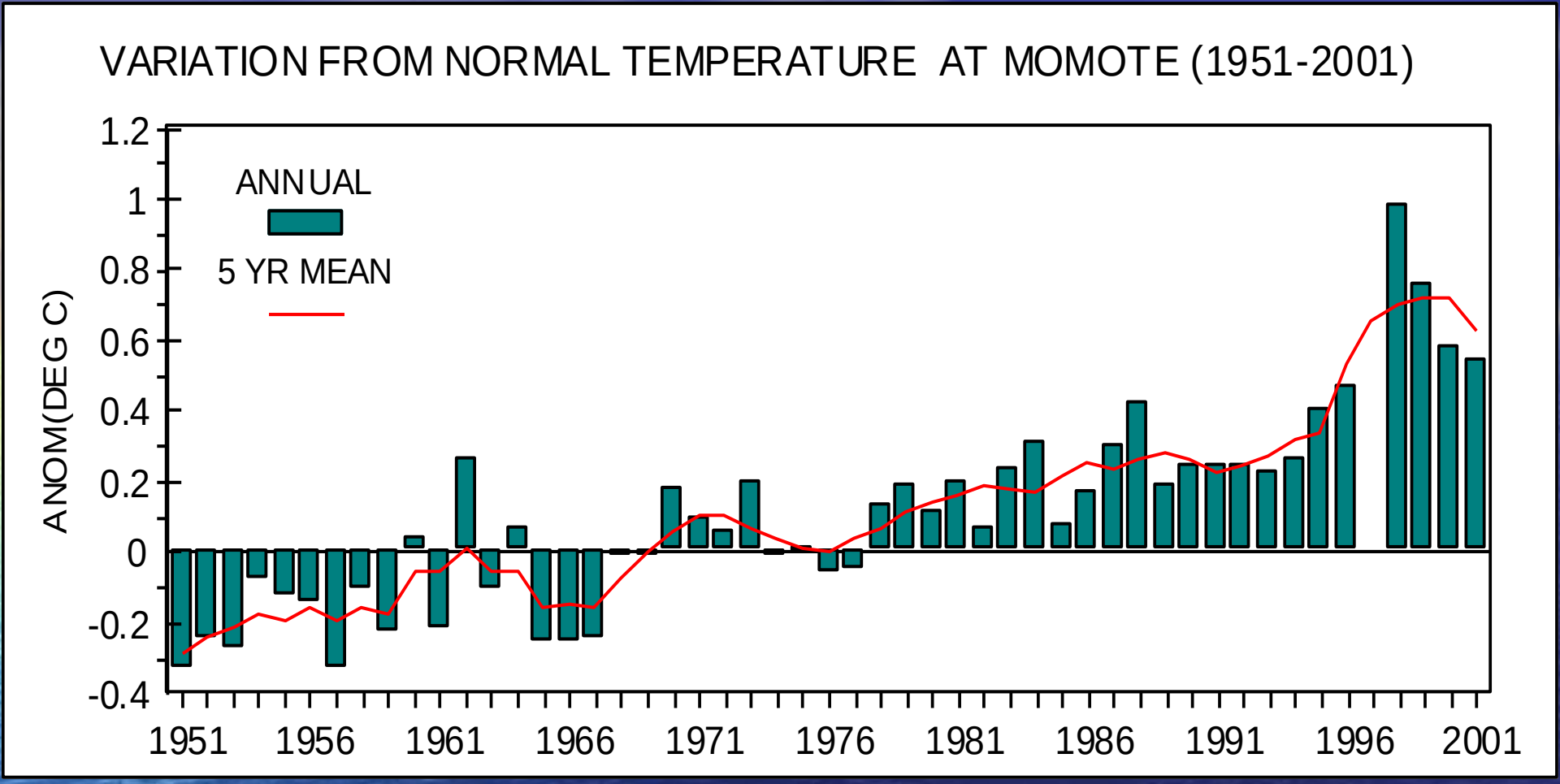


WHAT DOES CLIMATE CHANGE MEAN FOR APEC COUNTRIES & SIDS

How bad is it going to get?

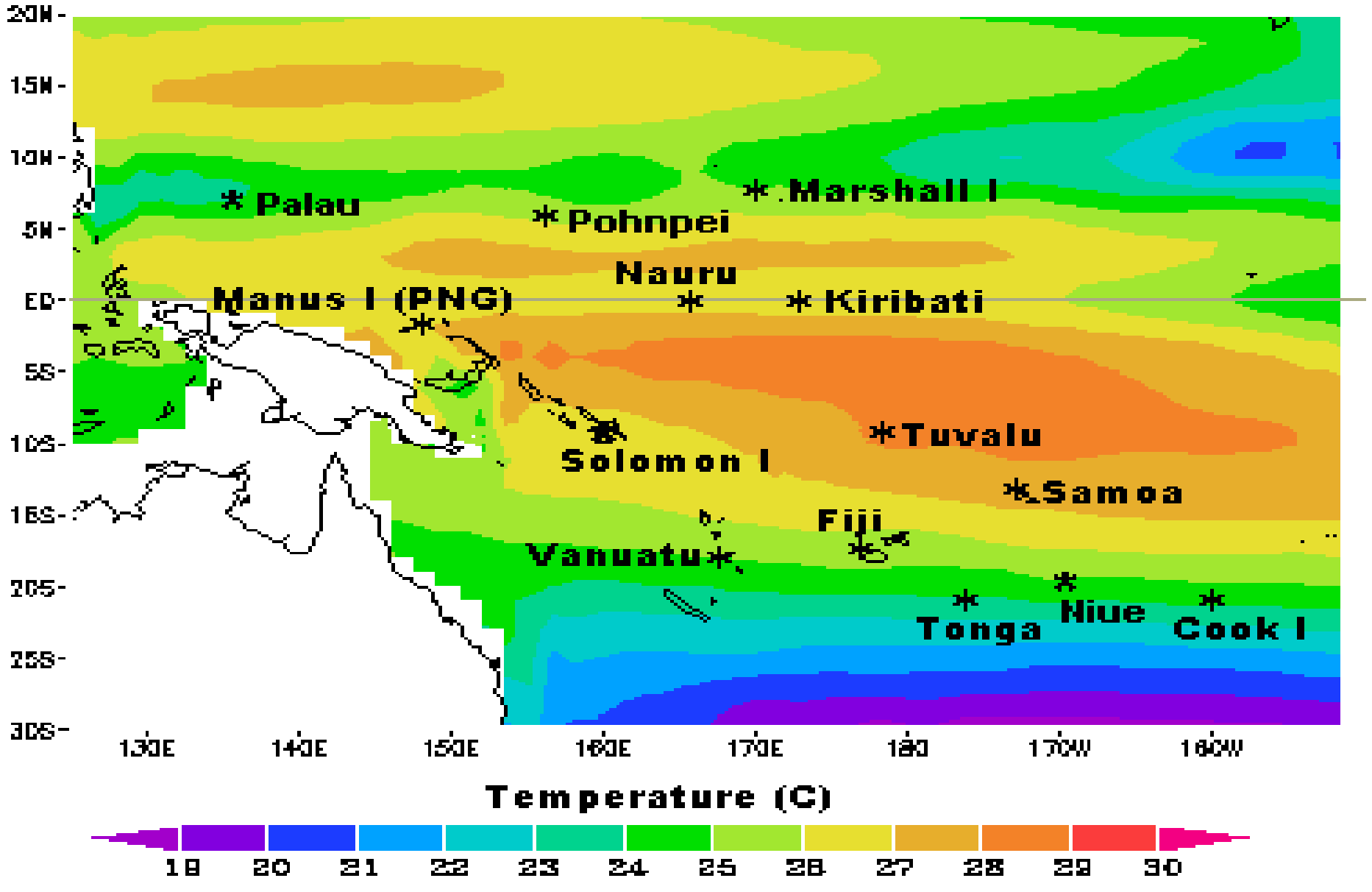


Rahmstorf et al. 2007

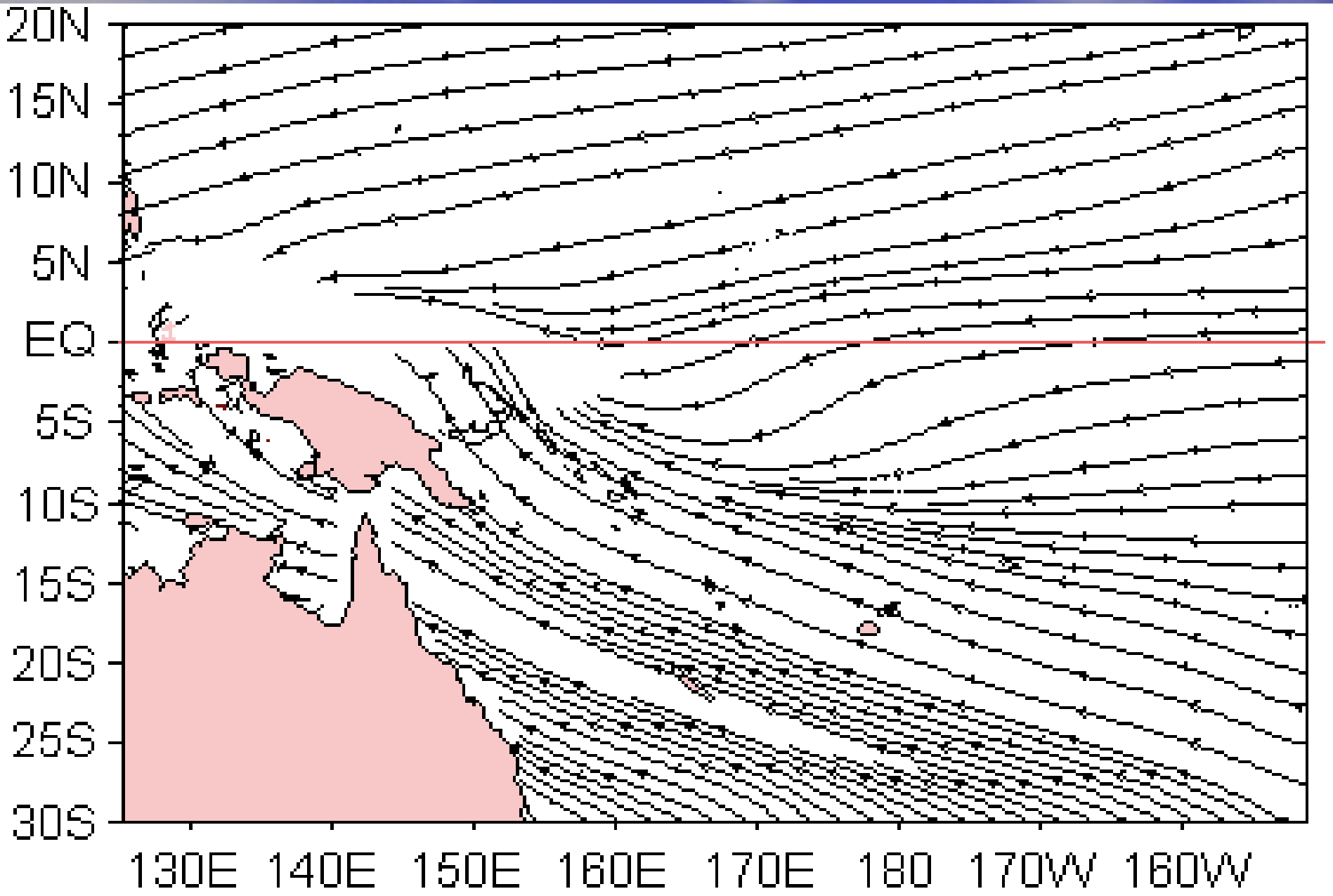


Temperature Variation in Momotee Airport, Manus Province

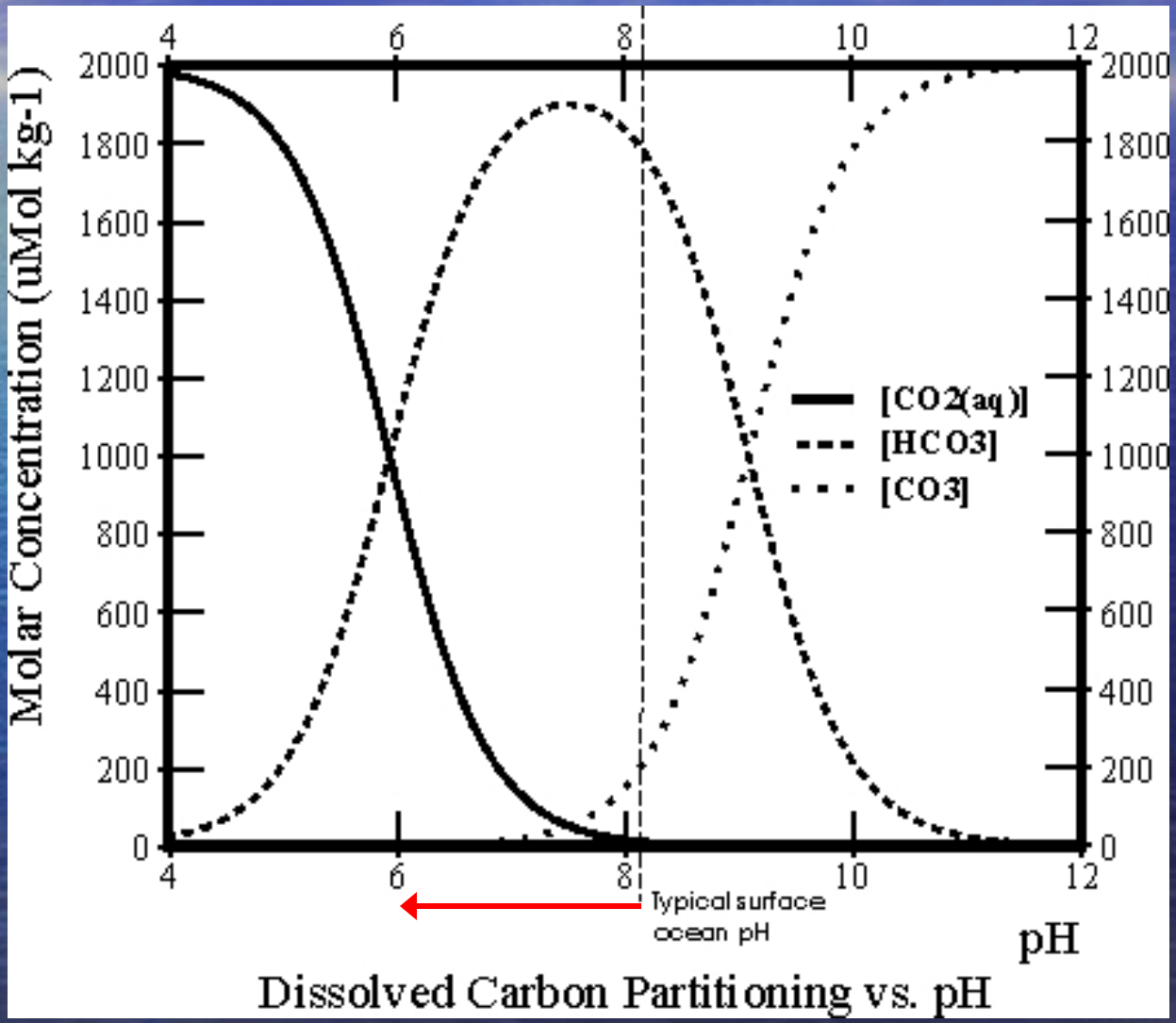
THE South Pacific Convergence Zone- Influence in the Pacific.



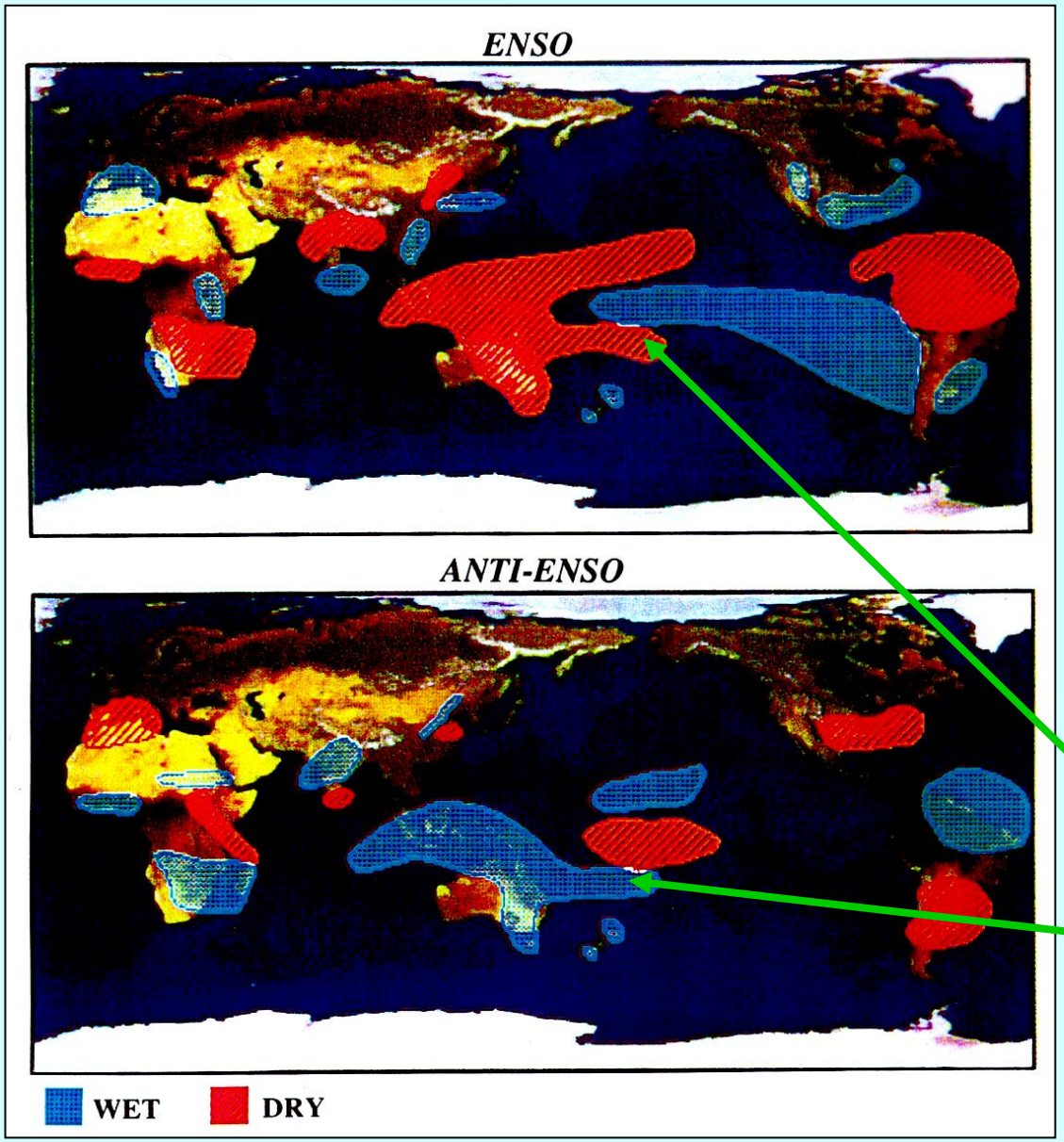
THE STREAMLINE OF MEAN SURFACE WIND



Ocean acidification



El Niño Southern Oscillation (ENSO) Impacts



Wetter and Drier regions associated with

ENSO

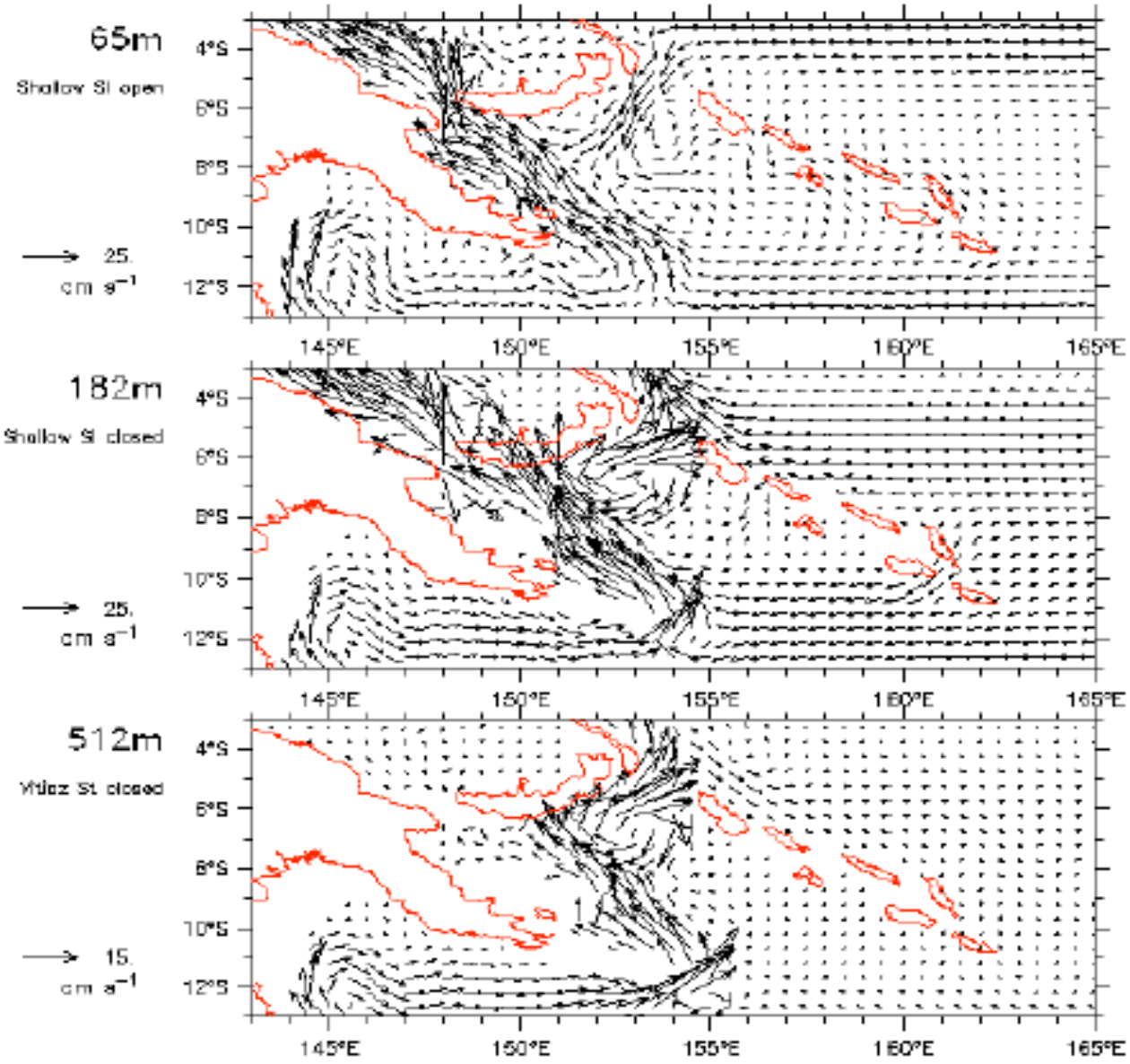
and

La Nina (anti-ENSO)

episodes

PNG

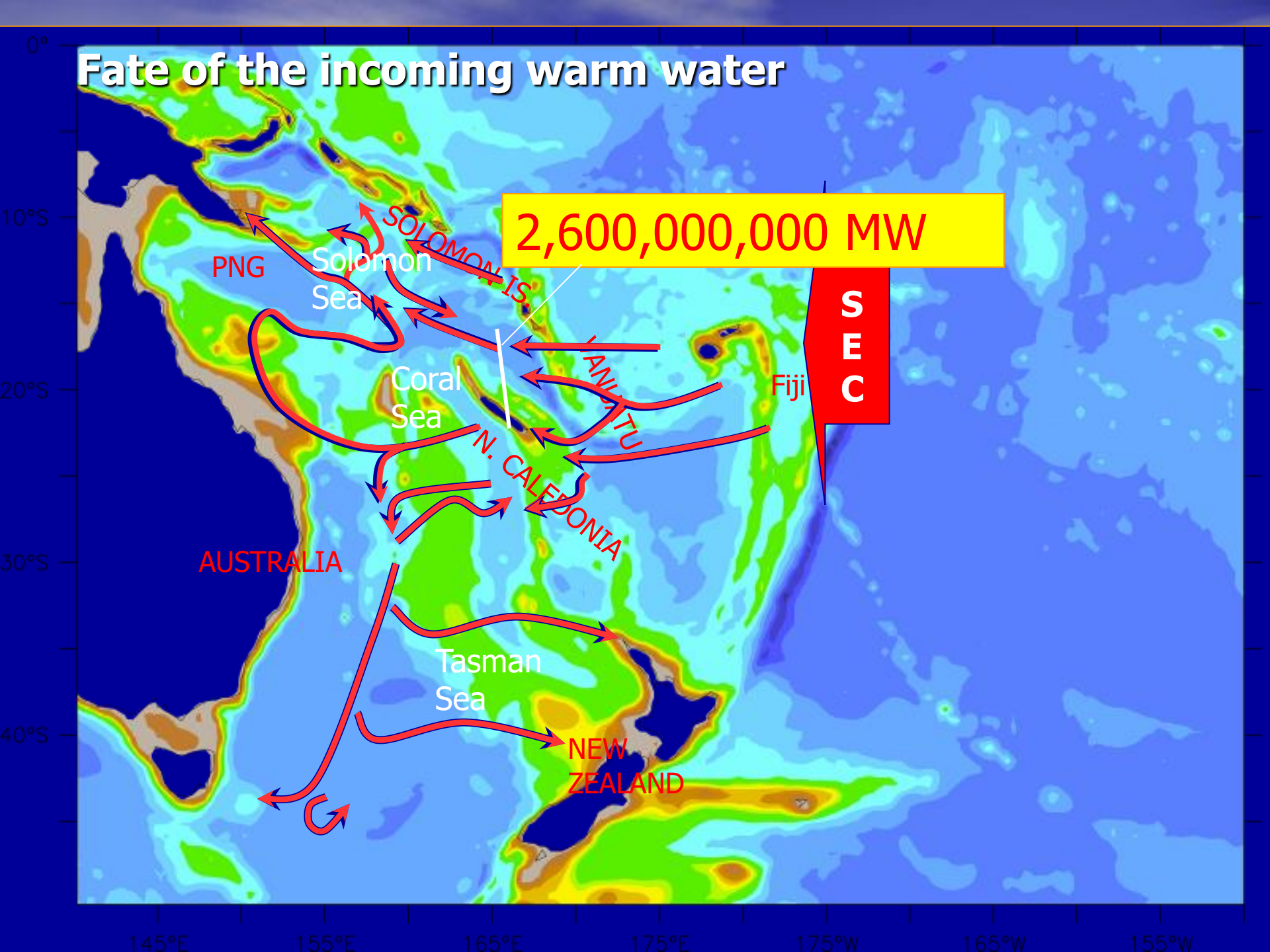
ORCA model circulation at surface, thermocline and below



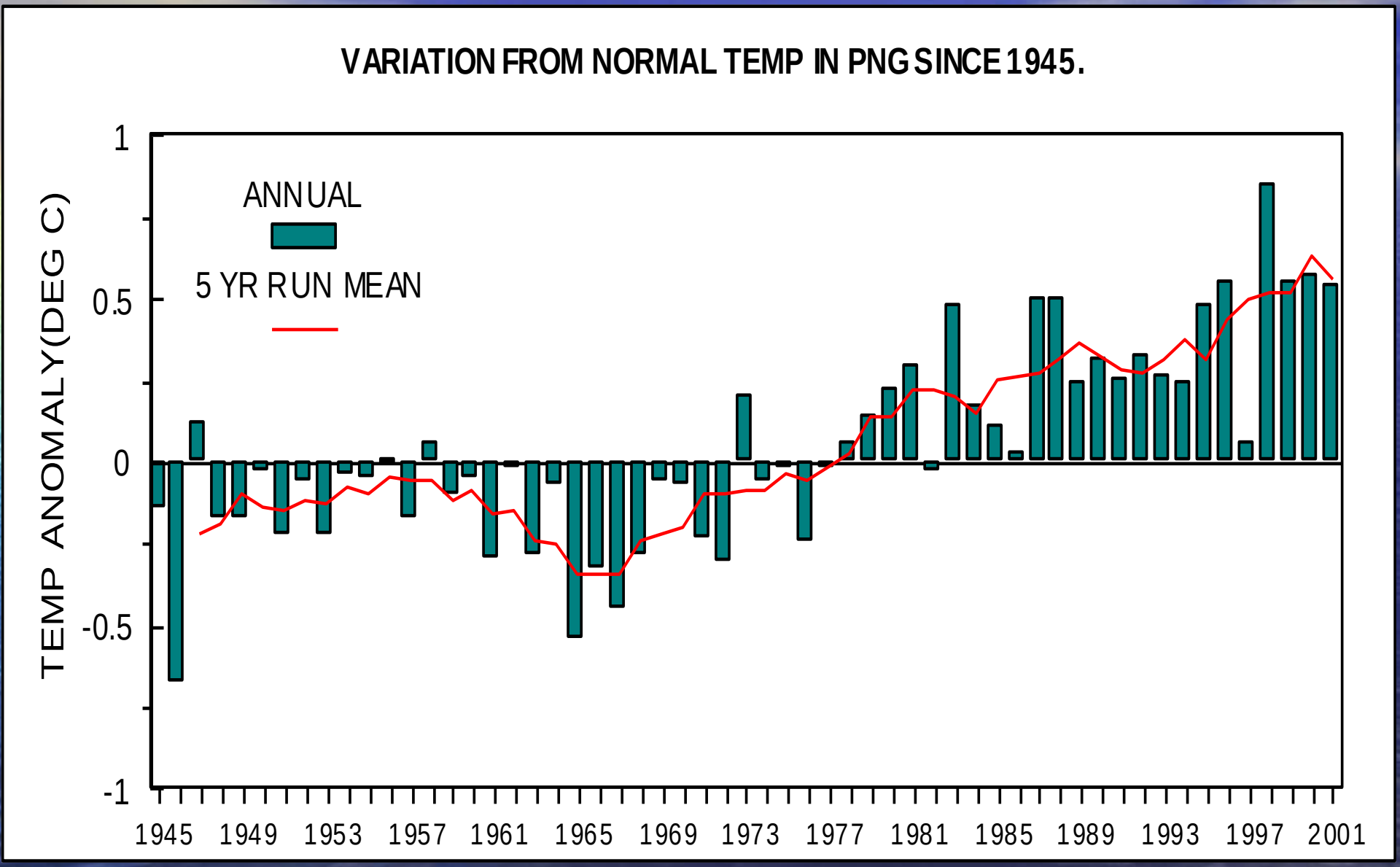
Above 100m:
Flow through Sol. St. is *southward*.
(Consistent w/ obs).

Thermocline level:
Sol. St. flow is northward
(Pacific inflow ~1/2 total).

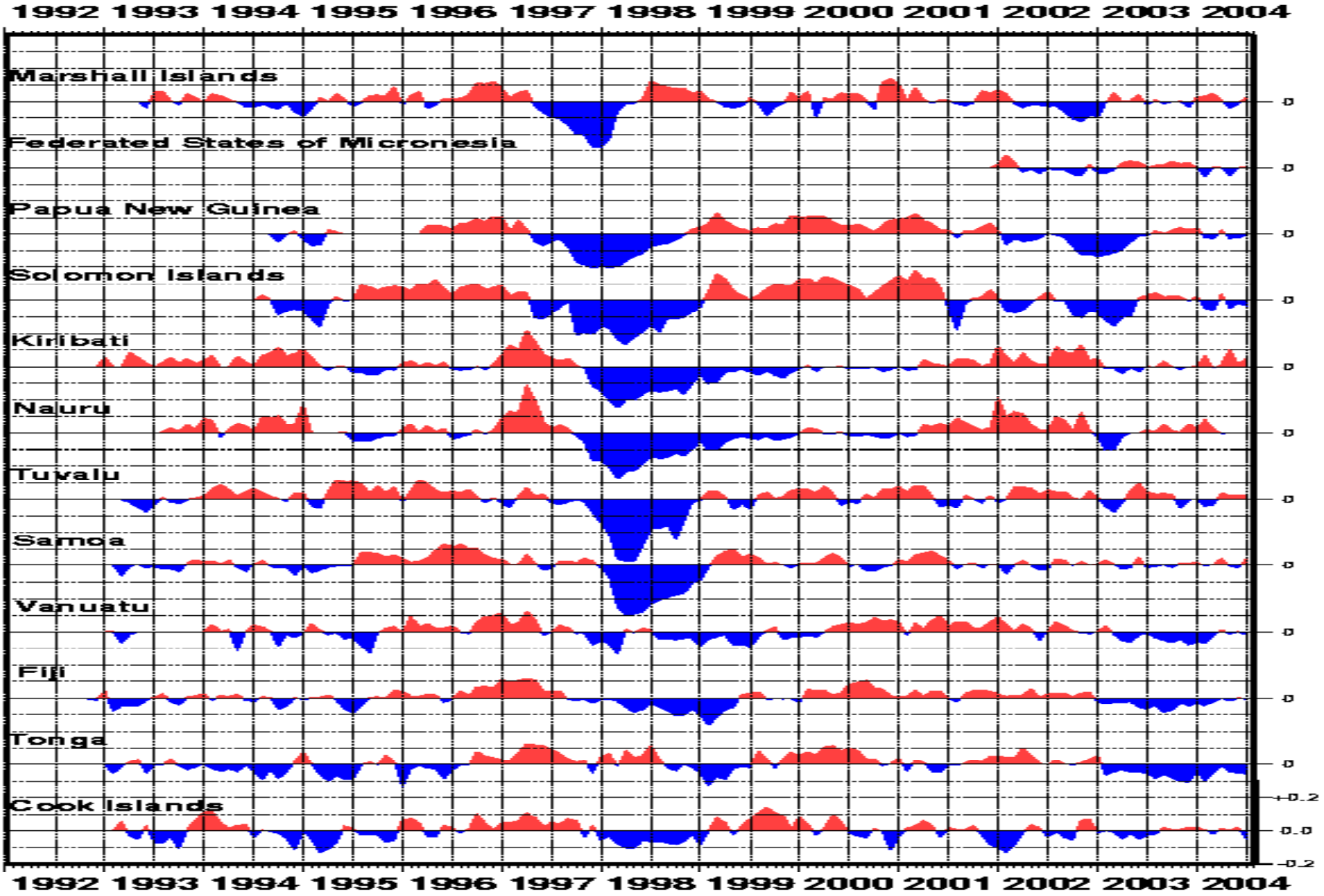
Below Vitiaz St:
Entire WBC exits Solomon Sea via Sol. St.
(No Pacific inflow).


Fate of the incoming warm water
2,600,000,000 MW
PNG
Solomon Sea
SOLOMON IS.
Coral Sea
VANUATU
Fiji
SEC
N. CALEDONIA
AUSTRALIA
Tasman Sea
NEW ZEALAND
0°
10°S
20°S
30°S
40°S
145°E
155°E
165°E
175°E
175°W
165°W
155°W

PNG IS ALSO WARMING



SEA LEVEL ANOMALIES THROUGH JUNE 2004 (m)



Sea Level Rise/Changes =

TIDE LEVEL + WIND EFFECT +

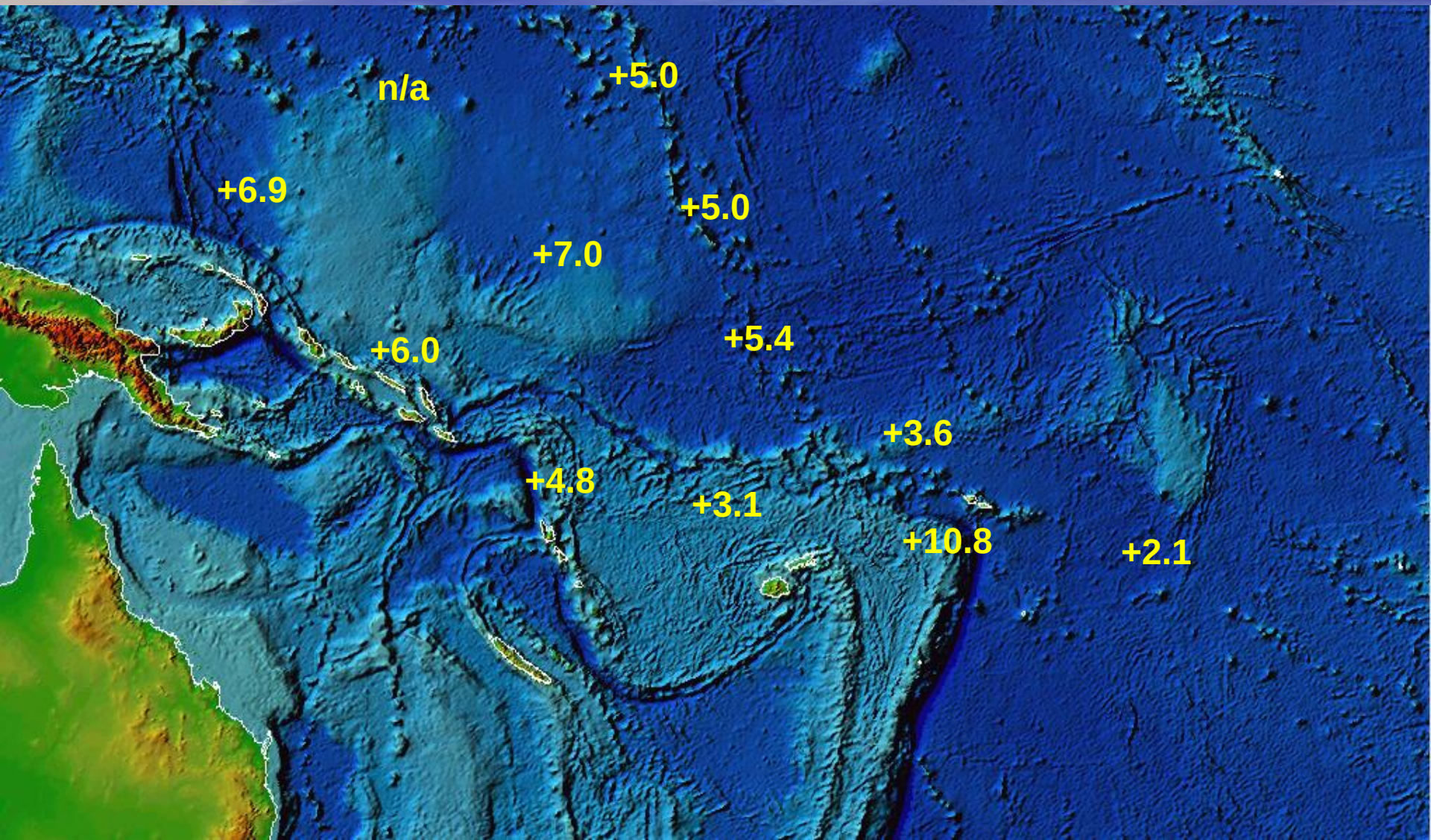
ATMOSPHERIC EFFECT + LAND

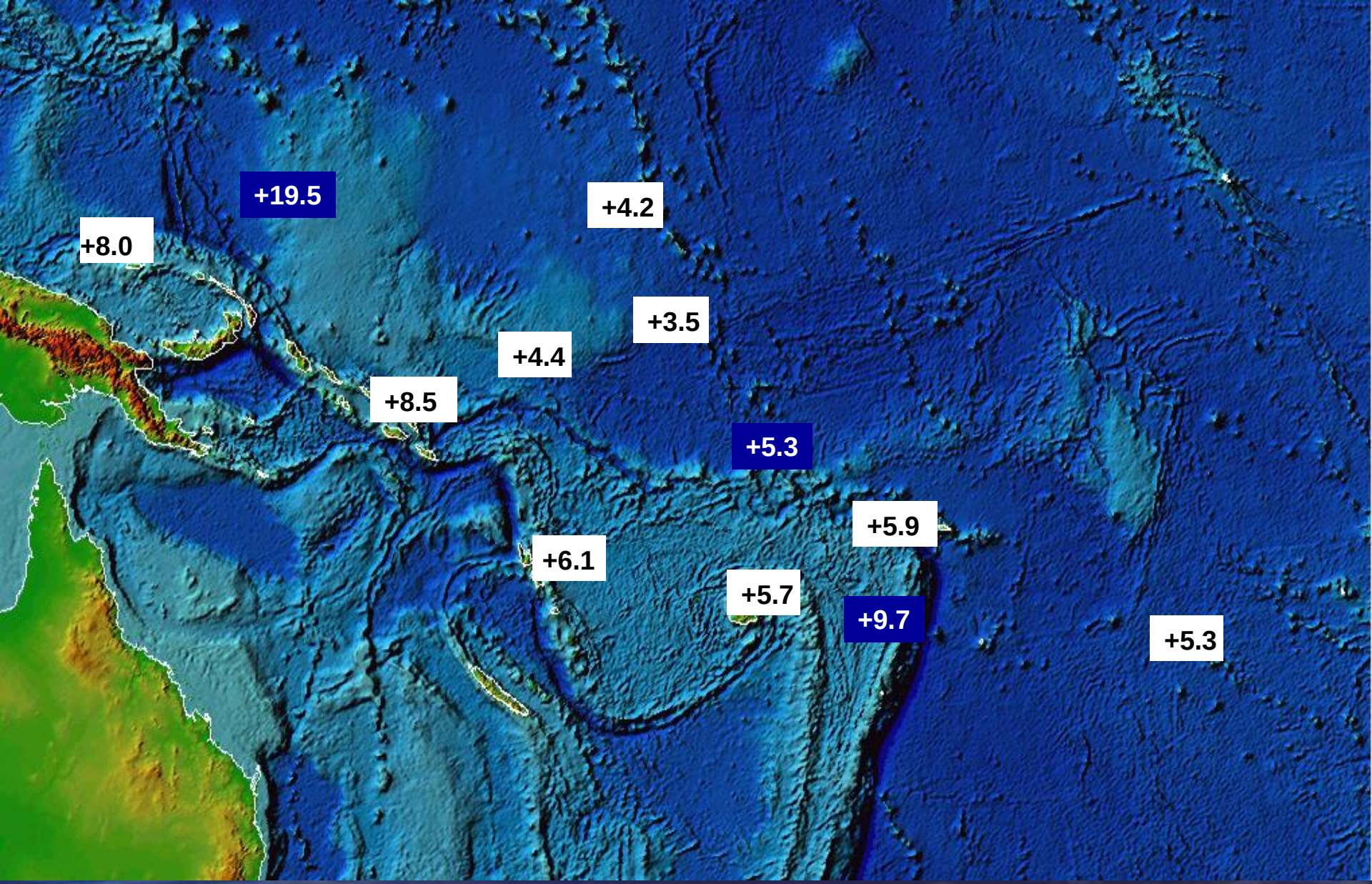
MOVEMENT+ OCEANOGRAPHIC EFFECT +

GHG Signals[thermal expansion]

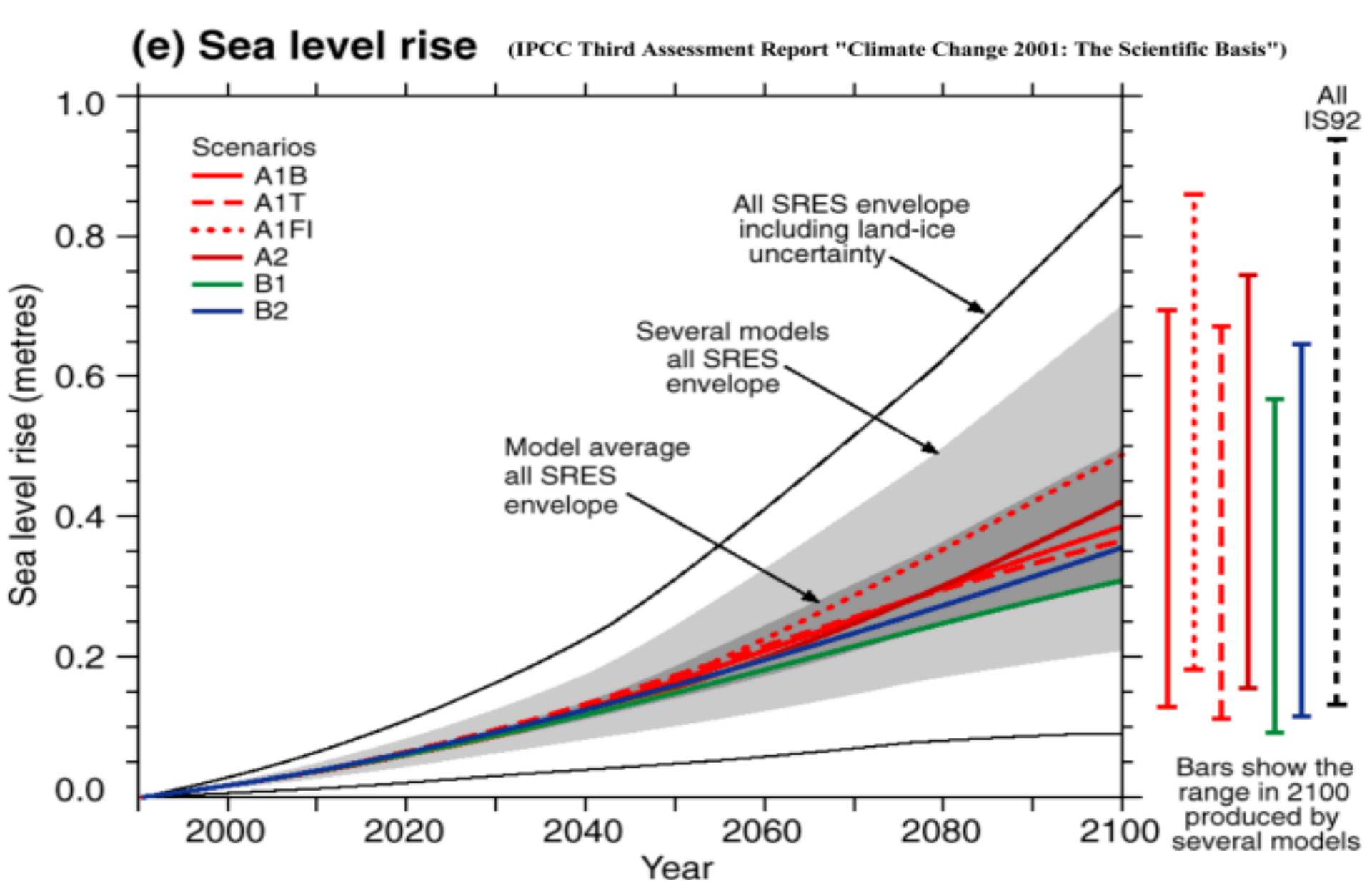
Results to end of June 2004

Net relative sea level rise (mm/year)





Rates of sea level rise (mm/year): August 2009

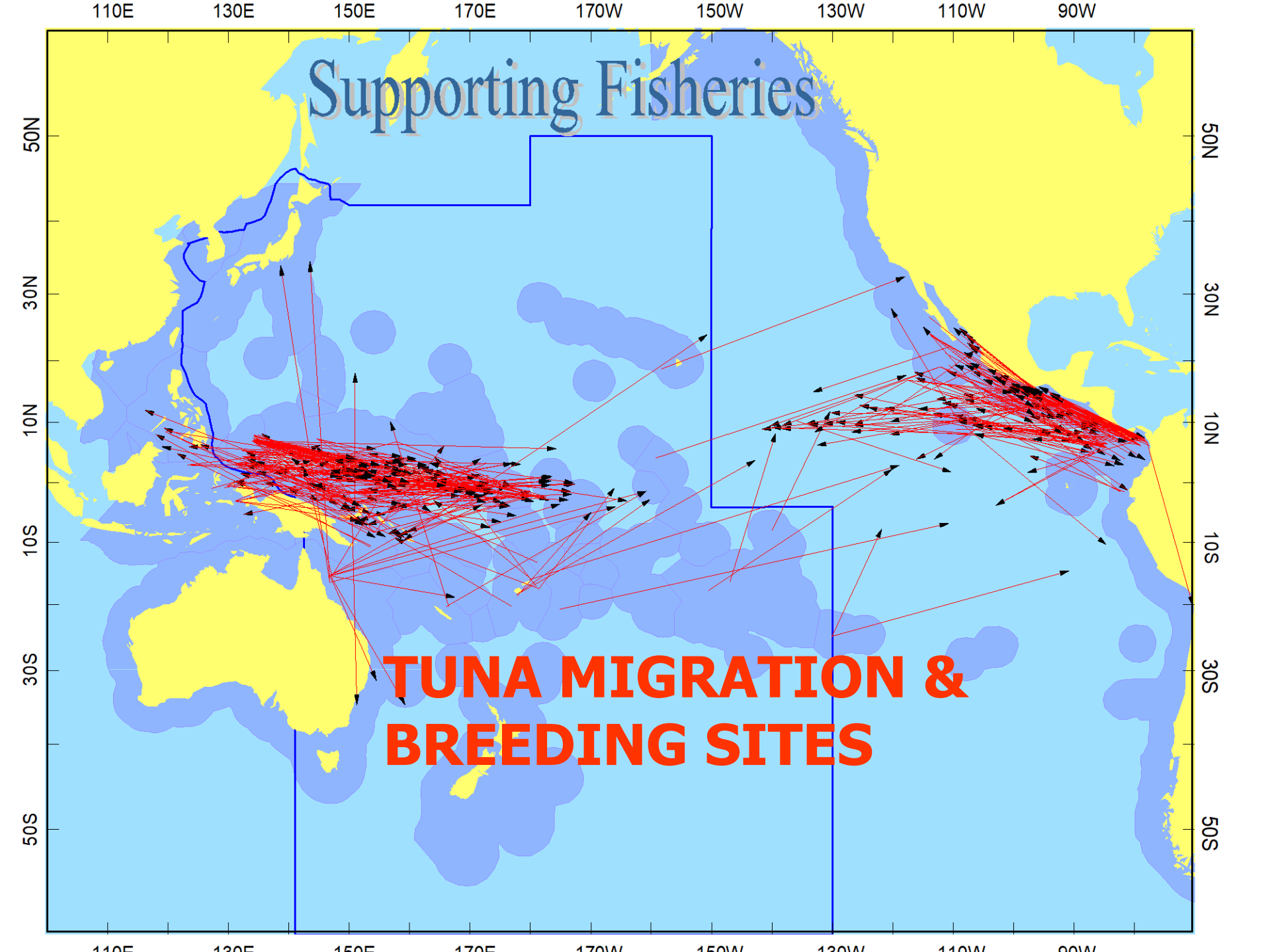

(e) Sea level rise
(IPCC Third Assessment Report "Climate Change 2001: The Scientific Basis")
Sea level rise (metres)
1.0
0.8
0.6
0.4
0.2
0.0
Scenarios
A1B
A1T
A1FI
A2
B1
B2
All SRES envelope including land-ice uncertainty
Several models all SRES envelope
Model average all SRES envelope
2000
2020
2040
2060
2080
2100
Year
All IS92
Bars show the range in 2100 produced by several models

4TH IPCC-2007 Conclusions: Pacific Region

- Sea Level Rise: **2-9 mm/yr**
- Increase in air temp: **1.6-3.40C by 2100**
- Rainfall: mostly rise in the eastern and fall in the western Pacific - up to 20%
- Increase in **El Nino-like** Conditions
- Increase in Extreme Events

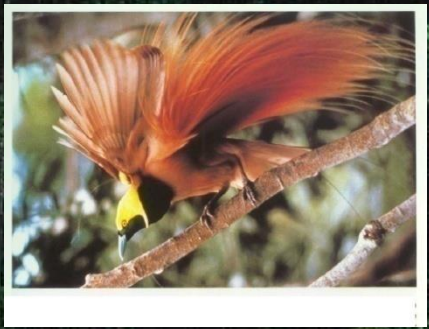
IMPACTS ON

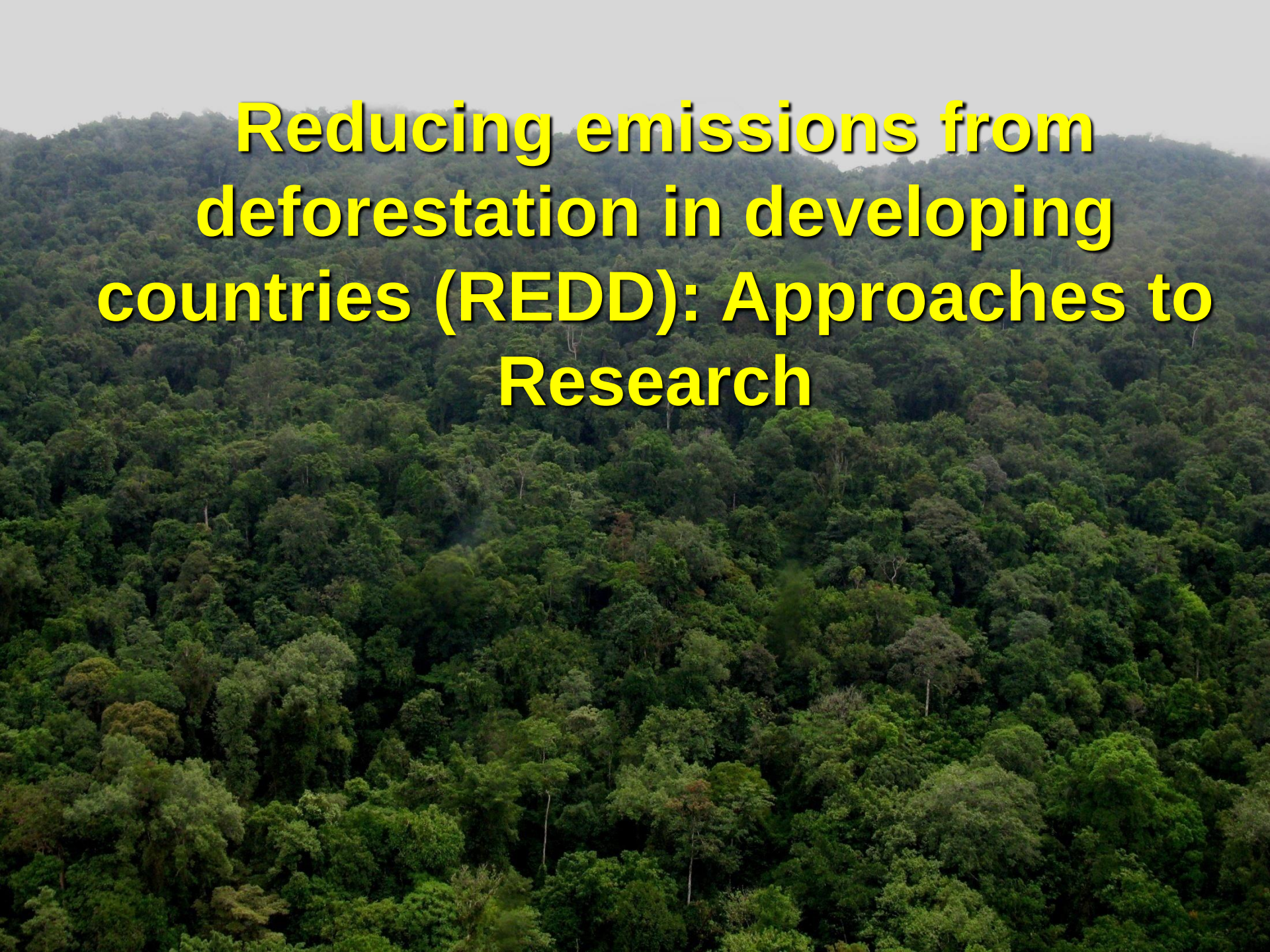
- Biodiversity
- People
- Water
- Fisheries
- Tourism
- Forestry & Agriculture


Supporting Fisheries
110E
130E
150E
170E
170W
150W
130W
110W
90W
50N
30N
10N
10S
30S
50S
TUNA MIGRATION &
BREEDING SITES


MANGROVES SPECIES & Economic Initiatives?

Loss of Biodiversity



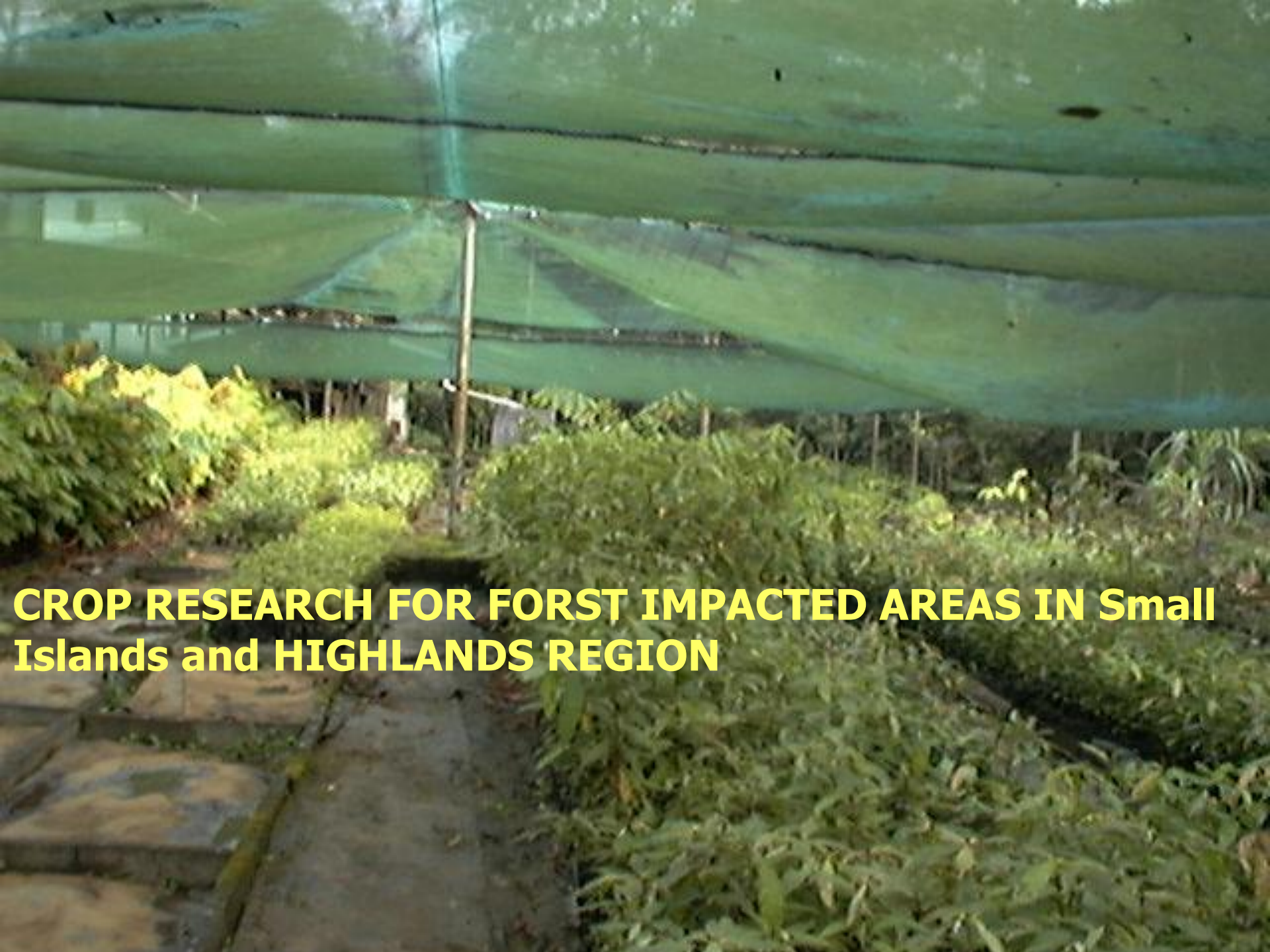

Reducing emissions from deforestation in developing countries (REDD): Approaches to Research

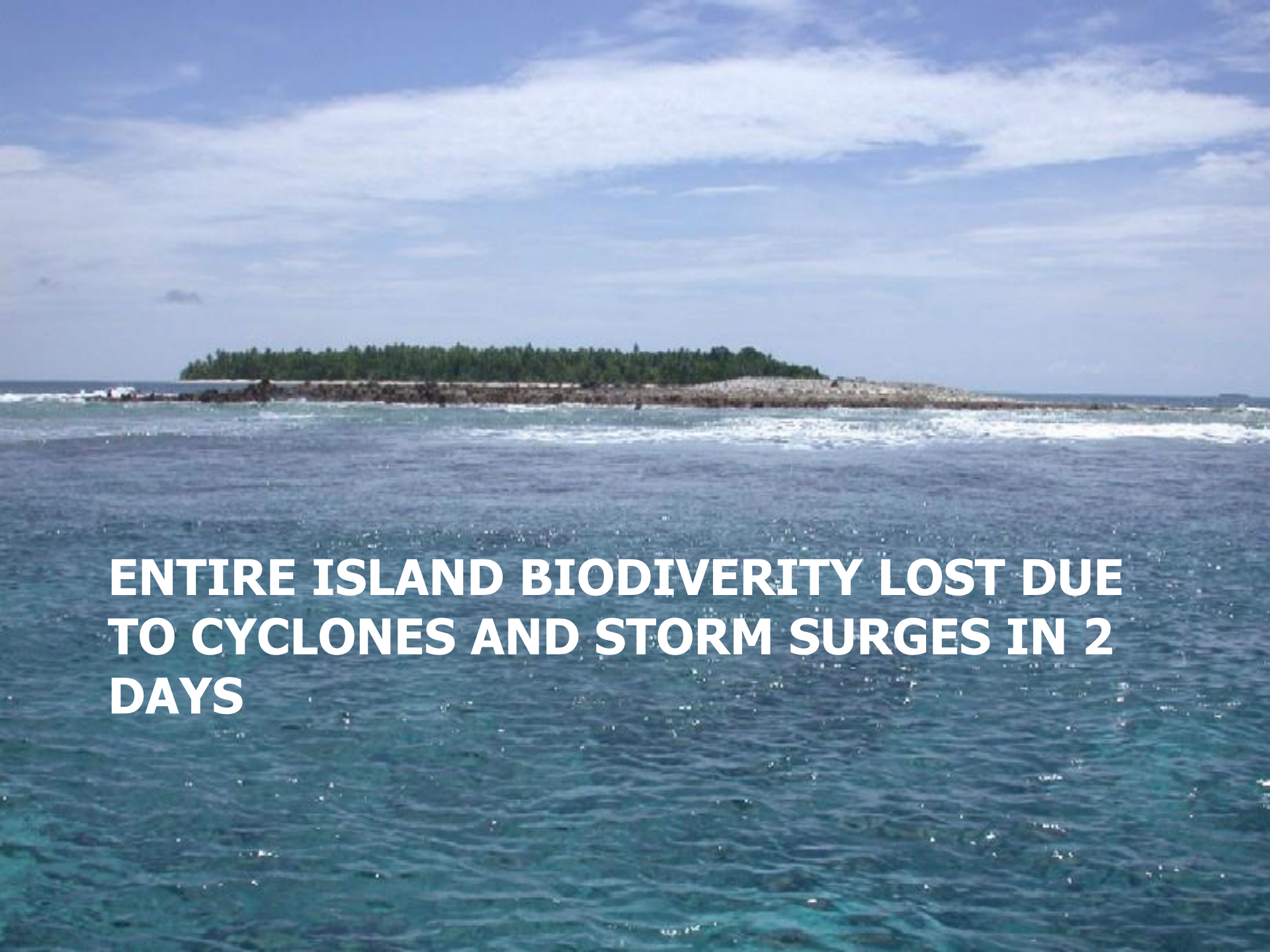
ATOLL ISLANDS

- FLOODING
- TIDES
- WASTE


CORAL REEF PROTECTION &
SOCIAL CHALLENGES


Unique Island Biodiversity Protected


CROP RESEARCH FOR FORST IMPACTED AREAS IN Small Islands and HIGHLANDS REGION


ENTIRE ISLAND BIODIVERITY LOST DUE TO CYCLONES AND STORM SURGES IN 2 DAYS

VULNERABILITY ASSESSMENT, RESILEINCE SUSTAINABILITY PROCESS

Organisation of this Talk

1. Understanding vulnerabilities
2. Enhancing resilience
3. Acknowledging contexts
4. Refining interventions

Part 1. UNDERSTANDING VULNERABILITIES

- Climate-change linked vulnerabilities are well known. They include –
  - Coastal livelihoods
  - Food production
  - Exposure to extremes

Olosega Island, Samoa

Part 1. UNDERSTANDING VULNERABILITIES

- **Climate-change linked vulnerabilities are well known. They include –**
  - **Coastal livelihoods**
  - **Food production**
  - **Exposure to extremes**
- **Other vulnerabilities of island countries –**
  - **Comparative smallness**
  - **Comparative isolation**
  - **Core-periphery disparities**

Groundwater salinization kills coconut palms, Tebunginako, Abaiang Atoll, an outer island of Kiribati

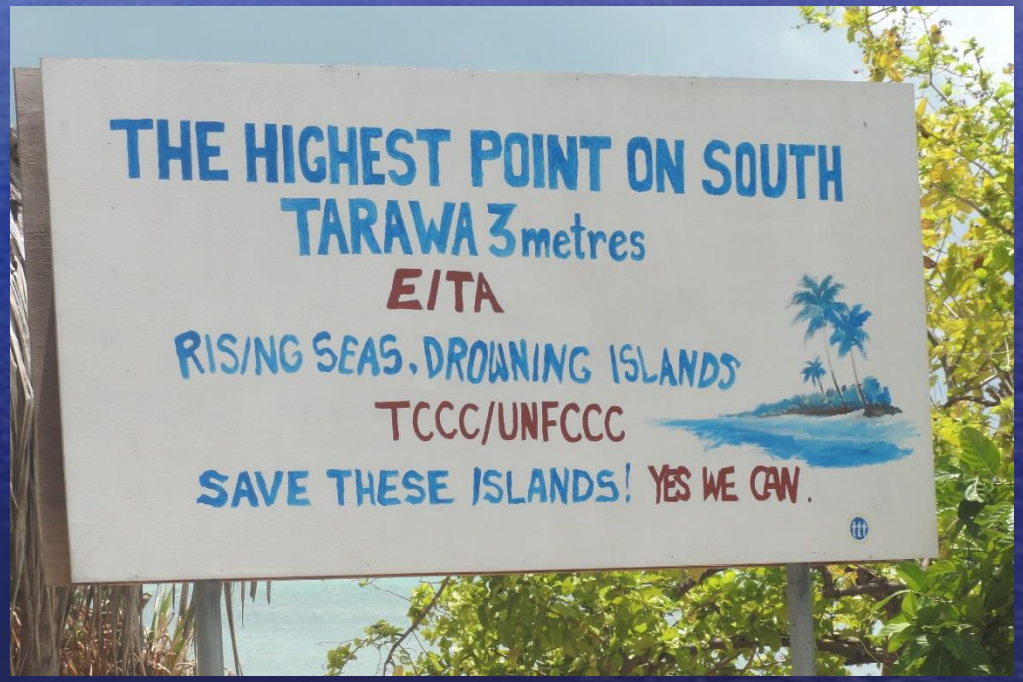
Part 2. ENHANCING RESILIENCE

- **Inherent resilience of island countries is less widely appreciated. It includes –**
  - **Societal resilience**
  - **Cultural resolve**
  - **Coping traditions**

Men's house (*faluw*) built on a stone platform, Riy, Rumung Island, Yap, Federated States of Micronesia

Part 2. ENHANCING RESILIENCE

- **Inherent resilience of island countries is less widely appreciated. It includes –**
  - **Societal resilience**
  - **Cultural resolve**
  - **Coping traditions**
- **Much indigenous resilience has been marginalised by the portrayal of Pacific Islands as vulnerable**



Sign, South Tarawa, Kiribati

Part 3. ACKNOWLEDGING CONTEXTS

- **Most attempts to raise awareness about climate change in the Pacific have failed, largely because –**
  - **Communication has been in (at least) a second language, encouraging climate change to be regarded as an alien concept**
  - **Communication (for communities) has been in inappropriate cultural contexts**

Developing the *iTaukei* (Fijian) climate-change glossary

Part 3. ACKNOWLEDGING CONTEXTS *(continued)*

- **Most attempts to develop sustained CCA in the Pacific Islands have failed, largely because -**
  - **External funds are used**
  - **Governments are expected by donors to use funds as they would**
  - **In-country capacity is insufficient**
  - **Communities are not properly engaged to sustain adaptation**

Collapsed seawall (and Japanese TV journalist), Yadua, Viti Levu Island, Fiji

Part 4. REFINING INTERVENTIONS

- **Pacific Island people need external assistance to meet the challenges of climate change over the next few decades.**
- **Intervention strategies need to change to become effective and produce sustainable adaptation.**

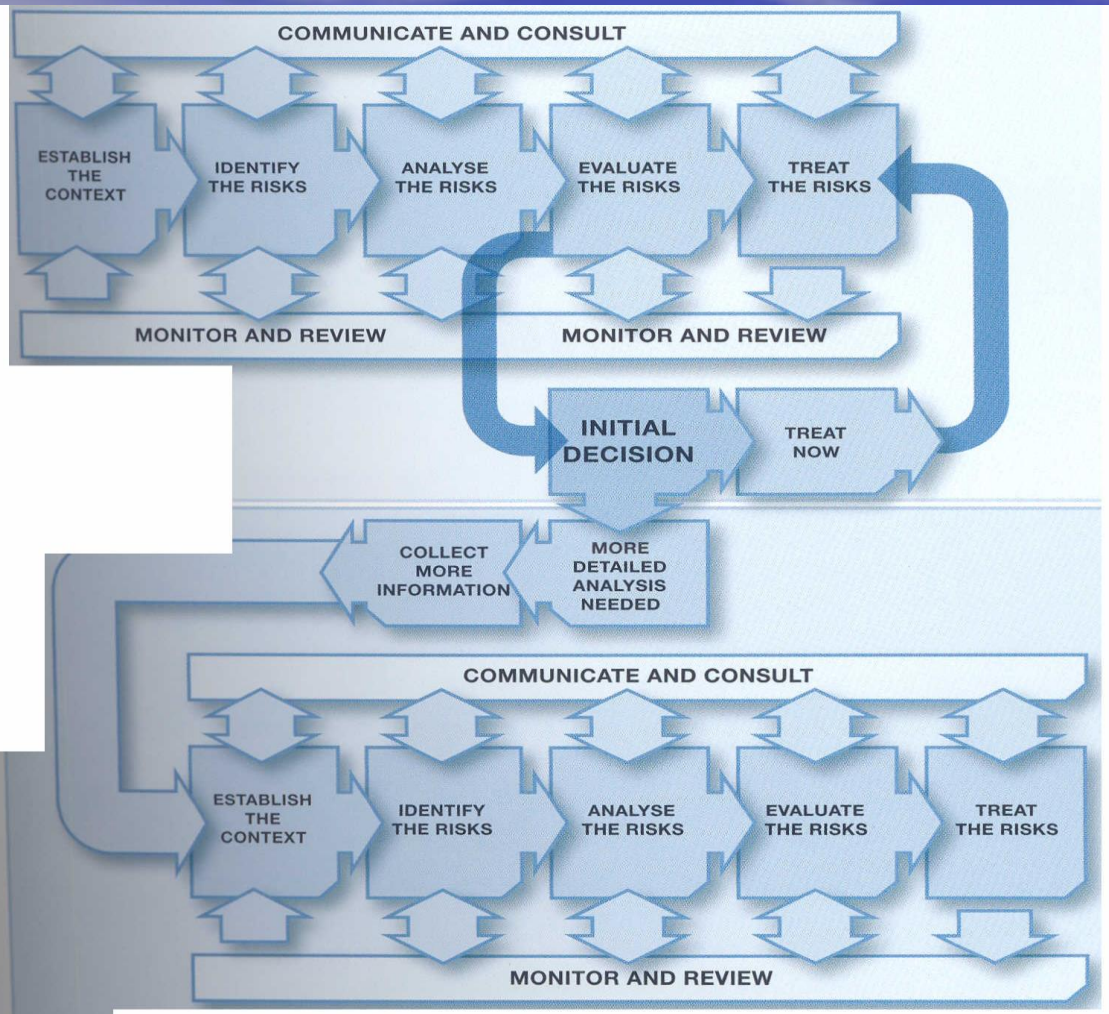
Living by the Marovo Lagoon, Solomon Islands
(**Photo**: Edvard Hviding)

Part 4. REFINING INTERVENTIONS *(continued)*

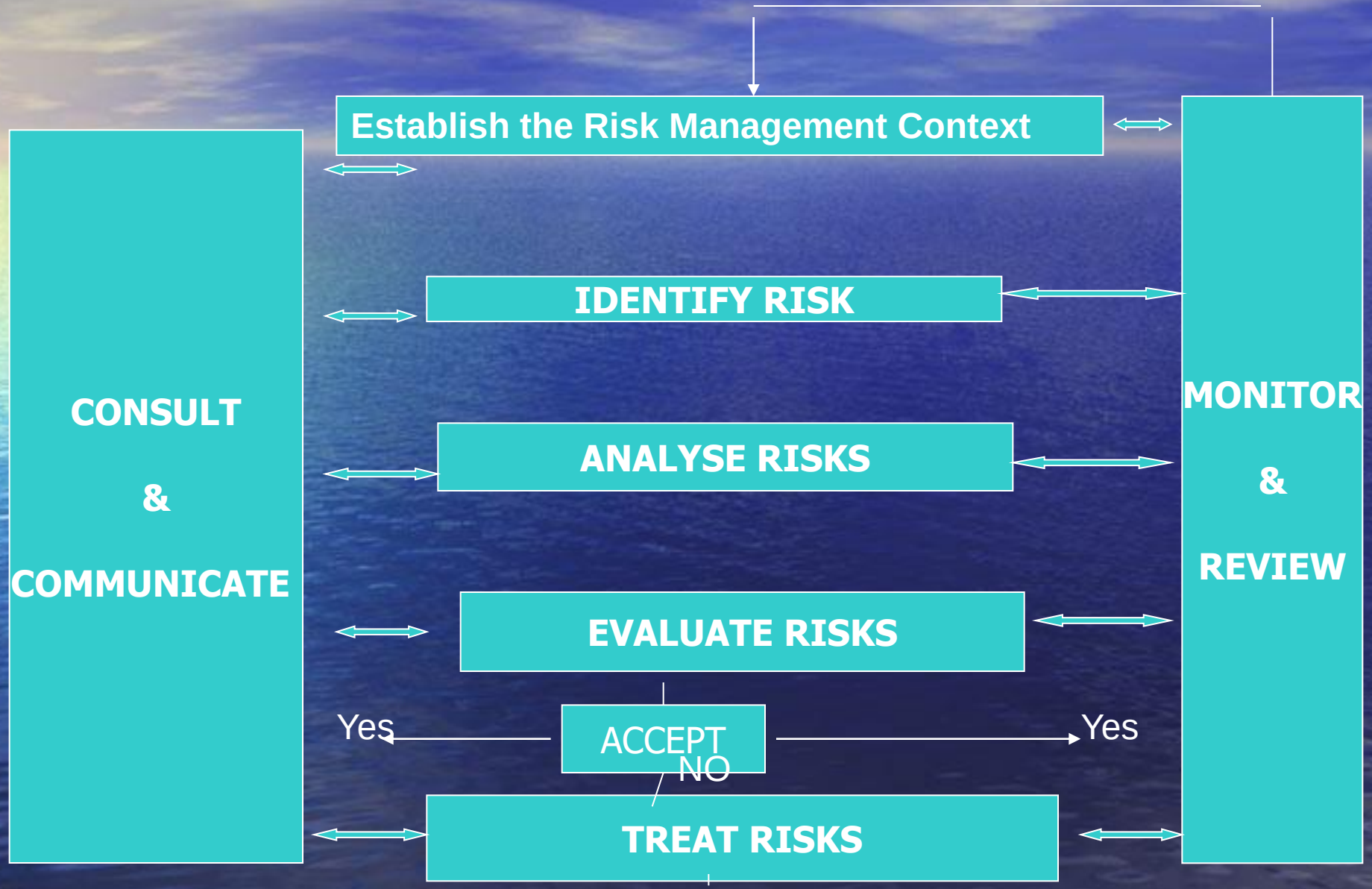
- **Recommendations**
  - **Governments should demonstrate 'ownership' of climate change by allocating internal revenue to adaptation**
  - **Community leaders should be engaged directly by intervention agencies**
  - **Climate change should be contextualised as a Pacific issue**

Option 1.

Comprehensive Hazard & Risk Management


COMMUNICATE AND CONSULT
ESTABLISH THE CONTEXT
IDENTIFY THE RISKS
ANALYSE THE RISKS
EVALUATE THE RISKS
TREAT THE RISKS
MONITOR AND REVIEW
MONITOR AND REVIEW
INITIAL DECISION
TREAT NOW
COLLECT MORE INFORMATION
MORE DETAILED ANALYSIS NEEDED
COMMUNICATE AND CONSULT
ESTABLISH THE CONTEXT
IDENTIFY THE RISKS
ANALYSE THE RISKS
EVALUATE THE RISKS
TREAT THE RISKS
MONITOR AND REVIEW

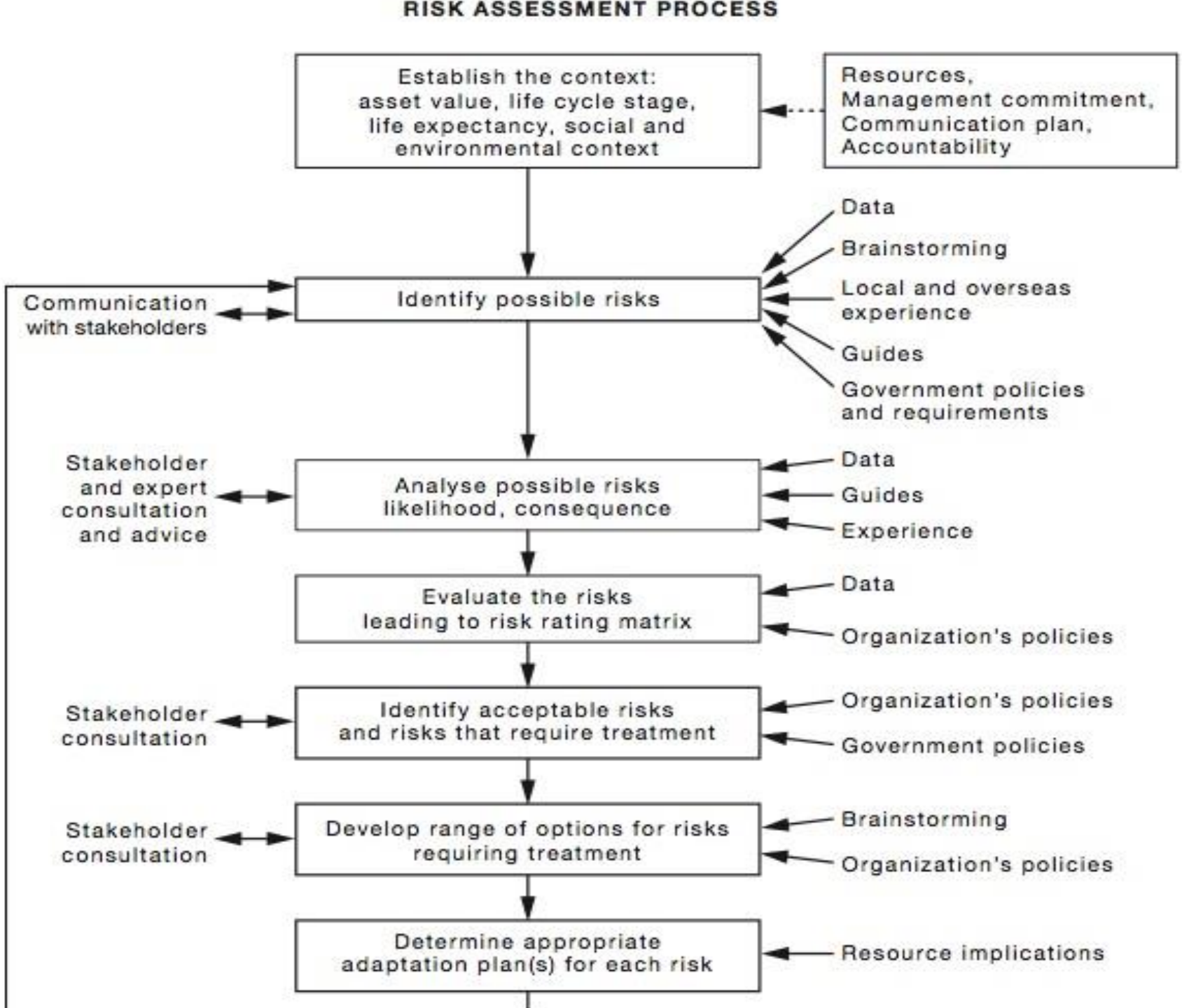
CHARM – KEY PROCESS STEPS-
Climate Change & Sea Level Rise



Option 2

APPLYING RESILIENCE AND SUSTAINABLE DEVELOPMENT


LE MIGRATING & RESETTLEMENT??


RISK ASSESSMENT PROCESS
Establish the context: asset value, life cycle stage, life expectancy, social and environmental context
Resources, Management commitment, Communication plan, Accountability
Identify possible risks
Communication with stakeholders
Data
Brainstorming
Local and overseas experience
Guides
Government policies and requirements
Analyse possible risks likelihood, consequence
Stakeholder and expert consultation and advice
Data
Guides
Experience
Evaluate the risks leading to risk rating matrix
Data
Organization's policies
Identify acceptable risks and risks that require treatment
Stakeholder consultation
Organization's policies
Government policies
Develop range of options for risks requiring treatment
Stakeholder consultation
Brainstorming
Organization's policies
Determine appropriate adaptation plan(s) for each risk
Resource implications

The Way forward

- Science evidence is critical in addressing the Impacts of Climate Change and Variability are REAL for the APEC AND SIDS REGION, start planning now.

- **Applying CHARM & Resilience and Sustainable Development**

- **Ensure government Policies are aligned to meet these new emerging issues as a "No Regrets Option".**


TENK YU TUMAS

The End