Community based adaptation in the Pacific

Espen Ronneberg
Climate Change Adviser
Dean Solofa
PI-GCOS Officer
SPREP

Secretariat of the Pacific Regional Environment Programme
PO Box 240. Apia, Samoa sprep@sprep.org

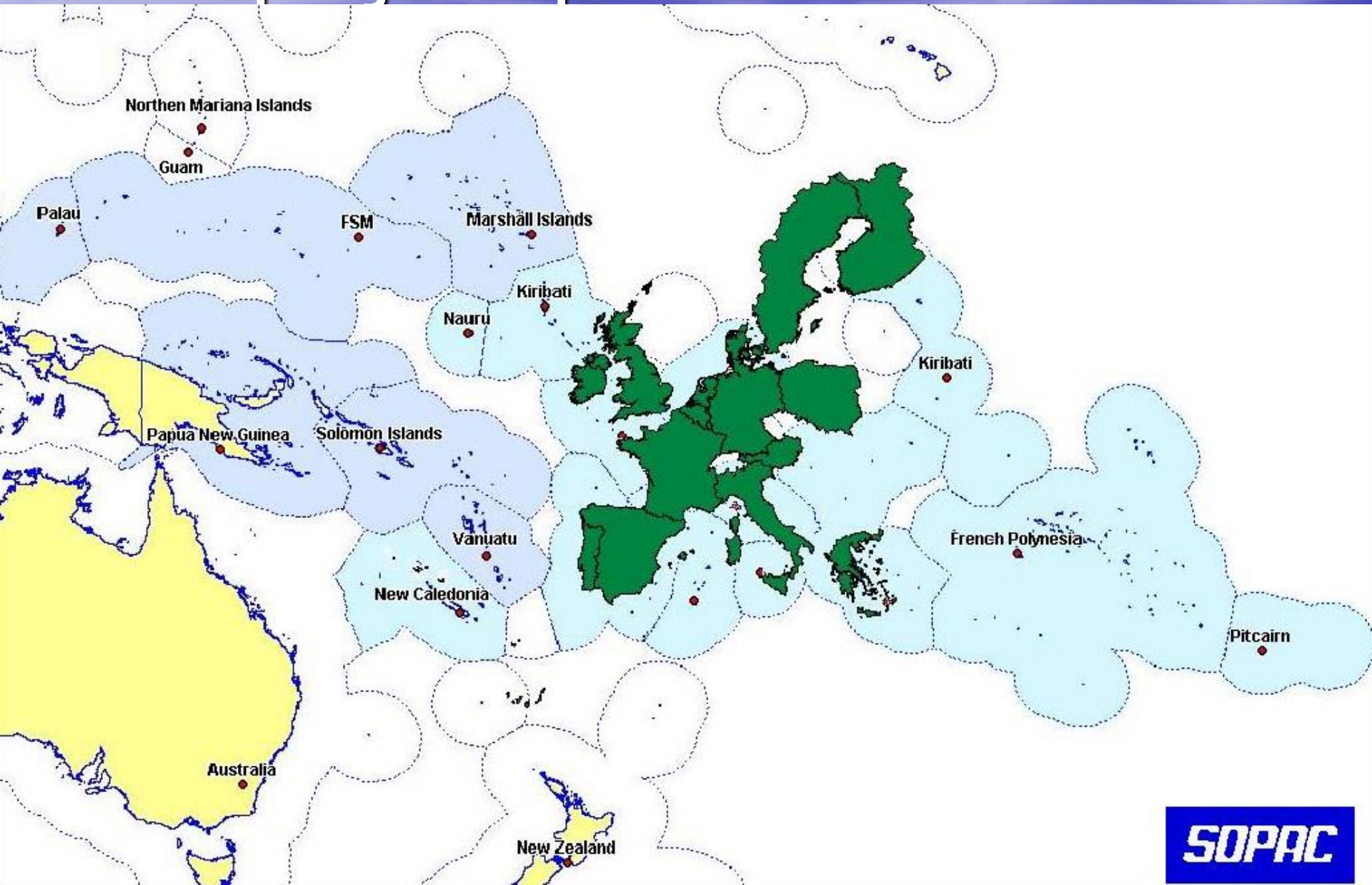
Overview

- adaptation activities in the Pacific
- lessons learned and best practices identified
- costs of extreme events to Small Islands
- emerging risks and trends identified by climate change scientists

The Pacific SIDS and SPREP

- 14 Independent SIDS covered by this presentation – Cook Is., Fiji, Kiribati, Marshall Is., Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Is., Tonga, Tuvalu, Vanuatu
- Although work by SPREP also involves the non-self-governing territories of the Pacific, except Pitcairn
- Supported by our Members Australia, France, New Zealand and USA

Europe juxtaposed on Pacific



Why? Because impacts are being observed in SIDS

Land loss and beach erosion

Adaptation experiences of past climate change programmes

- Pacific Island Climate Change Assistance Programme (PICCAP) – established as an enabling activity project for the then Parties to FCCC, expanded to include all 14 States
- Primarily to enable completion of Initial National Communications to UNFCCC
- Allowed for adaptation activities, through vulnerability and adaptation training and some individual site studies, set stage for future work

Impacts of PICCAP

- PICCAP as an enabling activity has built capacity largely of Environment/Meteorology Department offices. SPREP is broadening its capacity building programme to reach out to other line government departments and communities
- V and A assessments done using simple models
- Related projects CLIMAP and CBDAMPIC – have enabled us to trial Stage 3 implementation, and to look at risk reduction. PICs are calling for more implementation projects as a result – Pacific Adaptation to Climate Change Project

Pacific Adaptation to Climate Change Project

- 3 focal areas: water resource management, coastal management and infrastructure, food production and food security
- National consultations resulted in consensus for one project for each SIDS, bearing in mind existing efforts and needs
- Eg. Niue on water mgt, Vanuatu on coastal zone mgt, Fiji on food security

Lessons learned

- focus on sea-level rise and storm surges from tropical cyclones
- early emphasis on protecting land through 'hard' shore-protection measures rather than "soft" – now changing
- costs of overall infrastructure and settlement protection is a significant proportion of GDP well beyond the means of SIDS
- recent studies on adaptation: water resources and watershed management, reef conservation, agricultural and forest management, conservation of biodiversity, energy security, increased share of renewable energy in the energy supply, and optimized energy consumption
- emphasis has thus become more broad-based and looks at climate change impacts from a more comprehensive perspective.


What do these images have in common ?

Impacts of extreme events

- Cyclone Heta hit Niue
- 2 dead, 200 homeless, 20% of population
- NZ$50 million damage, $29,000 for every single Niuean, or 200 years of exports
- Only museum lost 90% of its collection
- All from a single extreme weather event

Hurricane Ivan - Grenada

- 28 dead, mostly elderly
- 212% of GDP damages
- 90% of nutmeg crop destroyed, takes 18 years to re-grow
- 90% of short-term crops destroyed
- 92% of forest and watershed areas damaged
- significant damage to over 70% of tourism facilities
- 89% of housing stock damaged
- 80% of electricity grid damaged
- From a single extreme event

Increase in extreme events?

- Prior to 1985, the Cook Islands were considered to be out of the main cyclone belt, and could expect a serious cyclone approximately every 20 years.
- five cyclones within one month in Feb/March 2005, of which 3 were classified Category 5
- caused damage of 10% of the annual budget, destroyed 75% of homes on Pukapuka, but luckily no lives were lost.

Other costs of climate change

- The king tides in Tuvalu and Kiribati - wells and agriculture poisoned by sea water, house foundations undermined and graves exposed.
- Vector borne diseases such as malaria are increasing their range upland in PNG, and the incidence of dengue fever increasing.
- World Bank found that island like Viti Levu, Fiji, could see damages of 23 million to 25 million US$ per year by 2050, (2-3 % of GDP), islands like Tarawa, Kiribati, could see damages of more than 8 million to 16-27 million US$ a year (17-18 % of GDP)

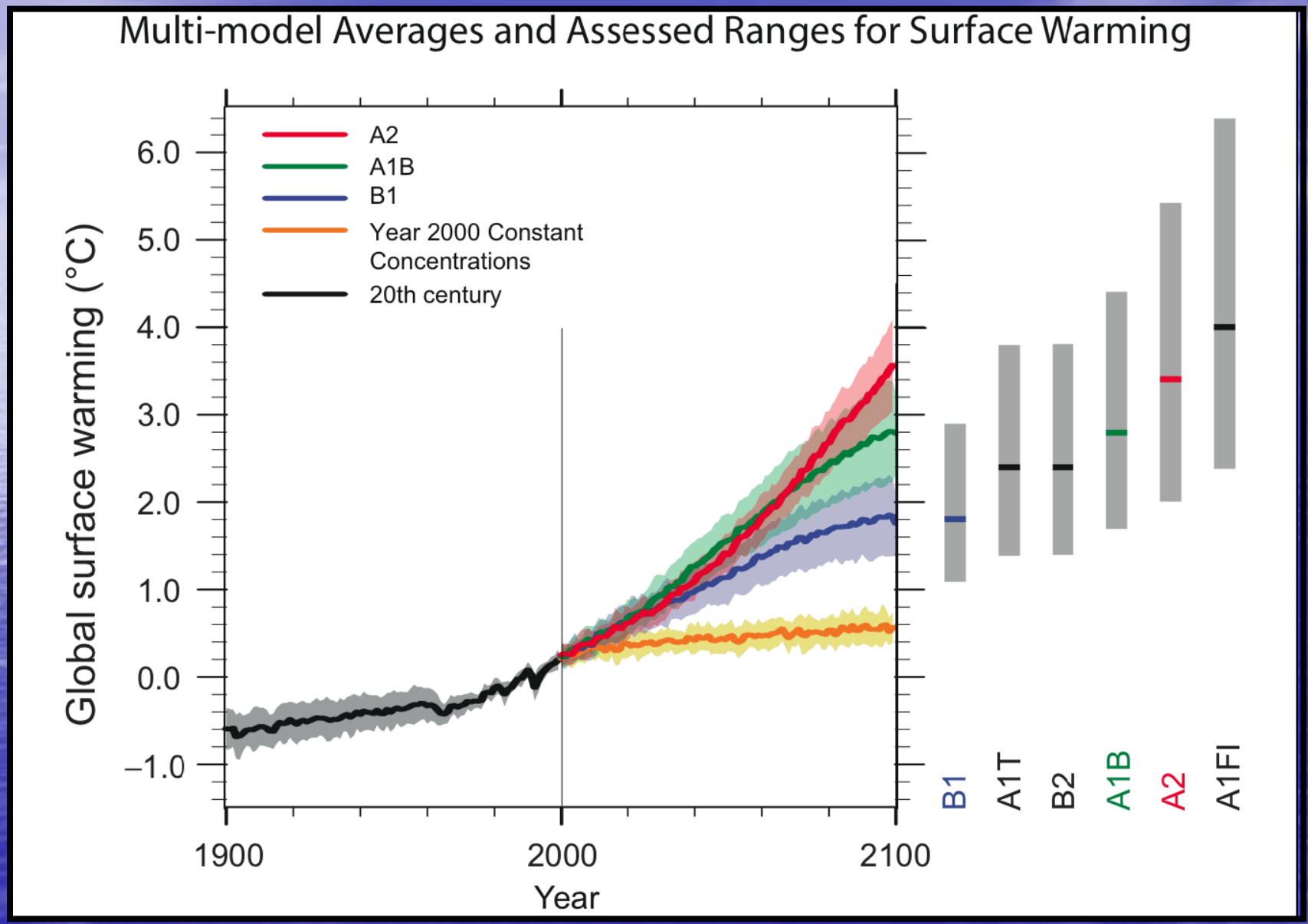
What are climate change scientists predicting?
- key conclusions from IPCC Fourth Assessment Report

- **For the next two decades a warming of about 0.2°C per decade is projected**
- **many changes in the global climate system during the 21st century that would *very likely* be larger than those observed during the 20th century**
- **There is now higher confidence in projected patterns of warming and other regional-scale features, including changes in wind patterns, precipitation, and some aspects of extremes and of ice.**
- **Anthropogenic warming and sea level rise would continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized.**

What are climate change scientists predicting?

Projection of future changes in climate

Case	Temperature Change (°C at 2090-2099 relative to 1980-1999)		Sea Level Rise (m at 2090-2099 relative to 1980-1999)
	Best estimate	Likely range	Model-based range excluding future rapid dynamical changes in ice flow
Constant Year 2000 concentrations	0.6	0.3 – 0.9	NA
B1 scenario	1.8	1.1 – 2.9	0.18 – 0.38
A1T scenario	2.4	1.4 – 3.8	0.20 – 0.45
B2 scenario	2.4	1.4 – 3.8	0.20 – 0.43
A1B scenario	2.8	1.7 – 4.4	0.21 – 0.48
A2 scenario	3.4	2.0 – 5.4	0.23 – 0.51
A1FI scenario	4.0	2.4 – 6.4	0.26 – 0.59


Multi-model Averages and Assessed Ranges for Surface Warming
Global surface warming (°C)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
–1.0
1900
2000
2100
Year
A2
A1B
B1
Year 2000 Constant Concentrations
20th century
B1
A1T
B2
A1B
A2
A1FI

What are climate change scientists predicting?

Meteorological trends indications

Phenomenon and direction of trend	Likelihood that trend occurred in late 20th century (typically post 1960)	Likelihood of a human contribution to observed trend	Likelihood of future trends based on projections for 21st century using SRES scenarios
Warmer and fewer cold days and nights over most land areas	*Very likely*	*Likely*	*Virtually certain*
Warmer and more frequent hot days and nights over most land areas	*Very likely*	*Likely (nights)*	*Virtually certain*
Warm spells / heat waves. Frequency increases over most land areas	*Likely*	*More likely than not*	*Very likely*
Heavy precipitation events. Frequency (or proportion of total rainfall from heavy falls) increases over most areas	*Likely*	*More likely than not*	*Very likely*

What are climate change scientists predicting?

Meteorological trends indications

Phenomenona and direction of trend	Likelihood that trend occurred in late 20th century (typically post 1960)	Likelihood of a human contribution to observed trend b	Likelihood of future trends based on projections for 21st century using SRES scenarios
Area affected by droughts increases	***Likely in many regions since 1970s***	***More likely than not***	***Likely***
Intense tropical cyclone activity increases	***Likely in some regions since 1970***	***More likely than not***	***Likely***
Increased incidence of extreme high sea level (excludes tsunamis)	***Likely***	***More likely than not***	***Likely***

Phenomena and direction of trend	Likelihood of future trend	Examples of major projected impacts by sector			
		Agriculture, forestry and ecosystems	Water resources	Human health	Industry/settlement
Warmer and fewer cold days and nights; warmer/ more frequent hot days and nights over most land areas	**Virtually certain**	Increased yields in colder environments; decreased yields in Warmer environments; increased insect outbreaks	Effects on water resources relying on snow melt; increased evapo transpiration rates	Reduced human mortality from decreased cold exposure	Reduced energy demand for heating; increased demand for cooling; declining air quality in cities; reduced disruption to transport due to snow, ice; effects on winter tourism
Warm spells/heat waves: frequency increases over most land areas	**Very likely**	Reduced yields in warmer regions due to heat stress; wild fire danger increase	Increased water demand; water quality problems, e.g., algal blooms	Increased risk of heat-related mortality, especially for the elderly, chronically sick, very young and socially isolated	Reduction in quality of life for people in warm areas without appropriate housing; impacts on elderly, very young and poor.
Heavy Precipitation events: Frequency increases over most areas	**Very likely**	Damage to crops; soil erosion, inability to cultivate land due to water logging of soils	Adverse effects on quality of surface and groundwater; contamination of water supply; water scarcity may be relieved	Increased risk of deaths, injuries, infectious, respiratory and skin diseases, post traumatic stress disorders	Disruption of settlements, commerce, transport and societies due to flooding; pressures on urban and rural infrastructures

Phenomena and direction of trend	Likelihood of future trend	Examples of major projected impacts by sector			
		Agriculture, forestry and ecosystems	Water resources	Human health	Industry/settlement
Area affected by drought: increases	Likely	Land degradation, lower yields/crop damage and failure; increased livestock deaths; increased risk of wildfire	More widespread water stress	Increased risk of food and water shortage; increased risk of malnutrition; increased risk of water- and food borne diseases	Water shortages for settlements, industry and societies; reduced hydropower generation potentials; potential for population migration
Intense tropical cyclone activity increases	Likely	Damage to crops; Windthrow (uprooting) of trees; damage to coral reefs	Power outages cause disruption of public water supply	Increased risk of deaths, injuries, water- and food borne diseases; post-traumatic stress disorders	Disruption by flood and high winds; withdrawal of risk coverage in vulnerable areas by private insurers, potential for population migrations
Increased incidence of extreme high sea level (excludes tsunamis)	Likely	Salinisation of irrigation water, estuaries and Freshwater systems	Decreased Freshwater availability due to Saltwater intrusion	Increased risk of deaths and injuries by drowning in floods; migration related health effects	Costs of coastal protection versus costs of land-use relocation; potential for movement of populations and infrastructure; also see tropical cyclones above

Thank you