



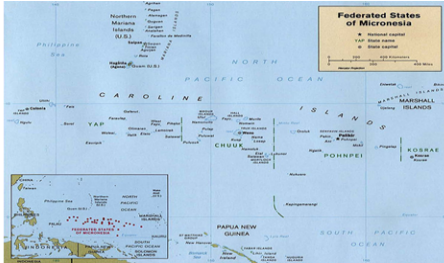
Federated States of Micronesia

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Pacific-Australia Climate Change Science and Adaptation Planning program



The Observed Climate, Climate Variability and Change Federated States of Micronesia



Comprised of Chuuk, Pohnpei, Yap and Kosrae, the Federated States of Micronesia (or "FSM") stretches from 136° to 168° East.

Most of the 607 islands are volcanic islands while the rest are small coral islands. The capital city is Palikir, located in the state of Pohnpei. The economy is characterized by farming and agriculture. Tourism is an attractive source of income to the country although is limited by the remoteness of the islands. Changes to the climate impact on these important sectors.

The country has 5 major languages. English is the official language spoken by many.



Damage from high sea surge, Lekiniach, Chuuk



Sea water inundation event causing flooding and damage to roads



Landslide caused by heavy rainfall

Observed Climate

In the FSM there is little seasonal variation in temperature, with less than 3°F (1.5°C) between the average hottest and coolest months. The country has two seasons – a dry season from November to April and a wet season from May to October (Figure 1).

Rainfall in the FSM is affected by the movement of the Intertropical Convergence Zone. The wet season occurs when the Intertropical Convergence Zone strengthens and moves north close to the FSM. The West Pacific Monsoon also impacts rainfall, bringing additional rain during the wet season.

The FSM's climate varies considerably from year to year due to the El Niño-Southern Oscillation. In Pohnpei, El Niño tends to result in drier conditions during the dry season, but higher than average rainfall during the wet season. La Niña tends to bring above average rainfall in the dry season (Figure 2).

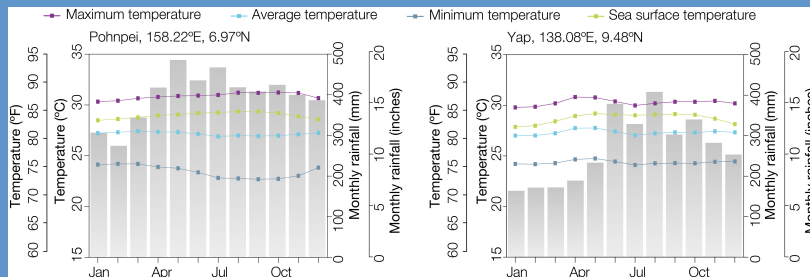


Figure 1: Seasonal rainfall (grey bars) and temperature at Pohnpei and Yap

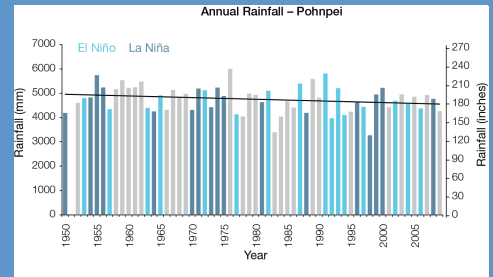


Figure 2: Annual rainfall for Pohnpei. Light blue bars indicate El Niño years, dark blue bars indicate La Niña years and the grey bars indicate neutral years

Making climate projections

The 21st century climate projections for FSM are created using the 18 Global Climate Model data obtained from the International Coupled Model Inter-Comparison Project phase 3 (CMIP3) experiments. These models were selected based on their ability to reproduce important features of the current climate. Results are based on three emissions scenarios, B1 (low), A1B (medium), and A2 (high) (Figure 3).

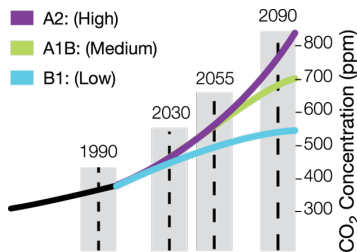


Figure 3: CO₂ concentrations (ppm) associated with 3 IPCC emissions scenarios: low emissions (B1-blue), medium emissions (A1B-green) and high emissions (A2-purple)

Acknowledgement

Materials in this presentation are obtained from BoM and CSIRO (2011) *Climate Change in the Pacific: Scientific Assessment and New Research (Vol. 2: Country Reports)* produced by the Pacific Climate Change Science Program.

Projected Climate

Projections for all emissions scenarios indicate that the annual average air temperature and sea surface temperature (Figure 4) will increase in the future in the FSM. By 2030, under a high emissions scenario, this increase in temperature is projected to be in the range of 0.7-1.9°F (0.4-1.0°C) in eastern FSM and 0.8-1.8°F (0.4-1.1°C) in western FSM.

Almost all the global climate models project an increase in average annual and seasonal rainfall over the course of the 21st century. However there is some uncertainty in the rainfall projections and not all models show consistent results. Droughts are projected to become less frequent throughout this century. Model projections show extreme rainfall days are likely to occur more often.

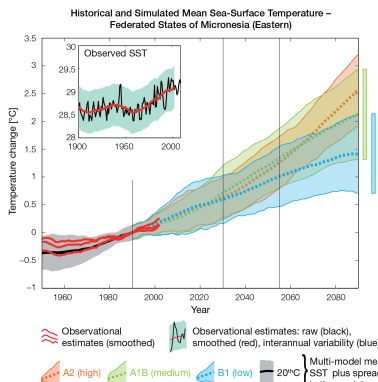


Figure 4: Projected sea surface temperature around East FSM

Summary of FSM's Future Climate over the 21st Century

- Surface air temperature to increase (*very high confidence*)
- Sea-surface temperature to increase (*very high confidence*)
- Annual and seasonal mean rainfall to increase (*high confidence*)
- Intensity and frequency of extreme heat days to increase (*very high confidence*)
- Intensity and frequency of extreme rainfall days to increase (*high confidence*)
- Incidence of drought to decrease (*moderate confidence*)
- Tropical cyclone numbers to decline in tropical North Pacific Ocean basin (*moderate confidence*)
- Ocean acidification to continue (*very high confidence*)
- Mean sea-level rise to continue (*very high confidence*)

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