Regional Statement on the Climate of 2016/17 and Climate and Tropical Cyclone Outlook for the Pacific Islands

Key Messages:

Climate in late 2016 and early-mid 2017

- The Pacific has seen El Niño-Southern Oscillation (ENSO) neutral conditions in the past year. Near La Niña conditions were present in late 2016 and near El Niño conditions developed in the eastern parts of the Pacific in early 2017;
- Associated with the above was below normal rainfall in the central Pacific (Kiribati, Tuvalu and northern Cook Islands) from late 2016 to early 2017 and below normal rainfall in the south Pacific e.g. Vanuatu and Fiji from about May 2017. In New Caledonia, rainfall was the lowest on record from June to August 2017. Also in June and July, rainfall was above normal in the vicinity of the New Guinea Islands and the northern Solomon Islands;
- The 2016-17 South Pacific tropical cyclone season (November to April) was the least active since 2011-12, and one of the quietest on record with only four cyclones occurring east of 160°E.

Climate, Ocean and Tropical Cyclone Outlooks October to December 2017

- The El Niño-Southern Oscillation (ENSO) state is currently neutral trending towards La Niña thresholds;
- Irrespective of La Niña thresholds being reached or sustained, near La Niña conditions are likely to affect the region with resulting impacts on rainfall and air and sea surface temperatures.
- Near normal to above normal rainfall is forecast for Palau, western and central Micronesia, Guam, the Northern Mariana Islands and most of the region from southern Papua New Guinea to southern French Polynesia. Near normal to below normal rainfall is forecast for the northern Marshall Islands, Nauru, Kiribati, northern Tuvalu, northern Cook Islands and American Samoa;
- Air and sea surface temperatures are forecast to be above normal for most of the region, except for the central and eastern Pacific where there is a high chance for below normal air and sea surface temperatures;
- Coral bleaching alerts have been issued for Micronesia for the four weeks from 1 October;
- Higher than normal sea levels are forecast for southern Micronesia;
- Typhoon activity for the western north Pacific is expected to be below normal. Further east, near-normal or above normal typhoons are favoured in the central and eastern Pacific. Regional-scale south Pacific tropical cyclone outlooks for the upcoming November to April season favour near average numbers of tropical cyclones in the southwest Pacific. West of the Date Line normal to above normal tropical cyclones are expect with normal to below normal numbers east of the Date Line.

Review of 2016-17 climate:

Most of the central Pacific (Kiribati, northern Tuvalu and northern Cook Islands) received below normal rainfall in late 2016 and early 2017 due to near La Niña conditions in the second half of 2016. In late February 2017, some international climate models favoured El Niño conditions from June. While an El Niño did not eventuate, warmer than normal central and eastern Pacific sea surface temperatures were sufficient to enhance the South Pacific Convergence Zone and displace it northeastward generally from about May. This resulted in suppressed rainfall in parts the western south Pacific e.g. Vanuatu and Fiji which continues into late September. Drought was also experienced in some locations in the northern Marshall Islands in the first half of 2017.

The 2016-17 south Pacific tropical cyclone season was the least active since 2011-12, and one of the lowest on record with only four cyclones occurring east of 160°E. The low cyclone numbers were a result of typical rainfall and cloudiness patterns being shifted over land, particularly Australia and South America.

Autumn saw the development of TC *Donna*, the strongest May cyclone on record which caused significant damage in the Solomon Islands, Vanuatu and New Caledonia. Out-of-season cyclones are rare, especially during neutral and La Niña periods.

Climate and Health:
Increasing evidence suggests climate change is negatively impacting human health in the Pacific Islands. There is positive correlation with climate change and the increasing occurrence of food safety hazards at various stages of the food chain such as increasing incidences and severity of ciguatera poisoning. Additionally the relationship between high rainfall and the increasing risk of vector borne diseases including malaria and dengue is well documented. Adverse impacts of climate change on the environment, economy and well-being may lead to negative mental health impacts. Rising temperatures will increase heat stress and human discomfort, and a warmer Pacific climate may result in a decrease in human activity, aggravating the non-communicable diseases crisis in the region.

El Niño Southern Oscillation (ENSO) outlook for October to December 2017:
The El Niño-Southern Oscillation (ENSO) state is currently neutral trending towards La Niña thresholds. Sea surface temperatures have cooled in the eastern tropical Pacific since mid-winter. Waters beneath the surface are cooler than average, with further cooling expected. Other indicators of ENSO, such as the Southern Oscillation Index and equatorial trade winds, remain neutral.

Most international climate models suggest further cooling of the tropical Pacific Ocean is likely http://www.bom.gov.au/climate/model-summary/#tabs=Pacific-Ocean and http://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/?enso-sst_table
Neutral to La Niña conditions are likely as most models predict La Niña thresholds to be approached or exceeded in the final quarter of 2017. If a La Niña event does develop it is likely to be short-lived. It is unusual for La Niña to develop this late in the calendar year. Irrespective of La Niña thresholds being reached or sustained, near La Niña conditions are likely to affect the region with resulting impacts on rainfall and air and sea surface temperatures.

Climate and Ocean outlooks for October-December 2017:
The outlook for the next three months depends significantly on whether the near La Niña conditions develop into a La Niña.

As the present near La Niña conditions have developed recently, there is little consistency in the model forecasts. These forecasts are likely to align better in the coming weeks. The following is based on the most recent model forecasts:

Near normal to above normal rainfall is forecast for Palau, western and central Micronesia, Guam, the Northern Mariana Islands and most of the region from southern Papua New Guinea to southern French Polynesia. Near normal to below normal rainfall is forecast for the northern Marshall Islands, Nauru, Kiribati, Tuvalu, northern Cook Islands and American Samoa.

Air and sea surface temperatures for the coming three months are expected to be above normal for much of the region, except for the central and eastern Pacific where there is a high chance for below normal air and sea surface temperatures. For the rest of 2017 heat exposure capable of causing bleaching and mortality will continue in the central and western north Pacific. Coral bleaching alerts have been issued for Micronesia for the four weeks from 1 October.

Higher than normal sea levels are forecast for southern Micronesia during October-December 2017.

All forecast products show some La Niña-like conditions. These may change depending on the activity in the tropical Pacific with a possible strengthening of the La Niña-like conditions.

Tropical Cyclone Outlook:
Typhoon activity in the western north Pacific is expected to be below normal through the remainder of 2017. Further east, near-normal or above normal hurricane numbers are favoured in the central and eastern Pacific.

Regional-scale south Pacific tropical cyclone outlooks for the upcoming November to April season favour near average (8-10) numbers of tropical cyclones in the southwest Pacific. West of the Date Line normal to above normal tropical cyclones are expect with normal to below normal numbers east of the Date Line. The outlook is generated in collaboration with the National Meteorological and Hydrological Services in the south Pacific.

Tropical cyclones have a significant impact in the tropical Pacific. In the south Pacific Vanuatu and New Caledonia typically experience the greatest activity, with an average of two or three named cyclones passing close to land each year.

If conditions change over the coming months then the tropical cyclone outlook will be updated. All communities should remain vigilant and follow forecast information provided by their National Meteorological and Hydrological Service.

Coordination between National Meteorological Services and National Ministries of Health:
Relationships between NMHSs and national health services vary across the region. In most countries, the health sector has access to weather forecasts, seasonal climate outlooks, extreme event warnings and in some cases, rainfall and temperature data. Generally, this information is accessed via general products and services provided by NMHS including websites, emailed monthly bulletins, social and traditional media, and in-person briefings.

However, there are few instances in which health services are currently able to access information that is specifically tailored to their decision-making needs. Establishing mechanisms and products to increase regular and systematic information exchange between NMHS and health services is a priority. Examples include: establishment of MoUs; focal points in both NMHS and Health Ministries; tailored outlooks and bulletins that include sector-specific impact information, joint business plans; technical working groups, and; simplification and translation of information contained in bulletins.

Recommendations from PICOF-3:
Regional forums such as the PICOF are important for sharing information, best practices, and lessons learnt. This should continue and be linked to the functions of the Pacific Islands Regional Climate Centre (RCC), as this becomes established. Pre-PICOF training is useful, but should also include experts from the north Pacific.

Close working relationships between NMHSs and the Health Sector are critical to effective warning of climate hazards leading to early preparedness. All countries throughout the region should continue to strengthen these relationships, as well as with other sectors through such mechanisms as one-on-one discussions, cluster group meetings and NCOFs.

Indices of the strength of El Niño and La Niña are very useful for monitoring the status of ENSO, but there should be a common index used for the Pacific region. Impact-based indicators associated with disease outbreaks, freshwater availability and quality, food

production, and hospital admissions should also be well monitored, with the data stored in national impacts databases.

In addition to the production of national seasonal climate outlooks which are well communicated to sectors, there is a need for simplified products and messaging around the risk to human health, especially for rural and remote communities. Health impacts are most often related to drier or wetter than normal conditions. NMHSs should continue to develop climate products tailored for the health sector, relevant to their needs, and incorporating where possible elements based on traditional knowledge.

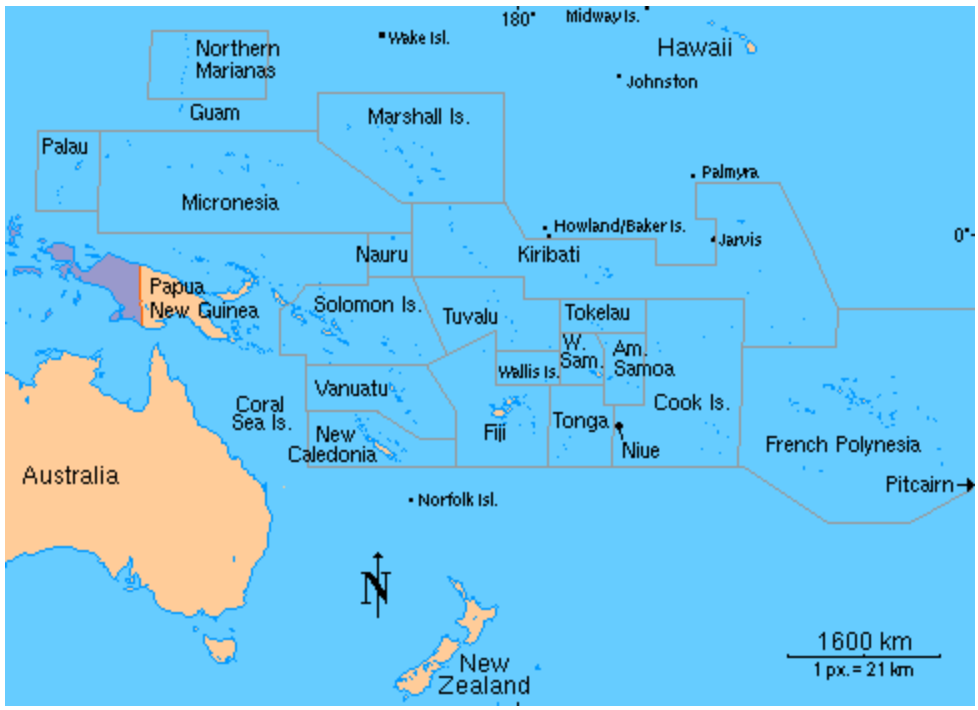
Climate and Tropical Cyclone outlooks for the whole Pacific region should continue to be well communicated to all NMHSs in the region prior to general release, to ensure consistent responses are provided to local media enquiries.

Further Information:
For more country-specific information please contact your local National Meteorological and Hydrological Service and/or Ministry of Health.

This statement was produced at the third Pacific Islands Climate Outlook Forum (PICOF) held at the Taumeasina Hotel, Apia, Samoa from 27-29 September 2017. The forum had a specific focus on the climate of September 2016 to September 2017, and the regional climate and tropical cyclone outlook for 2017/18. Representatives at the forum were from regional organisations, National Meteorological and Hydrological Services, Red Cross and Ministries of Health.

PICOF-3 was attended by members from Australia, Cook Islands, Federated State of Micronesia, Fiji, French Polynesia, Kiribati, Marshall Islands, New Caledonia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Singapore, Solomon Islands, South Korea, Tokelau, Tonga, Tuvalu, United States of America and Vanuatu. SPREP provided logistical support for of the events; the Samoa Meteorological Division arranged the hosting of the events; SPREP, BoM, NOAA and NIWA and APCC-South Korea provided technical support with input from WHO, SPC, IFRC, Samoa Red Cross Society and USP and other regional and environmental bodies. Financial support from Governments of Samoa, Australia and Republic of Korea, Climate and Oceans Support Program, Disaster Resilience for Pacific SIDS, Republic of Korea-Pacific Islands Climate Prediction Services project, Environment and Climate Change Canada, World Meteorological Organization, SPREP and APCC.

This statement is consistent with the Nuku'alofa Ministerial Declaration for Sustainable Weather and Climate Services for the Resilient Pacific, which recognises the importance of Meteorological and Hydrological Services in support of relevant national needs, including protection of life and property, sustainable development and safeguarding the environment. The same noted that weather and climate services are not an option but are a responsibility and a basic human right.



Map of the Pacific Islands region including those countries and territories involved in the preparation of the statement.