

CLIMATE RESEARCH

Seasons in Samoa

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Is there a role for indigenous knowledge of weather and climate in improving scientific understanding of future changes in the climate?

Teachers: this article can be used for NCEA Achievement Standards in Geography (3.1, 3.6, 3.7). See other curriculum connections at www.niwa.co.nz/pubs/wa/resources

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Long before the advent of complex numerical climate models, indigenous communities have used changes in their environments to predict changes in the weather and climate. Social and communal activities like feasting, fishing and hunting patterns were planned in response to these changes and revolved around the different seasons.

While weather and climate patterns have been documented for many years using Western scientific techniques, little attention has been paid to documenting the traditional environmental observations made by indigenous peoples. Therefore it is possible that scientists may be missing some valuable insights into climate change and prediction.

For example, recent research by NIWA aimed at documenting knowledge of weather and climate forecasting in Samoa found that Samoans have their own unique seasonal calendar (shown opposite). Unlike the European calendar, which is based on astronomical events, the Samoan calendar is based on observations of environmental change, which are in turn largely influenced by the onset of extreme weather and climate events. The next phase of our research is to investigate whether these indigenous observations and traditional knowledge could be used to help improve scientific understanding of the climate system and its effects.



Damage from Tropical Cyclone Val, Samoa, 1991

Recreational activities for Pacific children depend on historic knowledge of their environment



The scientific approach

We tend to assume that scientific problem-solving abilities are superior to those of indigenous knowledge. However, the issues facing scientists today in the area of resource and environmental management are becoming extremely complicated, often calling for more creative forms of collaboration between scientists and society and a broader range of disciplines and skills.

In research into climate change, for example, some of the most important tools being employed are climate models. These models have evolved considerably over the years and now include more detail than ever before. The outputs from various climate models are assessed by an international panel of scientists, the Intergovernmental Panel on Climate Change (IPCC). The climate projections in the IPCC's Third Assessment Report draw on the output from global climate models run for a range of plausible greenhouse gas scenarios. The scenarios used are the levels of greenhouse gases expected given a certain level of population change, socio-economic development, and technological change.

The best way to test a climate model is to run it for a period in the past using known greenhouse gas concentrations, and compare the output with past climate observations. This brings us to the importance of local observations, either in conventional data collection or in the documentation of indigenous knowledge and perspectives on weather, climate variability and change.

An indigenous perspective

Pacific Island Meteorological Services monitor and collect data from many parts of the southwest Pacific, continuing datasets that in

The Samoan seasonal calendar and its origins

Samoan seasonal descriptions are listed under the approximate equivalent month in English, followed by an English translation and explanatory notes.

January

Utu va mua *First yam digging.* Utu va mua and Utu va muli, two brothers, fled to the earth and brought the January storms with them when there was war in heaven and their party was beaten. During a great war on earth, they escaped to the heavens. The hills are the heaps of slain covered by earth dug up from the valleys. When the two brothers look down upon them, their weeping, wailing and exasperation causes the storm or hurricane.

Aitu *Great Ghost*
Tagaloa Tele *Big God*

February

Toe utu va *Digging yam again.* Further digging up of the yams to raise storms.

March

Faaafu *Withering.* From withering of the yam vine and other plants, which become coloured "like the shells" in March.

Ta'a fanua *Roam or walk about the land.* This is the name of a god worshipped in April.

Atiu iti *Small gods.* From the household gods worshipped at the time. They are specially implored to bless the family for the year "with strength to overcome in quarrels and in battles".

April

Lo *A kind of fish.* From the name of a small fish which comes in plentiful shoals at this time of the year.

Fagona *Destruction.* The name of a god worshipped at the eastern extremity of the Samoan group of islands at this time.

May

Au nunu *Stem crushed.* This is from the crushed or pulverized state of the stem of the yam at that time. Others say the month was so named from multitudes of malicious demons supposed to be wandering about at that time. Even the fish of the sea were thought to be possessed and unusually savage in this month. May is often an unhealthy month, as it marks the transition from the wet season to the dry - hence the sickness and superstition.

Sina *White.* From the worship of a goddess of that name.

June

Ologa manu *The singing of birds.* Named from the unusual joy among the birds over a plentiful supply of favourite buds and berries. The bright scarlet flowers of the *Erythrina indica* then begin to come out and attract a host of parakeets and other happy chirpers.

July

Palolo mua *The first Palolo.* Palolo "virides" are the worms that swim out from certain parts of the barrier reefs for three days every year and of which Samoans are very fond (all the more so from its rareness). *Pa* means to burst and *lolo*, fatty or oily. Hence, the origin of the name probably lies with the fatty or oily appearance of the worms as they break, burst, and are mixed up in heaps after they are caught. This is the first month of the half-year called the Vaito'elauo season. The other half of the year is Vaipalolo season.

August

Toe palolo *The last Palolo* or
Palolo muli *the last of the palolo.*

September

Muli fa *End of the stem of a taro, Arum esculentum.* The month is unusually dry and the scorching rays of the sun leave little of the taro stem except for a small piece at the end. Another derivation of Muli fa is the end of the season for catching the fish Fa.

October

Lotu o uaga *Rain prayers.* Named after the special prayers which are offered to the gods for rain.

November

Taumafa mua *The first of plenty.* Fish and other food become plentiful at this time and this is followed by the so-called palolo feasts. Public dinners in the houses of the leading men of the village are the order of the day.

December

Toe taumafa *The finish of the feasting or final supper.* Food is less plentiful after some of the December gales or tropical cyclones.

some areas started over 100 years ago. For example, climate observations began in Apia, Samoa, in 1890. Long-term information like this is now assisting scientists in their understanding of past, present and future climate changes in the Pacific region. This includes the testing and validation of climate models.

Unfortunately, few parallel records have been kept of indigenous perspectives on weather and climate. However, NIWA now recognises the important role of local observations, knowledge and views. Samoa, with its long history of climate data collection combined with local knowledge on predicting weather and climate events, was the obvious place to start exploring these issues in the Pacific region as a whole. A project begun in March 2001 has documented the seasons from a Samoan perspective (left). Work is also underway with Māori regarding traditional weather and climate knowledge, and adaptation to climatic events. ■

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Further reading

Berkes, F. (2001). Making sense of Arctic environmental change? *In: Navigating social-ecological systems, building resilience for complexity and change*, pp. 335-349. Cambridge University Press.

Davis, S. (1997). Documenting Aboriginal seasonal calendar. *In: Webb, E.K. (ed.). Windows on meteorology: Australian perspective*. CSIRO Publishing, Melbourne.

Lefale, P.F. (2002). Traditional knowledge of weather and climate prediction, the Samoa experience. *In: Proceedings of the APN Workshop on Ethnographic Perspectives on Resilience to Climate Variability in Pacific Island Countries*, p. 30. Macmillan Brown Centre for Pacific Studies, University of Canterbury, Christchurch.

Turner, G. (1884). Samoa: a hundred years ago and long before. London Missionary Society. First printed London 1884, reprinted 1984, 1986, 1989. Institute of Pacific Studies, University of the South Pacific, Suva, Fiji.