Climate and Oceans Support Program in the Pacific

APRIL 2014

Manager's message

I hope that all our friends in the Pacific enjoyed a happy Easter, and are excited to tackle the busy months ahead!

I recently attended the Global Framework for Climate Services (GFCS) meeting in the Cook Islands, where many Pacific partners gathered to share information about work being undertaken in our region. I have returned from this meeting inspired by the great ideas and opportunities discussed, and enthusiastic to further explore COSPPac plans for the next 12 months at the COSPPac annual Planning and Steering Committee meetings in Fiji in May—you can read more about these meetings later in the newsletter.

A major success for the COSPPac team is the recent establishment of a specialised IT Support Unit. The new IT unit will provide IT expertise to COSPPac to support the ongoing development of tools such as the ocean portal, SCOPIC, the real-time tidal data display and the TK database. As COSPPac has progressed, the range of IT tools we provide has grown with the demand from island stakeholders. Now with an IT unit we will be able to make sure those tools are built to meet stakeholder needs and are sustainable beyond COSPPac.

Lastly, I would like to extend my warm wishes to two members of the COSPPac team who recently welcomed babies into the world—congratulations to Shannon McNamara on the birth of Aubrey, and to Grant Smith on the birth of Zach.

Best regards
Janita

Contact

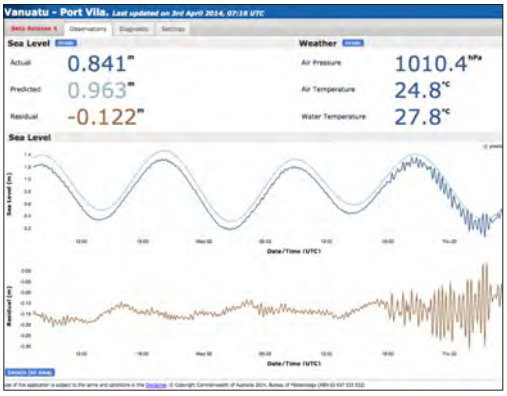
Bureau of Meteorology

GPO Box 1289 Melbourne VIC 3001
700 Collins Street, Docklands VIC 3008

T: +61 03 9669 4158
E: COSPPac_CDC_Unit@bom.gov.au
W: www.bom.gov.au

The COSPPac team hope that all our partners across the Pacific are enjoying a productive start to the year and had a happy Easter. There are many exciting activities occurring over the coming months.

Upcoming events	Regional Observers Workshop (Fiji)
	COSPPac Planning Meeting
	PNG workshop
	COSPPac Regional Workshop
	Tonga Workshop



Real-time display on 4 April 2014 for Port Vila, Vanuatu, clearly shows the spread of waves from the Chilean tsunami.

Real-time data display is officially released!

After a successful trial period, we have officially released our real-time data display for the Pacific tide gauge network. The real-time data display provides a convenient and easy to interpret 'dashboard' view of sea level and weather conditions for 16 tide gauges in the Pacific Sea Level Monitoring network.

There are two versions of the real-time display: an 'online' version, which allows you to view information from any tide gauge in the Pacific network (www.bom.gov.au/cosppac/rtdd/q1c7o0hj48yu), and a local version, which may be useful in Pacific countries with limited internet connectivity, and displays only information from each country's own tide gauge.

The internet version of the real-time display was circulated around Pacific National Disaster Management Offices to seek their feedback. The tool proved very useful in monitoring the spread of waves generated from the April 2014 Chilean tsunami throughout the Pacific region—as you can see in the screenshots of the tide gauge data from Vanuatu.

Project partners met to discuss progress: (L–R) Andrew Darcy (National Health Training and Research Institute), Grant Beard (COSPPac), Erick Hale (National Vector-Borne Disease Control Program) and Lloyd Tahani (Solomon Islands Meteorological Service).

Malaria project in Solomon Islands shows great promise

In early April, key stakeholders in the COSPPac MalaClim project gathered in Honiara to discuss progress. Partners included the Solomon Islands Met Service; the National Vector Borne Disease Control Programme; Ministry of Health, Ministry of Mines and Energy, and Ministry of Lands; and, Jason, Isabelle and Grant from COSPPac.

The MalaClim partners are looking at the relationship between climate and malaria transmission in the Solomon Islands. Early studies have focused on statistical analysis for North Guadalcanal and mapping malaria transmission suitability. So far, this has shown a strong relationship between low rainfall in the early wet season and high malaria incidence in the following months—but we're still not sure if the correlation is true for other parts of the country.

Ultimately, they are hoping to be able to develop a model that can be used to forecast the severity of a malaria season using weather and climate information. The relationship between climate, weather and malaria is not simple, and the model development requires a lot of complex analysis.

Isabelle, Jason and Adna have been working with their colleagues in the Solomon Islands to further downscale this information. One of the main aims of this trip was to share information with key experts in-country and to collect their feedback.

The trip was a great success, with lots of discussion and the discovery of crucial additional data. It was also a valuable opportunity to connect with project partners.

Top: Polapola Keli (Tuvalu Meteorological Service) talking to local students on World Meteorological Day. Bottom: Kasis (Papua New Guinea National Weather Service) speaking about training priorities with Melissa (COSPPac).

Tuvalu and Papua New Guinea look toward the future

To help plan for the future, the Capacity Development & Communication (CD&C) team have been working with Pacific Met Services to create individualised learning and development (L&D) plans. This March saw a busy couple of weeks, with Molly joining the Tuvalu Met Service, and Melissa and Roan visiting the Papua New Guinea National Weather Service (NWS) to meet with staff and begin work on their L&D plans.

Molly's visit also coincided with Tuvalu's first-ever World Meteorological Day, which was a resounding success. Under the theme of 'Engaging Youth', Tuvalu Met opened its doors to hundreds of young people throughout the week, from pre-schoolers to University of the South Pacific students. They participated in observations, released weather balloons, and learnt about climate and forecasting.

Over in Papua New Guinea, Melissa and Roan were made very welcome by the friendly team at the National Weather Service. During the week, the dedicated staff of the climate section took time to discuss the work that they do and their training and development priorities. At the same time, they were busy making preparations for their own World Meteorological Day celebrations. One highlight of this was relaunching a mini weather station at the University of PNG, where a partnership arrangement will see students collect real-time data for study, and share the data with the NWS.

Through one-on-one interviews and discussions, the CD&C officers were able to get a good grasp of the Tuvalu and PNG teams' skills and priorities for future training.

Fa'afetai lasi and Tenkiu tumas to the Tuvalu Met Service and the PNG National Weather Service for the warm welcome and insightful discussions.

Melissa, Molly and Malcolm (COSPPac) contributing to brainstorming.

Sea level program planning workshop a success

In February, COSPPac held an intensive three-day planning workshop with the National Tidal Centre in Adelaide.

We explored what had already been achieved in the 20-year history of the Pacific Sea Level Monitoring (PSLM) Project, and brainstormed ideas for training and development activities that could be valuable in the future.

It was exciting to begin the initial planning stage for the next two years of PSLM training with such a committed and passionate group, and the COSPPac team is enthused to work with our 14 partner countries on delivering some valuable PSLM activities.

We'll be in touch shortly to see what you think of our ideas.

Stamy and Malcolm (COSPPac) using the Niue tide prediction calendar to estimate the tidal range for the Niue tide gauge.

Tide calendars in action

In late December and early January, we distributed over 1000 tide prediction calendars to met services, land and survey divisions, maritime service industries, and other partners across the region. The calendars are a reliable resource for tide times and heights for 16 locations across the Pacific, and are in high demand every year.

'I get lots of requests for calendars from shipping companies and the ports in Lautoka and Suva,' says Electronics Technician Peni Musunamasi (SPC). 'We rely on them as well when we conduct hydrographic surveys around the region.'

The tide calendars are one of the longest running and most well-known products of the Pacific Sea Level Monitoring Project, however this year there are a few changes that long-time users may notice. For instance, each country calendar now has the highest and lowest tides of each month marked with black triangles.

These changes were based on some of the suggestions from COSPPac's tide calendar satisfaction survey last year. We look forward to further improving 2015 calendars with your feedback.

Monthly tide calendar pages can also be downloaded from the Bureau website at the following link: www.bom.gov.au/oceanography/projects/spslcmp/tidecalendars.shtml

The 2013 Planning Meeting was a great success and helped to formulate plans for COSPPac's activities over the last 12 months.

COSPPac Planning Meeting and Mid-Term Review

The two-day Planning Meeting in May is the most important time we spend with our most important stakeholders, including national meteorological services, lands and survey departments, SPC/SOPAC, SPREP, GeoScience Australia, and the Australian Department of Foreign Affairs and Trade. This meeting is our annual opportunity to get a better understanding of the priorities in the region and work out how we can best meet them, while coordinating with other regional programmes. The feedback and guidance we have received during the past two meetings have given us lots of information about what we're doing well, and where we can still improve.

Following the Planning Meeting, the COSPPac Steering Committee will accept or alter the plans that have been drawn up, ensuring that COSPPac is headed in the right direction.

These meetings will also be an opportunity to introduce the panel members for our upcoming COSPPac Mid-term Review, which will begin in June 2014. The Australian Department of Foreign Affairs and Trade have selected a panel of independent experts in the fields of aid and development programmes, climate forecasting and tidal science to review the effectiveness of the programme so far, and provide insights on areas for improvement. The independent panel will be present at the 2014 Planning and Steering Committee meetings, and will be able to give us all some information on how the review will take place over the coming months.

What was the answer to last edition's tricky question about cognitive illusions? Photo credit to Marco Bellucci, www.flickr.com/photos/marcobellucci/.

Barriers to using seasonal outlooks—cognitive illusion: reasoning

In the last edition of the COSPPac newsletter, Grant Beard asked us to consider the following scenario:

Imagine a climate prediction model with 90 per cent accuracy predicts that my farm will be in drought next year. Imagine also that historically there is a 10 per cent chance of being in drought. Assume further that the model is unbiased—that is, over the long run it forecasts just as many droughts as occur in reality (10 per cent). What is the chance that there really will be a drought on my farm next year?

The answer is not 90 per cent (model accuracy), but 50 per cent. Why?

The easiest way to frame the question is to construct a table which describes the various possibilities. As for the forecasts, there are two possibilities: forecast of drought or forecast of no drought. Similarly for the observations: either a drought is observed or it isn't. So a 2 (possibility) x 2 (possibility) would result in:

	Drought was forecast	**Drought was not forecast**
Drought observed	*Possibility **A***	*Possibility **B***
Drought not observed	*Possibility **C***	*Possibility **D***

Now, in the question we are given three key pieces of information about the model and nature:

1. Accuracy = 90 per cent. This means that the sum of A and D = 0.9, i.e. hits. Therefore A + D = 0.9.
2. The model is unbiased. This means that the model forecasts droughts at the same frequency as observed in nature, that is, 10 per cent. Therefore (i) A + C = 0.1 and (ii) B + D = 0.9.
3. The historical drought frequency is 10 per cent. Therefore (i) A + B = 0.1 and (ii) C + D = 0.9.

Here, we use Bayes' Theorem about conditional probability to understand the relationship between these factors. If we combine these equations, and solve them simultaneously:

From 1: A = 0.9 – D From 2(ii): B = 0.9 – D

Substitute for A and B in 3(i): 0.9 – D + 0.9 – D = 0.1

-> 1.7 = 2D -> D = 0.85

It then follows that A = B = C = 0.05.

The original question asks what is the chance of a drought given a drought was forecast by the model. In other words we want to know the fraction of droughts (A) out of all the model drought forecasts (A + C).

This equates to the fraction A / (A + C) = 0.05 / 0.1 = ½ = 50 per cent, meaning there is a 50 per cent chance that there really will be a drought on the farm next year!

What is Bayes' Theorem?

Bayes' theorem is a formula for determining conditional probability and is named after Thomas Bayes, who first suggested using the formula to update beliefs.

The theorem is a way of understanding how the probability that a theory is true is affected by a new piece of evidence. In science, Bayes' theorem is often used to clarify the relationship between theory and evidence, and particularly, how a theory may change as you discover new evidence.

While we may use the theorem to assess probabilities in seasonal outlooks, it can also be used in a great variety of other fields from marine biology, to finding lost objects, to determining the accuracy of medical tests.

Jeff Aquilina.

Jeff Aquilina, Maintenance Supervisor of the Sea Level Network, Pacific Sea Level Monitoring Project (PSLM)

Jeff has been with the Bureau of Meteorology since 1985. After completing his Certificate in Technology, he started working in the Bureau's Head Office in Melbourne, where he spent ten years before transferring to the National Tidal Centre in South Australia.

In 2011, he changed roles and started working as the Maintenance Supervisor of the sea level network, working in a small team with Rob Durieu and Tod Iolovski.

This work sees him spending a lot of time travelling between different countries—Jeff's favourite part of his job is meeting and working with the local technicians from the in-country Met Offices and SOPAC staff, Peni Musunamasi, Maleli Turagabeci and Poate Degei.

When he is not working, Jeff likes spending time with his family (especially time at the beach together!) and enjoys watching and playing sport.

Meelina enjoying her work.

Meelina Ailesi, Climate Officer, Tuvalu Meteorology Service

Meelina joined the Tuvalu Meteorology Service in December 2013, as a Climate Officer funded by the COSPPac project. In her daily routines, she enjoys logging climatological observations, accessing CliDE and SCOPIC and preparation of OCOF tables for teleconference, as well as producing her Climate Outlook Update for local clients and the Tuvaluan public.

Meelina is a Geographical Information System (GIS) graduate and served 15 years in the engineering field. She has been involved in many areas such as technical work, field work, researching, data management systems, data analysis, and project proposal and reporting.

Meelina is cooperative, supportive and a very friendly person, who is keen to explore and learn more.

Outside of work, she likes being with her kids and particularly enjoys taking them cruising on the island.

Australian Government

Tell us about your work on climate and sea level

Down here in Melbourne, we'd love to hear about the work you are doing in the sunny islands. If you have attended a terrific climate or sea level conference, done some interesting work with stakeholders, or even just broken a climate record recently, drop us an email to let us know about it! COSPPac_CDC_Unit@bom.gov.au.