



Approaching storm, the beginning of what turned into tropical cyclone Gabrielle. Taken at Madau Island

Maria Habona

The ECA team of George Aigoma, Steven Taugopi and David Mitchell made a joint 'patrol', field work to the outer Trobriand Islands with members of the Environment Unit of Milne Bay Admin and national CCDA.

This was as part of the BRCC, Building Resilience to Climate Change in PNG, ADB funded program on Food Security. This work took us to the rarely visited preselected islands of the Luzancays; Kawa and Konia, the villages of Keileuna Island and Lalela village of Kitava Island. As getting to these places is a full days dinghy travel from Alotau on an open 23' fibreglass banana boat with a 40HP engine hanging off the back, the calmer the weather the better.

Though the windows of calm weather are mostly during the doldrums before, after and to some extent during the NW Trade/Monsoon wind season this is also the cyclone season.

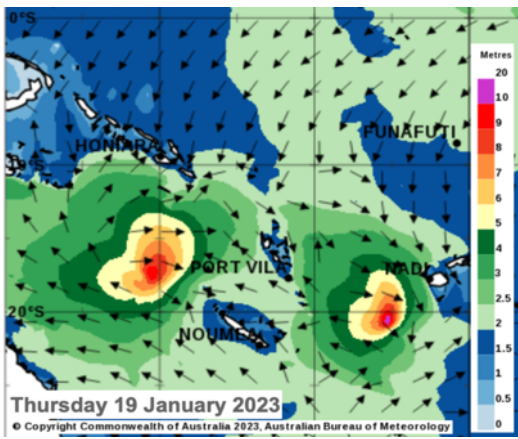
Though we got rained on a lot, the weather held out apart from one day sheltering on the island of Nauria during a gale that blew in from the NW.

The picture above was when the government team tried to extend their fieldwork whilst we returned to Alotau in calm seas. They had to shelter for some days and after a change of plans headed back.

Unfortunately around this time a dinghy capsized in its approach to the easternmost Budibudi Islands and everyone including school students were lost at sea. Such are the sad hazards of travelling at sea in a maritime province, often in increasing unpredictability of the weather that seems to be an emerging factor of climate change. Being so remote and with limited search and rescue capability the initial 24 hours come and go and response opportunity is usually lost.

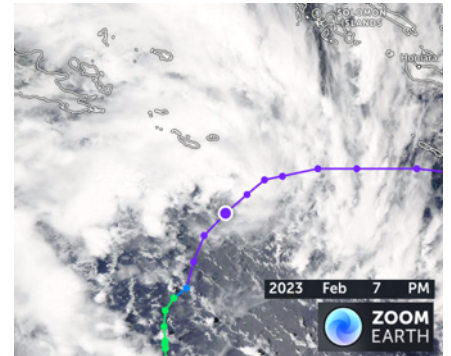


Squall on the approach to Konia Island.



Before we went on fieldwork we observed the weather carefully as when we were planning to go, two low pressure systems travelled west to east. The map left shows the 9-10 meter waves these generated. In our area it was then predicted calm for a week so we took off for fieldwork 24th Jan. By the 6th of February we saw another low system coming from east to west so we headed back to Alotau. Two days later this became Tropical Cyclone Gabrielle.

Its intensification reached Milne Bay through the tail of cloud feeding into it clockwise, as seen by the satellite image right.



This caused heavy rain as seen in the map left, causing landslides in Vanuatu and sea swells in New Caledonia. It then caused heavy flooding of the north Island of New Zealand that led to a State of Emergency in some areas.

This was the first TC in the 2022-23 South Pacific cyclone season.

Two weeks later Tropical Cyclone Judy 28th of Feb intensified to Category 3 then 4 hitting Vanuatu. TC Kevin closely followed hitting Vanuatu again as a Cat 4 on the 4th of March. It too was fed from our region. Two earthquakes then hit Vanuatu one a Magnitude 6.5 off the main island on the fault line.

It can be more than a bit tricky doing field work at this time on our waters.

Letter From the Director

Welcome to our fourteenth ECA newsletter for Eco Custodian Advocates, In this time, we did a stint of field work in the remote Luzancay islands in the top left corner of the province. It was at a time of cyclone generation and we had to be pretty mindful of the weather which features throughout this newsletter, including a broader look at global warming and climate change impacts we are seeing on the environment and peoples food security. These trends are very disturbing and concerning with very visible deterioration of our natural environment quite evident.

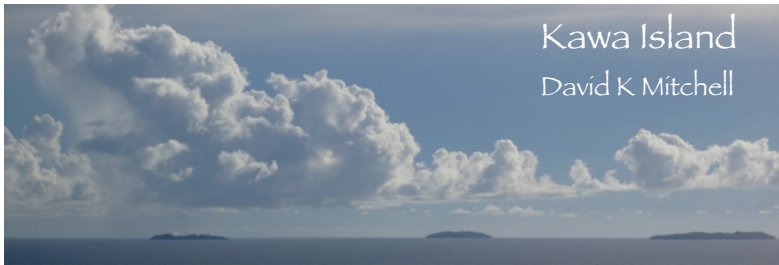
We gave a lecture at UPNG, on gwala, customary law and recording this on smart phone; presented gwala at a meeting in Kavieng and with the ward members of the Bwanabwana Local level government.

A lot of time was dedicated to donor applications, and discussions. Some 15 in all, as sourcing sufficient ongoing funding is a major concern and we have so far gained support from partners in the US, UK and South Korea that we will report what we managed to achieve, in the next newsletter.

David Mitchell

David K Mitchell





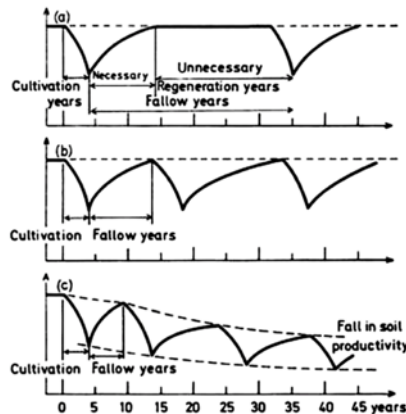
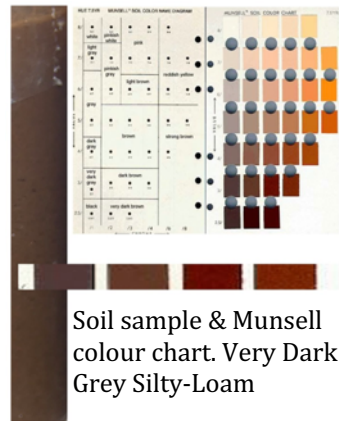
Matagina, Nauria & Kawa as seen from the peak of Konia Island



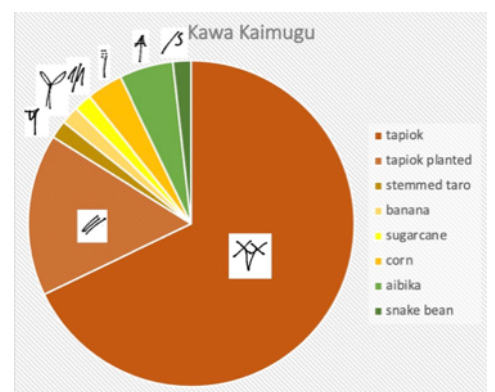
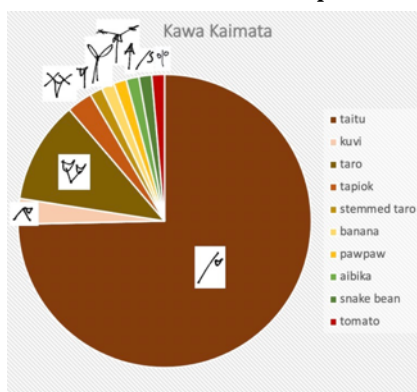
Disaster map of Kawa Island CCVA

On small outer islands it is not unusual at the beginning of the year for households to eat only one meal a day such as this dish of tapiok on the left, or the drought food of *Pueraria* root on the right. When a population that relies on subsistence agriculture exceeds 500 people per arable square kilometre of land, it becomes more difficult to become self-sustaining.

Doing surveys of all of a household's gardens on each of the islands gave us a picture of what amounts and types of food could potentially be produced from these gardens. It was based on doing botanical survey transects that I learnt in Botany 1 at university, way back in 1977 that I'd adapted in looking at gardens on the Amphlett Islands in 1986. Basically, it involves walking through a garden from 'bottom' to top and from one side to the other noting everything seen in a meter wide transect. I record this by drawing symbols of the food plants as in the pie diagrams on clipboard and paper or a waterproof slate if in the rain.

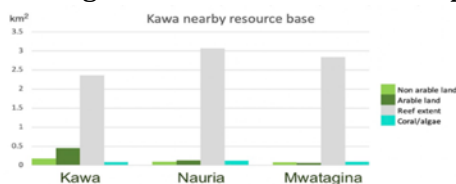


But first a bit about soils. As the fallow period of the subsistence garden is decreased, the return to fertility of the soil also decreases making the harvest less productive. This is usually due to decreased organic matter, that maintains soil structure, water holding capacity and the release of available nutrients. It takes 100-200 years for 1cm of soil to form from rock in the wet tropics. So, soil, we have to look after it.



First year *Kaimata* garden

The results for a Household, HH on Kawa Island for two of their gardens is shown here. The first-year planting of *Kaimata* and subsequent years of *Kaimugu* and *Takwaba* gardens. There was also a pawpaw/banana garden on Kawa and on the island of Nauria, *Kaimata* and *Kaimugu* gardens. From all these garden surveys an estimate of total amount of food from the gardens and subsequently how much per person each day in the household can be calculated with some level of confidence and error.





Kawa outer Islands

David K Mitchell

Loading planting materials for Kawa

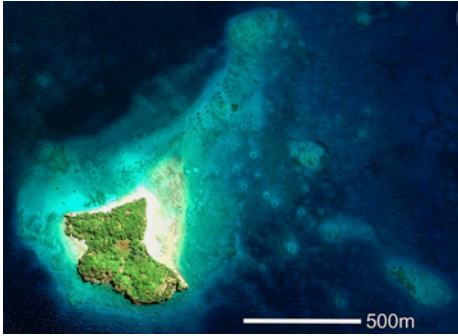


Lake and taro Matagina Island



Cracked saido nuts Matagina Island

The Kawa community also have access to the nearby islands of Nauria and Matagina.



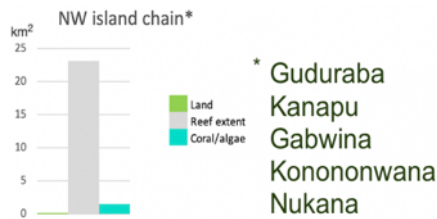
Matagina with lake (brown) in centre



the SE point with beach and anchorage in the bay behind

Matagina island has always intrigued me with its fresh water lake in the middle. This usually covers near 2500m², but after the rain on this trip it covered more like 9000m².

There are also small islands to the NW of Kawa that are used mainly for their coconuts, but also mangrove for timber and fuelwood. In addition, there are sand cays, some of which were quite extensive, supporting turtle rookeries, however due to sea level rise many of these have been totally washed away in recent years.



* Guduraba
Kanapu
Gabwina
Kononowana
Nukana

There are extensive reefs fringing the islands and more remotely, many of which are poached mainly by fishers from Trobriand Island especially for high value resources such as sea cucumbers when the season is open. There is a need for the marine rights tenure areas of the small islands to be delineated along with the usage rights outlined and enforced through the Kiriwina Local Level Government and headquarters based at Losuia Government Station.



Fresh water well and husked coconuts Kononowana Island

Surprisingly the ADB CCVA Climate Change Vulnerability Assessment and others such as by IOM visited the inhabited island of Kawa, but did not factor in the far-ranging extent and variation of their resources. Kawa Island represents only 60% of available land and less than <10% of reefs.

Also, these islanders trade with the people of Goodenough Island to the south. The mountains of which are clearly visible from the gardens of Nauria. There are however extensive emergent reefs in this passage making it a challenge to pass across.



Goodenough Island as seen from gardens on Nauria



Kawa reefs

David K Mitchell



Structural coral and bleached coral in both pictures with a large proportion of dead coral covered in algae.

These reef pictures are the sad and scary reality of the present and future change of our reef association, a steady state that flips a tipping point (Degree Heating Weeks) to the next state of an algal ecosystem. This 'flip' was predicted by Oceans Flagship CSIRO researchers in 2010 to be seen in

Milne Bay waters around 2060, but are we seeing the signs much, much, earlier? The Lusancay reefs are at 8.5° degrees S and the water temperature, thermocline as we go closer to the equator from the Coral Sea to the Solomon Sea gets warmer, where we would anticipate seeing such change, rather than this far south.



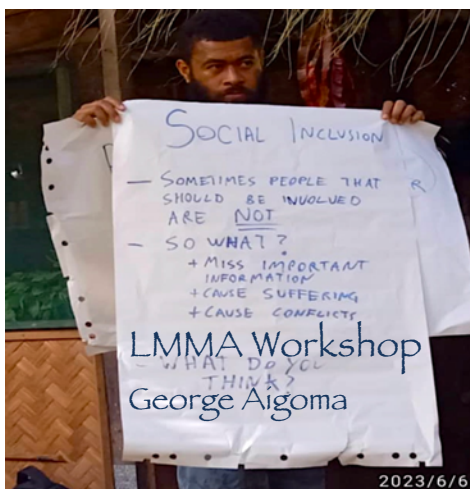
Kawa islanders' approximation of their marine tenure Watching *Gwala* Rising on Nauria Island

We discussed with islanders about the extent of their marine tenure which they felt extended into Northern Province and further than equidistant towards Goodenough Island. Yet this has not been clearly determined or defined and their rights of marine tenure have not been clearly recognised.

In talking to an educated resource custodian from Ufaufa on the NNW corner of Goodenough Island she challenged that the marine tenure rights of the Simsim people extended so far south. This is where talks are needed to take place between Goodenough, Cape Vogel, Collingwood Bay, Tufi, Simsim, Trobriand/Kaileuna and Fergusson across 6 LLGs and 2 provinces to sort it out. Where

customary rights meet and inform formal government.

Here also as for other islands we set up a white screen, wired up a genset, projector, boom box and showed 'Gwala Rising' and 'Gwala is Life' to communities to see and think about customary marine closures especially over part of the islands fringing home reefs. Also, we showed the animated movie Moana and I was quite tickled by some of the old ladies tut-tutting away and making comments on the young girl Moana. In remote communities they do not have telecommunication network coverage, so no internet to reach beyond the horizon so such a show was appreciated by many.



C-Change of Fiji ran a workshop supported by the Wildlife Conservation Society, WCS for local marine resource owners, in Kavieng, known as '*Bilas peles*', so called for its turquoise clear waters and beautiful green jungles. People came in from the far flung Musau Island, the remote Emira to Anir islands, the New Hanover Islands and the main island of New Island from the west, central and east coasts. They represented CBOs, faith-based organisations and their communities bringing their experiences of local and traditional knowledge in marine management. Also, some counterparts from other local PNG NGOs, including ECA were invited to share their experiences. The second week brought people in from the Solomon Islands, Vanuatu and Fiji. Whilst the big NGOs continue in formal LMMAs

there remains the customary management approach.

On right some cowries I collected. They evoke a sense of mystique for many, the largest, once *Cypraea* is now *Talparia talpa*. [Etymology; mole Latin]





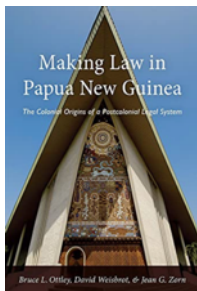
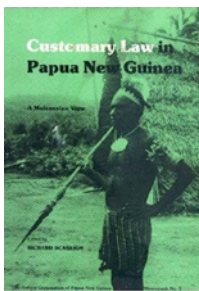
Gwala Bwanabwana LLG
David K Mitchell

The President of the Bwanabwana Local Level Government Hon Elama Peter submitted a policy paper in relation to the practice of *gwala* as it relates to conservation, sustainable resource use and customary law. In this June sitting of the assembly held at Samarai they passed a resolution in support of this.

Bwanabwana LLGov in session. The Assembly Clerk in 'Cambridge' gown ep

The policy will be outlined in the next newsletter as this is an important innovative development of formally recognising *gwala* as a customary law, both within the extent of the Bwanabwana language-cultural 'nation' and within the jurisdiction of the Bwanabwana Local level Government administrative area, that both essentially cover the same cluster of communities. Prior to this I gave the ward members an outline of the relevant sections of the constitution, national, provincial and local level government laws, and

national development plans that relate to and support or strengthen the case for village-based governance of natural resources. We need to ensure that the people maintain the power of their rights over the resources that they are holding in trust for the future generations in their place. This awareness and initiative had been delayed since 2019 due to a long string of different reasons, so we were glad that this idea that we had been proposing for so long finally eventuated.



Within the CLRC discussion and development in applying customary law has been rather start-stop. Of the books on the left I freely downloaded the 1983 one edited by Scaglione and bought *Making Law in PNG* from the publisher, who were very helpful. From a USP review; 'The authors emphasise that the alternative to the impartial judge, the customary law, had knowledgeable and experienced big men or elders. [Yet] when the codified laws of the Western legal system were implemented in the territory, the suppression of the customary laws was obvious, with no

efforts made by the colonisers to adapt them according to the customs and traditions of PNG.' Having read the book through, it is a solid outline of colonial law to the present. The book after dispatch through USPS took 2 months to get to me crisscrossing from North Carolina to New York, to Miami and back to New York before being dispatched out of the US. Maybe a PNG address was a hot potato of the unexpected?



Object Type
fish-hooks

Museum number
Oc. 6324

Description
Fish-hook (with line), hook is formed of two pieces of palm wood lashed together in a 'V' fashion with three ply fibre cord.

Production ethnic group
Made by: Trobriand Islander
Made by: Mission

Production date
19thC (before 1893)

Excavator/field collector
Field Collection by: William Whitton



Fishing is a major activity that supports small island people such as those of the Lusancay islands with protein-energy, in what is otherwise a high starch, carbohydrate diet from garden food staples along with coconut. Before the introduction of iron, steel hooks and

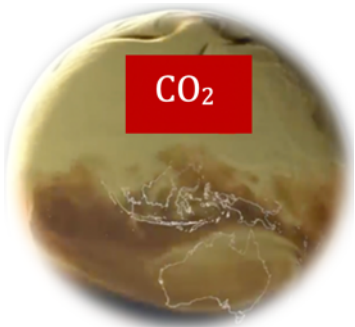
Traditional fish hooks and lines from Trobriand Islands circa 1893 collected by a trader/recruiter from Samarai Island; Current day hooks and line preferred Hooks 5/0, line 45lb

monofilament lines the fishers would make both barbs and string for catching fish. Though highly functional these are also a work of art, far from being rudimentary they are highly sophisticated in their manufacture. Yet another indication of the capability of these communities pre-colonial contact.

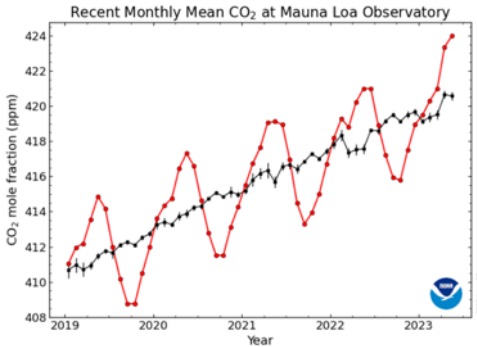


Gwala on Kitava island with a full bulk carrier on its northern voyage, another empty on the southern return voyage.

While in coastal communities across Milne Bay *gwala* marine set asides are in place for the local ecology to recover, more and more coal is being exported from Australia to Asia passing through our waters. This is destined for coal-fired power stations with resultant CO₂ released to the atmosphere which contributes to global warming and to the bleaching of the very corals we are trying to look after.

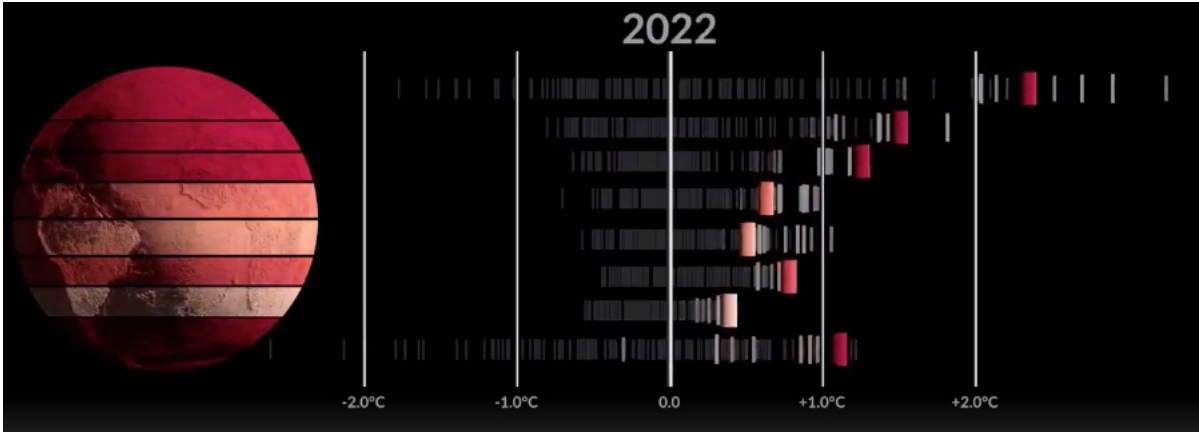


CO₂ 2021 NASA



The levels of the GHG Greenhouse gas, Carbon Dioxide CO₂ continues to rise without any indication of levelling out, let alone decreasing back to 350ppm.

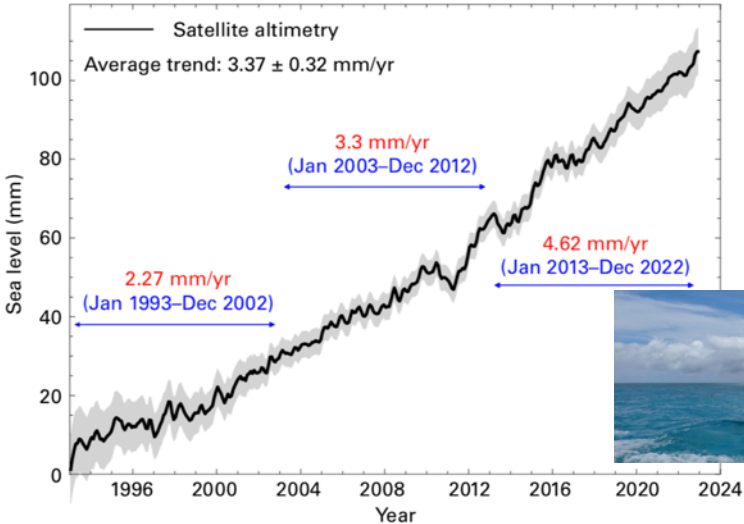
From the world map left it is apparent that much of the CO₂ is produced in the northern hemisphere.



Temperature increases vary within and between years but also by latitude. For PNG in 2022 that's near a 1°C in increase from preindustrial times.

UNDRR 'The world is on course for a disastrous **temperature rise** of 3.2°C instead of the agreed 1.5 °C

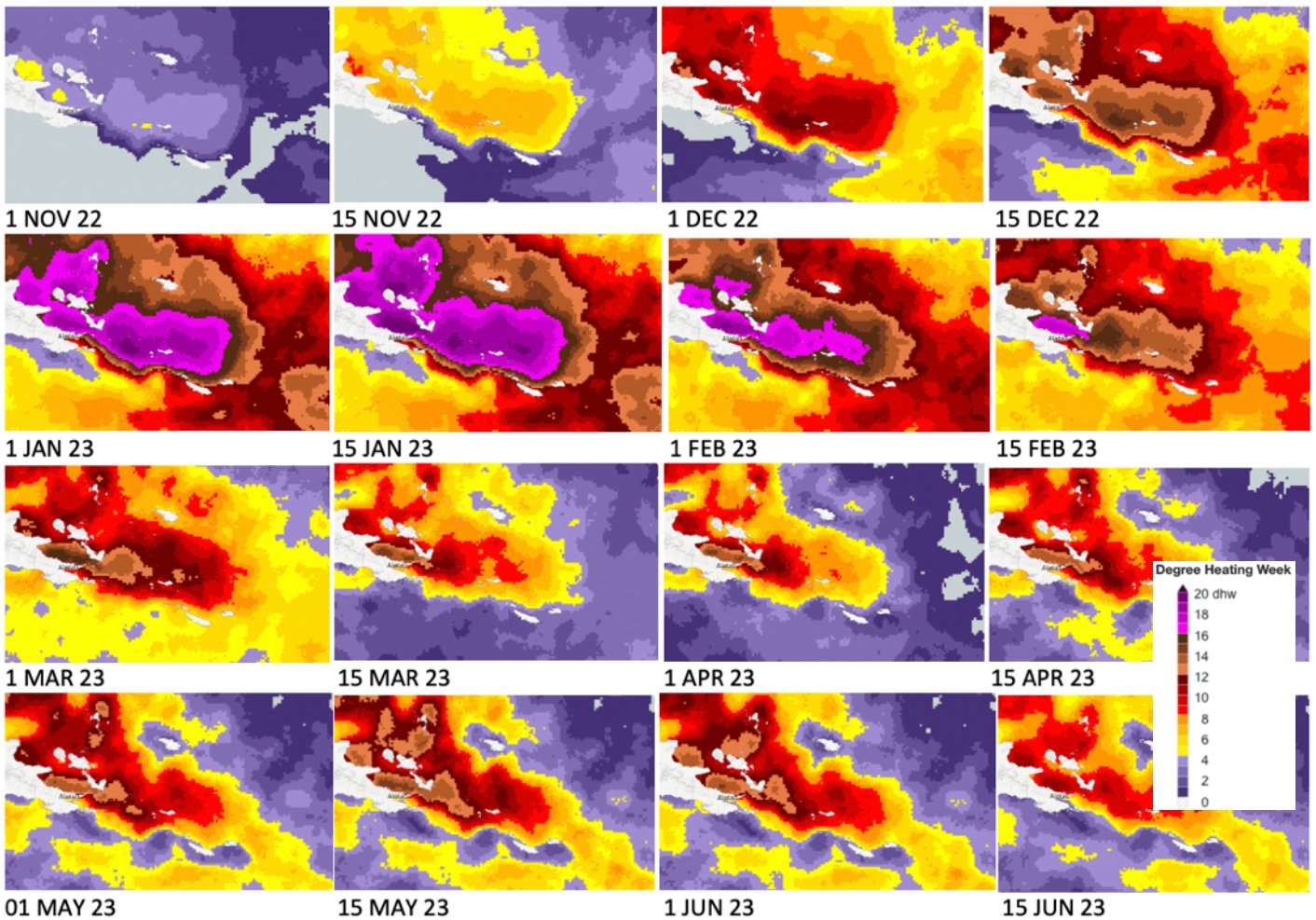
Sea level rise



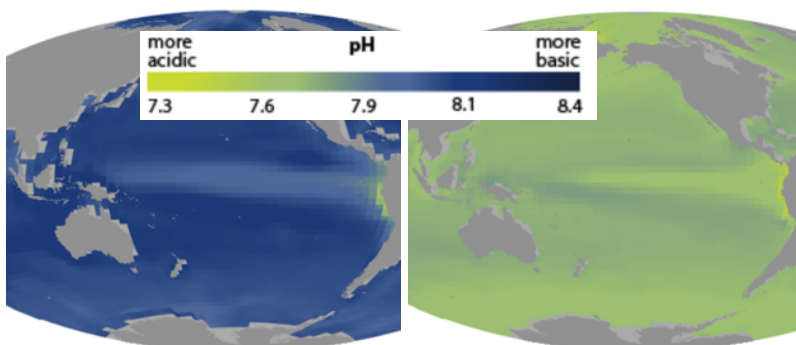
Above; turtle tracks, looking NW to Konokonowana and Gabwina islands. Left and above; the disappearing Nukuana Island.

Average sea level rise is accelerating every decade. Even at the current rate the sea will rise at least 12.5cm by 2050 and at least 35cm by 2100 or much, much more.

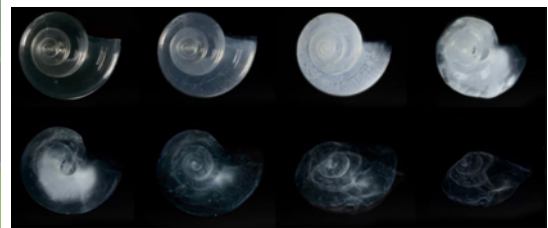
Sea surface temperature



The waters of Milne Bay saw catastrophic levels of sea surface temperature in the first half of 2023. This caused extensive coral bleaching when > 4DHW and mortality > 8DHW of different forms of coral. Climate change and impacts on the coral association that is home to the second highest known richness of coral fishes globally is looking dire. With an El Nino likely occurring in the second half of this year we will be watching it anxiously. These maps were taken from NOAA on the free to use Allen Coral Atlas <https://www.allencoralatlas.org>



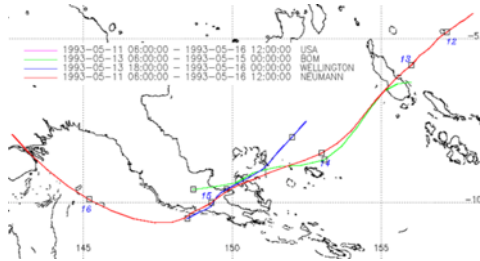
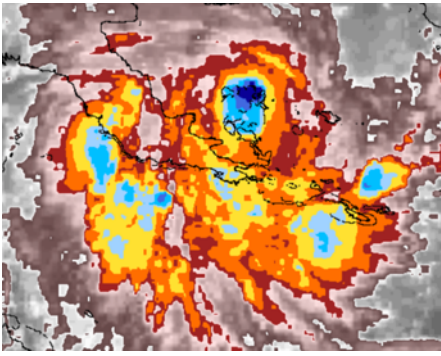
Ocean Acidification



Present ocean pH pH 2100 with no CO₂ reduction NOAA Climate.org Pteropod shell out to 2100

With the absorption of CO₂ by the oceans the pH decreases and the acidity increases; The equation of this is $CO_2 + H_2O = H_2CO_3$. dissolved carbon dioxide plus water produces carbonic acid.

This makes it harder to create CaCO₃, Calcium Carbonate which is a building block of corals and molluscs, sea shells that will seriously dissolve at the acidification levels anticipated by 2100 if not before. It makes me wonder if sea shells will still be in our oceans in two generations time due to the current rate of acidification increase that rarely gets a mention. That is why I collect sea shells that are washed up on the beach whenever I get out into the field.



Cyclones too hit Milne Bay. TC Adel hit late in the season, May 14 1993. It followed a very different path cutting right through the province. After I remember counting over 100 landslides on Fergusson & Goodenough islands

looking out the window of a light aircraft flight to Vivigani soon after.

Left; TC Adel intensity when over the Trobriand Islands

Above; the track as per different sources

Below; how this was reported, in the then local paper

The Eastern Star

MILNE BAY PROVINCE

Number 41 Monday, May 24, 1993 24 pages Fortnightly 20t in Milne Bay Province; Elsewhere 40t
 PHON E 61-1141 FAX 61-1370 Classified advertising bookings close 5 pm Tuesday before publication P O BOX 423 Alotau MBP PNG

K200,000 CRISIS AID

Adel claims four dead, 600 homes, huge food losses in 26 villages

By Judith Livinai

The National Government presented the Administrator, Mr Ataia Andrew, with K200,000 on Thursday, May 20, to provide immediate assistance for families in the areas ravaged by Cyclone Adel.

The K200,000 was presented to the Administrator, Mr Ataia Andrew after he requested funds as the Chairman of the Provincial Disaster Relief Committee, for the cyclone victims.

Mr Andrew had requested Sir Julius for K100,000 but Sir Julius had given twice the amount requested for.

Regional Member, Mr Tim Neville, when presenting the K200,000 on behalf of the government, said he was extremely concerned about the

extent of the damage Cyclone Adel had caused on Woodlark islands, Trobriand islands, Goodenough, Fergusson, Normanby and the Amphlett islands.

Mr Neville said he was aware that the North coast areas of Rabaraba, Tarakwaruru and the nearby villages were also affected.

On behalf of his family, Mr Neville conveyed deepest sympathy to the families who had lost loved ones in the cyclone.

"I would urge the Provincial Disaster Relief Committee to ensure that the K200,000 relief funds from the National Government are used wisely to assist those areas of the province which are very badly affected by the cyclone", Mr Neville said.

He called on the

districts not affected by the cyclone to assist wherever possible in their own little way to restore services in the badly affected areas.

Mr Neville said this meant putting away differences and working together.

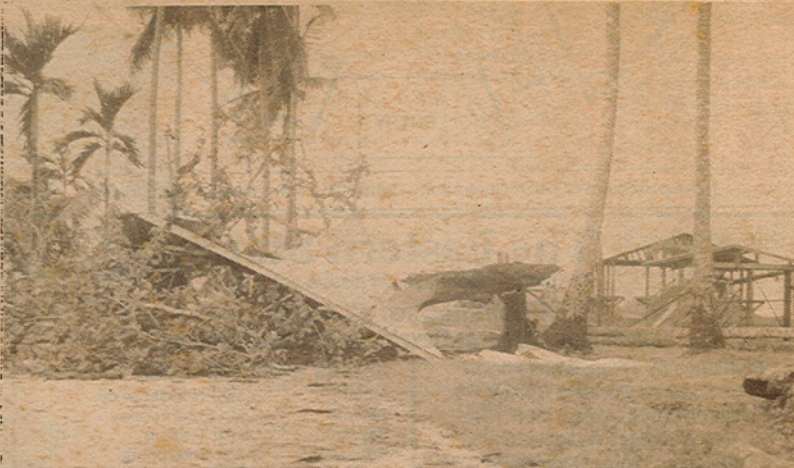
"In this time of difficulties we must put aside our personal, political, religious or cultural differences and work together for the restoration of services to those families that are currently suffering as a result of the damage caused by the cyclone," Mr Neville said.

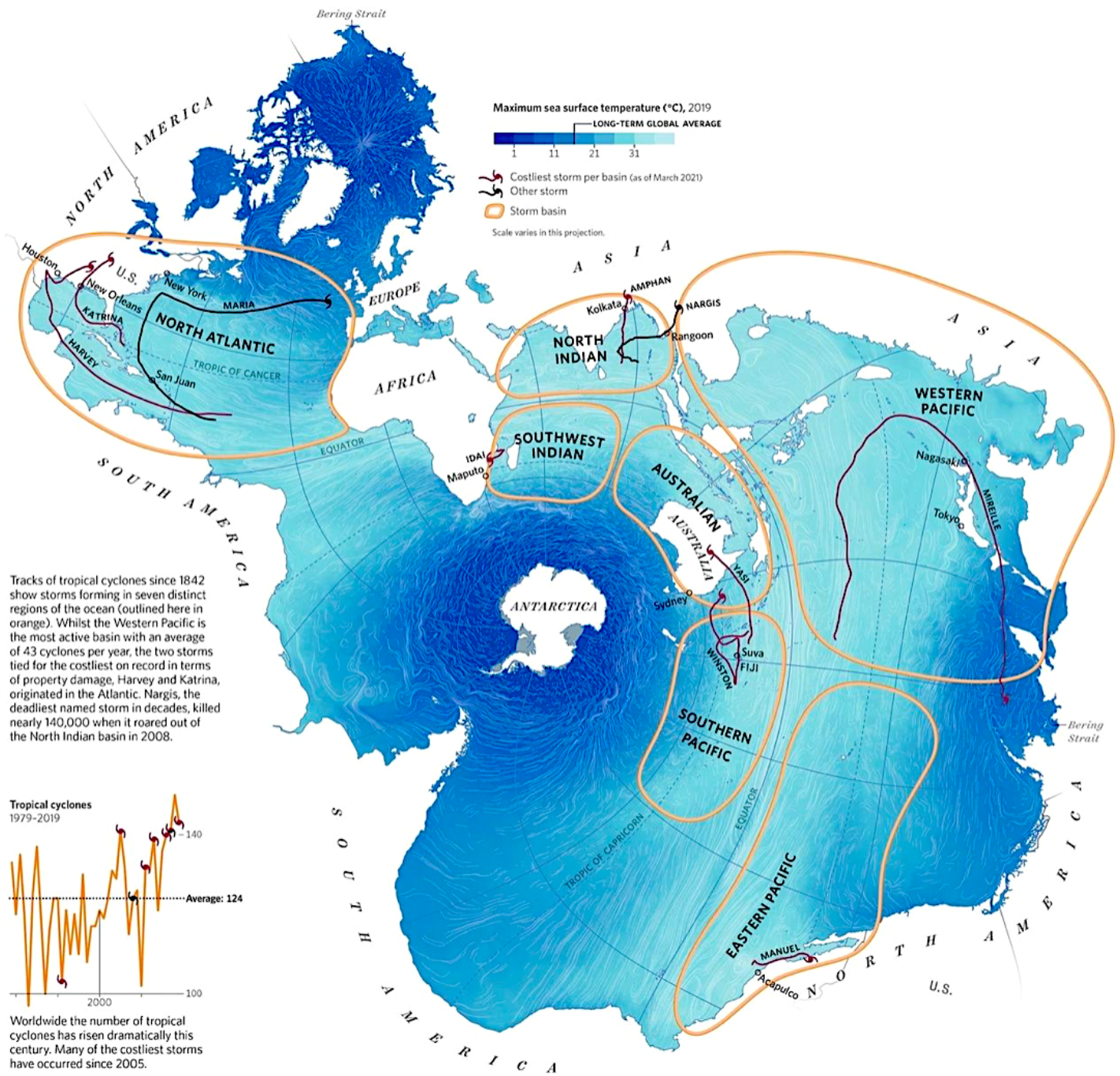
Assessment
 Meanwhile the Provincial Disaster and Relief Committee has been working full time assessing the extent of the damage caused by Cyclone Adel in the affected areas of the province.

Seventeen villages
Continued page 12



• Above: Hon. Titus Philemon consoling the captain and survivors of the sunken MV Kiwali at Losuia after they were flown in from Iwa Island. Below: This is what remains of the boat shed that used be down by the Losuia government wharf. Pictures by Bunting Kauri

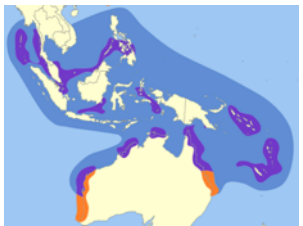




Just out of interest an Ocean view map for a change. This one shows storm basins with Milne Bay being in the Australian Basin that is influenced by cyclones coming in from the west. The graph is showing that the number of cyclones worldwide is increasing.



We came across this seabird that was rescued out of the sea at Konia Island and put out to dry, it being exhausted from the wind and rough weather. It looks like a non-breeding Roseate Tern, *Sterna dougallii gracillis* [Etymology; tern OE, McDougall, a Scottish doctor who first 'found' it, slender Ln] is a subspecies found in our region.



The Administrator of Papua, Captain Barton on one of his visits of inspection in January 1907 to Konia wrote of his surprise at seeing terns that 'flew about among the people settling upon them in the tamest manner imaginable.' No-one on the vessel knew how to speak Kilivila so he couldn't learn any more about it. It is not unusual though for coastal people to look after birds as pets that aren't caged but fed and left to fly around freely.



Lester Seri OBE
D K Mitchell

Papua New Guinea is oft called the 'Land of the Unexpected', a mystique evoked by a series of Air Niugini posters in the mid 1990's, and an expression that seriously caught on. One of these posters was of a bushy looking character atop a self-confident wildlife officer with vast field experience. It was a white, Common Spotted Cuscus, in this case without any spots, on the head of Lester Seri. Lester, shown here with this poster had worked as a field assistant with the Australian mammologist Tim Flannery on a bag load of expeditions across the mountains and islands of New Guinea. It was during this time that the illusive Seri's Tree Kangaroo of the remote Star-Maoke Mountains and the Seri's Sheath-tailed Bat of New Ireland were brought to light and scientifically named. So, when the photographer on assignment for Air Niugini was at the 7 Mile Moitaka Wildlife Sanctuary and needed some help in getting images, Lester who was taking him around, was the best qualified to do so, and hence this iconic poster. Lester has long left the government service, but is still an environmental activist, with a passion that has stirred him up to campaign against destructive illegal logging in the courts to being a representative on the boards of many environmental and legal organisations in PNG.

In the recent PNG King's Birthday Honours list Lester was given an OBE for services to Nature Conservation and Research. Deserving indeed. And the cuscus, who knows?

And in a twist to the story of the 'Land of the Unexpected', it may come from a much earlier time. Miss Beatrice Grimshaw an adventurous Irish born journalist, was a travel writer for the Union Steamship Company in the Pacific for a time, but in 1907 she came out to settle in what was then the Territory Papua on Sariba Island looking across to Samarai. During her early time there she wrote several newspaper articles to promote the colony and books that portrayed the era, written very much in the English of the times.



Curiously in one of her books *New New Guinea*, that came out in 1911, which was most likely proof read by Lieutenant-Governor Murray, she penned that 'in Papua, more truly than in any other country in the world, it may be said that nothing happens save the unexpected' and later in apparent exasperation '....in Papua, that land where truly, "nothing arrives save the unexpected" '.

This is essentially a yarn that didn't make the editor's cut for the *Paradise* inflight magazine for Air Niugini some years back, but I hope you like it.

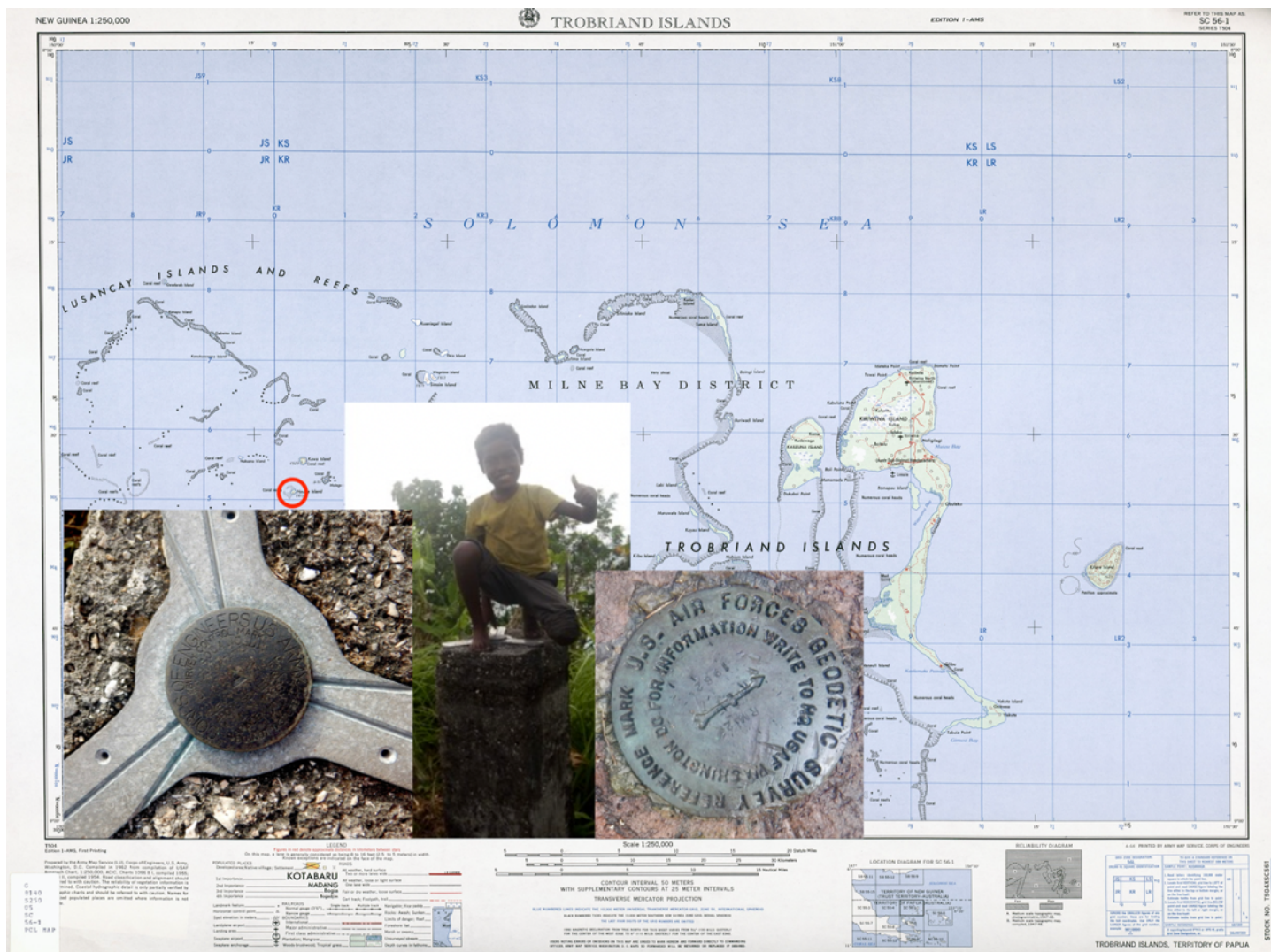


George Aigoma with Bernard Jack in ECA office

Maintaining support for our work is a challenge especially financially to keep operating and continuing on in our work. From discussions in a morning tea break at the PA Forum in mid 2021 an idea was put forward to the then CTA of the USAID funded *Lukautim Graun* project. A proposal was put together, initially designed as a two-year project, that was reworked and reworked and reworked as the available time for implementation whittled away. Thankfully the proposed work was approved and an agreement was signed in late April. Here in the office is the President of the Yeleyamba Local level Government Hon Bernard Jack who took a smartphone recording of a *hivi* marine closure being put in place in one of the wards. He wrote requesting for us to do extension work in his area a couple of years ago and now hopefully with USAID support and other donors we will finally get to his place to learn, see and support his efforts with his people



The Lusancay islands and reefs, îles et Ressifs Lusancay were first mapped during the 1793 voyage of D'Entrecasteaux on his search for the lost La Pérouse. They appear on Map No. 28 that was drawn up by Beautemps-Beaupré, the 'father of hydrography' in the Atlas of the voyage published in 1807. They were named after Pierre Antoine François-de-Salles Carré, seigneur de Lusancay who was a lieutenant on the vessel *L'Espérance*. This map has a Paris Meridian of zero degrees.



Corps of Engineers US Army 1963 Control Mark, small lad on the mark, US Air Forces Geodetic Survey 1962 Reference Mark

In the ground work of producing a more recent map 170 years later [TROBRIAND ISLANDS SC56-1 1:250,000] the US Air Force Geodetic Survey team placed a Reference Mark on Kukumilakaliga hill, Nauria Island in 1962, with another being placed in 1963. There are a lot of similar markers across the islands of Milne Bay on customary land and their purpose is often misunderstood. For example, we

were told the story that other islanders came to Nauria and tried to dig up the cement survey mark thinking that a secret cache of weapons had been hidden underneath. Whilst the real purpose of the marker was to 'anchor' the map by having these known points on the ground used in triangulation surveys.

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