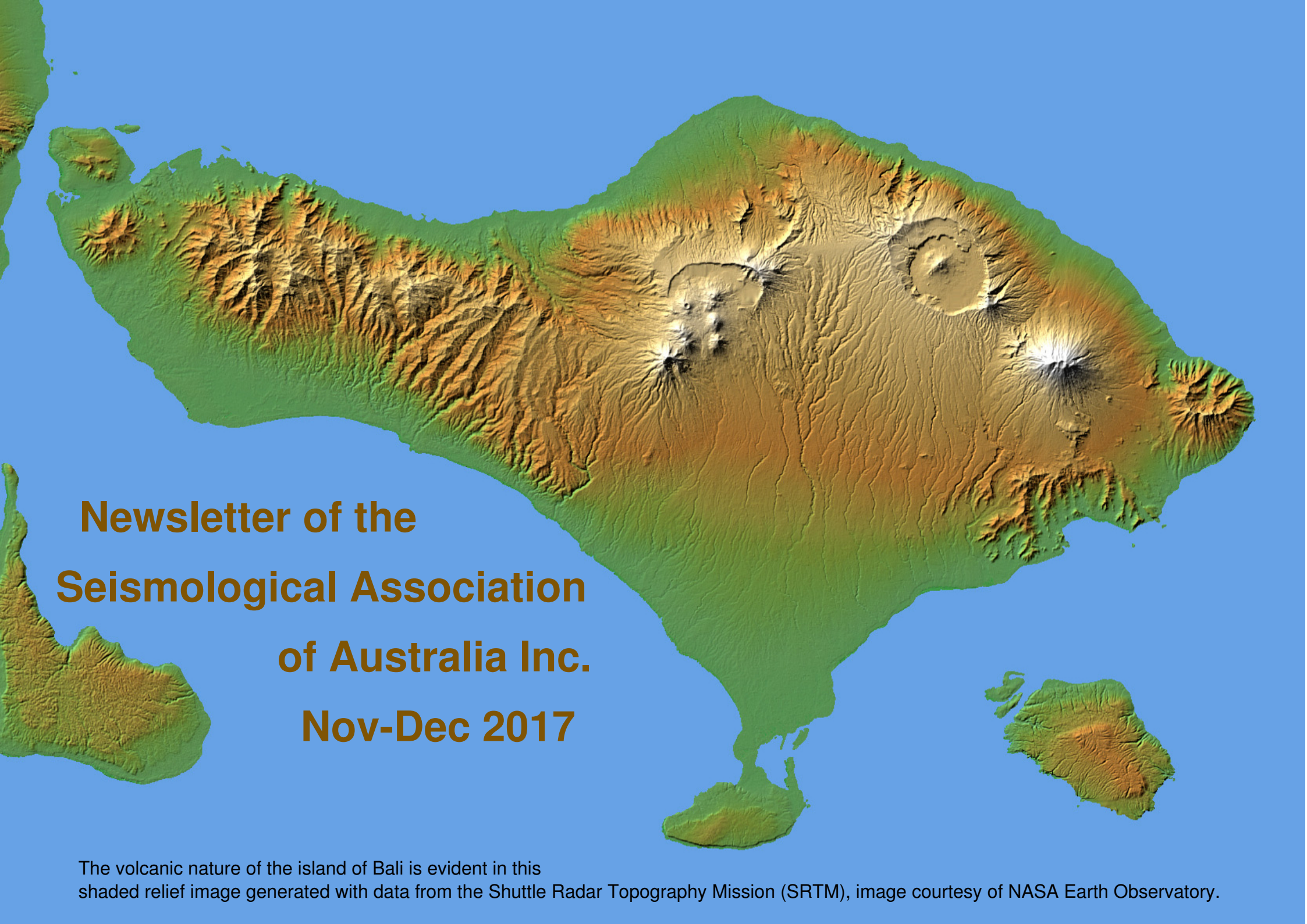

Newsletter of the Seismological Association of Australia Inc.

Nov-Dec 2017

The volcanic nature of the island of Bali is evident in this
shaded relief image generated with data from the Shuttle Radar Topography Mission (SRTM), image courtesy of NASA Earth Observatory.

Seismological Association of Australia Inc.

Newsletter of the
Seismological Association of Australia Inc.
PO Box 682, Mylor SA 5153

Your Committee

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The SAA can be contacted by post to the address above, or by email to any member of Committee, as listed above

Membership of the SAA is open to all, with the only prerequisite being an interest in seismology. Membership applies for the calendar year (January through to December)

Membership fees are:
Full member $50

A Membership application form can be obtained from the Treasurer.

Member Submissions
Submissions for inclusion in the Newsletter are welcome from all members; submissions may be held over for later editions.
Wherever possible, text submissions should be sent via email in almost any word processing format. Your name may be withheld only if requested at the time of submitting. Images should be high resolution and uncompressed, although high resolution JPEGs are acceptable.

All enquiries and submissions should be addressed to the Editor and preferably sent by email to weaksignals@iinet.net.au

A word from the Chairperson
Welcome to our third newsletter. It's been an interesting and busy first six months to say the least. We've had our first AGM, with members having the upmost confidence in the interim Office bearers who were re-elected unopposed. I wish to thank everyone for their continued support to our Association.
We welcome Peter Gray to the role of Editor and thank Joe Grida for the superb effort on the first two newsletters for our Association. You've set a high standard Joe!
We are still looking for a member to take on the role of Secretary. Should some wish to take that on, we would be most thankful.
Our seismic network is healthy, but there is still much work to be done in servicing sites and some repairs / upgrades. I'd also like to thank the ongoing support by the farmers and members who host instruments. Without you all, we would not have a network.
It is with sadness that I have to advise you all of the passing of John Harris (MPTV) and our condolences to his wife Joan. Joan will continue to host the instruments that John built and our server at Morphett Vale, thank you Joan.
Best wishes to everyone for the festive season, Blair

Farewell John Harris

When the Mount Barker earthquake rattled Adelaide in April 2010, John rang the Geological Survey of SA with his felt report, also telling us that he had a digital record of it from an instrument he had built. We connected him with Vic Dent, and John became the first PSN user in SA, located at Morphett Vale (MPTV).
On 27 June 2011 he was at the first Adelaide seismology meeting at Payneham, where we talked late into the night. He went north with Vic the following day, to install PSN instruments at Peterborough and Jamestown schools. This went well, and turned out to be really useful when a swarm of earthquakes happened right between them at Yongala in September.
John organised the second Adelaide seismologists meeting, which was held at the O'Halloran Hill Pistol Club in early 2012.
Vic connected John with Dale Hardy, and they collaborated on quite a few innovative projects. John installed at his place one of the first "Forced Balance" long period recorders that Dale had designed. Like Dale, John seemed to have an ever-lasting supply of enthusiasm for science and technology, and was always keen to apply his knowledge to new, little, but very useful devices. The MPTV site has been one of the longest running stations to the ACG website, with at last count, eight channels running.

John built a small calibrator that worked by putting a step current into a signal coil. This enabled better calibration than the method previously used by the SA network.
John and Joan bored (by hand) and cased a 10m hole on their property. John had parts of a downhole probe and was planning to install it to see if the noise level could be reduced. In January this year, at the same time as we were deciding to form an association, John received the bad news that he had mesothelioma. In March, John and Joan helped in the decommissioning of the Myponga site, but already John was needing to take things easy, so Joan did the heavy lifting. Despite his deteriorating health, John put in a big effort and came to an evening meal on 3rd August, when Adam Pascale was visiting to install a new Gecko and Prism. It was his last outing with us. John died at home on November 10th. He donated his body to science, and it was quickly taken away. Joan will organise a small rememberance service next year. When the body remains are eventually released, Joan will take his ashes to Norfolk Island, a favourite place for both of them.

We will miss you John.

Left to right Nina & Blair, Paul, Adam, Heather, John & Joan

SAA News & rumblings

Annual General Meeting of the SAA

The inaugural AGM of the association was held on October 30th at the offices of Nova Systems, Mile End SA. Of the 27 paid up members of the association, 15 were in attandance and 3 submitted apologies. The interim committee positions were declared vacant and persons nominated for the new committee were elected unopposed. The list of committee members and their contact details can be found on Page 2 of this and future Newsletters. Unfortunately, the position of Secretary remains unfilled. Should anyone have a change of heart, there are mechanisims in the constitution to allow this. David Love gave a presentation on New Zealand earthquakes and a short summary of the seismic sites currently being operated by the SAA. The meeting concluded with supper and a group photo (below)

Left to Right
Judy Carter
Nina Stansfield
Lyn Grida
Alison Wallace
Blair Lade
Ian Anderson
Paul Hutchinson
David Millar
Jim Deer
Joe Grida
David Love
Heather Love
John Duffield

It's your Newsletter

Welcome to **your Newsletter**. I am just the new editor and I hope you like this format. As we don't produce and post out hard copies, I thought that the A4 landscape layout might be better for onscreen reading. I stress again that this is **your Newsletter** and it will only be as good as the content that members contribute to it. If you want better resolution images, let me know and I'll increase the size. Once the SAA website is up and running, you will be able to download your Newsletter directly yourself. While we are restricted to distribution by e-mail, I'm trying to keep the file size within reasonable limits, many ISPs still restrict email attachment sizes.

SAA Databases

Did you know that the SAA maintains several databases? These are to help manage the assets of the association and assist members to support their seismic sites.

Station Register: While many of the ex. Geological Survey of South Australia (GSSA) sites are similar in equipment configuration, there are significant differences between sites. As for the privately owned/operated sites, the equipment mix can be made up from whatever was available or convenient to use. In an attempt to maintain a robust and reliable seismic network, the more we know about the way everyone's seismic station works, the better we can provide technical support, should the need arise. This is particularly prudent when remote sites are considered. It may take several hours travel to visit a site that requires some maintenance and it's a long trip back to pick up a connector specific to a Guralp CMG-6T, if we think there's a Kinemetrics SS-1 fitted at the site.

Asset Register: The association has a considerable investment in physical assets that need to be tracked, accounted for and possibly even insured. The Asset register encompasses all equipment in service at seismic stations and in offline storage. With this information, the seismic network can be improved, as required, from existing equipment or help identify weaknesses that require replacement with new equipment.

SAA News & rumblings

November in Canberra

The annual Australian Earthquake Engineering Society Conference is normally held in late November. This year it was held in Canberra, at Geoscience Australia (GA). SeismOz, the Australian Seismologists Meeting was held on the morning before the conference, and invited people attended a workshop on the Australian Hazard map being developed by GA. This all made for a very busy Thursday to Sunday.

Big talking points through all these meetings were the hazard map and moment magnitude. GA had presented a hazard map to the building code committee, with much lower hazard levels than the previous version. For this and other reasons, the map was not accepted and the previous one will be used in the next building code update. The hazard map work has been done using moment magnitude, however no-one in Australia is currently calculating moment magnitude for Australian earthquakes. To make a moment magnitude catalogue, other magnitudes were converted, which caused much discussion. For moment magnitude to become a normal part of Australian seismology, we need to have more well calibrated stations, studies across the country to determine the absorption at a range of frequencies, and simpler software, and training. Moment magnitude is a more complicated beast than Richter.

SeismOz 2017

SeismOz attendees take a break for the camera

SeismOz has become a regular meeting, particularly for observational seimologists around the country to say what they have done in the past year, and intend to do in the next. It is fairly informal with questions and discussion, but only limited academic material. There were presentations from Geoscience Australia, Australian National University (ANU), Seismology Research Centre (SRC), University of Melbourne, and I presented a bit covering the end of GSSA, the start of SAA, and PSN. There is much happening around Australia when it is all presented at once! ANU reported that their new in-house recorder 'Terrasaur" runs on 200mW. They are intending to set up about 80 insturments in a line between Oodnadatta and Marla in 2018. GA reported that the Australian Seismological Report 2016 has been delayed due to the extra seismic activity in the year, and their desire to improve the report.

Do you have some interesting news that you would like to share with other members or something seismic you want to sell ? If so, please submit it to weaksignals@iinet.net.au for inclusion in the next edition.

Tennant Creek Pt. 2

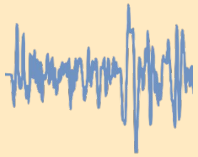
We had almost 10 inches!
In the morning we pulled all of Geopeko's 4WDs out of very boggy carparks and did little else, it was still raining a bit. I drove down the Stuart Highway a few days later just to see how it looked. Water everywhere! The ground was so wet that the snakes had come onto the highway to dry out. There were a few cars bogged on the side of the road (silly people) and I helped pull a few back onto the road with my 4WD.
Reaching the Station turnoff, it was obvious that driving any appreciable distance down the dirt road was going to be risky and the chance of getting there and back without either sliding off the hard surface or breaking through the top was low.
I decided to go back to Tennant Creek and get one of my motor bikes, that way I could walk and ride when the conditions were appropriate. Back to the Station turnoff, it was wet, it was muddy but I got to the station after about an hour's hard ride down the 10 miles of dirt. It looked very grim and the ride had tired me out a lot. I wasn't going to be able to do that every day and I called up Geopeko's manager Paul le Messurier on the 2way and told him that I was going to shut everything down as further trips would only damage the road more and the risk of personal injury would grow with each trip.
He was 'sort of' happy with that, so I turned everything off, made a cup of tea then shut down the generator. Warramunga was 'off the air' and I started the ride back to town arriving exhausted from the day's work.
The Geopeko staff helped retrieve cars and trucks bogged all over town. It was sort of 'fun' and hard work but it was different from what we had all been doing. For the next 2 weeks we did odd jobs and serviced Toyotas while the weather improved somewhat and the ground dried out a bit. I drove to the station turn off accompanied by 2 other vehicles with as much chain, Wallaby jacks, timber, shovels etc that we could muster, Strewth, there was a remote chance that we might get bogged.
Now getting bogged in the Northern Territory during the wet season is expected and nothing to be overly concerned about. After all, legend has it that the township of Tennant Creek is where it is today because the beer truck got bogged there many years ago and it was so bad that they decided it was less work to move the town which was then located 7 miles to the north of the beer truck, than get the beer truck to the town.

It's probably only a one carton bog

Tennant Creek Pt. 2

Bogs are rated according to how well you got bogged and how much it takes to get 'unbogged'. Note how much, not how long it takes to get unbogged.
A one carton bog is hardly worth writing about, expecially if there are a few people who are the bogees. Where as a ten carton bog is pretty damm good no matter who is there...
The image (previous page) was taken in Tennant Creek last year by persons unknown, and shows the typical country and conditions I experienced each wet while at Warramunga, it's probably only a 1 carton bog. Google 'getting bogged in the Northern Territory' for some further imagery.
There are stories of 20+ carton bogs… some of the trucks might even do more!
Well, we probably had a six carton one, a bit hard to tell as we had three 4WDs bogged and no cartons! Out came the shovels, each man trying to prove that he was better than the next at getting 'unbogged'. It was a stinker of a day and time flies when you're having fun, so as the sun slowly crept towards the western horizon it was finally time to fess up, get on the radio and call for help. About half an hour later, the big ballooned tyred, 6WD RFW 'unboggable' truck and a couple of other Toyotas turned up.
Despite the advertising, we managed to get the RFW bogged to the axles but eventually we all got pulled out by the 4WDs and returned to Tennant Creek for dinner, skip dinner, it was a 6 carton bog and 6 cartons it was going to be. Didn't earn a lot that pay week!!
A couple of days later (well it was a 6 carton bog), we attempted again to get to the Station with considerably more luck. A couple of the creek crossings near the station on the road in had been washed away by all the rain and would need considerable repair work later on, but with difficulty, we made it to the Station.
Arriving at the station, first job was to put the kettle on, start the Lister HR3 diesel generator and have a quick look around the lab for anything that might need immediate attention. We had 2 of these generating sets, with 25kVA Dunlite alternators in the station power shed.

Now, we all drank black tea in Tennant Creek (well that was during the day time, night time was beer as if you couldn't guess) because there were no fresh milk deliveries to the town. All you could buy was tins of powdered milk, and for those that don't know, the powdered milk in the coffee sort of curdles and isn't the nicest to drink. So back then, tea it was.
I started to turn the station back on. First on the list was the 'clock' which came alive; so did the old Eddystone shortwave radio. Now all I had to do was find the now defunct Australian time signal from VNG between the crackle from distant lightning storms for a time check.
https://en.wikipedia.org/wiki/Radio_VNG
The seismic signals from the array came into the station two ways; most via two antennae and a bunch of 450MHz receivers on top of the nearest hill, but a couple of the closest instruments came in via overhead 'telephone' wires on wooden creosoted poles. I turned on the receiver power supplies and about half of the array came to life. The local short period pit (Blue 2 I think) that fed the helicorder rack was alive and the LP was making noises but didn't sound very well. Robbo from England had said that it was very easy to make the LP unhappy; well it had been off for 2 weeks, so I'll leave it alone for a few days to warm up. I found the VNG radio signal, setup the oscilloscope and set the clock. Warramunga was 'back on the air'.
A new waxed paper sheet on the helicorder (I did have ink charts but not for seismic) and turned on the inverter, which was synced to 50Hz from the clock, and I had a trace on the heli... So far so good. New tapes on the 24 track EMI logging tape decks, pushed the start button



Tennant Creek Pt. 2

and away we went; data again.
I sent a radio signal from the lab to test the remaining receivers; two had died but the rest appeared to be OK, so it was probably transmitter failures that had killed the rest.
I then looked at the microbarograph array signals that come into the lab via overhead 'telephone' wires, nothing, not even a hint. Bit of a bugga that, probably the wires had been hit by lightning and it was going to be a far amount of work to recover.
Having put the seismic part of the station back on air, we decided to call it a day, locked up and started the drive home.
One of the 4WDs slid off the road, and went straight down to the axles. We managed to pull it back onto the road, but got covered in mud, the side of the road was so soft, you could push a 6 foot star picket down a couple of feet without trying.
Bush work was going to have to wait!
Back in town, I sent a telex from the Geopeko office to the ANU and UK advising of the current status. Time for the pub… it had been a long day.

This "Tales of Tennent Creek Part 2" , article was submitted courtesy of Blair Lade. It was written at short notice when the original lead article was delayed by technical issues.

Just a bit more SAA News (to fill the page)

Data, data, where to send my data
For seismic sites using the Kelenji Echo type recorders and other devices producing miniseed files, you will probably be familiar with sending your data to the Melbourne Uni Eqserver at:

http://meiproc.earthsci.unimelb.edu.au/eqserver/

The SAA was able to salvage a functional server from the closure of the GSSA, it is available at:

http://ade-eqserver.dyndns.org:8080/eqserver/

please contact David Love if you would like to add your station.

If you are running the Webtronics WinSDR software, you can also be set up to send data to the SAA Eqserver. However, WinSDR is only able to send event data in miniseed format. When a triggered event is recorded by WinSDR, only then will a trace appear on the SAA Eqserver.
Of course you have the option of the Regional Seismic Network site at the Australian Centre for Geomechanics at:

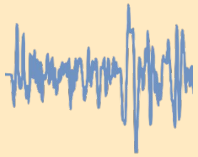
http://www.regional-seismic.net/

and the Regional Seismic Users website at:

http://www.rsuw.daleh.id.au/index.html

For those of you who do use the ACG-RSN website, I'm hoping to do an article in a future Newletter on some of the advanced features available to users with log-in priveleges.

Bunnings BBQ Fundraiser
There is a significant cost to maintaining a network of seismic stations. There are data plans for communications, replacement batteries for back-up power requirements and those unexpected failures that happen from time to time. As an association with a small but enthusiastic membership, we don't want to use all our limited resources on these tasks. A Bunnings BBQ has been booked for early 2018 at the Mt. Barker (SA) store, on a date to be determined and announced soon. Volunteers will be needed for the day, hopefully the more the merrier. We hope to have some demo hardware onsite to keep the punters amused while we scrape the plate for something edible. You have been warned, any doctors certificates presented on the day will be used to light the burners!



Events from the past

A NORTHERN MYSTERY!
SIX WEEKS OF EARTH TREMORS.
Mr. John Melrose, of Ulooloo, writes to The Register:—"Daily, for the last six weeks or more, residents round about this district have been watching the press for some explanation of what has gone wrong with the works of the earth, or something having influence over it. So far as I have noticed, only one correspondent has re-marked on the phenomena, and that one was, I think, from Spalding. In the last six weeks we have hardly missed a day without feeling earth waves or hearing rumblings. On some days there have been as many as a dozen; and they appear to me to be generally from the north-west, al-though many people think they come from other directions. The duration is usually short. Mostly they are simply rumbling sounds as of a heavily laden trolly, with which the horses have got away over how-low ground or over a large bridge. Others shake buildings and rattle the gas globes and loosely hanging articles. The tremors or noises average three or more in a day; so that I am well within the mark in estimating the total number heard or felt at something over a hundred. We would be glad to hear what our Government Meteorologist has to say on the subject, and whether the seismograph has recorded anything".

Governor Astronomer's Statement.
The Government Astronomer (Mr. G. F. Dodwell, B.A.), when shown the above letter, stated that he had received a some-what similar, communication from the post-mistress at Hallett, who stated that a great number of tremors, not of a severe character, had been felt there, accompanied by a noise like the rumble of a laden dray. At times they appeared to shake the house as the passing of a heavy vehicle would. The tremors were most severe on the Booborowie Plain, 10 miles distant, between the two ranges. Mr. Dodwell, continuing, said: "I have examined the seismograph record for the period November 25 to 28, and find that the first-mentioned day was fairly quiet, but that on the other days — particularly November 27 and 28 — micro-seismic tremors are indicated, more or less continuously, and mainly during the hours between 3 p.m. and 8 a.m. Similar experiences were recorded a few years ago, but not over so long a period as your correspondent indicates. The dry season may have some causative influence in these phenomena. At the time of the last drought, 1914, considerable tremors, which were perhaps the result of a progressive shrinkage of the ground through the drying to a considerable depth of the moisture in the earth's surface strata, caused cracks to develop in buildings. Many of the deeper-seated springs also failed at that time. In places where there are geological 'faulting' and instability, such as occur in certain parts of our ranges, and particularly the Flinders Range, the effect of a dry season may thus be the factor in causing minor readjustments and consequent tremors."
Considerable public interest has been aroused in consequence of reports which have appeared recently in The Register regarding continued earth tremors in the north. Some time ago our Spalding correspondent drew attention to the mystery and a further communication on the subject from Mr. John Melrose, of Ulooloo, was published on Wednesday, together with comments by the Government Astronomer (Mr. G F. Dodwell, B.A.). The latest report from Spalding states: "During the past fortnight we have experienced three and four earthquakes daily. Some of the tremors have been only slight, but others have been much more pronounced". On Sunday night, at about 9 o'clock, the severest of the lot occurred. Travelling in an easterly direction, the rumble could be heard for fully 10 minutes. The ground shook, and the noise was like that of a big flood as it proceeded through the hills to the east of the town. Walls of buildings were cracked and pictures and plaster fell to the ground.
This "swarm of earthquakes" article was submitted courtesy of Kevin McCue and originally published in The Register Newspaper back in 1919.

Have you seen an interesting article that you would like to share with other members? If so and you are able to provide some details of it's source (for copyright reasons), please submit it to weaksignals@iinet.net.au for inclusion in a future edition.

Member Sites

MTON: Middleton, South Australia
Location: 35.483438S, 138.678381W
Owner/Operator: Peter & Maxine Gray

As if we really needed another seismometer on the Fleurieu Peninsular. The Geological Survey of SA had seismometers at Myponga (MYP) and on the fringes at Strathalbyn (STR2), Kelly Hill Caves, Kangaroo Island (KELC). Paul Hutchinson was running Hindmarsh Valley (HMV1) and in the process of developing The Peters Seismic Observatory (TPSO). John Harris's private station at Morphett Vale (MPTV) rounded off coverage of the area quite nicely. Still, David Love was not about to say no to another cog in the wheel.

Armed with a Willmore Mk.II courtesy of Blair Lade, a 16bit ADC/filter card from Larry at Webtronics and an old PC running WinSDR on Windows XP, I set about constructing my very own seismic station. Housing the seismometer was to be my biggest problem, having been told what happens to seismic stuff when it get wet. Fortunately, they grow FRP pipe offcuts in a paddock near McClarenVale so I bought one and set about using it as a vault. I was unable to find bedrock on the site so a concrete base was formed and the seismometer/electronics package installed into my makeshift vault.

1.4m dia FRP pipe prior to concrete pour

An old satellite dish was used as a lid for the vault. The PC was installed in the garage some 30m from the vault and hardwired back to the house for data and power. Data links to the internet were established using a 3G wireless modem. MTON went live on the ACG website in April 2014 and then added to RSUW in May. It has made a reliable and consistent contribution to the seismic record since then.

Willmore Mk II in its styrofoam filled case

Several upgrades have been undertaken in the interim period, the Windows PC (120W) was replaced with a Linux Notebook (14W) running WinSDR. A Sprengnether HSA-3 accelerometer courtesy of David Love was added to provide three axis to complement the vertical Willmore. The 3G modem was replaced when the NBN Skymuster Satellite service was introduced in 2016. Most recently, the Linux Notebook was replaced by a Raspberry Pi 3B Single Board Computer (2.6W) running WinSDR.

It's just me and the spiders

The primary purpose of each upgrade was to reduce power consumption and 24/7 running costs. With the exception of the NBN service, each upgrade was able to achieve significant savings over the previous configuration without sacrificing system stability or reliability. Future upgrades will focus on improvements to dynamic range by replacing the 16bit ADC with the Webtronics 24bit ADC and reducing the effects of wind and rain noise on the roof of the vault.