Newsletter number 16: November 2017

The Geoscience Pathways Project

Our Geoscience Pathways Project *(GPP) is a 'not-for-profit' incorporated body of like-minded teachers and geoscientists. We work together to support the teaching of* ***Earth in Space*** *and to foster and support the uptake of senior secondary* ***Earth and Environmental Science (EES)*** *in SA schools. Thanks to our sponsors we are able to offer member schools unique and timely support across most primary and secondary year levels.*

International Earth Science Olympiad

Left to Right: Chen Zhou, YiJie Neo, Jemima Jeffree and Joshua Lee.
Image courtesy of Greg McNamara.
IESO France 2017: http://tinyurl.com/y8ssylfa

Four students who represented Australia at the International Earth Science Olympiads in France, brought home a swag of medals and awards this year. Congratulations to all four on a brilliant result. In the individual events students completed two theory exams and four practical exams with YiJie Neo from John Monash Science School winning Gold, Jemima Jeffree from Indooroopilly State High School winning Silver, Chen Zhou from North Sydney Boys High School and Joshua Lee from Barker College each winning Bronze. International teams of students also collaborated to produce an Earth Science Poster and an oral report on a field investigation. YiJie was a member of a team that won a Silver for their poster and Jemima was a member of a team that won a Silver for their presentation.

SACE Earth & Environmental Science

Dr Bernd Michaelsen is currently completing a range of support materials, including a set of course notes for the new SACE Stage 2 EES course. These timely resources will be provided (freely) to teacher participants in our **Implementation Workshop** on December 13th. The workshop and resources are free, however registration is required for catering purposes. (See below)

DON'T MISS THESE WORKSHOPS:

Friday 1st December 2017:

SASTA STEM (6-11) conference,
Australian Science & Mathematics School (ASMS)
Bedford Park (Flinders Uni)

Workshop 2.02 at 11:45 am for 1 hour:

SACE EES for new STEM careers

For information and registration visit:
http://www.sasta.asn.au/professional_learning/stem_6_11_conference_2017

Wednesday 13th December 2017
(12:30 – 4:00 pm):

SACE EES Implementation Workshop
South Australia Drill Core Library
Tonsley Boulevard, Clovelly Park

This workshop is FREE.

For detailed information and registration visit:
http://geoscience.msc.sa.edu.au/Article/Detail.aspx?p=6&np=1&id=2087

Teacher Mentoring

Thanks to the ongoing generosity of our sponsors mentoring support is available **free of charge** to our member schools. Membership is also free. We offer our qualified and experienced mentors to directly provide a range of laboratory and field investigations to suit the Earth and Space sub-strand of the Australian Science Curriculum as well as the new SACE EES courses. Mentoring support and subsidy of the cost of transport, (if required), are available on a 'one-off' basis to individual teachers. Arrangements can be made through our coordinator.

Zoe Petrinolis

Zoe is a Geology Honours Graduate from the Univ. of Adelaide. She is a secondary science graduate teacher with a passion for teaching, particularly EES. Zoe currently works for Sci-World as a science communicator but has a flexible schedule that enables her to assist in our mentoring program.

John Mignone

John is the Government of SA's Mineral Resources Division **Community Education Officer**. He is a recipient of the Australian Society of Exploration Geophysicists' prestigious Lindsay Ingall Memorial Award in recognition of his promotion of geophysics to students and the wider community. John has run the highly successful Earth Sciences Summer School for many years. This program is intended for high school students keen on science but can't get any Earth Science at their school. However, if any teachers wish to attend all or part of the course, for professional development purposes, they should email John to make such arrangements. He can email you a copy of the full program for details. The fee is Gratis!

The Earth Sciences Summer School flier and student application form are included at the back of this newsletter.

Kelly Sharrad

Kelly is a teacher-geologist with experience both in industry and education. She has worked as a member of the curriculum writing team for the SACE Earth and Environmental Science subject outline. Kelly is currently teaching senior secondary science at Marden Senior College and the OAC but might be available to mentor laboratory and field work at certain times by arrangement. Kelly is happy to work with classes at all year levels 5 – 12 and provides an excellent role model to spark STEM ideas, particularly for girls.

Mark Bishop

Mark has previously worked as head of Geoscience at UniSA and more recently as a NASA-registered education and communication specialist (through the Planetary Science Institute in Arizona USA). He is an enthusiastic and highly valued member of our mentoring team and available to support your activities and field investigations, by arrangement.

Opals Unit

Did you know that Australia produces 96% of the world's opals and that South Australia produces 86% of that?

Our new **'Opals' unit** was launched last December. Schools can freely access these excellent teaching and learning materials on our website. They include background notes for teachers, student workbooks, lesson plans and practical investigations: http://geoscience.msc.sa.edu.au/Content.aspx?p=1070

Groups of up to 20 students from member schools can visit and view the magnificent ***Majestic Opals*** display in Medindie. Sophia Provatidis, (Majestic Opals), is keen for teachers to bring their students to see the collection and to engage in hands-on activities, however students should have some prior knowledge *before* their visit. Arrangements for visits can be made by contacting our GPP Coordinator: laltman@msc.sa.edu.au

Equipment for loan

A range of special equipment is available on loan to our member schools. These include class sets of compass/clinometers, GPS units, gold pans and our "Quake Caster". *(see photos below)*

Our **"QuakeCaster"** has been adapted from a design by the USGS. It can be used to enhance inquiry based learning about earthquakes. It is an ideal apparatus for facilitating a 'design-prac' for Year 8- 9 Science, (eg in the 'Plate Tectonics' unit) or SACE Stage 1 EES.

Other equipment available for short term loan :

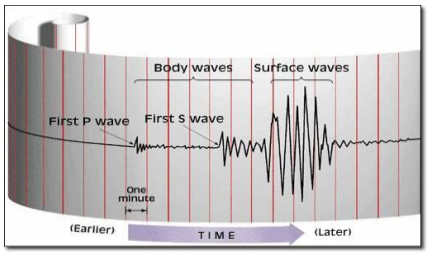
- **Garmin 60 GPS units**
- **Suunto compasses** (include clinometers)
- **Gold pans**

Remember our Aim

We aim to increase student interest and engagement in Science through our special focus on developing engaging learning activities across the *Earth and Space* sub-strand of the Australian Science Curriculum (F-10). We thereby aim to increase student interest and uptake of senior secondary science, particularly the new ***Earth and Environment Science*** courses as they are launched in SA.

Earthquake and Seismometer

A range of activities are available at **Marden Senior College**, by arrangement.



Groundwater hydrology

Our project can also arrange and provide subsidies for the cost of student buses to participate in activities in the **Flinders University** groundwater hydrology laboratory. A **Kaurna perspective** can be provided by also arranging a visit to the Tjilbruke springs in nearby Brighton, as part of the same excursion. These activities have consistently been successful with Year 7 students as part of their studies of the 'water' topic in Earth and Space. They are also suitable for students at senior secondary year levels, for example in SACE Earth and Environmental Science (EES) under the 'Hydrosphere' topic. For all students, meeting with faculty, honours and/or PhD students as part of a University visit is an excellent way to present **STEM careers** and associated study pathways in *groundwater hydrology*, *hydro-geology* and *environmental science.*

Teachers in partner schools can make arrangements for the above activities, including bus subsidies and the free provision of a mentor teacher, (if required), by contacting our project coordinator.

Plate Tectonics for Year 9's

Our project can arrange activities and provide bus subsidies (if required) for visits to the **University of Adelaide.** These visits are designed to enhance the learning of Year 9 students in their studies of 'Plate Tectonics'. The practical activity "Plate Tectonics in a box" has been particularly successful with year 9's.

Professor Alan Collins of the Centre for Tectonics Resources and Exploration together with PhD Candidate **Morgan Blades** offer half-day workshops to suit Year 9 Science. These can be arranged through membership of the GPP..

Consider the following recommendation:

I want to let everyone know how good the Plate Tectonics workshop was The students were engaged in the lead up presentation and also in the hands on plate tectonics in a box, where each group of 3 or 4 students did their own, along with measuring. Alan was very engaging with the students, and his undergraduate students and PhD candidates worked really well guiding the students in the practical. I would strongly recommend this to other schools to take advantage of this opportunity. Keith Lavers, Yankalilla Area School

All teachers have an open invitation to attend our committee meetings and/or to make written requests and suggestions for proposed activities.

Our Next Committee Meeting:
Tues. 14th November from 4:30 pm,
at Marden Senior College

PLEASE JOIN US

The Teacher Earth Science Education Program

TESEP is a valued sponsor of our Geoscience Pathways Project. Face to face teacher training workshops and associated field excursions can be arranged at your school (or elsewhere) or across a cluster of schools, according to numbers. Generally a minimum of 12 teacher participants are required. Valuable resources and ideas for practical student activities are provided at each workshop. A non-refundable registration fee of $55 per teacher is required, (concessions applyfor student/ unemployed/ under employed) and the training is ASTA accredited. Travel and accommodation expenses may also be provided for country participants attending workshops in Adelaide, (conditions apply).

TESEP Workshops include:

- PD1: Round and Round with Rocks
- PD2: Riding the Climate Roller Coaster
- PD3: Greening coal
- PD4: Fossil sunlight
- PD5: Wet rocks (groundwater)
- PD6: Hot rocks (geothermal energy)
- PD7: Our Place in Space
- PD8: Powerful stuff (nuclear energy debate)
- PD9: Plate Tectonics

For information visit : http://www.tesep.org.au or email: SA_coord@tesep.org.au

will receive the above poster and other hard copy resources.

Our Management Committee:

Chairperson	Len Altman
Secretary	Amanda Vernik
Treasurer	Kelly Sharrad
Other members	Peta Abbot (DSD)
	Alan Collins (Univ. of Adelaide)
	Katrina Holmes (BHS)
	Anna Lane (OAC)
	Luke McKay (Geo- TRT)
	John Mignone (DSD)
	Bronte Nicholls (ASMS)
	Mark O'Callaghan (NASC)
	Zoe Petrinolis (Geo- /educ. student)
	Cynthia Pyle

S.T.E.M in EARTH SCIENCES Summer School

YEARS 9, 10, 11 or 12

11–20 December 2017

The Earth Sciences Summer School is being offered to students currently in Years 9, 10, 11 or 12. Participants' awareness of planet Earth and career paths will be increased through working with professional geoscientists from the Geological Survey of South Australia, University of Adelaide, TAFE and the resources sector. The course will culminate with a visit to an operational gold mine.

The Geosciences Summer School is being funded by Minerals and Energy Resources group within the Department of the Premier and Cabinet, Government of South Australia.

Students who are not able to take geoscience courses at school will find this a useful insight into TAFE or University courses and the resources industry. Some schools may wish to identify this as work experience placement.

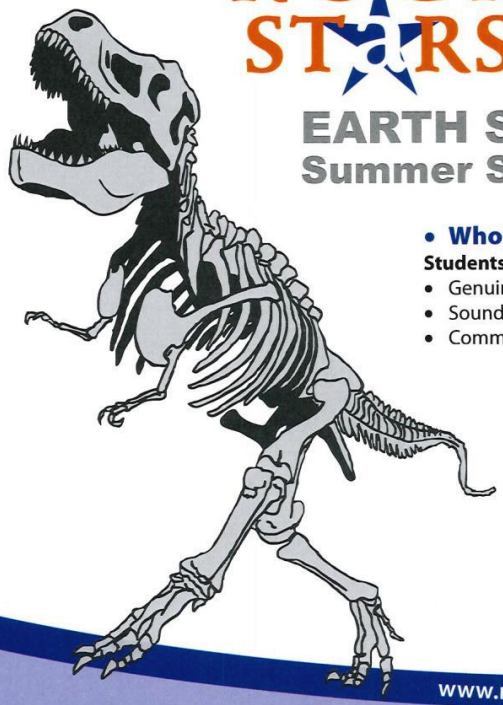
Program

Through lectures, practicals and fieldwork, participants will learn about:

- Planet Earth's formation and evolution
- Mineral and energy resources exploration methods
- Age dating rocks
- Paleontology
- Field mapping rock formations
- Geothermal energy
- Mining engineering
- Analysis of diamond drill core
- Environmental management in mining
- Earthquake seismology
- Gemmology, crystallography and mineral identification
- Operating gold mine, site visit, including process workings
- Nuclear Processes

ROCK STARS

EARTH SCIENCES Summer School



Applications must be received by

3 November 2017

All applications will be acknowledged.

Post or email applications to:
John Mignone
State Drill Core Library
Community Education Service
GPO Box 320, Adelaide 5001
Email: **John.Mignone@sa.gov.au**

• Who should apply?

Students currently in Years 9, 10, 11 or 12 with:

- Genuine interest in Earth Sciences
- Sound academic achievement in science and mathematics
- Commitment to attend the full 8-day course

How to apply

The application form is available www.minerals.dpc.sa.gov.au/education_service and copies have also been sent to school science coordinators.

Selection process

Applications will be reviewed by Department of the Premier and Cabinet and the 20 successful applicants will be selected by end of 20 November 2017. All applicants will be notified by email.

Location of Summer School

Based at State Drill Core Library,
Tonsley Boulevard, Clovelly Park,
Adelaide, SA, 5042

www.minerals.dpc.sa.gov.au/geosciences_summer_school

SOUTH AUSTRALIA

Government of South Australia
Department of the Premier and Cabinet

07/06/2017–204890

Government of South Australia
Department of State Development

AusIMM THE MINERALS INSTITUTE

MARDEN SENIOR COLLEGE your pathway to success

GEOLOGICAL SOCIETY OF AUSTRALIA

TESEP

The South Australian branches of **AIG**, **ASEG**, **AusIMM**, **GSA** *and* **SACOME**, *with principal supporters* **Department of the Premier and Cabinet** *and* **Paydirt**, *invite you to the:*

SA EXPLORATION & MINING CONFERENCE

AUSTRALIA'S BEST VALUE MINING INDUSTRY CONFERENCE

South Australian **Exploration** and **Mining Conference**

Friday 8 December 2017 • *Adelaide Convention Centre*

ONLY $180 Earlybird ($200 after 30 September) • STUDENTS $40

- Online registration via website (Registration on the day $225).
- Registration fee includes full day catering, 22 presentations, five networking sessions including post conference drinks.

- Optional workshops before and after.
  - AIG Ore Textures Workshop – 6 & 7 December,
  - Geological Survey of South Australia Discovery Day – 7 December,
  - AusIMM Essington Lewis Lecture – 7 December,
  - AIG Wine Tour – 9 December

Principal supporters:

SOUTH AUSTRALIA

Government of South Australia, Department of the Premier and Cabinet

Australia's Paydirt

SOUTH AUSTRALIAN RESOURCES & ENERGY INVESTMENT CONFERENCE

Organised by:

AusIMM THE MINERALS INSTITUTE Adelaide Branch

Australian Society of Exploration Geophysicists

Geological Society of Australia

sacome

Australian Institute of Geoscientists

Please visit our website at:

www.saexplorers.com.au

Government of South Australia, Department of State Development

AusIMM THE MINERALS INSTITUTE

MARDEN SENIOR COLLEGE your pathway to success

Geological Society of Australia

TESEP

Newsletter number 16: November 2017

25 years of leadership in teaching geoscience

Marden Senior College has been a leading school in geoscience education and training over the past 25 years. Studying Geology has led many students to tertiary studies and professional careers in exploration, mining, energy, engineering and environmental science, while training in **Vocational Geoscience** and **Vocational Geophysics** has provided career pathways in field work for others, some of whom have become leaders in specialised fields, working both in Australia and internationally.

The Geoscience Pathways Project

The Geoscience Pathways Project (GPP) and website were established under an Australian Schools Innovations in Science Technology and Mathematics (ASISTM) grant in 2006. Since then, the project has received 'Seed-funding' and 'Impact' awards from the NAB Schools First Program and ongoing funding from the Geological Society of Australia (GSA) and the SA Government's Department of Premier and Cabinet (DPC). The Project's website is hosted by Marden Senior College and the web-master position is jointly funded by the Petroleum Exploration Society of Australia (PESA) and the Australian Society of Exploration Geophysicists (ASEG).

In the past, the GPP arranged and organised a number of 'Careers Nights' in DECD, Catholic and Independent schools, in collaboration with industry, TAFESA and the universities. The project currently offers support at all year levels (F-12) with an established network of around 20 government and non-government schools, with their own dedicated page on the GPP website. Many class groups of primary and secondary science students have visited the re-furbished Geology laboratory at Marden for hands on activities and/or participated in field investigations. During the past decade the project has also hosted professional development presentations, workshops and field trips for teachers at many SA and national Science Teacher Association conferences.

The GPP became an independent incorporated body in 2015. The Geoscience Pathways Project (Inc.) is now a not-for profit association of like-minded teachers, academics and professionals who share a passionate commitment to advance the teaching and learning of Earth Science in SA schools. The project now offers teacher mentoring in EES laboratory and field investigations, specialised equipment loans, access to a working seismometer (provided at Marden under the national Seismometers in Schools Program), subsidy of student transport for approved EES activities, university visits and associated practical work to suit the Earth and Space (5–10) strand of the Australian Science Curriculum. The GPP has prepared a range of teaching and learning resources, as well as exemplar materials, which are freely available on the project's website. Currently, teaching and learning resource materials are being prepared to support the introduction of the SACE Stage 2 EES course.

Over the past decade Marden's geoscience teaching staff have won a number of state and national awards for their work. As part of the 2007 SA Training Awards the College received a Training Initiative Award for Vocational Geoscience, a VET course provided at Marden in shared delivery with TAFESA. Individual teachers have been recognized through awards including a National Excellence in Teaching Award (NEiTA), an Inspirational Secondary School Teacher of the year award (SA Public Teaching Awards) and the 2009 Prime Minister's Prize for Excellence in Science Teaching in Secondary Schools.

Newsletter number 16: November 2017

Earth and Environmental Science

Teachers at Marden Senior College have been directly involved in the design and development of Earth and Environmental Science (EES) courses at both the national and state levels. They have played an integral part in the writing of the new Stage 1 and Stage 2 SACE EES courses, through their work with the SACE Board of SA.

This new 'Australian Science Curriculum' EES subject is recognised nationally across state and territory jurisdictions. It provides students with a unique opportunity to study the big environmental issues of our time, whether local, national or global, from a multi- disciplinary scientific perspective. The subject will expose students to a range of STEM studies, training and career pathways in Earth and Environmental Science, including climate science, renewable energies and our need to find ways to secure the long term sustainability of water, energy, soil and other Earth resources for future generations.

The Teacher Earth Science Education Program

The Teacher Earth Science Education Program (TESEP) is an award winning national program that has provided a range of funded workshops for primary and secondary science teachers in SA (and elsewhere) over many years. TESEP has been a valued partner of our GPP and have provided a range of in-kind support to the GPP program. In particular, TESEP has assisted teachers to update their knowledge of the science and to hence develop more engaging teaching and learning activities. The SA Coordinator continues to be based at Marden Senior College and many of these teacher PD workshops have been here at Marden Senior College.

Breaking news! Trees For Life receives threatened species grant

We're thrilled to announce a $250,000 grant to help secure the future of the threatened Silver Daisy Bush (*Olearia pannosa*). This vulnerable species occurs in several regions of SA. The funding will be delivered over 18 months and was one of 18 projects to receive funding from the Threatened Species Recovery Fund.

Trees for Life have recently announced their successful application for a grant ($249,780) for 'community action' across SA to protect the endangered silver daisy bush, in a changing climate.

Climatic changes over the coming decades will determine the future of the silver daisy bush in SA. Currently found in Mediterranean habitats, increasing aridity & shifting rainfall patterns are placing many populations at risk of extinction, particularly those in the north of its range. Our project will secure the species' ongoing future by undertaking translocations to:

(i) establish new populations in areas of suitable future habitat, to reduce the probability of total extinction,

(ii) introduce genetic material from northern populations into those of the south, to broaden the species' evolutionary capacity to adapt to climatic shifts,

(iii) increase local population size, to mitigate against extinction from stochastic catastrophes.

The project will cover the entire range of the species & will use innovative techniques to target on ground conservation actions in priority locations.

http://www.nrm.gov.au/system/files/pages/9d130a47-9239-4694-9392-9fee1d57cd76/files/tsrf-approved-projects.pdf