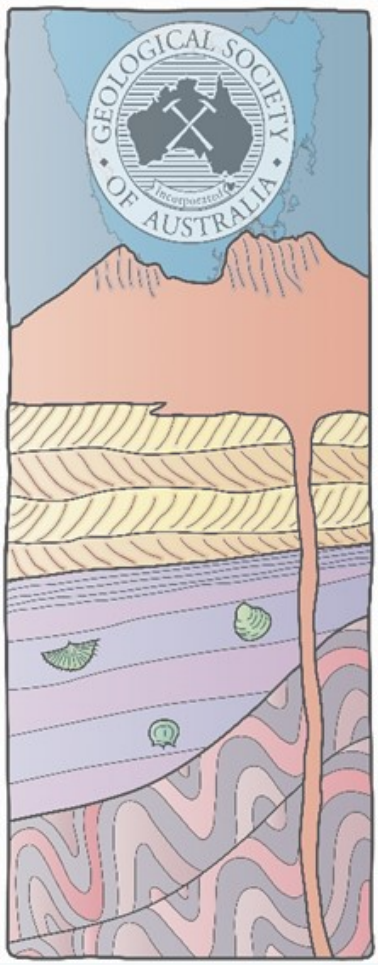
Geological Society of Australia Tasmania Division June 2023

The Tasmanian Geologist



Next Meeting Colin Jones will be discussing
The Petrogenesis of the East Tasmania Devonian Granites


Image JJ Harrison (https://www.jjharrison.com.au/)

IN THIS ISSUE

Our Next Meeting 22nd June 5:30 for 6:00PM Earth Sciences University of Tasmania is the Tasmania Division Annual General Meeting (AGM)

Summary of the year 2022-23
Election of committee and office bearers
Awards Announcements

Followed at 6:15 by a presentation by Colin Jones

Colin Jones will be dissecting the evolution of some of Tasmania's north-eastern granites using some cutting edge technologies in Earth Sciences. Join us to find out some of the latest science on these icons of Tasmania.

Inside this issue

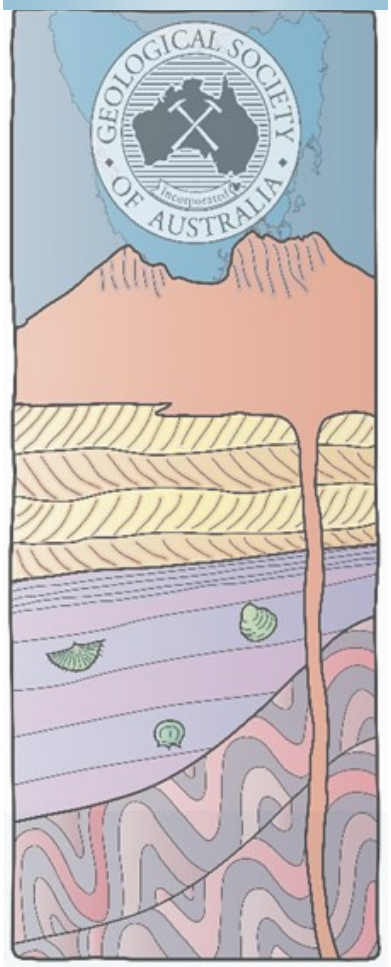
Future Meetings

27th July Film night

24th August Student night with AIG

9th September Saturday One-day field trip to north coast

10th September Sunday RST-NC Inveresk joint meeting Michael Roach



North Eastern Granite

Eastern Tasmania comprises the sedimentary Mathinna Supergroup extensively intruded by granitoid batholiths. These igneous intrusions cover about a quarter of Eastern Tasmania. The largest bodies are the Scottsdale, Ben Lomond, Blue Tier and Eddystone Batholiths. There are smaller bodies in the south including at Deep Glen Bay and Hippolyte Rocks. North lie the Furneaux Islands which are 70% granite. The intrusions range in age from early Devonian to middle Carboniferous. Many include high-level intrusions associated with important metals including tin and tungsten. They are also iconic to Tasmania's tourist industry with stunning coastal outcrops and beautiful sweeping sandy beaches.

The Petrogenesis of the East Tasmania Devonian Granites

Colin commenced his geological studies as a later age student some 8 years ago. He studied the magmatic-hydrothermal transition in granites at Bluestone Bay in the Freycinet Peninsula in Honours studies and has extended this work to PhD studies of the provenance of the magmas of the Devonian granites of north-east Tasmania through the support of Mineral Resources Tasmania and the TMVC at CODES at the University of Tasmania.

Supplied by Colin Jones

The sources of the magmas for the Eastern Tasmania Terrane (ETT) Devonian granites are unknown and the petrogenetic interactions of those magmas are insufficiently understood. These aspects of granite petrogenesis were subject to a range of studies. The sources of granitic magmas were investigated by zircon O and Hf isotopes using SHRIMP-dated zircons isolated from chemically characterized granites, 11 from the ETT and 1 from the West Tasmania Terrane. The occurrence of mixing of magmas, late in the crystallizing of the magmas (post-zircon crystallization), was studied using zircon and quartz O isotopes. The most basic and mafic rocks from the Devonian in the ETT, the Hogans Road Diorite (HRD), were dated (using a combination of U-Pb LA-ICP-MS on zircon, monazite and ap-

atite, and Ar/Ar on hornblende) and chemically analyzed to determine if their magmas were related to the magmas comprising the terrane granites. The granitic magmatic zircon isotope results showed zircon crystallized from melts with distinct $\delta^{18}O$ and εHf_i values that range from near mantle to crustal values, I-type granite zircons have lower median $\delta^{18}O$ and higher εHf_i, and within each granite zircon population the isotope values vary indicating crystallization under different conditions. Three granites with mantle or lower crustal zircon $\delta^{18}O$ values have different εHf_i results implying they are sourced from different mantle/infracrustal reservoirs, and all granites were modelled as evolving along two separate isotope paths from infracrustal to more supracrustal values. Two highly fractionated granites (Mt Stronach and Tombstone Creek) had zircons displaying lower crustal $\delta^{18}O$ signatures indicating evolution without significant mixing pre-zircon crystallization. However, the comparison of zircon and quartz O isotopes in these two granites indicated they had mixed with material bearing a supracrustal signature post zircon crystallization. Dating of the HRD showed emplacement and mineral crystallization concurrent with the earliest ETT granite emplacement. Petrography and chemical analysis showed the rocks were derived from the mixing of a lower crustal olivine-hornblende pyroxenite cumulate xenolith and a basic, high Ca and Al magma; the felsic end of the mixing line fractionating to diorites and granodiorites. The chemistry of the most mafic and basic end-member of the HRD is most likely of oceanic or lower continental crust or possibly mantle origin. The results of the studies show ETT granite petrogenesis involved mixing at mantle/lower crustal, mid-crustal and crustal levels and that the mafic component could be introduced by Cambrian oceanic crust forming the basement of the ETT.

I want to zoom into the meeting

NEW KILAUEA AND MAYON ERUPTIONS

Halemaumau crater on the summit of Kilauea Volcano on the Big Island of Hawaii commenced a new eruption phase on the 7th of June 2023 after a quiescence of 3 months. Lava has been flowing over the crater floor with limited fire fountaining at times, the production of Pele's hair and outpouring of abundant gas.

At Mayon Volcano, the most active volcano in the Philippines, ramping up seismic activity caused the evacuation of some 16,000 people in the inner 6-km radius hazard zone. Steam, gas and ash plumes have been observed as lava dome growth and collapse continues with pyroclastic density currents sweeping down several of the drainages.

MELBOURNE SHAKEUP

About 40 minutes before midnight on 28th of May Melbournians were shook by a shallow ML 4 earthquake under Sunbury, 40 kms northwest of the city. Some people were woken up and many felt it as far away as Bendigo and across Bass Strait. Smaller shakes had been rumbling at shallow depths in the eastern suburbs under Boronia and Croydon in the preceding weeks. This was the largest earthquake in suburban Melbourne since 1905.

Melting of the Thwaites Glacier

The Thwaites and Pine Glacier in Western Antarctica are losing ice mass faster than any other glaciers on the continent.

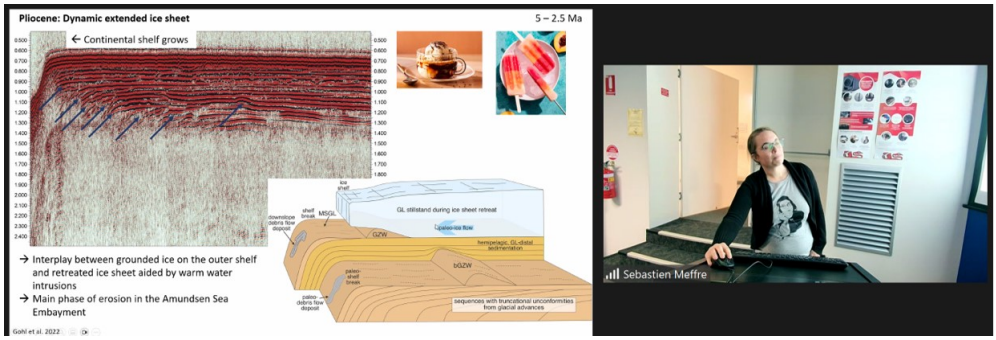
The Thwaites Glacier covers an area just a bit smaller than Victoria. The bed of the glacier is about 1 km below sea level. Melting of this glacier is contributing about 0.1 mm per annum to sea level rise double what it did in the 1990s. This is significant as all of the glacial melting on Greenland is adding about 0.5 mm per annum to global sea levels (UCAR https://scied.ucar.edu/learning-zone/climate-change-impacts/greenlands-ice-melting#). If the glacier melts then we could expect up to 65 cm of sea level rise (https://www.antarcticglaciers.org/2020/01/what-is-the-ice-volume-of-thwaites-glacier).

Katharina in her talk alluded to the geoengineering solutions proposed by Wolovick et al. (2020) to a seabed anchored curtain that would unfurl and flex diverting warm ocean water away from the ice shelf and Thwaites and Pine Glacier fronts. The diversion would retain cooler water and allow the glacier to increase in thickness and reattach again on the seabed. This should significantly slow the melting which is accelerating and help reduce the glaciers contributions to sea level rise. Katharina asked us what we thought of this idea?

Michael Wolovick[1], John Moore[1], Rajeev Jaiman[2], Jasmin Jelovica[2], and Bowie Keefer[2] 2020 Targeted Glacial Geoengineering through Seabed Anchored Curtains EGU General Assembly 2020-8750. https://doi.org/10.5194/egusphere-egu2020-8750

May 18th Katharina Hochmuth

Last meeting we travelled in time and space to Antarctica ably guided by Katharina Hochmuth. Katharina is a seismologist/geophysicist working at the Australian Centre of Excellence in Antarctic Science (ACEAS) at the University of Tasmania and has been on various voyages to Western Antarctica. She took us through the changing environment in Thwaites Glacier-Pine Glacier-Amundsen Sea region where the highest rate of ice mass loss of Antarctic ice sheets is occurring. Prograding sediment on the Antarctic Shelf built a stratigraphy that captures the changes in climate and conditions of the continent as Antarctica became separated from the rest of Gondwana. Forests were widespread in the Cretaceous. Rivers flowed over the area in the Paleocene-Eocene. Unconformities in the Miocene deposits indicate the presence of fluctuating icesheets. Extensive seawards growth happened in the sediment wedge during the Pliocene as ice ground down Antarctica's interior. The data also indicates that the architecture of the Amundsen Sea floor allows warm water to enter deep under the glaciers in this area contributing to rapid melting. Thank you to Katharina for an informative talk given with enthusiasm, icy-poles and coffee analogues to help us all understand more about the links between this important area of Antarctica and climate change.



Screenshot from ZOOM

May 25th Federal GSA Annual General Meeting Outcomes

The GSA Annual General Meeting was held via ZOOM on the 25th of May. The meeting was chaired by Peter Betts. It enacted **major changes** in the way the GSA is run and also **re-organised membership** categories.

Summary of the main changes:

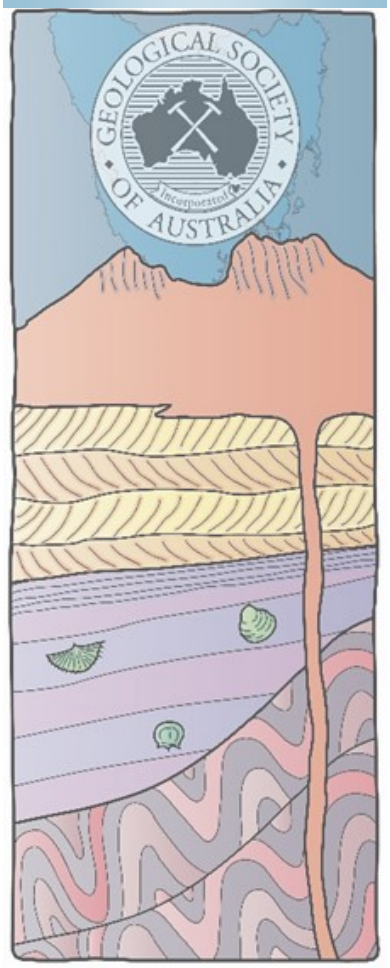
1) There will no longer be a CEO of the organisation and no central office. All reference to the CEO is removed from the organisation rules.

2) Administration of the organisation will transition to an Administration Management Company (AMC) which will be The Association Specialists (TAS) who already work with other geoscience organisations.

3) Main Membership changes:
Current Fellows = **Distinguished Fellows**
(can use postnominal DFGSAust.)
Current Members = **Fellows** (can use FGSAust.)
Current Retired member = **Retired Fellow**
Current Life Member = **Life Fellow**

To find out more details please go to the website link below:

I want to know more about these changes



Verity Normington (Treasurer) reported on GSA Finances.

GSA remains in a strong financial position with and investment portfolio underpinning an asset base of over $3 million. However the GSA has been operating at a deficit for 8 of the last 9 years. This has been caused by declining full fee paying members due to changing demographics, reduced subscription to our journal AJES across the globe mainly in North America and reduced income for the AESC since 2016.

The financial realities are the driver to the new administrative model approved at the AGM.

What is the GSA Endowment Fund?

The Geological Society of Australia (GSA) Endowment Fund was set up in 2007 to support students undertaking graduate studies in the Earth Sciences. The fund was set up as a separate entity to the GSA and the Australian Tax Office imposed elements that restricted this support to Australian students at Australian educational institutions. Financial assistance in the form of awards can be granted to Australian students by the GSA Endowment Fund Committee and the awards are not restricted to GSA members. Honours/ Masters student from each state are eligible for a $1000 grant and PhD students compete nationally for a $5000 grant. There are also discretionary awards.

The Geological Society of Australia Endowment Fund is a charity and all donations are tax deductible. (*from GSA website)*

Student Members

Hello student members. Exams are over and you have a short break! Although many of you will be gearing up to go on those important field trips.

We have a student night on the 24th of August in conjunction with AIG so please put that in your calendar.

Endowment Fund
THE GEOLOGICAL SOCIETY OF AUSTRALIA

A Tasmanian student is the recipient of a discretionary award provided by the Endowment Fund for 2023. Come along to the AGM to find out who has been granted $1500.

One of our PhD students has gone into the mix for the big $5000 grant. Good luck to them.

Membership

There are also special rates for graduate membership so no need to miss out once you have graduated. We would love to keep in touch!
Any queries about your membership contact our membership officer Rebecca Carey (Rebecca.Carey@utas.edu.au).

You can become a member right now

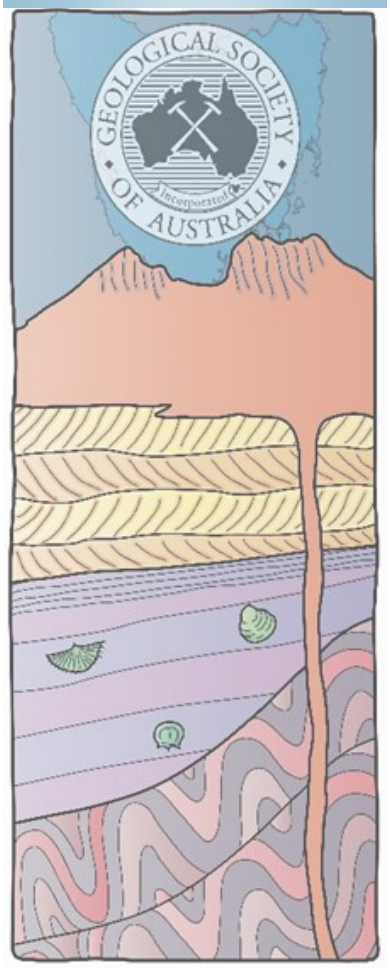
I want to become a Member

Meet a graduate

Olivia Wilson won the Honours Endowment Scholarship for Tasmania in her honours year in in 2020. Despite the lockdowns of that year, she eventually managed to get into the field to spend her money. Olivia is now employed by Entura in Hobart. She was an undergraduate member of the GSA and here is her testament to how it can be helpful for your future.

"Being a student member of the Geological Society of Australia enriched my experience of studying geology."

Supplied by Olivia Wilson



Olivia Wilson on being a GSA student member

'Being a student member of the Geological Society of Australia enriched my experience of studying geology. Especially important to me were the opportunities to make connections and learn about the research of other society members. As a student, it is also invaluable to have an environment in which you can interact with geoscientists from all career stages – hearing their experiences allows you to develop your own career aspirations. GSA membership also demonstrates that you have a level of passion and commitment to your field beyond '

Other Events coming up

AESC2023 in Perth
27-30th of June 2023.
Registration Open Now

13th Tasmanian Geoscience Forum Tullah
30th of November

The Geological Evolution of Tasmania

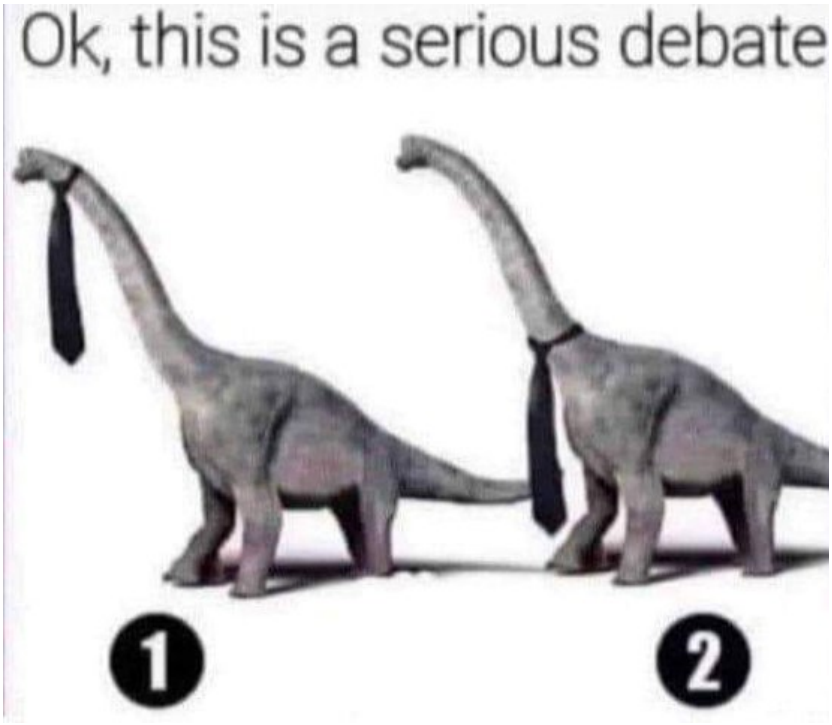
The flagship publication of the Tasmanian Division of the GSA, 'The Geological Evolution of Tasmania' (Special Publication 24 of the GSA) is available for ordering.

I want to know more about the book

You can purchase them personally from Caroline Mordant (publications@CODES.utas.edu.au or phone on +61 3 6226 7537.

Members	$99
Non Members	$113
Students	$75

Last word from Noel



ANNUAL GENERAL MEETING

22nd of June 2023 University of Tasmania Earth Science Lecture Theatre

6 PM

See back page for details

Our details

Geological Society of Australia website:
www.gsa.org
And our own website:
http://
www.gsatasmania.org

GSA Tasmania Division Committee 2022-2023

Chair: Karin Orth
Secretary: Sebastien Meffre
Sebastien.Meffre@utas.edu.au
Treasurer: Claire Kain

Committee Members:
Sheree Armistead
Jeremy Asimus
Rebecca Carey (Membership)
Acacia Clark (Student Rep)
Matt Ferguson
Jacqueline Halpin
Wei Xuen Heng
Claire Kain (Geotourism)
Peter McGoldrick
Sebastien Meffre
Phil Sansom (Education)
Olivia Wilson
Grace Cumming

ANY NEWS, ANNOUNCEMENTS OR INTERESTING PHOTOGRAPHS FOR THE NEXT ISSUE OF THE TASMANIAN GEOLOGIST PLEASE SEND IT THROUGH VIA EMAIL PRIOR TO 20/07/2023 TO

karin.orth@utas.edu.au

The Annual General Meeting Thursday 22nd of June 6:00 pm

Come along to congratulate student winners of the Carey and Banks Prizes and learn about our new student awards for 2023.

Nominations will be open at the AGM for committee members and office bearers. Nomination form below.

Geological Society of Australia, Tasmania Division
2023-2024

I hereby nominate……for the position of……

……. **…….(nominator)**
(print name) (signed)

…….. **…….(seconder)**
(print name) (signed)

I accept nomination **…….**