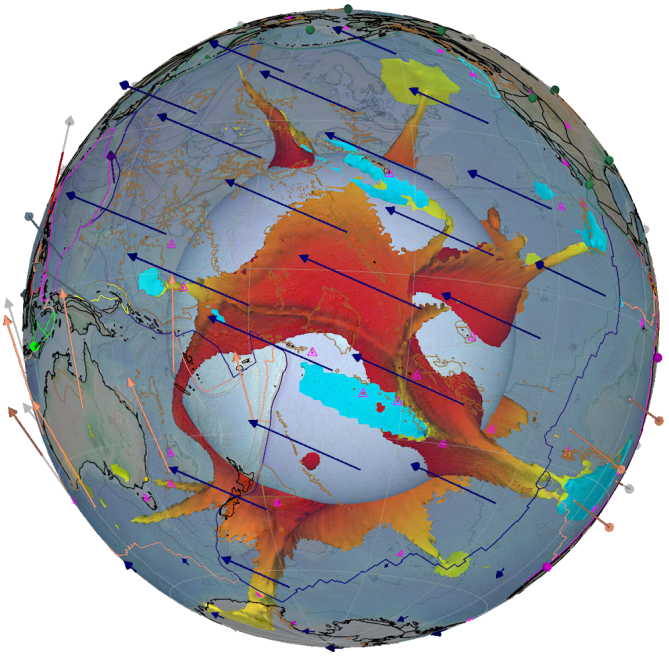
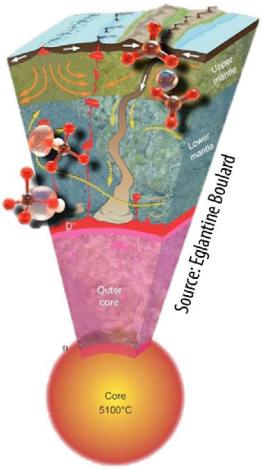
Carbon Down Under

Galvanizing Australia's research community for the next decade of deep-time Earth modelling and visualization of deep carbon science

SYDNEY DCO WORKSHOP / 24 - 26 July 2019

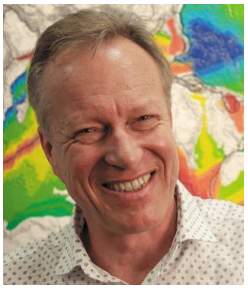




WORKSHOP ORGANISERS

Dr Sabin Zahirovic
University of Sydney
sabin.zahirovic@sydney.edu.au
+61 416 77 55 89

Ms Darlene Trew Crist
DCO Synthesis Manager



Prof Dietmar Müller
University of Sydney

Dr Adriana Dutkiewicz
University of Sydney

Dr Patrick Smith
Australian Museum

Dr Sara Morón-Polanco
University of Sydney

THE UNIVERSITY OF SYDNEY · EarthBYTE Building a Virtual Earth · ALFRED P. SLOAN FOUNDATION · DEEP CARBON OBSERVATORY

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This workshop aims to discuss progress and future plans for modelling the planetary carbon cycle, with a focus on better integrating the different components of the system (tectonics, biosphere, chemistry, etc.). The workshop and field trip will bring together representatives of "deep carbon"-related research from across Australia, as well as some international participants, to help pave the way for the next decade of collaborations and research in this field.

About 30 participants from across Australia will be funded to attend, which will include their travel, accommodation, and catering during their stay in Sydney. The workshop is funded by the Alfred P Sloan Foundation through the Deep Carbon Observatory, with in-kind contributions from The University of Sydney.

Where: School of Geosciences, The University of Sydney
When: 24 - 26 July 2019
Cost: FREE for invited participants (flights, accommodation, food, field trip covered)
Organisers: Dr Sabin Zahirovic, Darlene Trew Crist

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SYDNEY DCO WORKSHOP / 24 - 26 July 2019

WEDNESDAY 24 JULY

Morning

8:15 - 9:00 AM	Registration (outside F23 Auditorium doors)
9:00 - 9:10 AM	Introduction and Welcome **Sabin Zahirovic** (University of Sydney)
9:10 - 9:30 AM	Ten years of deep carbon research **Darlene Trew Crist** (DCO Synthesis Manager)
9:30 - 9:50 AM	Linking plate tectonic reconstructions to components of the planetary deep carbon cycle **Sabin Zahirovic** (University of Sydney)
9:50 - 10:10 AM	The relationship between atmosphere O2, CO2, evolution and mass extinction in the Phanerozoic **Ross Large** (University of Tasmania)
10:10 - 10:30 AM	The long-term evolution of the Australian continent, from hot-plate tectonics to recent aridification **Sandra McLaren** (University of Melbourne)
10:30 - 11:00 AM	Morning Tea / Coffee Break
11:00 - 11:20 AM	Deep Carbon and Continental Rifts **Stephen Foley** (Macquarie University)
11:20 - 11:40 AM	Diamonds and diverse mantle rocks explained by melt/rock interaction in the lower cratonic lithosphere **Zsanett Pintér** (Macquarie University)
11:40 - noon	Antiskarns, carbonatite reactivity, and the not-so-deep carbon cycle **Michael Anenburg** (Australian National University)
noon - 12:20 PM	Melt and fluid inclusion perspective on kimberlite melts: Insights into carbon in the subcontinental lithospheric mantle **Adam Abersteiner** (University of Tasmania)
12:20 - 12:40 PM	Magmatic and tectonic controls on kimberlite genesis and evolution beneath Slave Craton locations **Stephanie Greene** (Macquarie University)

12:40 - 1:40 PM	Lunch

Afternoon

1:40 - 2:00 PM	Subduction and melting of sediments in the deep mantle produce saline fluid inclusions in diamonds **Michael Forster** (Macquarie University)
2:00 - 2:20 PM	Arc migration and its influence on what gets subducted **Chris Spencer** (Curtin University)
2:20 - 2:40 PM	Slab decarbonation and orogenic gold - how are they related? **Weronika Gorczyk** (University of Western Australia)
2:40 - 3:00 PM	Slab subduction controls on carbonate melting in the upper mantle **Christopher Gonzalez** (Monash University)
3:00 - 3:30 PM	Afternoon Tea / Coffee Break
3:30 - 3:50 PM	Submarine volcanism in Intraoceanic Arcs **Rebecca Carey** (University of Tasmania)
3:50 - 4:10 PM	Subduction, accretion and exhumation in the Western Tethys - implications for the carbon cycle **Derya Gürer** (University of Queensland)
4:10 - 4:30 PM	Quantitative 3D seismic stratigraphy and geomorphology: Rebuilding depositional environments and processes of the past **Victorien Paumard** (University of Western Australia)
4:30 - 4:50 PM	Modelling the long-term surface carbon cycle and its coupling to plate tectonics **Stuart Daines** (University of Exeter)
4:50 - 5:10 PM	Simulating the physical processes that underpin the carbonate-silicate cycle with Badlands **Amanda Thran** (University of Sydney)
5:10 - 5:30 PM	Additional discussions
6:00 - 9:00 PM	**Free conference dinner** (we will assume everyone is coming!) Thai Pothong, 294 King St, Newtown NSW 2042 Google Maps link: https://goo.gl/maps/ttD3xq6PMG6ht9MX6 https://www.thaipothong.com.au/newtown/menus/dinner/banquet

Carbon Down Under

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SYDNEY DCO WORKSHOP / 24 - 26 July 2019

Thursday 25 JULY

Morning

8:30 - 9:00 AM	Registration
9:00 - 9:20 AM	Carbonate systems of Australasia through the Cenozoic: implications for carbon sequestration **Moyra Wilson** (University of Western Australia)
9:20 - 9:40 AM	The early Holocene initiation of One Tree Reef: Insights into reef development during a period of rapid sea-level rise and environmental change on the Great Barrier Reef **Kelsey Sanborn** (University of Sydney)
9:40 - 10:00 AM	Project HALO: *Halimeda* bioherms in the northern Great Barrier Reef - origin, function, and fate **Mardi McNeil** (Queensland University of Technology)
10:00 - 10:20 AM	Changes in the shallow water (neritic) carbonate mass flux and its impact on the Carbon cycle **Bradley Opdyke** (Australian National University)
10:20 - 10:40 AM	Linking phylogenetic biogeography and geology/palaeogeography using model-based inference **Nick Matzke** (University of Auckland)
10:40 - 11:10 AM	Morning Tea / Coffee Break
11:10 - 11:30 AM	Tectono-sedimentary simulations 2.0 **Claire Mallard** (University of Sydney)
11:30 - 11:50 AM	Inverse Modelling for Climate and Geology **Peter Rayner** (University of Melbourne)
11:50 AM - 12:10 PM	The role of geology in keeping the Earth habitable **Dietmar Müller** (University of Sydney)
12:10 - 12:30 PM	Can Earth become uninhabitable to humans due to global warming? **Steven Sherwood** (University of New South Wales)
12:30 - 1:30 PM	Lunch

Afternoon

1:30 - 1:50 PM	Oceanic gateways, orogenies or slowing seafloor spreading: evaluating the drivers of the Eocene-Oligocene climate transition **Stefan Löhr** (Macquarie University)
1:50 - 2:10 PM	More efficient North Atlantic carbon pump during the Last Glacial Maximum **Jimin Yu** (Australian National University)
2:10 - 2:30 PM	Radiocarbon monitoring of the Antarctic carbon cycle: Past, Present and Future **Chris Turney** (University of New South Wales)
2:30 - 2:50 PM	El Niño Southern Oscillation under Greenhouse Warming **Agus Santoso** (University of New South Wales)
2:50 - 3:10 PM	Inspiring the next generation of Earth Scientists **Anita O'Connell** (TAFE Digital / OTEN)
3:00 - 3:30 PM	Afternoon Tea / Coffee Break
3:30 - 5:00 PM	Planning and discussions
5:00 - 5:30 PM	Additional discussions + Field trip safety briefing
	Dinner to be planned by individuals

Carbon Down Under

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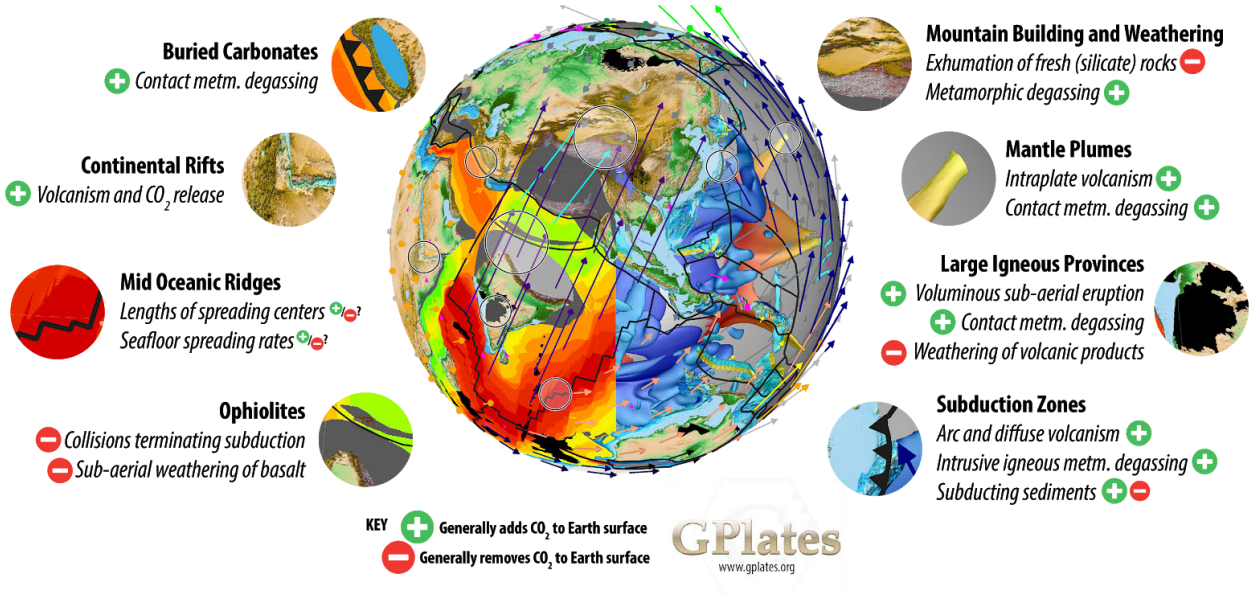
SYDNEY DCO WORKSHOP / 24 - 26 July 2019

THEMES

- Tectonic and geodynamic processes influencing the storage and exchange of carbon between deep and surface reservoirs
- Chemical and physical processes involved in the planetary carbon cycle
- Role of surface processes (weathering and erosion) in modulating the carbon cycle
- Interactions with the biosphere (mass extinctions, evolution of pelagic ocean calcifiers, carbonate platforms/reefs, etc.)
- Major perturbations to the carbon cycle (bolide impacts, tectonics, etc.)
- Deep carbon cycle and planetary habitability and climate (past and future)
- Atmospheric and ocean circulation (calcite compensation depth, etc.)
- And any other theme aligned to your own research!

Much of what we have been working on has focused on modelling the deep carbon cycle in the context of plate tectonics, and below is a summary figure. This might prompt some ideas and links with your own work, but we look forward to discussing the broader aspects of the deep carbon cycle.



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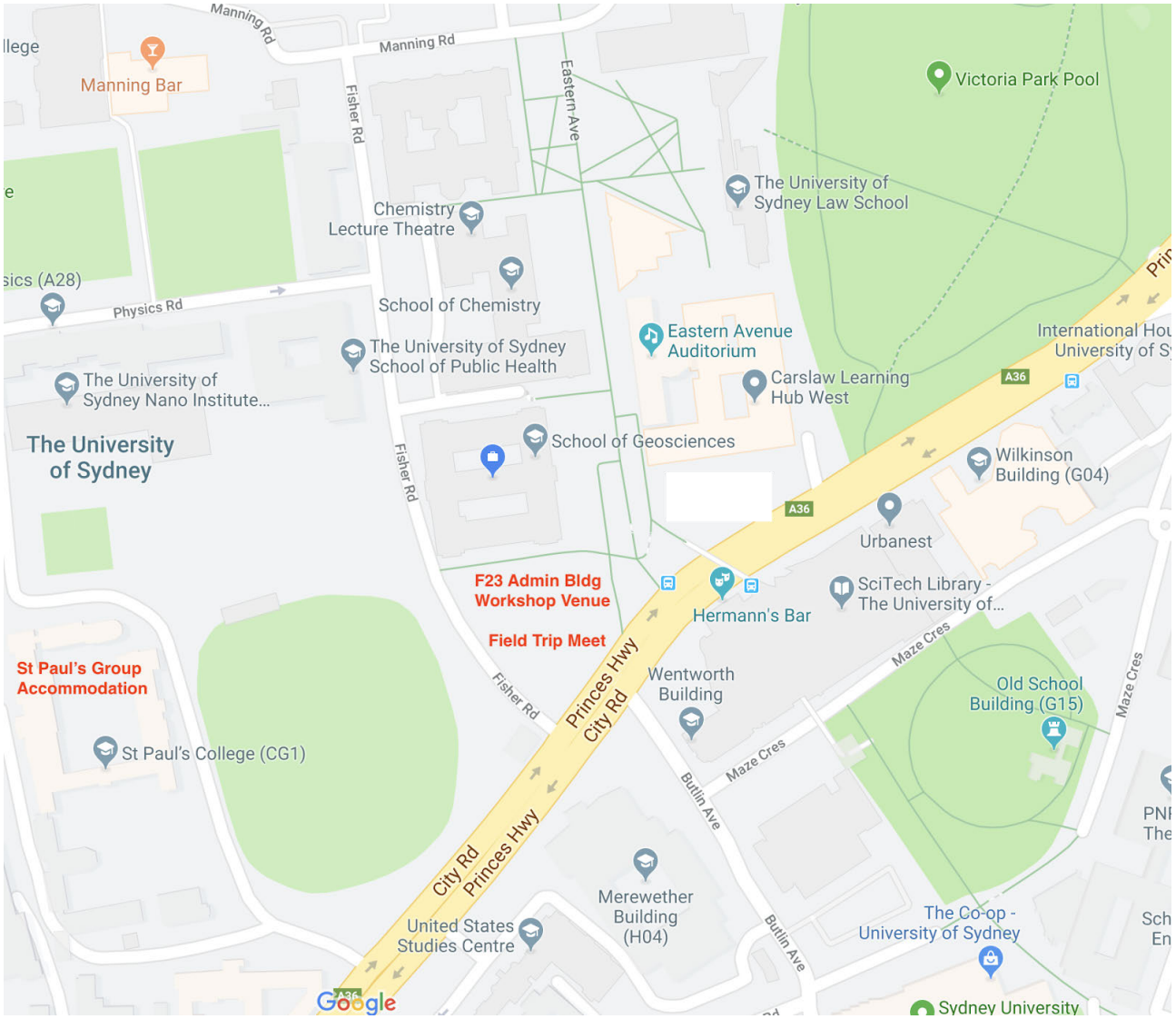
SYDNEY DCO WORKSHOP / 24 - 26 July 2019

WORKSHOP VENUE, REGISTRATION AND GENERAL INFORMATION

The workshop venue is the Auditorium in the F23 Administration Building on the corner of Eastern Avenue and City Road (Camperdown NSW 2006, see map below). Registration will open at 8:15 am on both Wednesday and Thursday (24 and 25 July) at the entrance of the auditorium, and the workshop will start at 9 am, sharp. We will have several oral sessions and discussion slots on Wednesday and Thursday, and will aim to finish at 5 pm, although some discussions may continue to 5:30 pm. On Wednesday evening, we will have a free conference dinner for all attendees at Thai Pothong in Newtown at 6 pm. On Thursday at 5 pm we will have a field trip safety briefing, and we will meet at 7 am in front of the workshop venue on Friday morning to depart for the field trip.

MAP - Workshop Venue and Group Accommodation annotated in red



Workshop venue, F23 Admin Building (left), and the School of Geosciences (adjacent to F23) on City Road (image credit: Grimshaw Architects)

CATERING

For those staying in the group accommodation, breakfast will be provided at St Paul's College. Morning tea, lunch, and afternoon tea will be provided during the workshop. Food will be provided for the field trip on Friday as well. We will cater to dietary requirements, and food/coffee will be served in front of the auditorium.

FREE CONFERENCE DINNER

We will assume that all workshop participants are attending the conference dinner on Wednesday evening from 6 pm at Thai Pothong. This restaurant is about 10-15 minutes walking distance from the workshop venue. The dinner and a couple of drinks will be covered by our funding.

Thai Pothong, 294 King St, Newtown NSW 2042
Google Maps link: https://goo.gl/maps/ttD3xq6PMG6ht9MX6
https://www.thaipothong.com.au/newtown/menus/dinner/banquet

COSTS

You should incur minimal costs, largely for transport to/from the airport, and incidentals. Accommodation, economy return flights, catering, and a conference dinner will be covered by our funding for non-Sydney participants. Accommodation will be in comfortable single en-suite rooms on-campus at newly-renovated facilities at St Paul's College. Check-in will be Tuesday afternoon and check-out is on Saturday morning. You will need to book and pay for your domestic flights, and these costs will be reimbursed to you through the University of Sydney - but you must keep tax invoices of those transactions. Sabin will e-mail you two forms that you must fill out, and return with scanned PDFs/JPGs of your tax invoices.

INSURANCE AND REIMBURSEMENTS

You need to make sure that your home institution will provide insurance for your trip - if not, please contact Sabin (sabin.zahirovic@sydney.edu.au) by mid July. Participants without confirmed insurance will not be able to attend the field trip.

INFORMATION FOR SPEAKERS

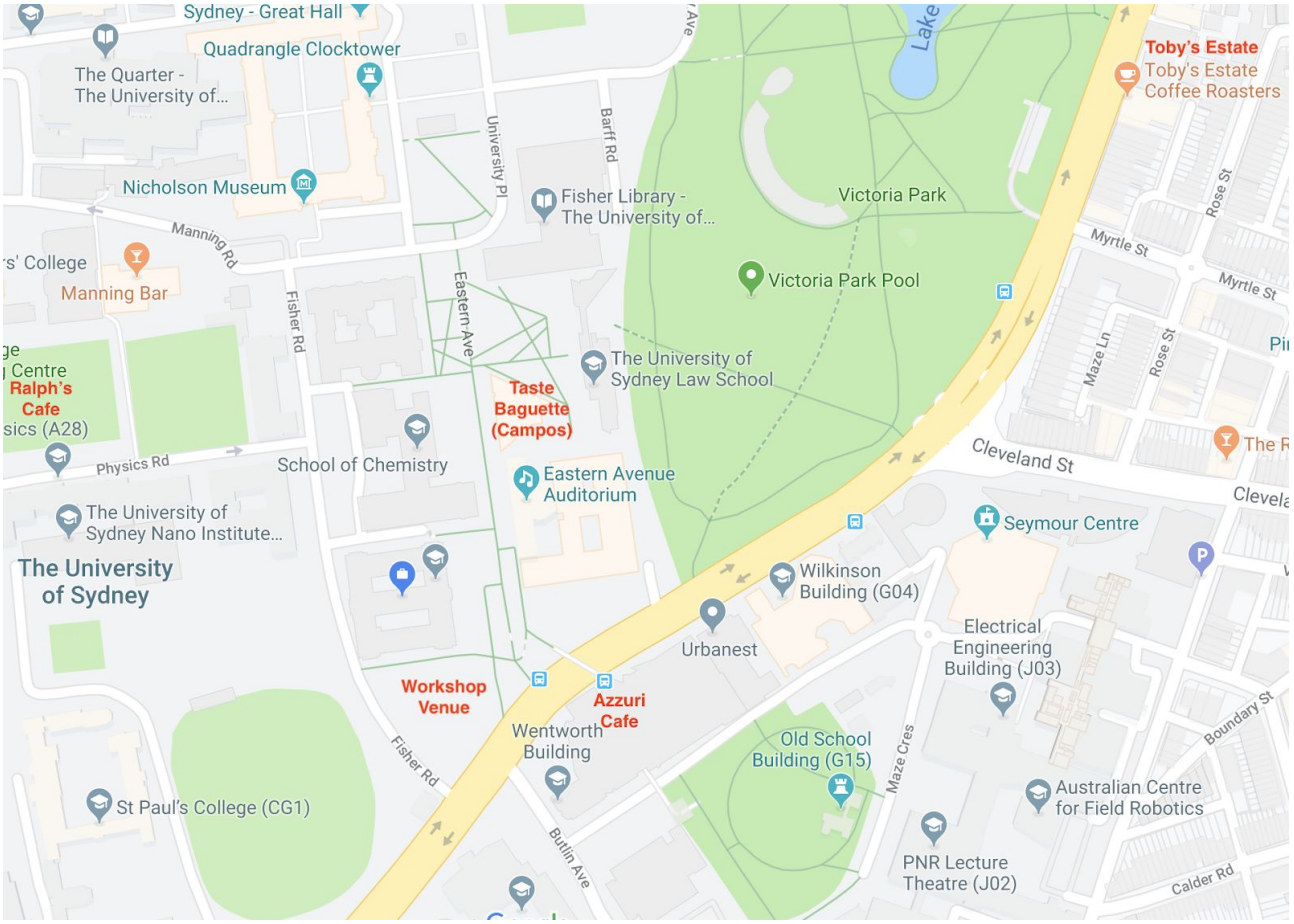
We have 65 confirmed workshop participants. Unfortunately we cannot offer a speaking slot to everyone, as we would run out of time for vital discussions. There are currently 35 people scheduled to talk, and currently talks are scheduled for a 20 minute slot. It may be best to aim for a ~15 minute talk in order to have sufficient time for questions.

The workshop venue has a widescreen (16:9) projector and a PC at the lectern. An HDMI connection is also available at the lectern in case you need to use your own laptop (where animations might break using the PC, etc.). Talks should be prepared in PowerPoint, if possible, and uploaded here the day before the talk:
https://www.dropbox.com/request/hgsLI7WHAsQI7Ih7msd6

COFFEE

As Dietmar says, "No coffee, no science". We will be serving coffee at the morning and afternoon tea breaks, but some of you (including Sabin) may prefer a famous local "flat white" or similar. Sabin's favourite coffee spots are below, in order of preference:

Taste Baguette (Campos), Azzuri Cafe, Toby's Estate (a bit of a walk, but so very good), Ralphs' Cafes



WIFI

Plan A
Your best bet is to use eduroam, but please make sure that it is set up while you are on your home institution's network. Instructions on how to set up eduroam are found here:
https://www.eduroam.edu.au/eduroam-for-users/

Plan B
ICT will provide a WIFI hotspot called CarbonDownUnder. Password is 16853025.

Plan C
Alternatively, connect to 'UniSydney-Guest' and go to this link:
https://auth.wireless.sydney.edu.au/guest/guest_register.php
There you will need to provide some details, and enter Sabin's information as sponsor (Sabin Zahirovic, sabin.zahirovic@sydney.edu.au) to get a 24 hour block of access. Repeat the process when the 24 hour access expires.

TWITTER AND SOCIAL MEDIA

Spread the word with #CarbonDownUnder

MAIN ORGANISER CONTACT

Dr Sabin Zahirovic, Postdoctoral Research Associate
Rm 404, Madsen Building F09
School of Geosciences
University of Sydney NSW, 2006
sabin.zahirovic@sydney.edu.au
Ph: +61 416 775 589

FIELD TRIP ORGANISER CONTACTS

Prof Dietmar Müller dietmar.muller@sydney.edu.au
Dr Sara Morón-Polanco sara.moronpolanco@sydney.edu.au
Dr Sabin Zahirovic sabin.zahirovic@sydney.edu.au
Dr Patrick Smith Patrick.Smith@austmus.gov.au
Dr Adriana Dutkiewicz adriana.dutkiewicz@sydney.edu.au

ST PAUL'S COLLEGE CONTACT

Kate Bowery, General Manager Hospitality
St Paul's - Events and Stays
9 City Road, Camperdown, NSW 2050
kate.bowery@stpauls.edu.au
Ph: +61 2 9550 7444

WORKSHOP VENUE

Auditorium (ground level)
F23 Administration Building
Corner of Eastern Avenue and City Road
Camperdown NSW 2006

UNIVERSITY OF SYDNEY CAMPUS SECURITY

9351 3333

EMERGENCY

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SCHOOL OF GEOSCIENCES

+61 2 9351 3390 or +61 2 8627 8352

Carbon Down Under - Field Trip

Galvanizing Australia's research community for the next decade of deep-time Earth modelling and visualization of deep carbon science

SYDNEY DCO WORKSHOP / 24 - 26 July 2019

Friday 26 JULY

The optional (and free) field trip will run on Friday, 26 July. We will have a bus that will take us down to Wollongong, and we will be exploring the Permian geology of eastern Gondwana at the stops, including tectonics, volcanism, sedimentary processes, and paleobiology. Make sure you read the field trip safety notes. A comprehensive field guide will be provided.

The field trip will be run by Dietmar Müller[1], Sara Morón-Polanco[1], Sabin Zahirovic[1] Patrick Smith[2] and Adriana Dutkiewicz[1]

[1] *School of Geosciences, University of Sydney*

[2] *Palaeontology Department, Australian Museum Research Institute*

Field trip safety overview

On Friday, 26 July 2019, about 45 participants will board a Telfords bus at 7 am (meet at 6:45 am outside the workshop venue). The bus will be loaded with first aid equipment, some emergency bottled water, and food for the day. We will make six stops at field sites throughout the day, each with slightly different environmental conditions - from a local quarry to beaches and headlands. Safety is paramount. We will stay in small groups, and at times as one large group, and no participants should ever be alone in the field (especially near water). Please listen out to announcements, and ensure that you read ALL of the information below BEFORE the workshop and field trip. If you have any concerns, let the field trip organisers (such as Sabin) know immediately. Whistles will be provided, and must be used to gain attention if there is an incident (to you or another participant). Please look out for your own safety, as well as the safety of those around you. Although the field areas are not remote, there is a requirement of moderate physical fitness, especially in terms of navigating the terrain on/around the beaches and headlands.

We assume that you have arranged insurance coverage for the workshop and field trip from your home institution, or bought it privately (we can reimburse those charges). Participants without insurance coverage are asked not to board the bus in the morning, and to avoid this, please ensure that you have confirmed insurance coverage. We will make several stops during the day for toilet breaks, and we will be on our way back to the University of Sydney from the last stop at around 5 pm. Given that this is peak hour, we hope to be back by 7 pm, but in an extreme case of road closures and accidents, we may arrive as late as 9 or 10 pm. Ensure that you have enough water, medication, clothing, and other materials for the duration of the field trip. Please read all of the information below carefully. For all field trip attendees, make sure that you have filled out the separate field trip form requesting emergency contact details, and so on: https://forms.gle/KffNe4GZ95sZkuUS8

Field trip safety rules

- We assume that **you** have arranged insurance coverage from your home institution before attendance - or have bought additional insurance to cover the workshop and field trip
- No field work will be done after sunset or in very low light (after 5:11 pm)
- Sturdy closed footwear suitable for field conditions (rocky and potentially slippery terrain) is essential
- Broad-brimmed hat, sunglasses, sunscreen, and raincoat/rainpants are essential

- Bring any personal medication with you, including painkillers and antihistamines/epi-pens
- No geological hammers are to be used for both safety and heritage/conservation reasons (bring a hand lens!)
- We will stay in one large group, or several small groups - no participant is to be alone (especially near water) in the field
- Whistles will be provided, use them to alert others to danger
- Drink plenty of water and keep yourself and other team members safe at all times
- Do not enter the water at the field sites, as this is not part of the field trip
- Report any incident (illness, accident, etc.) to workshop organisers immediately, or at least within 24 hours (this is a legal requirement)
- Adhere to the precautions in the table below, as well as exercise safety and common sense in all other scenarios

Potential Hazard	**Description**	**Precautions**
Tripping	Tripping on rocks and other uneven ground, or even entering/leaving bus.	Be aware of your environment at all times. Must wear sturdy/closed footwear appropriate for field work, such as hiking shoes/boots with good grip.
Slipping	Slipping on wet surfaces, including rocks covered in algae at low tide.	Do not step on surfaces covered with algae, and avoid stepping on wet surfaces. If raining, take extra precautions. Footwear with good grip is essential.
Dehydration	Not drinking enough water.	Ensure you have a 2 L bottle of water with you. Drink water regularly. We will make several toilet stops throughout the day.
Manual handling	Lifting heavy or bulky gear, including packed food or drink packs. Lifting rocks.	Ask others for help, and exercise safe lifting procedure (lift with legs, not your back, etc.). Do not lift rocks larger than a closed fist!
Exposure - sun, wind, water, temperature	Sunburn is guaranteed if not wearing sunscreen, and temperatures and wind likely to make it very cold on the exposed beaches and headlands.	Make sure you apply and reapply sunscreen, and wear a broad brimmed hat and sunglasses. Wear warm clothing (layers), bring a raincoat, and preferably a change into dry clothes.
Road/vehicle accident	Bus will be driven by professional bus driver, but there is always a small risk of road accidents. Crossing the road is a bigger threat to safety.	Ensure you wear the seat belt during transit on the bus. Cross any road very carefully, especially where visibility is limited. This is especially the case for international participants. Exercise caution in car parks and on roads.
Allergic reaction	Bee stings and other environmental conditions, or inadvertent contamination of food.	Carry epi-pen and/or antihistamines if you have any allergies. Check your food before consuming, in case there was an obvious mix-up.
Rock falls	Edges of cliffs may break off, or rocks may tumble down cliffs to outcrops.	Do not stand near the edge of cliffs, and visually inspect any outcrop or cliff face for rocks that may be easily dislodged.
Falling	Falling off rocks or even the edge of a rock cliff.	Tripping and falling off an outcrop or even coastal cliff is potentially extremely dangerous. People have died on the NSW coast by attempting to take “selfies”. Please exercise

		extreme caution, and stay away from cliff edges.
Lightning	Thunderstorms that can sweep through very quickly.	Lightning strikes can be fatal, and the risk is higher in exposed areas such as beaches and headlands. Field trip activities will be cancelled in the case of a severe storm or lightning storm, and attendees will be required to return to the bus.
Dangerous animals - marine life, snakes, spiders	Snakes may be sunbathing on rocks, while spiders may be hiding underneath rocks. Blue-ringed Octopus in rock pools can also be deadly. Ant, bee, and other insects may sting.	Approach all outcrops slowly, and be aware of your environment. Make noise as snakes will prefer to escape. Try not to overturn rocks bigger than a closed fist. Avoid interaction with Blue-ringed Octopus at all cost, do not approach or handle, under any circumstances. Be aware of any insects that may be around or on rocks.
Bushfires	Bush fires can start during dry and warm weather, or even during lightning strikes. Occasionally, back-burning, accidental fires, or intentional fires may be lit.	Smoking is discouraged on the field trip. Do not light any fires. If any smoke or fire is visible, alert others, and evacuate the field area safely.
Rogue waves	Some waves can be much higher than others - called “significant waves”. These can surprise people on headlands, and in extreme cases can wash people off the headland.	Keep your distance from the water, and keep an eye on the water conditions - including waves. Under no circumstance should attendees walk off on their own out of sight from other field trip participants.
Tsunami	Very unlikely, but remotely possible - can be triggered by distal earthquake or proximal submarine landslide.	If water recedes suddenly or is unusually low, alert others, and proceed to higher ground.
Others ?	Alert Sabin (sabin.zahirovic@sydney.edu.au) to any other potential safety issues.	

Image: Blue-ringed Octopus (Animal Planet) - these live in/around rock pools, stay away from them!

Emergencies, incident reporting, and nearest hospitals

In any emergency, call 000 immediately.
After responding to any emergency, report any critical incidents through Campus Security on (02) 9351 3333. Any other incidents need to be reported via RiskWare (https://riskware.sydney.edu.au/) by USYD staff within 24 hours.

Wollongong Hospital (closer to field sites, with Emergency Dept)
Loftus Street
Wollongong
NSW 2500
Ph: (02) 4222 5000

Royal Prince Alfred Hospital (closer to workshop site, with Emergency Dept)
50 Missenden Rd
Camperdown NSW 2050
Ph: (02) 9515 6111

Note: Bulli District Hospital DOES NOT have an Emergency Department.

Food for the field trip

Our caterers will pack sandwiches/wraps, muffin, piece of fruit, large cookie, and an orange juice. They will cover the dietary requirements, but if you prefer an alternative, please bring along your own food.

CONFIRMED PARTICIPANT LIST

Mr	Adam	Abersteiner	University of Tasmania
Mr	Christopher	Alfonso	University of Sydney
Ms	Quinn	Anderson	University of Sydney
Mr	Michael	Anenburg	Australian National University
Mr	James	Bakis	The University of Sydney
Ms	Josephine	Balado	University of Sydney
Mr	Omer	Bodur	University of Sydney
Mr	John	Cannon	University of Sydney
Dr	Xianzhi	Cao	University of Sydney
Dr	Rebecca	Carey	University of Tasmania
Dr	Timothy	Chapman	University of New England
Dr	Chunfei	Chen	Macquarie University
Mr	Teng Jin	Chua	University of Sydney
Dr	Stuart	Clark	University of New South Wales
Mr	Cian	Clinton Gray	University of Sydney
Prof	Peter	Cowell	University of Sydney
A/Prof	Kelsie	Dadd	University of Sydney
Dr	Stuart	Daines	University of Exeter
Mr	Charles	Doggett	University of Sydney
Ms	Elizabeth	Dowding	University of New South Wales
Dr	Adriana	Dutkiewicz	University of Sydney
Prof	Stephen	Foley	Macquarie University
Dr	Michael	Forster	Macquarie University
Mr	Julian	Giordani	University of Melbourne
Dr	Christopher	Gonzalez	Monash University
Dr	Weronika	Gorczyk	University of Western Australia
Mrs	Stephanie	Greene	Macquarie University
Ms	Marin	Gudmundsdottir	University of Sydney
Dr	Derya	Gürer	University of Queensland
Mr	Youseph	Ibrahim	University of Sydney
Ms	Irene	Koutsoumbis	University of Sydney
Mr	Anthony	Lanati	Macquarie University
Prof	Ross	Large	University of Tasmania

Mr	Carlton	Li	University of Sydney
A/Prof	Chang	Liu	Tongji University
Dr	Stefan	Löhr	Macquarie University
Dr	Claire	Mallard	University of Sydney
Dr	Ben	Mather	University of Sydney
Dr	Nick	Matzke	University of Auckland
Dr	Sandra	McLaren	University of Melbourne
Ms	Mardi	McNeil	Queensland University of Technology
Dr	Sara	Moron	University of Sydney
Prof	Dietmar	Muller	University of Sydney
Ms	Anita	O'Connell	TAFE Digital
Dr	Bradley	Opdyke	Australian National University
Dr	Victorien	Paumard	University of Western Australia
Ms	Zsanett	Pintér	Macquarie University
Prof	Peter	Rayner	University of Melbourne
Prof	Peter	Roy	University of Sydney
Ms	Kelsey	Sanborn	University of Sydney
Dr	Agus	Santoso	University of New South Wales
Dr	Maria	Seton	University of Sydney
Prof	Steven	Sherwood	University of New South Wales
Dr	Patrick	Smith	Australian Museum
Dr	Chris	Spencer	Curtin University
Ms	Amanda	Thran	University of Sydney
Ms	Darlene	Trew Crist	Deep Carbon Observatory
Prof	Chris	Turney	University of New South Wales
Ms	Marina	Veter	Macquarie University
Ms	Prudence	Warner	Masters Student
A/Prof	Jody	Webster	University of Sydney
Dr	Moyra	Wilson	University of Western Australia
Dr	Nicky	Wright	Australian National University
A/Prof	Jimin	Yu	Australian National University
Dr	Sabin	Zahirovic	University of Sydney
Ms	Charmian	Zhang	University of Sydney
Ms	Kate	Zhuang	University of Sydney

PARTICIPANTS REQUIRING GROUP ACCOMMODATION

Please let Sabin know ASAP if your name should be on this list (there are a few rooms available!)

CONFIRMED FIELD TRIP PARTICIPANTS

About the Deep Carbon Observatory (DCO) https://deepcarbon.net/about/about-dco

Carbon plays an unparalleled role in our lives: as the element of life, as the basis of most of society's energy, as the backbone of most new materials, and as the central focus in efforts to understand Earth's variable and uncertain climate. Yet in spite of carbon's importance, scientists remain largely ignorant of the physical, chemical, and biological behavior of many of Earth's carbon-bearing systems. The Deep Carbon Observatory is a global research program to transform our understanding of carbon in Earth. At its heart, DCO is a community of scientists, from biologists to physicists, geoscientists to chemists, and many others whose work crosses these disciplinary lines, forging a new, integrative field of deep carbon science. To complement this groundbreaking research, the DCO's infrastructure includes public engagement and education, online and offline community support, innovative data management, and novel instrumentation.

In 2007, Robert Hazen, a Senior Staff Scientist at the Carnegie Institution's Geophysical Laboratory (Washington, DC, USA) gave a talk at the Century Club in New York. He spoke about the origins of life on Earth, and how geophysical reactions may have played a critical role in getting the biological ball rolling. Jesse Ausubel, a faculty member at Rockefeller University and Project Officer at the Alfred P. Sloan Foundation, was in the audience. Inspired, he sought out Hazen's book, *Genesis: The Scientific Quest for Life's Origins*. Three months later, he sent Hazen an email. After two years of careful planning, collaboration, and brainstorming, Hazen and colleagues officially launched DCO in August 2009, with its Secretariat based at the Carnegie Institution of Washington, DC, USA. Hazen and Ausubel, along with input from over 100 scientists invited to participate in the Deep Carbon Cycle Workshop in 2008, expanded their original idea. No longer were they focused solely on the origin of life on Earth. Instead, it had become clear that to further human understanding of Earth and our place here, carbon, that critical element, had to take center stage.

The DCO is a 10-year initiative to intensify global attention and scientific effort in the burgeoning field of deep carbon science. The Alfred P. Sloan Foundation pledged $50 million over the duration of the initiative to fund infrastructure development, scientific workshops, novel technology development, and preliminary research and fieldwork. This seed funding was awarded to catalyze collaborative scientific efforts around the world, increase public and private sector spending in deep carbon science, and leave a thriving community of international scientists as its legacy.

Deep Carbon Observatory Policy on Respect

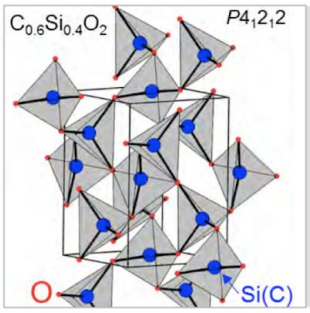
The Deep Carbon Observatory is a multidisciplinary organization comprising members with diverse professional backgrounds, genders, ages and ethnicities. It is expected that every DCO member will treat other members, staff, and everyone that they meet with courtesy, respect and professionalism at all times. DCO meetings and field excursions should be positive experiences for all. DCO does not tolerate unprofessional conduct, discrimination, intimidation or sexual harassment. Any incident that runs contrary to the DCO culture of collegiality and this Policy on Respect should be reported immediately to a member of the DCO leadership.

Deep Carbon Observatory Code of Conduct

DCO meetings and field excursions are community events intended for networking and collaboration as well as learning. We value the participation of every member of the community and want all participants to have an enjoyable and fulfilling experience. Accordingly, all participants are expected to show respect and courtesy to other participants throughout the event and in interactions online associated with the event. The event organizers are dedicated to providing a harassment-free experience for everyone, regardless of gender, gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, religion (or lack thereof), technology choices, or other group status. The DCO code of conduct draws on similar codes currently used by other scientific organizations and communities.

DEEP CARBON OBSERVATORY

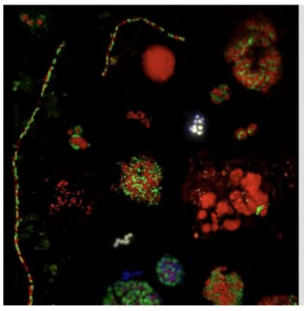
Science Communities



EXTREME PHYSICS AND CHEMISTRY

RESERVOIRS AND FLUXES

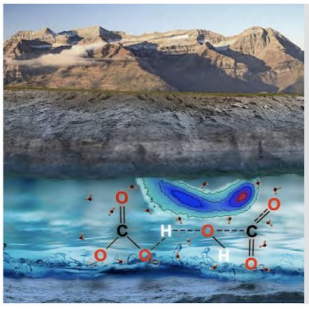
DEEP ENERGY



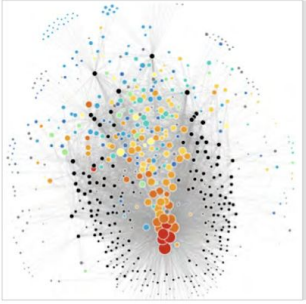
DEEP LIFE

Crosscutting Activities

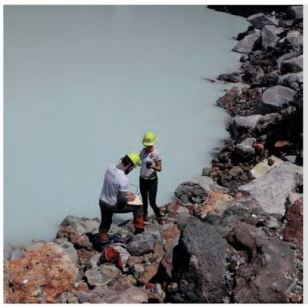
INSTRUMENTATION



MODELING AND VISUALIZATION



DATA SCIENCE



FIELD STUDIES

THE UNIVERSITY OF SYDNEY · EarthBYTE Building a Virtual Earth · ALFRED P. SLOAN FOUNDATION · DEEP CARBON OBSERVATORY

DEEP CARBON OBSERVATORY

Mission

The Deep Carbon Observatory is a ten-year research program to discover the quantities, movements, forms, and origins of Earth's deep carbon:

Quantities How much carbon is stored in Earth? Where is it stored?

Movements How does it move between and within reservoirs?

Forms What are the forms of carbon at depth, both organic and inorganic?

Origins What can deep carbon tell us about origins of life, Earth, and the Solar System?


Credit: Tobias Fischer

THE UNIVERSITY OF SYDNEY EarthBYTE Building a Virtual Earth ALFRED P. SLOAN FOUNDATION DEEP CARBON OBSERVATORY

NOTES

Madsen Building, School of Geosciences
University of Sydney