

WORKSHOPS & FIELD TRIPS

AESC 2014 FIELD TRIPS

All Field trips will begin and conclude at Newcastle City Hall unless otherwise noted.

PILBARA, WA FIELD SCHOOL 2014

Leader: Prof Martin J. Van Kranendonk, *University of NSW* **CANCELLED**

No. of Days: 8 days/7 nights

Departure: Saturday 28 June

Return: Saturday 5 July

Cost: \$3000 p/p

NB This tour departs from Perth

Inclusions: All accommodation (Sat 28/6 – Fri 4/7 incl.); transport *, all meals#, mapping equipment & notebooks.

(*Transfers to Perth to join this field trip and from Perth to Newcastle at its conclusion are not included. #Meals on travel days –Sat 28/6 and Sat 5/7 are not included).

Booking deadline: Friday 30 May 2014

The field school will examine the early Archean rocks of the Pilbara Craton of Western Australia, in the North Pole Dome and around the town of Marble Bar, where fossilised remnants of Earth's oldest convincing evidence of life are preserved in excellent exposures. The field school is designed to give participants the chance to observe these ancient fossils in their natural settings and to spend time mapping key exposures in order to gain experience in geological mapping techniques and an appreciation for the complexity of geological interpretation and habitat reconstruction in these very old rocks.

This field school is designed for both experienced geologists and novices alike: educators, administrators and others with an interest in early life on earth and the search for life on Mars are encouraged to attend.

Access to the sites will be by 4-wheel drive vehicles. Indoor accommodation will be provided near mapping sites, but participants will have the option to camp Aussie-style, under the stars.

Participants are advised to bring sun protection (hat, sunglasses, sunscreen) and wear appropriate clothing, including study rubber-soled hiking boots, leg gaiters (for spinifex) and either shorts or lightweight long pants. Temperatures can be warm to hot during the day (22-35°C/72-95°F) and cool to warm during the night (10-20°C/41-68°F). Although rain is not common at this time of year, a raincoat is advised. Participants should bring a camera.

GEOLOGY & MINERAL SYSTEMS OF THE NEW ENGLAND OROGEN **CANCELLED**

Leader: Dr Sol Buckman, *University of Wollongong*

Contributors: Dr Phil Blevin, *Geological Survey of NSW*

No. of Days: 4 days/3 nights

Departure: Thursday 3 July, 0730

Return: Sunday 6 July, 1700

Cost: \$750 p/p Twin Share; \$900 p/p Single*

Inclusions: Pick up from Newcastle City Hall; 3 nights' accommodation (Nundle, Armidale & Port Macquarie); all meals except dinners which will be paid individually and return to Newcastle in time for the Convention Ice Breaker. (NB: Twin share accommodation only, is available in Nundle).

Booking deadline: Friday 30 May 2014

The New England Orogen forms part of the Tasmanides in eastern Australia stretching from north of Newcastle to northern Queensland. Exposures in northern NSW present an opportunity to view and discuss different facets of the New England Orogen, including:

- Comparison of the Gamilaroi terrane (a Siluro-Devonian intra-oceanic island arc sequence) and the Kuttung Arc (Carboniferous-Permian Andean-style continental arc sequence).
- The nature of oroclines in the southern part of the orogen. The oroclines can be traced by the presence of serpentinite.
- I-, S- and A-type granites of the Late Carboniferous-Triassic New England Batholith.

The orogen has a rich mineral endowment with significant Sn, Au, Ag and Sb production, as well as production of other metals, industrial minerals and gemstones

HUNTER VALLEY COAL: FROM THE EXPLORATION SITE TO THE COAL SHIP

Leader: Ms Sarah Jardine, *Geological Survey, NSW*

No. of Days: 1 day

Departure: Saturday 5 July, 0800

Return: Saturday 5 July, 1700

Cost: \$110 p/p

Inclusions: Pick up from City Hall; all refreshments, return to CBD hotels

Booking deadline: Friday 30 May 2014

The Hunter Valley is the largest coal-producing region in NSW. It is rich in resources, hosting several large coal mines, an extensive transport network and one of the largest coal-exporting ports in the world.

This field trip follows the journey of mined coal through the Hunter Valley. The day starts at an exploration drill rig where Permian black coal resources of the northern Sydney Basin are discovered and analysed to determine their mining potential. The trip continues to an open-cut coal mine operation, where mine design, mining techniques, coal processing and handling will be observed.

Most coal is transported to a domestic or international market via a rail network. This network delivers the export product to large coal terminals at the port of Newcastle. The field trip continues on through the port's coal terminals, where the trains are unloaded, coal is stockpiled and ships are loaded.

The field trip is a must for those interested in the complex process of discovering, mining, transporting and exporting coal from the Hunter Valley

BLUE MOUNTAINS WORLD HERITAGE AREA/ JENOLAN GEOTOURISM **CANCELLED**

Leader: Mr Angus Robinson, *Chair, GSA Geotourism Sub Committee*

Contributors: Dr Ian Percival, *Chair, GSA NSW Division Geoheritage Sub Committee*; Mr John Pickett, *lead author of Layers of Time*

No. of Days: 2 days/1 night

Departure: Saturday 5 July, 0600 (Newcastle), 0800 (Sydney)

Return: Sunday 6 July, 1800

Cost: \$395 p/p Twin Share; \$495 Single

Inclusions: Two day excursion – coach departs Newcastle 6am for 8am pickup at Sydney Central Station; visit Mt Tomah (Blue Mountains World Heritage Centre); guided cave tour and surface walk at Jenolan Caves; overnight accommodation at historic Caves House including Yulefest dinner and breakfast; visit Govetts Leap, descent into Jamison Valley (and return ascent) on the recently modernised Scenic World Railway, and lunch on second day. (NB lunch on Day 1 at own expense). Return transport to Newcastle. Complimentary copies of *Layers of Time* (Blue Mountains geology field guide) and Earth Sciences History Group field notes.

Booking deadline: Friday 2 May 2014

The Greater Blue Mountains World Heritage Area is an accessible wilderness, covering more than one million hectares of rainforest, canyons, eucalypt forest and heath lands west of Sydney. It extends north to the Hunter Valley and includes various national parks (e.g. Blue Mountains and Kanangra-Boyd), as well as the Jenolan Karst Conservation Reserve. The Blue Mountains is a sandstone plateau of Triassic Age which shelters a rich diversity of fauna and flora, including a number of ancient plant species, the most famous of which is the Wollemi Pine. The area is also home to the world famous and

historic Jenolan Caves, eroded into Silurian limestone, and arguably Australia's first significant geotourism icon.

This two day excursion will showcase some of the most scenic and historic vistas in the Blue Mountains. We will visit the World Heritage Exhibition Centre in the Mt Tomah Botanic Gardens, and various geosites including the iconic sandstone landscape at Govetts Leap as well as the sandstone escarpment and underlying Permian coal measure exposures in Jamison Valley, accessed by the steepest passenger railway in the world. Staying overnight in the famous heritage accommodation at Caves House, the excursion at Jenolan Caves will include guided tours of selected caves and encounters with wildlife including the quite unique opportunity to experience platypus frolicking in the wild in Jenolan's Blue Lake. The Yulefest Dinner that evening will be enlivened by a presentation of the fascinating Earth Sciences History of the Greater Blue Mountains by a distinguished scientist. The excursion will conclude in Newcastle in time for delegates to attend the AESC Ice Breaker function.

NB. This excursion will involve negotiating numerous flights of stairs (generally with handrails) within the caves at Jenolan. Some short bush walks are also included. Participants should be reasonably fit and mobile to fully enjoy the experience.

GEOLOGY OF THE GLOUCESTER BASIN

Leader: Ms Sarah Jardine, *Geological Survey of NSW*

No of Days: 1 day

Departure: Sunday 6 July, 0800

Return: Sunday 6 July, 1700

Cost: \$165 p/p

Inclusions: Pick up from City Hall; all refreshments, return to CBD hotels

Booking deadline: Friday 30 May 2014

The fault-bounded Gloucester Basin contains coal-bearing Permian sedimentary and volcanic units resting unconformably on Carboniferous strata of the New England Orogen. The basin's Permian sequence contains up to 50 coal seams which were deposited in an actively subsiding graben. The area hosts two operating coal mines, a developing petroleum industry and various agricultural enterprises.

This one day field trip will provide an overview of the geology of the region. Companies face challenges in extracting coal from seams that outcrop along the eastern margin of the basin, where the strata are folded and dip steeply. Towards the centre of the basin, the seams are flatter but deeper and the petroleum industry is developing projects to extract gas associated with the coal seams. Farming in the area has a long, successful history as a result of the soil and water resources associated with the local geology.

A coal mine, a coal seam gas field development and dairy farm will be visited allowing attendees to gain an understanding of how each industry operates and co-exists with others in the basin.

GEOLOGY AND WINES OF THE LOWER HUNTER VALLEY

Leaders: Mr Phil Gilmore, *Geological Survey of NSW*; Dr John Greenfield, *Geological Survey of NSW*

Contributors: Mr John Davis, *Tallavera Grove Vineyard*

No. of Days: 1 day

Departure: Sunday 6 July, 0800

Return: Sunday 6 July, 1700

Cost: \$120 p/p

Inclusions: Pick up from City Hall; all refreshments including a vineyard lunch; return to CBD hotels. Does not include wine with lunch.

Booking deadline: Friday 30th May 2014

The vineyards of the Hunter Valley are famous for their Semillon and Shiraz. This field trip provides a chance to sample local wines at the cellar door and examine the geology of the Mount View and Pokolbin area in the local Hunter Valley.

Geology stops will examine Late Carboniferous volcanism of the New England Orogen (Mount View inlier) and Early Permian sedimentary sequences (Sydney Basin).

The role of underlying geology and soil formation in viticulture will be examined, particularly their importance in the development of suitable soil profiles for growing Hunter Valley Shiraz.

Lunch will be provided in the vineyards, and of course there will be an opportunity to sample and purchase fantastic Hunter Valley wines.

GEOLOGY, SURF AND SCENERY OF NEWCASTLE: A SUNRISE COASTAL WALK

Leader: Mr Phil Gilmore, *Geological Survey of NSW*

No. of Days: 2½ hours

Departure: Wednesday 9 July, 0600

Return: Wednesday 9 July, 0830

Cost: \$40 p/p

Inclusions: 0600 bus pick up at CBD hotels for transfer to Nobby's. Coffee at Merewether Surf House before return transfer to hotels by 0900

Booking deadline: Friday 30 May 2014

A 6km sunrise walk along the Bathers Way from Nobby's to Merewether to enjoy the spectacular coastline, examine the local geology of the Late Permian Newcastle Coal Measures, discuss the European settlement and development of Newcastle and spot some whales! A good level of fitness is required for this tour.

GEOLOGICAL HISTORY OF THE LOWER HUNTER VALLEY

Leaders: Mr Phil Gilmore, *Geological Survey of NSW*; Dr John Greenfield, *Geological Survey of NSW*

No. of Days: 1 day

Departure: Friday 11 July, 0800

Return: Friday 11 July, 1700

Cost: \$95 p/p

Inclusions: Pick up from City Hall; all refreshments; return to CBD hotels

Booking deadline: Friday 30th May 2014

This one-day trip provides an overview of the geology of the Newcastle area from Port Stephens to the north, the coalfields to the west, Lake Macquarie to the south and coastal sections along the Tasman Sea. The role of mapping by Edgeworth David and others leading to the rich mining culture in the region will also be discussed.

Four main aspects of the local geology will be examined at field stops:

- Late Carboniferous sequences including volcanism of the New England Orogen in the Port Stephens area, and varved shales related to glacial activity in the Seaham area;
- Fossiliferous shallow marine sedimentary rocks of the Early Permian Branxton Formation;
- Sedimentary sequences of the Late Permian Newcastle Coal Measures, including *Glossopteris* and other plant fossils;
- Quaternary geology of the Hunter Valley, including formation of the barrier systems of Stockton Bight and the impacts of past climate change in the area's geomorphology.

INDIGENOUS SITES OF THE HUNTER VALLEY

Leader: Dr Anita Andrew, *Environmental Isotopes Pty Ltd*

Contributor: Ngurra Bu Cultural tours

No. of Days: 1 day

Departure: Friday 11 July, 0800

Return: Friday 11 July, 1800

Cost: \$160 p/p

Inclusions: All transport, morning & afternoon tea and lunch.

Booking deadline: Friday 30th May 2014

Join experienced Ngurra Bu Aboriginal guides as they share with you their knowledge of the culturally significant sites of Hunter Wine Country & the diverse uses of the

surrounding bushland. The Wollombi and Broke Valleys in the Hunter Valley are home to numerous Ceremony and Lore sites. This tour follows the traditional ceremonial journey to share the stories including why Mt Yengo is as significant to NSW Aboriginal people as Uluru is to the Central Desert people. Your tour includes a visit to the Biame cave at Milbrodale where Biame is depicted in red ochre in a cave painting, as a large figure with long outspread arms protectively embracing the tribal territory and the people of the valley. You will also have the opportunity to learn about rock carvings that are over 12,000 years old, bush food and medicines of the local area, artwork caves and how to connect to the spirit that is within us all.

GEODIVERSITY, GEOHERITAGE AND GEOTOURISM OF THE PORT MACQUARIE – LAURIETON- KEMPSEY- SOUTH WEST ROCKS, MID NORTH COAST OF NSW

Leaders: Dr Ian Percival, *Geological Survey of NSW*; Dr David Och, *Parsons Brinkerhoff*

No. of Days: 2 days/1 night **CANCELLED**

Departure: Friday 11 July, 0730

Return: Saturday 12 July, 1700

Cost: \$300 p/p Twin share, \$350 p/p Single

Inclusions: Pick up from Newcastle City Hall; 1 night accommodation in Port Macquarie; all meals except dinner which will be paid individually; entrance to Aarakoon Gaol; Return transport to Newcastle with drop off at Newcastle Airport and Newcastle CBD.

Booking deadline: Friday 30th May 2014

The Mid North Coast region of NSW, centred on Port Macquarie and extending north as far as South West Rocks (85 km by road), south to the Laurieton area (40 km by road), and occupying a relatively narrow coastal strip encompassing the inland towns of Kempsey and Wauchope, is exceptionally diverse in terms of its underlying rock types and overlying soil and sediment cover. Ages of the rocks we will see ranges from Ordovician (around 460 Ma) to Devonian, Permian, Triassic and Holocene. Geomorphological features of the region resulting from emplacement and erosion of these rocks are equally varied, and serve as the basis for the great variety of plant communities that are present, which in turn support a complex mosaic of native animal habitats. This excursion, conducted over two days, will sample some of the representative exposures of the region's geodiversity; one of these outcrops has significant

geological heritage value, and this and other sites have potential for inclusion in a regional geotourism strategy. Most of the excursion stops are beach outcrops or coastal headlands, and the area is very scenic. A visit to the only coastal exposure of blueschist-lawsonite-eclogite facies rocks in eastern Australia at Port Macquarie will be a highlight. A moderate level of fitness is required, involving walking over rocky outcrops and descending/ascending flights of stairs to access the beach

GEOLOGY & MINERAL SYSTEMS OF THE LACHLAN OROGEN **CANCELLED**

Leader: Prof Bill Collins, *The University of Newcastle*

Contributors: Dr Joel Fitzherbert, *Geological Survey of NSW*; Dr. Gary Colquhoun, *Geological Survey of NSW*

No. of Days: 5 days/4 nights

Departure: Friday 11 July, 0730

Return: Tuesday 15 July, 1800

Cost: \$1250 p/p Twin share, \$1500 p/p Single

Inclusions: All transport to/from Newcastle; 4 nights' accommodation (Orange x 2 nights, Cooma & Narooma); all meals except 1 dinner which will be paid individually. Return transport to Newcastle with drop off at Sydney Airport en route.

Booking deadline: Friday 30 May 2014

The enigmatic Lachlan Orogen forms part of the Tasmanides in eastern Australia. Exposures in central and southern NSW present an opportunity to view and discuss different facets of the Lachlan Orogen, including:

- Litho-stratigraphic relationships in the Lachlan Orogen.
- Intra-oceanic arc rocks of the Ordovician to Early Silurian Macquarie Arc, and the world class porphyry Cu-Au deposits (e.g. Cadia) hosted by the arc.
- Characteristics, petrology and tectonic setting of Silurian and Devonian I- and S-type granite.
- The Cooma metamorphic complex – a high temperature / low pressure metamorphic complex.
- Late Silurian to Early Devonian rift basins, including the Goulburn Basin, that hosts significant VMS mineralisation (e.g. Woodlawn, Captains Flat) and the Hill End Trough, that hosts the orogenic Au deposits at Hill End.

Spectacularly folded Ordovician deep marine sedimentary rocks at Narooma.