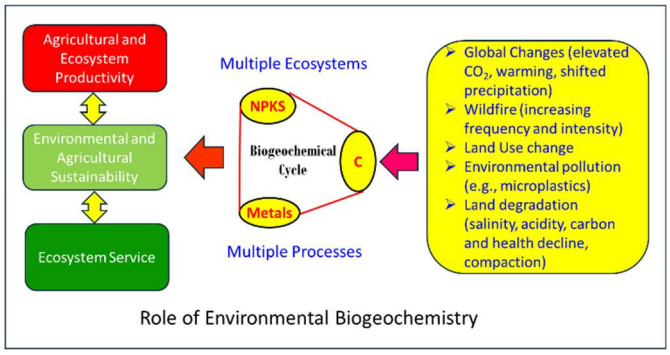
Program for the 4th Australia-China Environmental Biogeochemistry Forum (4th ACEBF)

Background

Environmental biogeochemistry focuses on the research of interactive biogeochemical cycles of elements and compounds and transformational processes within the Earth Systems. Environmental biogeochemistry plays a critical role in enhancing agricultural and ecosystem productivity, ecosystem service and environmental sustainability across terrestrial and aquatic ecosystems. Environmental biogeochemistry contributes to providing sustainable solutions to ensure food security and to manage the current global environmental crises (climate change, pollution, biodiversity loss) and human food production.



Role of Environmental Biogeochemistry

Both Australia and China are facing similar environmental challenges, including bushfires, frequent droughts and floods, land degradation, soil and water pollution, and disposal of increasing volume of wastes. The Australia-China Environmental Biogeochemistry Forum (ACEBF) provides a platform for facilitating transdisciplinary research and scientific exchange and enhancing research collaborations among the early- and mid-career Environmental Biogeochemistry scientists from Australia and China.

The 4th ACEBF

The 4th ACEBF will be held at **Griffith University, Nathan, Brisbane, Australia on 14-15 December 2025**. This forum will emphasis and capture the latest advances in 1) the conceptual framework of environmental biogeochemistry; 2) key biogeochemical processes across terrestrial and aquatic systems, 3) the dynamic links between diverse ecosystems under the environmental changes at different time and spatial scales, and 4) the fundamental role of environmental biogeochemistry in ecosystem productivity, service and sustainability. About 30 scientists from China and Australia will be invited to participate in this forum.

Organiser and contact persons

Australia

- Prof Chengrong Chen, School of Environment and Science, Griffith University, Brisbane, Queensland, Australia

  Email: c.chen@griffith.edu.au;

  Mobile: +61- 422377367

- Dr Yunying Fang, School of Environment and Science, Griffith University, Brisbane, Queensland, Australia

  Email: yunying.fang@griffith.edu.au. Mobile: +61 -433655665

- Dr Xiangyu Liu, School of Environment and Science, Griffith University, Brisbane, Queensland, Australia

  Email: xiangyu.liu@griffith.edu.au. Mobile: +61-451830713

China

- Prof Qiaoyun Huang, Faculty of Resources and Environment, Huazhong Agricultural University, Wuhan 430070, China

  Email: qyhuang@mail.hzau.edu.cn

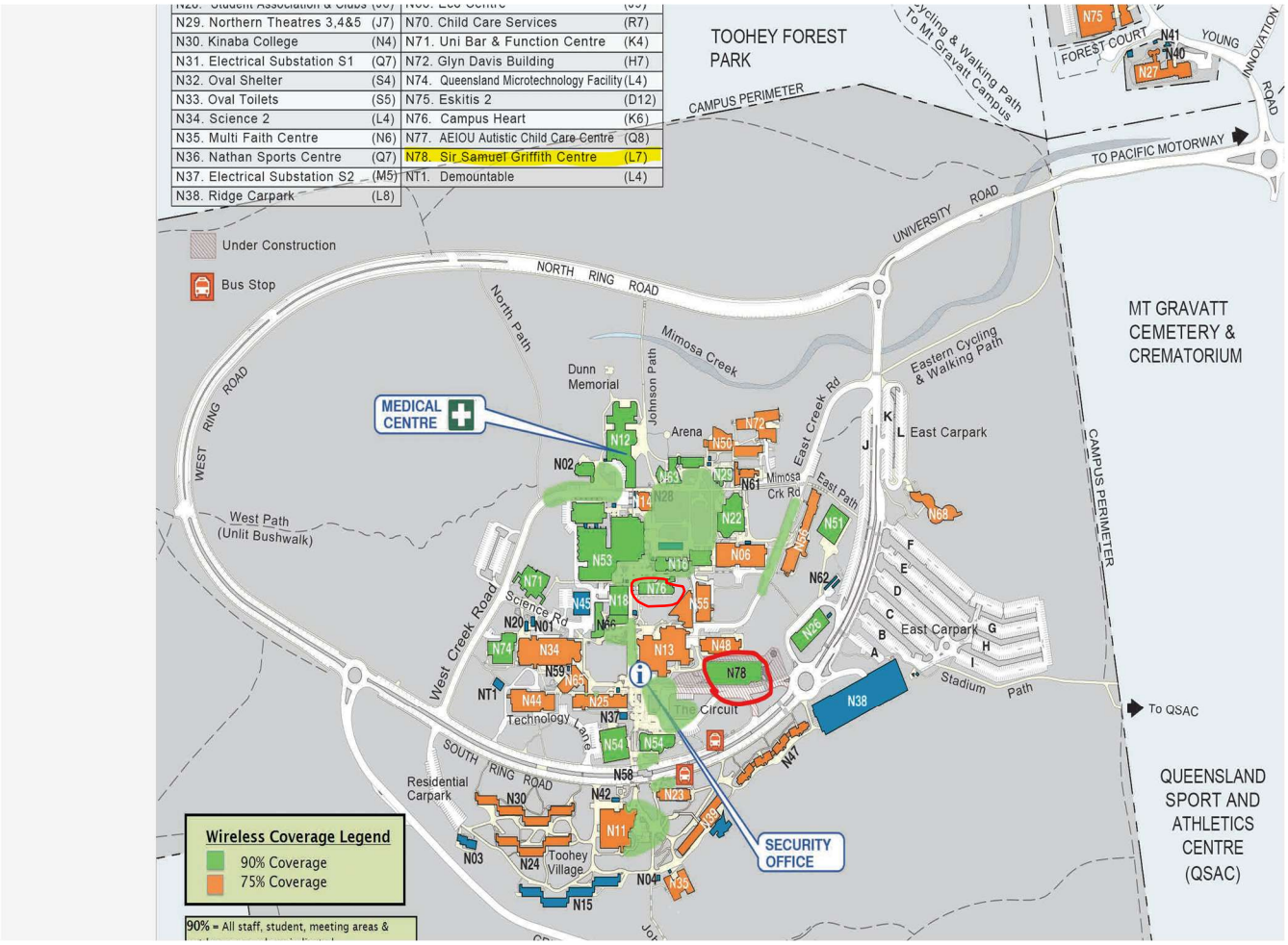
  Phone: +86-27-13871070292

- Prof. Peng Cai, Faculty of Resources and Environment, Huazhong Agricultural University, Wuhan 430070, China

  Email: cp@mail.hzau.edu.cn

  Phone: +86-13545219828

N78, 1.19 (Day 2), N76 1.05 (Day 1)



Local PhD and Postdoc Forum Organising Committee:

- Dr Xiangyu Liu
- Ms Wajiha Sarfraz
- Shayne Reano
- Mehedee Hasan
- Steve (Detian) Li

Program (Day 1, 14 Dec 2025) – PhD student and Postdoc Presentations

14 Dec 2025 (Sunday) - PhD and Postdoctoral Fellows' presentation

Time: 8:45am-5:00pm

Venue: N76, 1.05 (Above Café Rossa), Nathan Campus, Griffith University

- **Time of Presentation: 10 min talk plus 5 min Q & A**
- **20 PhD Student ; 4 Postdoctoral Fello**

8:45-9:30am Arrival & Morning Tea

Section 1 Chair: Ms Shayne Reano (Griffith University)

9:30-9:40 am	**Dr Yunying Fang (Griffith)- Welcome Message & house keeping**
9:40-9:55am	Nondestructive quantification of soil mineral associated organic carbon (MAOC) species and their distribution at global scale (**Daxin Gao**, Huazhong Agricultural University (HAU))
9:55-10:10 am	Quantification and Characterization of Labile and Stable Carbon in Organic Amendments **(Thilakshi Paranavithana,** Griffith**)**
10:10-10:25 am	Phyllosilicates as the primary loci for the sequestration of microbial necromass carbon in soils **(Jiaxin Zhao, HAU)**
10:25-10:40 am	Predicting Soil Properties Using Hyperspectral Imaging and Advanced Machine Learning (**Dr Suhad Al-Khafaji,** Griffith University)
10:40-10:55am	Regulation of carbon use efficiency by mineral-microbial interactions (**Qiuzhu Zheng,** HAU)
10:55-11:10am	Exploring the Predictors of Soil pH Buffering Capacity in Agricultural Systems: Field Surveys and Literature Review **(Kamrun Nahar,** Griffith)

Section 2 Chair: (Daxin Gao, HAU)

11:15-11:30am	Quantification of Microplastics in Plastic-Mulched Soils Using μ- FTIR and Py-GC-MS **(Mehedee Hasan**)
11:30-11:45am	Agricultural land use and mineral types control the formation of mineral-associated organic carbon in croplands **(Xinglei Su,** HAU)
11:45-12:00noon	Texture-Dependent Bioplastics Decomposition and Microbial C-N Cycling in Agricultural Soils **(Wajiha Sarfraz,** Griffith)
12:00-12:15pm	Microbial Extracellular Carbon Capture: A Soil Carbon Storage Pathway Beyond Cellular Residues **(Peipei Qian, HAU)**
12:15-12:30pm	Tracing Microplastics in Australian Agricultural soils **(Nayab Naeem,** Griffith)
12:30-12:45pm	Global dominant viruses and their potential roles in biogeochemical cycling (**Dr Li Bi,** Uni Melbourne)

12:45-1:30pm Lunch and Networking

Section 3 Chair: Mr Mehedee Hasan (Griffith)

1:30pm-1:50 Industry oriented research **(Invited Speaker, Prof Longbin Huang,** the University of Queensland)

1:50-2:05pm Investigating microbial intracellular and extracellular carbon synthesis efficiency using isotope 13C and 18O techniques **(Jingyi Ren, HAU)**

2:05-2:20pm Assessing Waterlogging Stress Responses in Rubber (Hevea brasiliensis) Using Sap Flow Sensor Technologies **(Shayne Reano,** Griffith)

2:20-2:35pm Modeling the Turnover and Stabilization of Soil Extracellular Polymeric Substances (EPS) **(Xiaoyu Cheng, HAU)**

2:35-2:50pm Electrochemically synthesized graphene oxide-sodium alginate (EGO-SA) aerogel as a carrier for *Bradyrhizobium japonicum* **(Sumbul Saeel,** Griffith)

Section 4 Chair: (Jingyu Ren, HAU)

2:50-3:05pm Chemical Features of Plant Root Exudates Shape the Rhizosphere Microbiome **(Jiale Li, HAU)**

3:05-3:20pm Glasshouse and Field Evaluation of Organic-Based Nitrogen Fertiliser for Crop Production & Soil Health **(Dr Zhenzhen Yan,** Griffith**)**

3:20-3:35pm Ecosystem-Specific Functional Differentiation of Cyanobacterial Carbon and Nitrogen Metabolism Revealed by Metagenomics **(Qingrun Xue, HAU)**

3:35-3:50pm Digital Soil Mapping with covariation (**Richi Lador**, Griffith)

3:50-4:05pm Greenhouse and field evaluation of innovative microbial carrier products **(Dr Rahat Shabir,** Griffith)

4:05-4:20pm Warming effects on post-fire soil respiration: Evidence from field and incubation experiments (**Detian Li,** Griffith)

4:20-4:35pm Understanding the role of roots in ecosystem responses to fire regime **(Tolulope Borisade,** Griffith)

4:35-5:00pm Early Career Researcher Award (ALSOL Award 2025) (Chairs: Prof Qiaoyun Huang, Prof Chengrong Chen)

Day 2 (15 Dec 2025) Keynote Speaker Presentations

15 Dec 2025 (Monday) – keynote presentations (**20 mins talk, plus 5 min Q & A**)

Time: 8:30 am-4:30pm

Venue: N78, 1.19, Nathan Camous, Griffith University

8:30-9:00am Arrival & Morning Tea

Section 1 Chair: Prof Chengrong Chen

9:00-9:10 am	Welcome opening address **(Prof David Hamilton**, Director, Australian Rivers Institute):
9:10-9:35am	Key research at Soil CRC and Australian National Soil Strategy **(Dr Michael Crawford** (CEO, Soil CRC).
9:35-10:00am	Organo–organic interactions dominantly drive soil organic carbon accrual **(Prof Qiaoyun Huang**, Huazhong Agricultural University (HAU))
10:00-10:25 am	Nutrient cycling and green house gas emissions under future climates in Australia's natural and managed ecosystems (**Associate Prof Catriona Macdonald**, Western Sydney University)
10:25-10:45 am	Managing subsoil constraints in sugarcane for environmental sustainability **(Dr Mehran Rezaei Rashti**, Griffith)

10:45-11:10 am Morning Tea

Section 2 Chair: Prof Qiaoyun Huang

11:10-11:35am	Formation and Spatiotemporal Distribution of Soil Biofilms at the Microscale **(Prof Peng Cai,** HAU**)**
11:35-12:00pm	Potential roles of soil virus in sulfur metabolism in acid sulfate soils **(Associate Prof Hangwei Hu**, The University of Melbourne)
12:00-12:25pm	On-Farm Practices Influence Microplastic Pathways and Risks in Soils: A Global Synthesis **(Prof Megh Mallavarapu**, The University of Newcastle)
12:25-12:45pm	Biochar-blended phosphorus fertilizers affect inorganic and organic carbon dynamics in a calcareous subsoil (**Dr Yunying Fang**, Griffith)
12:50-1:10pm	Fire reshapes soil bacteria and fungi through coupled shifts in pH, nutrients and moisture: a global meta-analysis (**Dr Xiangyu Liu,** Griffith)

1:10-1:40pm Lunch and Networking

Section 3 Chair: Prof Megh Mallavarapu

1:40-2:05pm	Fire as a key driver of ecosystem biogeochemical cycles **(Distinguished Prof Chengrong Chen**, Griffith University)
2:05-2:30pm	Microbial community for nitrogen cycling (**Prof Jianhua Guo**, the University of Queensland)
2:30-2:50pm	Nutritional physiology of soil microorganisms in low fertility soils **(Dr Orpheus Butler,** Griffith**)**
2:50-3:10pm	Random Fractional Calculus Models for Biophysical and Biogeochemical Processes (**Prof Ninghu Su,** James Cook University)
3:10-3:30pm	Phytoremediation of As-contaminated soils **(Distinguished Professor Andy Ball**, RMIT, Online)

3:30-5:00pm Afternoon Tea & Drink – Christmas Celebration