

# ENDPOINT Newsletter

**A publication of the Australasian chapter of the  
Society of Environmental Toxicology and Chemistry**

**Volume 27 Number 1  
May 2020**

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# Message from the Editor

**Darren Koppel** ([darren.koppel@uts.edu.au](mailto:darren.koppel@uts.edu.au))  
**Communications Officer**

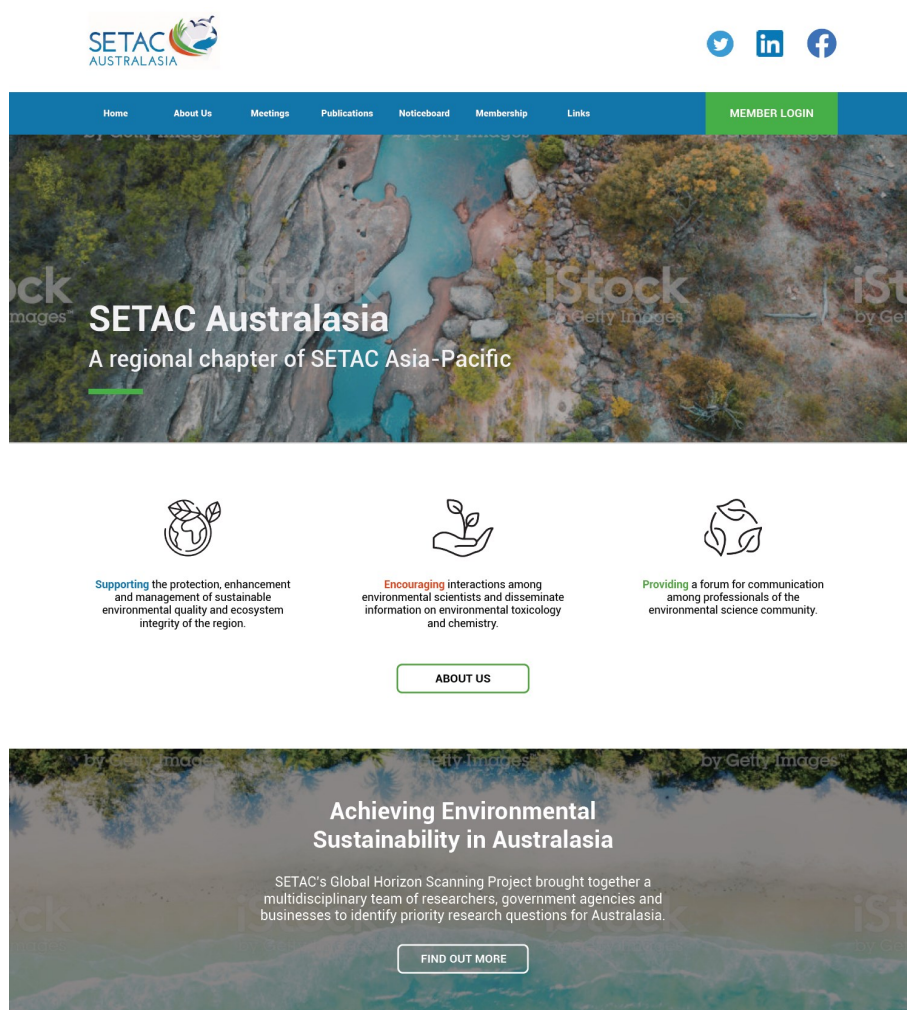


Welcome to the latest edition of Endpoint. I hope that, despite the uncertainty and hardship many are experiencing, you are staying well, taking care, and keeping connected.

Our digital home is getting a fresh coat of paint. I'm excited to report that we've commenced the SETAC AU has started the redevelopment of the SETAC AU website! We've engaged a web designer to help create a purpose-built website with our members in mind. The new website will include the existing functionality of our current website and include new features for members. We're hoping to release it towards the end of the year so keep an eye out!

We've been using our LinkedIn, Facebook, and Twitter accounts to share our members' successes and new opportunities. Make sure you follow us and the rest of the SETAC community. Social media can serve two purposes: keeping connected beyond our offices and broadcasting our work beyond reports and journal articles. Maximising your followers is key so if you're new on twitter send [@SETAC\\_AU](https://twitter.com/SETAC_AU) a direct message and we'll give you a shoutout / follow.

In these strange times maintaining community and connections are more important than ever. So grab a warm beverage, kick back and catch up with what's happening around Australasia.



A sneak peak of the concept design for our website's new homepage



# From the President



Welcome to the “lockdown” edition of 2020, which I profoundly hope will be the only one! It has been an insane start to 2020 and the COVID-19 pandemic has been a challenge for all of us to varying degrees and in different ways. I’ve been saddened to hear from friends and colleagues who have lost their work and experiments almost overnight and I hope that they will be back in the lab, field and/or office very soon. I have been extremely busy (at home) keeping different boats afloat whilst still progressing my day job. For SETAC, the Councils and Boards here and abroad have all been thinking of ways to help members and ways to keep our mission moving forward.

Like everyone else, our chapter and the broader SETAC community has been significantly impacted by the global lockdown, especially due to the restrictions that eliminated our ability to travel and meet. We have postponed many local and international events including the ANZG Water Quality Guidelines Workshop in Perth and the World Congress in Singapore. I’d like to thank all the members for their patience and understanding in regards to the announcements of these postponements. We are happy that we’ve come out the other end with good agreements with sponsors and venues and we can now look forward to finding new dates for the future of all our events. I’m pleased to announce that plans are now underway for the next SETAC AU conference, which will be a joint conference with the What’s In Our Water Symposium Series, to be held at RMIT University (Melbourne) in September 2021. More details can [be found here](#).

In amongst the pain of the global lockdown, I hope you have managed to find new opportunities that have emerged due to our rapidly evolving work-life. As I write this, the SETAC-EU virtual meeting *SciCon* is in progress and I’m enjoying the opportunity to participate myself. At the start of this year, I never dreamed that I would be a part of this year’s SETAC-EU meeting and now we all have a chance to view some of the best research in our field from the other side of the world. Access to the *SciCon* content will be enabled for a month, which gives everyone a chance to register very late (early-bird rates still apply!) and much more time to explore the depth of the content. It is also a whole lot cheaper than having to travel to Ireland! More information about *SciCon* can be found [here](#).

The SETAC-AU council has been concerned about the student members in our society, who have limited time to complete their experiments and communicate their work. We hope that you are finding support where you need it and the council is also developing ways that we can help. We know that getting out, meeting people and presenting your work is important at all stages of your candidature. Therefore, the council were happy to help Brad Clarke progress his idea of a virtual lecture series *EnviSMART*: <https://alec.science.unimelb.edu.au/sample-page/envismart/>. These events are a fantastic initiative to keep communicating our science during the lockdown and it will offer opportunities for students to present their work. A number of student invitations will receive an honorarium, so check out the website for details on submitting a student abstract and also see the great line-up of speakers. Thanks to Brad and Kath Hassell for assisting with the organising committee and all the speakers, sponsors and supporters, including Agilent, Eurofins, RACI, ACLCA and WaterRA.

Finally, I was excited to get a first glimpse of the new SETAC-AU website recently. Darren Koppel has been busily working on the design with our service provider and it is going to look spectacular! More importantly, we will use it as a better tool to communicate with the members and it will be loaded with even more valuable content, including the Australasian Ecotox database, much of the society’s historical work and a portal for the Environmental Contaminants Information Network. Look out for our launch in the near future and if you haven’t already, please give SETAC-AU a follow in [Facebook](#), [Twitter](#) and [LinkedIn](#). We are actively feeding relevant news through these platforms and it is the best way to hear from us.

I hope to see you all soon on the other side of the lockdown.

Stay safe and help stop the spread.

# Regional Report | New Zealand

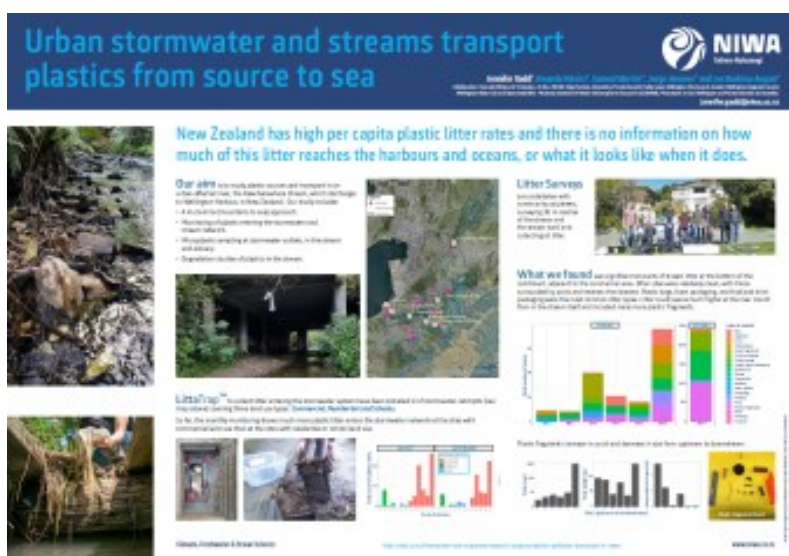
**Karen Thompson** ([Karen.Thompson@niwa.co.nz](mailto:Karen.Thompson@niwa.co.nz))

**New Zealand Regional Representative**



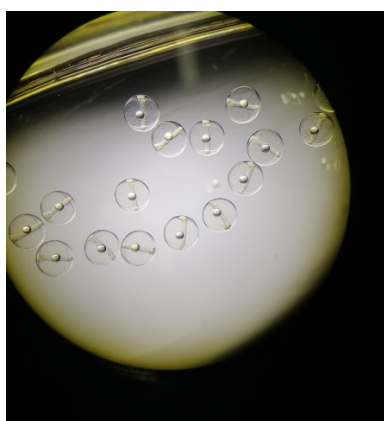
NIWA's Auckland-based Urban Aquatic Environments team are getting into a second year of stormwater quality sampling in Auckland, on behalf of the local council. Three sites within stormwater drains in the Whau Estuary catchment, Auckland, are up and running and nearly ready for sampling (once we are allowed out to do field work). These sites are part of Auckland Council's Whau catchment contaminant project, a multi-year project run by the Healthy Waters department. This year the focus is on commercial stormwater including carparks, and one site is in place at the shopping centre carpark. At each site we have installed a small weir and water level instrument, a water quality sonde to continuously measure physico-chemical variables, and an ISCO water sampler for storm event monitoring of a wide range of contaminants.

**Jenni Gadd** attended her first SETAC-North America conference last November, located in Toronto, Canada. She presented a poster describing some preliminary findings from the research project "Urban Rivers as Transporters and Transformers of Plastic Pollution - Te Wairere o Te Paratiki". The conference was full of people studying microplastics, with a workshop, special sessions, interest group meetings and social meetups.



Left: Poster presented by Jenni Gadd at SETAC-North America, November 2019. Right: Stormwater monitoring station

**Karen Thompson** and NIWA's Ecotoxicology team have been working on establishing acute (96-hour juvenile fish survival) and chronic (7-day egg to larva development and survival) toxicity testing protocols for yellow tail kingfish, *Seriola lalandi* and determining their sensitivity to two reference toxicants, zinc and SDS. Experiments were undertaken at NIWA's aquaculture facility in Ruakaka, where kingfish eggs and fish are easy to come by and the staff tearoom's not bad either!



Left: kingfish eggs under microscope. Center: larval kingfish. Right: Karen enjoying NIWA Ruakaka 'tearoom'



# Regional Reports | New South Wales

**Lisa Golding** ([lisa.golding@csiro.au](mailto:lisa.golding@csiro.au)),  
**New South Wales Regional Representative**



SETAC-AU emeritus member **David Leece** has received the honour of being appointed as a Member in the General Division of the Order of Australia (AM) in the 2020 Australia Day Honours List for “significant service to the environment and defence and security studies”. This award was in part an acknowledgement of his role in the establishment of the discipline of ecotoxicology in Australasia in the 1980s. In 1984 Professor Margaret Burchett of UTS and Dr David Leece of SPCC were instrumental in establishing the Centre for Ecotoxicology (CET; then called Centre for Environmental Toxicology) as a joint venture between the UTS (then NSW Institute of Technology) and the, then, State Pollution Control Commission (SPCC; later NSW EPA) (Chapman, 2019: [http://australasia.setac.org/wp-content/uploads/ASE-Vol16\\_No3-Final.pdf](http://australasia.setac.org/wp-content/uploads/ASE-Vol16_No3-Final.pdf)). The annual CET seminars were the forerunners for the ASE and now SETAC-AU conferences that we all enjoy! We have a lot to thank David Leece and the pioneers of ecotoxicology in Australasia for and we hope we can continue to build on their legacy within SETAC-AU.



**Dr David Leece (AM)** SETAC-AU emeritus member

## **ANSTO Aquatic Ecosystems Research (Tom Cresswell; [Tom.Cresswell@ansto.gov.au](mailto:Tom.Cresswell@ansto.gov.au))**

The last quarter has been busy in the group with the continuation of research into the potential impacts of pipeline scale from petroleum assets. We are developing a framework for assessing pipeline scale and pigging dust including a full radiological and inorganic characterisation, seawater and dilute acid leach tests and mercury speciation analysis using cold vapour atomic fluorescence spectroscopy (CV-AFS; CSIRO Land and Water) and X-ray absorption spectroscopy (XAS; Australian Synchrotron). Dietary tests have also been developed to determine the dietary bioavailability of contaminants associated with pipeline scale to benthic marine fauna.

The last 3 months has also seen the start of two new PhD students; **Danielle Hill**, who will be working with **Dr. Chantal Lanctôt** and **Dr. Will Bennett** (Griffith University) and **Dr. Tom Cresswell** (ANSTO) on understanding the impacts of metamorphosis on metal and radionuclide bioaccumulation by aquatic insects and amphibians; and **Amy Macintosh**, who will be working with **Dr. Katie Dafforn** and **Dr. Anthony Chariton** (Macquarie University), **Dr. Beth Penrose** (University of Tasmania) and **Dr. Tom Cresswell** (ANSTO) on assessing the impacts of naturally-occurring radioactive material (NORM) scale from offshore petroleum pipelines on marine organisms supported by industry. Amy is a recipient of the inaugural [ANSTO Industry Foundations Scholarships](#) supported by the NSW Government for graduate students working on industry-focused translational research projects.

PhD student **Sarah McDonald**, working with **Dr. Kath Hassell** (RMIT University), **Dr. Mick Keough** (University of Melbourne) and **Dr. Tom Cresswell** (ANSTO), will be undertaking extensive sampling during stormwater events around urban Melbourne in order to better understand the labile, dissolved and particulate metal loadings before, during and after stormwater events. Sarah will use analytical capabilities at ANSTO, La Trobe University and potentially at Griffith University to analyse an array of field samples. Sarah has had to put her field sampling on hold due to the COVID-19 situation but is hoping to collect samples at the end of the year. In the interim, Sarah will be writing up current data from her PhD and a paper on the benefits of the use of live-animal radiotracer techniques in aquatic ecotoxicology, with a special focus on animal care and ethics.

Seafood provenance research continues to gain increased momentum at ANSTO under the research leadership of Dr. Debashish Mazumder, with national and international industry groups and agencies submitting samples for analysis and interpretation by the research team. More information about ANSTO's food provenance research can be found [here](#).

## **CSIRO Land and Water, Lucas Heights, Aquatic Contaminants Group (Jenny Stauber; [jenny.stauber@csiro.au](mailto:jenny.stauber@csiro.au))**

Much of March has been devoted to COVID-19 preparedness at our CSIRO site at Lucas Heights, particularly for **Merrin Adams** organising a roster of staff to keep our cultures alive during our site shutdown. Little did **Jenny Stauber** know that a field trip to coal mines (underground and open cut) in the Hunter Valley in early March with the

## Regional Reports | New South Wales

Independent Expert Scientific Committee on CSG and Large Coal Mining Developments, would be the last travel she undertook for many months. This followed a week in Brisbane for Jenny at a nutrient workshop organised by the Gladstone Healthy Harbour Partnership and her regular Independent Science Panel meetings for Reef Water Quality. February water temperatures on the reef were the highest on record, and reef bleaching this year has been particularly bad across vast areas of the reef, especially the southern sections.

Our planned project to investigate the chronic effects of manganese on adult corals at AIMS SeaSIM in Townsville in April/May has had to be postponed due to travel restrictions. This is a joint project led by **Lisa Golding** and **Mandy Reichelt-Brushett** (SCU), and involving most of our ecotox team at Lucas Heights.

A new project has commenced (albeit slowly) in New Caledonia (funded by NiPERA Inc) to test the applicability of bioavailability models for predicting nickel toxicity in ultramafic waters. This project, co-led by Jenny, is part of a larger project involving the University of New Caledonia, Bioeko Consulting, Centre National de Recherche Technologique Nickel et son environnement, the University of Bordeaux, the French National Scientific Research Centre and wca in the UK.

Many other projects are on hold as we all get used to working from home. It is a great opportunity to write up some of our research for journal publication that has been on the back burner for some time! And we seem to have more time for daily exercise than previously, so there are some positives!



Above: Spot Jenny Stauber as she undertakes field trips to coal mines (underground and open cut) in the Hunter Valley in early March with the Independent Expert Scientific Committee on CSG and Large Coal Mining Developments

### **Environmental Protection Science, Department of Planning, Industry and Environment (DPIE) (Timothy Remail; [Timothy.Remail@environment.nsw.gov.au](mailto:Timothy.Remail@environment.nsw.gov.au))**

COVID-19 has changed much of the way we undertake our work here at Environment Protection Science (EPS). However, the wheels of environmental science continue to turn, and EPS is busy using science to improve and protect environmental and human health within the state of NSW. This has also included assisting with the Governments response to the recent bushfire emergency.

Since the last newsletter, the Ecotoxicology Team has warmly welcomed **Anneke Coomans** back from maternity leave. Anneke is helping the team go paperless by updating our forms to electronic spreadsheets - a very worthy endeavour! **Amanda McDonald** has started a secondment with the Chemical Forensics team and is diversifying her skills into analytical chemistry. Before her secondment, Amanda finalised a procedure for investigating the response of effluents to a sea anemone which is now being used for incident response testing. Before the COVID-19 situation, **Megan Gillmore** has been assisting the EPA investigate the use of passive samplers for monitoring intermittent pulse discharges from collieries.

The Contaminants and Risk Team (C&R) have been busy undertaking technical assessments (contaminant and microbiological) for the NSW EPA and has been working closely with the EPA to review the current NSW Biosolid Guidelines. C&R has also been an integral part of the NSW Technical Advisory Group (TAG) for PFAS informing policy and management actions for PFAS-impacted sites around the state. At the federal level, C&R has been contributing to the National Chemicals Working Group's review and update of the PFAS National Environmental Management Plan (PFAS NEMP). C&R is also more frequently working within the space of emerging contaminants and are aware of several groups which are also interested in this space. C&R is interested to speak to anyone undertaking work in the area of emerging contaminants.



# Regional Reports | New South Wales

## **Ecotox Services Australasia (ESA) (Rick Krassoi; [RKrassoi@ecotox.com.au](mailto:RKrassoi@ecotox.com.au))**

The end of the year will see the 20th birthday for ESA. In these surreal times, I'm not sure what kind of birthday celebrations we might allow ourselves, but maybe it's enough of a comfort to know that we made it this far. It seems a lifetime ago that we won NATA accreditation back in 2003, and I look back with great fondness of all the many dozens of bright young faces that passed through our lab over this time, now scattered all over the globe, carving out rewarding careers in ecotoxicology and beyond.

I'm pleased to report that SARS COV-2 has not made a great dent on our operations. We had a pandemic response plan minted in 2009 in response to Swine Flu, and we just dusted that off and amended details based on what we came to know about this novel coronavirus. We commenced accumulating lab consumables in mid-February as part of our preparations, and then went into lockdown on 2nd of March once we realised that a cluster was developing in a neighbouring suburb (with whom we share couriers etc). Now non-laboratory personnel are working remotely, and we lab folks keep a distance between us and douse everything liberally in Viraclean.

Our main fear over this time, from a lab operations perspective, was that domestic courier networks might be impacted given we receive time-critical shipments of both samples and test organisms from all regions of the country. Thankfully that has not transpired with this relatively small first wave, but we remain vigilant to this prospect with future waves.

I just want to finish by wishing all our colleagues, both those in isolation and those remaining at the bench, good health and happiness, and look to celebrating on the other side (20th birthday or no).



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## **Aquatic and Coastal Environmental Sciences Lab, Macquarie University - Department of Earth and Environmental Sciences (EES) (Giulia Filippini, [giulia.filippini@mq.edu.au](mailto:giulia.filippini@mq.edu.au); and Katherine Dafforn, [k.dafforn@gmail.com](mailto:k.dafforn@gmail.com))**

It has been a busy start to 2020 for the newly named Aquatic and Coastal Environmental Sciences (ACES) lab at Macquarie University. Our numbers have multiplied, and we are gradually accumulating students and researchers from Australia, New Zealand and Europe with research interests from coastal cities to offshore petroleum platforms.

Our supervisor, **Dr Katie Dafforn** began the year by attending 'ECOLight' - a European Union Foresight Workshop for 'horizon planning' at the University of Pisa. The workshop was hosted by **Dr Elena Maggi** and **Professor Lisandro Benedetti-Cecchi** (Vice Rector) in the Department of Biology and the topic was "Emergent impacts on coastal areas: adding the role of light pollution to the management and protection of ocean commons". The workshop began with a mini-symposium for the Department of Biology involving all of the workshop attendees. Katie presented a talk with **Dr Mariana Mayer-Pinto** (UNSW) entitled "Mapping the extent and potential impacts of Artificial Light at Night (ALAN) in Sydney Harbour". This included work from past and present students on the topic of light pollution. The symposium stimulated much discussion about how we measure and manipulate light pollution for ecological surveys and experiments. The discussion benefited greatly from having a mix of disciplines in the room from marine to freshwater ecologists and astronomers to astrophysicists.

Katie and Mariana kept the spotlight on ALAN by hosting a local workshop at the Sydney Institute of Marine Science (SIMS) with **Dr Emily Forbert** (Flinders University). This coincided with the release of the [National Light Pollution Guidelines for Wildlife](#) by the Department of the Environment and Energy who were represented at our workshop. Stay tuned for more outputs from those workshops coming in late 2020!

We welcomed and farewelled a few students in early 2020 including **Jonathan Tempesti** who joined us briefly for a six week internship from the University of Pisa. Jonathan worked closely with **Dr Nina Schaefer** to develop a taxonomic guide for common fouling species in Australian ports and harbours. He also got involved with a spot of fieldwork to sample [Living Seawall](#) installations around Sydney Harbour.

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(Left) Dr. Katie Dafforn in her snorkelling gear. (Middle) Dr. Aria Lee and Giulia Filippini helping Dr. Nina Schaefer (in the middle) to deploy experimental plates at the Australian National Maritime Museum in Sydney. (Right) Dr. Nina Schaefer in her PhD graduation with Dr. Katie Dafforn and Dr. Mariana Mayer Pinto from UNSW.

**Nina** is our early bird postdoctoral researcher; you can find her in the office around 6 am! She recently graduated with a Doctor of Philosophy from the University of New South Wales (UNSW) where her research focussed on the biodiversity of intertidal rocky shores. Currently, she is working on a project which aims to develop biosecurity applications for marine infrastructure. She [installed some cool experimental recruitment plates at the Australian National Maritime Museum](#) in Sydney Harbour, Port Phillip Bay in Victoria, and the Port of Townsville in Queensland to test if these biosecurity applications are effective in temperate and tropical waters.

**Megan Trethewy** and **Amy MacIntosh** recently joined the lab to study in the Masters of Research program. Meg is looking at Artificial Light at Night (ALAN) around Sydney Harbour and its ecological impacts on the organisms living on the intertidal zone. Keep an eye out for her wax grazing disks around Sydney's rocky shores – they're quite a bright shade of pink! She loves to sing and dance, so there is always lots of fun with her!

Amy is new to the lab and new to Sydney after recently completing her honours degree at the University of Tasmania. She is based mainly at ANSTO with her industry supervisor **Dr Tom Cresswell** and will be investigating the ecotoxicological effects of contaminants associated with offshore petroleum infrastructure. She is the first female recipient of the ANSTO Industry Foundations Scholarship and will continue her studies into a PhD to develop an ecological framework for closure of offshore petroleum structures with support from BHP.

We also said farewell to another visiting student, **Elena Gialdi**, who joined the lab for a six-month internship after completing her Masters degree in Italy. During this time, Elena was lucky enough to join a collaborative research project with UNSW to survey sediment health in twenty estuaries along the NSW and QLD coast. She had muddy fun in the field, getting up close and personal with Australia's iconic wildlife, and picked up important lab skills such as DNA extraction, PCR, infauna sorting, grain-size and organic material analyses.

Following the muddy theme, **Giulia Filippini** recently published a paper "[Sediment bacterial communities associated with environmental factors in Intermittently Closed and Open Lakes and Lagoons \(ICOLLS\)](#)" that investigated how continuous inputs of organic materials and nutrients into coastal lagoons are linked to significant changes in the sediment bacterial community structure. The work was supported by Northern Beaches Council.

She recently commenced a PhD project on the ecology of oyster reefs, focusing on associated biodiversity, ecosystem services and particularly how reefs influence nutrient and contaminant processing. Ah, she is Italian as well, so if you like Lasagne or Tiramisu you are in the right hands!



(Left) Jonathan Tempesti ready to travel in Australia. (Middle) Megan Trethewy enjoying fieldwork. (Right) Amy MacIntosh receives an ANSTO Industry Foundations Scholarship.



## Regional Reports | New South Wales



(Left) Elena Gialdi in a standoff with a curious crocodile during fieldwork in QLD. (Right) Giulia Filippini and Jason Ruszczyk from the Northern Beaches Council high five at the end of intense fieldwork.

As we write this update, our lab is taking a time out from lab and fieldwork and staying home to flatten the curve. From our lab to yours, we hope that everyone is staying safe and well in these difficult times and hopefully we'll have more exciting stories (likely desktop-based!) to share next time.

**Pollution Science Research Group, School of Environmental and Rural Science, University of New England (Susan Wilson; [swilso24@une.edu.au](mailto:swilso24@une.edu.au) and Matt Tighe; [mtighe2@une.edu.au](mailto:mtighe2@une.edu.au))**

### Team News and Highlights:

Since our last posting to Endpoint much has happened both for the group and for all! After much travel and conferences last year many of our students are now busy writing which is fortunate in current circumstances! Since last posting we have all become masters of zoom and managed through the trials of drought, bushfires and COVID-19.

Last year was international year of the periodic table and as many of you know a large part of the research we do in the group has focussed on the element antimony. Consequently we enjoyed contributing to the Royal Australian Chemical Institute Stories from the Periodic Table. Check out our story in the fourth round at <https://www.raci.org.au/events-awards/stories-from-the-periodic-table/antimony-by-susan-wilson> although that round was won by Mercury. Nevertheless, it was nice to see the story from Monash University's Rebekah Duffin on antimony win the first round <https://www.raci.org.au/events-awards/stories-from-the-periodic-table/antimony-by-rebekah-duffin>. Two very different perspectives profiling this element.

In October last year PhD student **Steven Doherty**, studying Sb and As biogeochemistry, travelled to Leipzig Germany funded by a DAAD grant to work at UFZ with **Dr Maria Ullrich**. Maria had visited us in September and experienced the extremes of sampling in the Macleay River catchment. During her week's visit we had a bushfire, a dust storm and some snow! Steven then joined Sue who was on sabbatical at Bern University working with **Professor Adrien Mestrot** and his Soil Science Group. With another successful application to the Australian Synchrotron we hope to extend Steven's work when we can again travel to Melbourne. Both Sue and Steven presented work at the Swiss Geoscience Meeting at University of Fribourg in November and Sue also spent time working at Lancaster University with Professor Crispin Halsall's laboratory.

Current PhD students include **Sajanee Gunadasa** working on Cd/As in Sri Lankan soils who will hopefully be presenting in the Armidale Soapbox Science during National Science Week, **Nicola Forster** working on microplastics in soils, **Roozbeh Ravansari** working on rapid quantification of soil organic matter, **Kirsten Drew** investigating glyphosate in high conservation soils, **Carolyn Sonter** investigating PFAS effects on honey bees, **Atefeh Esmaeili**



## Regional Reports | New South Wales

working on PAH bioavailability and postdoc **Martin Brummel** from Canada working on sub-lethal pesticide impacts upon pollinator foraging and nesting behaviour. Masters student **Elvis Lagble** also successfully completed his project on optimising PAH availability during composting bioremediation.

Please contact us if you want to chat about any of our projects or programs. You can also check out our webpage at [www.une.edu.au/pollutionscience](http://www.une.edu.au/pollutionscience), and follow us on Twitter at @UNEPollutionSci.

We have new PhD opportunities in a number of areas, including scholarships available for domestic students. Contact Sue or Matt for further information. When we can travel again, please call in to meet the group if you are close to or passing through Armidale! Hope to see some of you at the next possible SETAC meetings and stay safe.

### ***The Jolley Research Group, Darren Koppel ([darren.koppel@uts.edu.au](mailto:darren.koppel@uts.edu.au))***

The Jolley crew have been hard at work (at home). We've been busy looking into metal contaminants across soils, sediments, fresh and marine waters from the tropics to the poles. A couple recent wins from our group:

**Lakmini Egodawatta** recently submitted her PhD thesis titled "Factors influencing As and Sb bioavailability, accumulation and toxicity in agricultural plants", supervised by Dianne Jolley, Aleicia Holland, and Darren Koppel. The group celebrated isolation style with a zoom hangout! Go Lakmini!

**Megan Gilmore** (now doing great work at the NSW Department of Planning, Industry, and Environment) published a new paper, "[Effects of dissolved nickel and nickel-contaminated suspended sediment on the scleractinian coral, \*Acropora muricata\*](#)" in *Marine Pollution Bulletin*. This was a collaborative piece of work funded by NiPERA Inc. with support from the National Sea Simulator, UOW, CSIRO, SCU, ANSTO, JCU, Macquarie University, and LaTrobe University!

Stay safe, look out for each other, and hope to catch you when we can!



Above: 9 scientists, 4 furry colleagues, and 1 future scientist celebrating Lakmini (top left) submitting her PhD and paper success. Not all furry colleagues pictured.



# Regional Reports | Victoria

**Jackie Myers, ([Jackie.myers@rmit.edu.au](mailto:Jackie.myers@rmit.edu.au)),  
Victoria Regional Representative**



**AQUEST Research Group, School of Science, RMIT University – Jackie Myers ([Jackie.Myers@rmit.edu.au](mailto:Jackie.Myers@rmit.edu.au)). You can contact the Aquest research group at <http://rmit.edu.au/aquest>**

The start of 2020 has been busy at the Aquatic Environmental Stress research group (AQUEST) and while we are all working remotely now due to COVID, we are becoming experts in online conferencing technology! We have video team meetings weekly to stay connected and are preparing for a big field season, once we can get out.

We have several new students started and a visiting postdoctoral fellow. Dr Michela Di Giannantonio, a visiting postdoctoral fellow from The University of Fribourg, will spend the next twelve months working with the AQUEST research group. An environmental chemist, Michela will work closely with Dr Sara Long looking at developing new monitoring and assessment tools for freshwater and estuarine environments using metabolomic techniques.

Hilda Plooso has started an honours project looking at particle size distribution in wetlands and the relationship with toxicant concentrations under the supervision of Dr Kathryn Hassell. We also have two new PhD students joining the group. Madara Ranatunga, under Professor Vincent Pettigrove and Dr Claudette Kellar, looking at Environmental impacts of synthetic pyrethroids on aquatic ecosystems and Pulasthi Serasinghe, under the supervision of Professors Vincent Pettigrove and Dayanthi Nugegoda, will be looking at emerging pesticides of concern in the Greater Melbourne Area.

Our two citizen Science projects “The pesticide Detectives” and “Litter trackers” have been ploughing along. Citizen scientists from across Australia have been sending in sediment samples from their local waterways for assessment of pesticides as part of the Pesticide Detectives program. Latest results are on our webpage: <http://pesticidedetectives.com.au>. You can take part in this project by participating in an anonymous survey looking at pesticide use around your home – for more detail’s checkout the website.

We have tracked what happens to litter in 17 waterways across Greater Melbourne over the last year, deploying GPS enabled bottles at various sites in collaboration with school and community groups and tracking their journeys downstream towards Port Phillip Bay. Many of the bottles reached and even crossed the bay. You can check out the bottle journeys on the project website: <http://rmit.edu.au/littertrackers>, with animation videos of the journeys available soon!

There are several PhD projects on offer with the AQUEST group, to find out more about these please go to <https://www.rmit.edu.au/about/schools-colleges/science/research/research-projects/project-guides>.

Recent publications from the group include:

**McDonald, S.,** Cresswell, T. and **Hassell, K.** (2020) Bioaccumulation kinetics of cadmium and zinc in the freshwater decapod crustacean *Paratya australiensis* following multiple pulse exposures. *Science of the Total Environment* 720, 137609.

Nan, B., Su, L., **Kellar, C.**, Craig, N.J., Keough, M.J. and **Pettigrove, V.** (2020) Identification of microplastics in surface water and Australian freshwater shrimp *Paratya australiensis* in Victoria, Australia. *Environmental Pollution* 259, 113865.

**Sara M. Long,** Dedreia L. Tull, David P. De Souza, Konstantinos A. Kouremenos, Saravanan Dayalan, Malcolm J. McConville, **Kathryn L. Hassell, Vincent J. Pettigrove** and Marthe Monique Gagnon (2020). Metabolomics Provide Sensitive Insights into the Impacts of Low-Level Environmental Contamination on Fish Health—A Pilot Study. *Metabolites* 10, 24; doi:10.3390/metabo10010024

**Trestrail C,** Walpitagama M, Hedges C, Truskewycz A, Miranda A, Wlodkowicz D, **Shimeta J, Nugegoda D.** 2020. Foaming at the mouth: Ingestion of floral foam microplastics by aquatic animals. *Sci Total Environ.* 705:135826. doi:10.1016/j.scitotenv.2019.135826.

**Trestrail C, Nugegoda D, Shimeta J.** 2020 (in publication) Invertebrate responses to microplastic ingestion: reviewing the role of the antioxidant system. *Sci Total Environ.*

**Trestrail C, Shimeta J, Nugegoda D.** 2020 (in publication). Sublethal responses to microplastic ingestion in invertebrates: towards a mechanistic understanding using energy flux. In: Bolan NS, Kirkham MB, Halsband C, Ok YS, editors. *Particulate Plastics: Sources and Ecotoxicity in Terrestrial and Aquatic Environments*. CRC Press.

# Regional Reports | Victoria

**School of Biological Sciences, Monash University – Professor Bob Wong**  
([bob.wong@monash.edu](mailto:bob.wong@monash.edu), [bobwonglab.org](http://bobwonglab.org))

The past few months has seen the start of several new projects in the Behavioural Ecology Research Group.

Together with PhD student Jack Orford and recent PhD graduate Jake Martin (now a postdoc in the lab), we initiated experiments investigating the impacts of the agricultural pollutant 17B-trenbolone on the behaviour, morphology and physiology of tadpoles. As part of the research, we also plan to investigate the potential carry over effects of exposure on individuals post-metamorphosis. The project is funded by an ARC Discovery grant.

Another new PhD student, Hung Tan, will be investigating the impacts of caffeine on the behaviour and physiology of fish and frogs.

PhD student Lucinda Aulsebrook recently completed a study investigating the effects of the pharmaceutical fluoxetine on host-disease dynamics and life history traits using *Daphnia* as her model. Stay tuned for the results, which are currently being analysed.

Earlier this year, our lab hosted Dr Chad Johnson, who was on sabbatical from Arizona State University. A behavioural ecologist who works on spiders, Chad carried out a National Geographic funded study investigating the behaviour of fishing spiders collected from several localities above and below sewage treatment outflow. The research builds upon Dr Erin Richmond and colleagues' 2018 Nature Communications paper showing the presence of pharmaceuticals in the tissues of riparian spiders in Victorian waterways.

Lastly, Bob commenced his ARC Future Fellowship at the start of the year. The Project aims to track – with fish species and across different modes, scales, and levels of complexity from controlled laboratory experimentation to studies in the wild – how pharmaceuticals in the environment affect wildlife behaviour and survival. Unfortunately, due to developments with COVID19, some of the overseas collaborative research planned for Sweden in May has had to be postponed until 2021.

Recent relevant publications (lab members in bold)

**Tan H**, Polverino G, **Martin JM**, **Bertram MG**, **Wiles SC**, Palacios MM, Bywater CL, White CR, & **Wong BBM**. 2020. Chronic exposure to a pervasive pharmaceutical pollutant erodes among-individual phenotypic variation in a fish. *Environmental Pollution*. 263: 114450.

**Martin JM**, **Saaristo M**, **Tan H**, **Bertram MG**, Nagarajan-Radha V, Dowling DK, & **Wong BBM**. 2019. Field-realistic antidepressant exposure disrupts group foraging dynamics in mosquitofish. *Biology Letters*. 15: 20190615.

**Bertram MG**, **Tomkins P**, **Saaristo M**, **Martin JM**, Michelangeli M, Tomkins RB, **Wong BBM**. In press. Disruption of male mating strategies in a chemically compromised environment. *Science of the Total Environment*. 703: 134991.



Collecting spiders for behavioural ecotox work, source Bob Wong



Behavioural Ecology Research Group Christmas party, source Bob





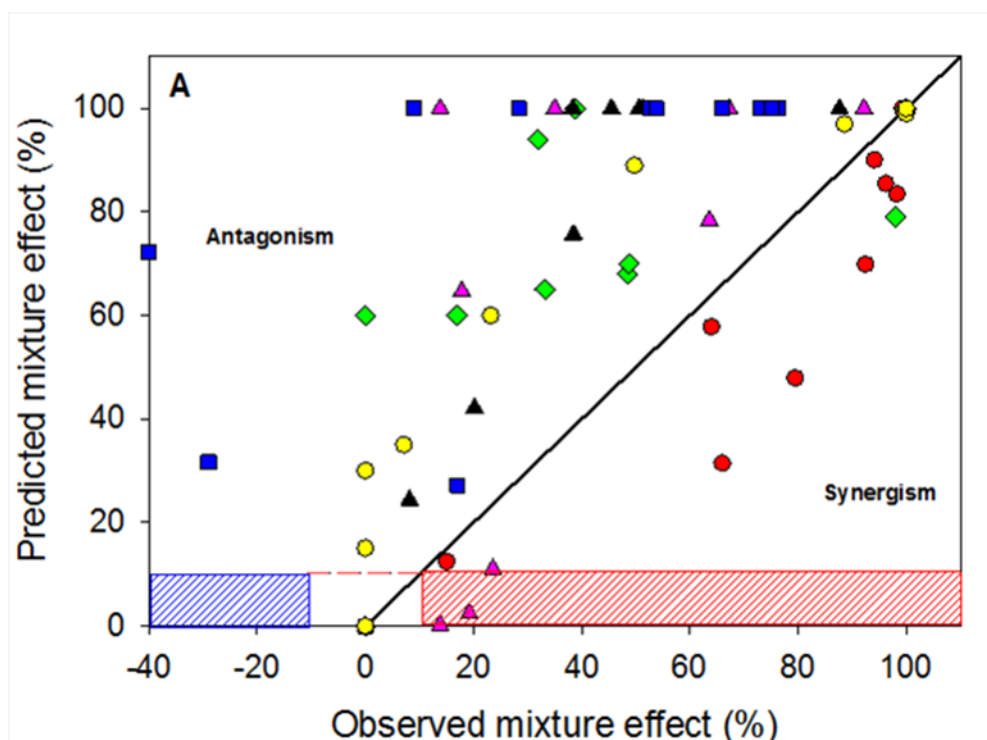
## Environmental Research Institute of the Supervising Scientist.

At eriss we have been using this time in isolation to work on publishing data from several major projects. Stay tuned for papers on the development of a chronic fish test method for our tropical freshwater fish and also the culmination of an extensive project on the toxicity of mine-water mixtures from the Ranger uranium mine.

The figure below is an example of what we see when we compare the toxicity observed from mine water exposures, with predicted toxicity based on the Mg, Mn, U and (for some species, where possible) Cu content. This work has led to us realising we need to have a better understanding (particularly for our snail and cladoceran) of how these species respond to Cu. We anticipate that the synergism we see occurring for these species may simply be our inability to account for the influence of Cu toxicity to these species. The degree of antagonism observed for many of the species has also led to further work in investigating how the two most bioavailable metals in the mixture, manganese and magnesium, interact to influence toxicity. This is currently being carried out for four of the freshwater species at eriss (alga, duckweed, hydra and cladoceran).

Another huge achievement is that we have put together a comprehensive compilation of the culturing and testing methods used for 7 species at eriss which will also be published in the near future in ABEEC. This should be a handy reference for any lab wanting to take up toxicity testing with a tropical freshwater species.

Tom Mooney has been finalising a manuscript on a mesocosm study which tested the hypothesis that elevated concentrations of Mg altered aquatic phytoplankton, zooplankton and macroinvertebrate assemblages. The results from this study were used to derive guideline values for Mg which are in line with phytoplankton field surveys. This manuscript has been accepted for publication in ET&C.



Pictured right: Predicted mixture effect (%) versus observed mixture effect (%) of mine-water using the concentration addition mixture reference model to incorporate the effect of contaminants Mg, Mn, U and Cu and Zn (where possible). The solid line represents the 1:1 line where observed effects = predicted effects. For data above the black line, observed toxicity was less than expected (antagonism occurring) and for data below the black line, observed toxicity was greater than expected (synergism occurring). Red-shading represents where the predicted mixture effect is <10% but the observed mixture effect is >10%. Key to data points; red: *A. cumingi*, black: *H. viridissima*, green: *Chlorella sp.*, pink: *M. macleayi*, blue: *L. aequinoctialis* and yellow: *M. mogurnda*.

# Regional Reports | Northern Territory

***Environmental Chemistry & Microbiology Unit (ECMU), Charles Darwin University. A collaboration between Anna Padovan, Zarah Hockey, Karen Gibb and Karen Kennedy (Power & Water)***

## ***Cyanotoxins in wastewater***

Leanyer-Sanderson waste stabilisation ponds (LSWSP), Darwin's largest treatment ponds, use a natural, cost effective form of treatment which relies on sunlight. The treatment process can support the growth of cyanobacteria under particular environmental conditions. Once the wastewater treatment is completed the effluent discharged has the potential to contain cyanotoxins. It is impractical to test for all toxins and expensive. Knowledge of likely toxins present and potential high-risk periods should inform targeted monitoring plans. Current, more cost-effective microscopy methods do not provide information about toxin production which can be strain specific or only occur under particular environmental conditions.

To identify likely toxins, potential high risk times and provide an alternative monitoring tool with more relevance for toxin potential, we used a molecular assay (Phytoxigene™ CyanoDTec, Diagnostic Technology, Australia) to quantify cyanobacteria and specific toxin genes for microcystin/nodularin, cylindrospermopsin and saxitoxin. The LSWSP outfall was monitored bimonthly in 2018 to obtain a broad overview of potential toxin production, with more intensive monitoring in the wet and dry seasons of 2019. Cyanobacterial loads fluctuated throughout 2018 with no obvious temporal pattern. The microcystin/nodularin gene was detected at low levels during 2018, but the microcystin toxin itself was only detected in December. No other toxins or toxin genes were detected. In 2019, levels of the microcystin/nodularin gene increased rapidly in the wet season, followed by an increase in microcystin toxin production, and levels of both the gene assay and toxin fell during the subsequent dry season.

These results showed that the toxin gene assay can serve as an early warning for potential toxin production and while a positive toxin gene assay test does not guarantee the cyanobacteria will be toxic, it could be used to trigger further sampling and follow up with conventional confirmation. Toxin gene assays can be also used to confirm that a bloom is non-toxic, therefore avoiding the need for expensive toxin analysis.



**Above: Leanyer-Sanderson waste stabilisation ponds**



# Regional Reports | Queensland

**Elissa O'Malley** ([e.omalley@uq.edu.au](mailto:e.omalley@uq.edu.au)),  
**Queensland Representative**



**Elissa O'Malley** ([e.omalley@uq.edu.au](mailto:e.omalley@uq.edu.au)), **Elvis Okoffo** ([e.okoffo@uq.edu.au](mailto:e.okoffo@uq.edu.au)) and **Sharon Grant** ([s.grant@uq.edu.au](mailto:s.grant@uq.edu.au)), **Queensland Alliance for Environmental Health Science, University of Queensland.**

Congratulations to Elvis Okoffo, Stacey O'Brien, Jake O'Brien, Ben Tscharke and Kevin Thomas on the selection of their review article, *Wastewater treatment plants as a source of plastics in the environment: a review of occurrence, methods for identification, quantification and fate* as the Best Review published in Environmental Science: Water Research & Technology Journal in 2019.

The QAEHS microplastics group published a novel method involving pressurized liquid extraction (PLE) combined with double-shot pyrolysis gas chromatography–mass spectrometry (Pyr-GC/MS) for selected plastics (polystyrene (PS), polycarbonate (PC), poly-(methyl methacrylate) (PMMA), polypropylene (PP), polyethylene terephthalate (PET), polyethylene (PE) and polyvinyl chloride (PVC)) identification and quantification in biosolid samples. The technique is practically faster and simple as it does not require pre-treatment of samples and plastics can be directly quantified in samples. This method can be useful in plastics quantification in other environmental matrices.



Stacey O'Brien, Jake O'Brien, Stephen Burrows, Elvis Okoffo and Francisca Ribeiro analysing samples for microplastics.

Profs Jochen Mueller and Kevin Thomas, and their teams at QAEHS, have recently developed a new collaboration with Prof Phil Hugenholtz and team at UQ's School of Molecular Biology and Dr Warish Ahmed at CSIRO to develop methods to test wastewater for SARS-CoV-2. A proof of concept study was completed using wastewater samples from two wastewater treatment plants in South East Queensland, representing populations living in the Brisbane region. The team found RNA fragments of SARS-CoV2 in untreated sewage which would have been shed in the wastewater stream by COVID-19 infected people. The study has been published in Science of the Total Environment. This method, which builds on work by research groups in The Netherlands and the US, is an important step towards developing an early warning surveillance system in Australia to track COVID-19 prevalence in the community.

## New Publications

Okoffo, E.D., O'Brien, S., O'Brien, J.W., Tscharke, B.J. and Thomas, K.V. (2019) Wastewater treatment plants as a source of plastics in the environment: a review of occurrence, methods for identification, quantification and fate. Environmental Science: Water Research & Technology, 5, 1908-1931. <https://doi.org/10.1039/C9EW00428A>

Okoffo, E.D., Ribeiro, F., O'Brien, J.W., O'Brien, S., Tscharke, B.J., Gallen, M., Samanipour, S., Mueller, J.F. and Thomas, K.V. (2020) Identification and quantification of selected plastics in biosolids by pressurized liquid extraction combined with double-shot pyrolysis gas chromatography–mass spectrometry. Science of The Total Environment, 136924. <https://doi.org/10.1016/j.scitotenv.2020.136924>

Ahmed W., et al. (2020) First confirmed detection of SARS-CoV-2 in untreated wastewater in Australia: A proof of concept for the wastewater surveillance of COVID-19 in the community. Science of The Total Environment, 138764. <https://doi.org/10.1016/j.scitotenv.2020.138764>

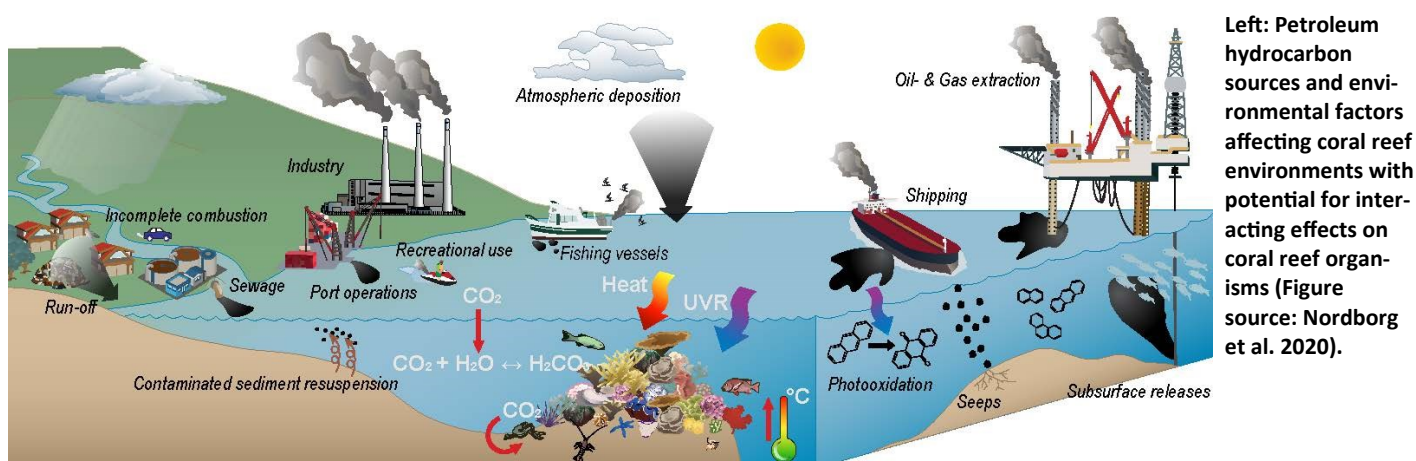
O'Malley, E., O'Brien, J.W., Verhagen, R. and Mueller, J.F. (2020) Annual release of selected UV filters via effluent from wastewater treatment plants in Australia. Chemosphere, 125887. <https://doi.org/10.1016/j.chemosphere.2020.125887>

Ojo, A.F., Peng, C. and Ng J.C. (2020) Combined effects and toxicological interactions of perfluoroalkyl and polyfluoroalkyl substances mixtures in human liver cells (HepG2). Environmental Pollution, 263, 114182. <https://doi.org/10.1016/j.envpol.2020.114182>

## Regional Reports | Queensland

**Mikaela Nordborg, Australian Institute of Marine Science, James Cook University, [mikaela.nordborg@my.jcu.edu.au](mailto:mikaela.nordborg@my.jcu.edu.au)**

Mikaela Nordborg (AIMS@JCU PhD Candidate at James Cook University and the Australian Institute of Marine Science, Townsville) and collaborators from JCU and AIMS recently published a review of the combined effects of petroleum oil with ultraviolet light, elevated temperature and lowered seawater pH towards coral reef species (<https://doi.org/10.1016/j.scitotenv.2020.137486>). The review provides initial quantification of the impact on oil toxicity of each co-factor and draws conclusions on the effects and importance of the co-factors, including that all three investigated co-factors can affect oil toxicity towards coral reef taxa as well as other tropical and subtropical marine species. It also presents recommendations for future research priorities and testing methodologies to ensure future oil toxicity testing appropriately accounts for the unique environmental conditions encountered in reef environments.



**Peta Neale, ARI-TOX group, Griffith University, [p.neale@griffith.edu.au](mailto:p.neale@griffith.edu.au)**

Like everyone at the moment, the members of the ARI-TOX group (<http://aritox.com/>) at Griffith University are all working from home currently, but we do have some new PhD students and visitors, grants and publications.

In early March we had the ARI-TOX retreat in Brisbane. The retreat was a chance for the group to spend two days together discussing a range of topics including grant opportunities, staffing and lab operations. It wasn't all work, with a fun afternoon spent at Escape Hunt.





Congratulations to Dr **Shima Ziajahromi**, who recently received an Advance Queensland Industry Research Fellowship. Her project entitled 'Risks of microplastics in biosolids to soils and agro-ecosystems' will investigate the fate and impact that microplastics in biosolids are having on agricultural land and soil biota. This will significantly improve our understanding concerning microplastics transport in soil-crop systems and will help guide the management of cropping land.

We have two new PhD students, **Hsuan-Cheng Lu** (top right) and **Danielle Hill** (middle right).

Cheng started his PhD under the supervision of Shima Ziajahromi, Peta Neale, and Fred Leusch in February. His research will focus on microplastic pollution in constructed wetlands. The first component of the research involves identification and quantification of microplastics in constructed wetland, investigation of sources of microplastics, and spatial distribution of microplastics across wetland. The second part will include investigation of common sediment dwelling biota in constructed wetlands interacting with the microplastics and further studies on food chain effect.

Danielle's research will investigate the effects of metamorphosis on the accumulation and biodistribution of common mining contaminants and radionuclides. Live animal radiotracer techniques will be used to study arsenic, mercury and selenium and the radionuclide contaminants, cesium and strontium, in aquatic insects and amphibians. Danielle's research will also investigate behavioural and morphological effects of these contaminants in amphibians and the effects of arsenic speciation on accumulation. Danielle is supervised by Chantal Lanctôt, Will Bennett and Tom Cresswell.

**Hannah Pfeifer** joins us conducting her Master thesis to finish her Master's programme in Ecotoxicology of the RWTH-Aachen University. In her project she will investigate the metabolic profile of fish liver cells which were exposed to environmental pollutants with different mode of actions. In this way she wants to contribute to a better understanding of adverse outcomes on the molecular level. The use of metabolomics in combination with in vitro bioassays is a quite new but probably promising approach in Ecotoxicology.

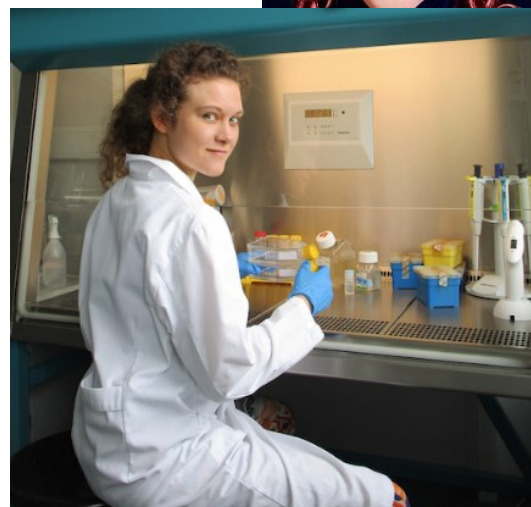
Before coming to Australia, Hannah did two internships to gain more practical experience in the lab: The first one at the EAWAG in the Department of Environmental Toxicology in Switzerland where she was involved in a project dealing with the prediction of biotransformation and bioconcentration of organic chemicals in fish cells. The second internship took place at the Institute of Game and Wildlife Research in Spain where she got an insight into the risk assessment of agrochemicals in wildlife. For her international research experiences she received the IDEA League research grant, the ERASMUS + grant as well as the PROMOS-scholarship.

In her Bachelor she studied Biology at the University of Leipzig and in her final thesis she investigated the effects of climate change on root production. Hannah wants to promote alternative methods to animal testing. Her interests include in vitro bioassays, the elucidation of AOPs particularly at the molecular and cellular level, metabolomics, endocrine disruption, risk assessment & management and bioremediation.

## New publications from ARI-TOX

Asif, M.B., Van De Merwe, J.P., Leusch, F.D.L., Pramanik, B.K., Price, W.E., Hai, F.I. Elucidating the performance of an integrated laccase- and persulfate-assisted process for degradation of trace organic contaminants (TrOCs). *Environ. Sci. Water Res. Technol.* 2020, 6 (4), 1069-1082 <https://doi.org/10.1039/C9EW01022J>

Kroon, F.J., Berry, K.L.E., Brinkman, D.L., Kookana, R., Leusch, F.D.L., Melvin, S.D., Neale, P.A., Negri, A.P., Puotinen, M., Tsang, J.J., van de Merwe, J.P., Williams, M. Sources, presence and potential effects of contaminants of emerging concern in the marine environments of the Great Barrier Reef and Torres Strait, Australia. *Sci. Total Environ.* 719: 135140 <https://doi.org/10.1016/j.scitotenv.2019.135140>



## Regional Reports | Queensland

Lancôt, C. M.; Bednarz, V. N.; Melvin, S.; Jacob, H.; Oberhaensli, F.; Swarzenski, P. W.; Ferrier-Pagès, C.; Carroll, A. R.; Metian, M. Physiological stress response of the scleractinian coral *Stylophora pistillata* exposed to polyethylene microplastics. Environ. Pollut. 2020, 114559 <https://doi.org/10.1016/j.envpol.2020.114559>

Leusch, F.D.L., Khan, S.J., Deere, D., Cunliffe, D., Neale, P.A., Humpage, A. Deriving safe short-term chemical exposure values (STEV) for drinking water, Regul. Toxicol. Pharmacol. 2020, 110: 104545 <https://doi.org/10.1016/j.yrtph.2019.104545>

Neale, P.A., Feliers, C., Glauch, L., König, M., Lecarpentier, C., Schlichting, R., Thibert, S., Escher, B.I. Application of in vitro bioassays for water quality monitoring in three drinking water treatment plants using different treatment processes including biological treatment, nanofiltration and ozonation coupled with disinfection, Environ. Sci. Water Res. Technol. 2020, Advance Article <https://doi.org/10.1039/C9EW00987F>

Pearson, R.M., van de Merwe, J.P., Connolly, R.M. Global oxygen isoscapes for barnacle shells: Application for tracing movement in oceans. Sci. Total Environ. 2020. 705: 135782 <https://doi.org/10.1016/j.scitotenv.2019.135782>

Ziajahromi, S., Drapper, D., Hornbuckle, A., Rintoul, L., Leusch, F.D.L. Microplastic pollution in a stormwater floating treatment wetland: Detection of tyre particles in sediment. Sci. Total Environ. 2020, 713: 136356 <https://doi.org/10.1016/j.scitotenv.2019.136356>

**Susi Vardy, Department of Environment & Science, [suzanne.vardy@des.qld.gov.au](mailto:suzanne.vardy@des.qld.gov.au)**

Susi Vardy's Investigations team from the Department of Environment & Science have almost completed an ambient PFAS monitoring program in QLD water. The objectives are to develop a baseline that will assist in managing PFAS in Queensland, create a PFAS database and develop a public portal for open access data.

The water samples were collected at 55 monitoring sites from the east coast of Queensland that represented different water types and land uses. Water types ranged from freshwater to estuarine and land use ranged from industrial areas to rural areas. Water samples were collected every two months over a full year. Sediment and biota samples were also collected but these were mainly focused in the South East Queensland region.

All of the samples were analysed using the standard PFAS and Total Oxidisable Precursor Assay (TOPA) methods. For a majority of our samples, PFAS concentrations were below the limit of reporting for most of the PFAS compounds. The compounds that were most commonly present across the monitoring sites were PFOS, followed by PFOA.

The very first phase of this project was to sort and track existing monitoring data from investigations that had occurred throughout the state. A number of organisations have agreed to supply us with ambient data, which is going to be beneficial for this project and help increase our understanding of the concentration levels that are present in the environment across Queensland. After cautiously identifying all the relevant ambient or background data throughout Queensland from the reports, and with the permission from the relevant organisations, we have collated these data in our database.

At this stage of the project, we are currently working on the public portal that will display data through PowerBI. This will consist of charts, tables and spatial information that will be interactive, with the public being able to visualise and extract the data.





# Students Corner

**Gwilym Price** ([Gwilym.A.Price@student.uts.edu.au](mailto:Gwilym.A.Price@student.uts.edu.au)) ,  
**Student Representative**



Hi All,

Hope everyone is staying healthy and looking after themselves. The current circumstances are sure to have disrupted everyone's projects, so while we are limiting our movements and maybe not doing the labwork/fieldwork we thought we might be doing see below for use ideas! Here are some useful links to some great online resources for learning a new skill or improving your statistics skills!

- [Online Textbooks](#): If you haven't heard, Springer have made a bunch of their textbooks free to download! So, whether you're interested in marine geology, multivariate calculus or taxation in the European Union there is probably a book in there for you.
- [LinkedIn Learning](#): If you belong to a university (and I'm guessing you probably do if you're a student) you may have access to LinkedIn Learning (previously called Lynda). There are lots of video tutorial series on programming through to photography. Check on your university website as they may have log in information. I recommend "Excel: Macros" to learn some coding to automate some of those routine data cleaning processes.
- [Applied Statistics with R](#): This is an online textbook/lecture course put together by David Dalpiaz, a statistics professor at the University of Illinois. The book starts at basic statistics principles and goes all the way through to logistic regression (those lovely dose-response curves so many of us crave!). The other great thing about this book is it includes chunks of R code you can copy straight into your own program to follow along with the examples.

## Coffee Club

Want to connect with other SETAC students from around Australia and New Zealand? Like coffee, tea, or water? Then SETAC student coffee club is for you! What is student coffee club you say? A fortnightly coffee zoom meeting with SETAC students to connect, meet new people and share tips, skills, resources. Stay tuned for more information as an email will be coming out. Is this something you're interested in? Let me know, to help gauge interest. Send an email to [gwilym.a.price@student.uts.edu.au](mailto:gwilym.a.price@student.uts.edu.au)

## Isolation Baking

Baking (and cooking in general) really is chemistry in the kitchen and there are definitely some chemists amongst us. If you have or plan on baking something, put it up on twitter with the hashtag #SETACbakers so the rest of us can see your successes.



# Student Profile

## with Brett Knowles

<b>Degree</b>	Doctor of Philosophy, "Fate, transformations, and toxicity of nanoparticles in the aquatic environment"
<b>Institutions</b>	University of Wollongong and CSIRO Land and Water
<b>Supervisor:</b>	Dr. Brad Angel, Dr. Simon Apte, Prof. Dianne Jolley, Prof. Jamie Lead
<b>Email:</b>	<a href="mailto:bmk330@uowmail.edu.au">bmk330@uowmail.edu.au</a>
<b>ORCID</b>	<a href="https://orcid.org/0000-0002-9861-3280">https://orcid.org/0000-0002-9861-3280</a>
<b>Twitter</b>	<a href="https://twitter.com/brettknowles">@brettknowles</a>



I undertook my Bachelor of Science majoring in Chemistry at the University of Wollongong while taking part in the BlueScope cadet program. This saw me complete my degree part-time while working full-time at the Port Kembla BlueScope steelworks in a range of roles over a 5-year period. I worked in air quality monitoring and stack sampling, paint and coatings research, in process chemistry at the cold-rolling mill, and finally as an environmental analytical chemist in the Central Laboratories. Here I was responsible for analysis of water, gas, solvent, and oil samples to ensure that the plant was meeting its stringent environmental regulation requirements, and where I became interested in environmental chemistry and protection.

Following completion of my degree and the BlueScope cadet program I continued to work at the Central Laboratories, taking responsibility for the environmental gas chromatography (GC) & gas chromatography-mass spectrometry (GCMS) laboratory. Here I was responsible for a range of environmental and process samples, including the analysis of ultra-trace volatile organic carbons and polycyclic aromatic hydrocarbons by GCMS. I quickly mastered the routine environmental and process chemistry analyses and found myself constantly wanting to learn more about the different Analytical Chemistry labs in the Central Laboratories. I was fortunate enough to have the opportunity to try my hand at almost every environmental chemistry discipline available to me in the Central Laboratories, and constantly given the opportunity to learn new aspects of the lab's responsibilities to BlueScope and the local community.

In general, I found that my role as a graduate chemist taught me that I wanted to be learning more. I enquired around with some of my university contacts about research, and when the opportunity to take on a research project with the University of Wollongong and CSIRO Lucas Heights I jumped at the chance. The project was a perfect fit; using applied analytical environmental chemistry coupled with research to solve the world's problems – sign me up. I joined Prof. Dianne Jolley's research group based at the University of Wollongong and was astounded at the diverse range of analytical chemistry and ecotoxicological problems the group were working on. Upon starting my own research journey, I was excited at the prospect of doing a deep dive in to my project and being able to contribute to the research group's weekly research talk and manuscript sessions.

In my project I am researching the environmental risk which some nanoparticles pose in freshwater aquatic systems. Nanoparticles are defined as possessing 3 physical dimensions smaller than 100 nm, and can be composed of a range of substances. A couple of popular examples include metal oxides such as ceria ( $\text{CeO}_2$ ) a photooxidative catalyst and titania ( $\text{TiO}_2$ ) often found in sunscreens, metal nanoparticles made of silver for antimicrobial coatings on medical dressings, fridges, washing machines, and even socks and undies. These types of particles see utilisation to suit a range of applications, and often will find their way in to freshwater ecosystems. Nanoparticles can be toxic to low-order freshwater organisms, and given their incredibly large surface area can be very reactive and can undergo a wide range of transformations in a freshwater environment. To that end, their fate in a freshwater ecosystem may prevent or enhance their eventual toxicity to freshwater organisms.



Feel the rainbow with silver nanoparticles.



# Student Profile

## with Brett Knowles

In the first year of my PhD program I was lucky enough to have the opportunity to live in the US for 6 months and work at the University of South Carolina at the Centre for Environmental Nanoscience and Risk with Prof. Jamie Lead. Here I worked on the synthesis of three-layer isotopically-enriched core-shell-shell  $^{107}\text{Ag-Au-}^{109}\text{Ag}$  nanoparticles for use as model probes in ecotoxicological experiments. These nanoparticles, coupled with the use of inductively-coupled plasma mass spectrometry, would help us discriminate between the effects of silver dissolution and whole silver nanoparticle effects on freshwater organisms.

I continued to develop these synthesis methods in the Lucas Heights CSIRO laboratories after my 6-month stay in South Carolina, and with the assistance of the University of Wollongong Electron Microscopy facility was able to learn a number of key factors influencing and dictating success (or failure!) of these syntheses.

The second half of my PhD research project has focused more on ecotoxicology than chemistry. We have been investigating the toxic effects of ceria nanoparticles on the tropical freshwater alga *Chlorella sp.12* in freshwaters, and in particular learning the effects that natural organic matter and suspended solids have on this relationship. I have been utilising chronic 72-h bioassays and flow cytometry to analyse the effect which ceria nanoparticles and natural suspended sediments have on the growth rate of this model alga.

### Future work

I have recently moved to Canberra, ACT while finishing my PhD research and have started working in a part-time capacity at the Australian National University Research School of Earth Sciences in the ICP-MS research laboratory. At present I am working on writing my thesis and once travel and distancing restrictions are relaxed I will be able to finish my last few experiments at CSIRO to finish my PhD and move on to new research opportunities.



How good are algal bioassays.

# What's Happening?

## Opportunities, conferences and workshops



### *‘Resilience and recovery amidst global environmental change’*

Planning is underway for the next SETAC-AU Conference, which will be a joint meeting with the CSIRO What's In Our Water Symposium Series.

Date: Mon 30<sup>th</sup> Aug – Fri 3<sup>rd</sup> Sept, 2021

Location: RMIT City Campus, Melbourne

The conference will focus on the environmental impacts of major environmental events, including bushfires, droughts and the global COVID-19 pandemic. Further details to follow, but lock in the dates and we will look forward to seeing you all in Melbourne next year!

SETAC-AU Co-Chairs: Kathryn Hassell and Vin Pettigrove

WIOW Co-Chairs: Anu Kumar and Mike Williams



# What's Happening?

## Opportunities, conferences and workshops

### ***Environmental Science Meeting for Australian Research Teams (EnviSMART)***

EnviSMART will operate weekly Thursdays 5 - 7PM, commencing May 7th and be a combination of academic and student speakers.

Many people throughout the country now find themselves isolated with dramatically reduced social interactions that may have previously occurred at their school, research group and broader community. We are running a weekly online seminar series to provide environmental science researchers throughout Australia a platform for scientific engagement and networking during the COVID-19 lockdown.

The technical program will be one academic and two student presentations (1 hour) followed by online 'Happy-Hour'. This week will feature Prof Bob Wong.



#### **Event Details**

**Date:**  
Thursday 7th May 2020

**Time:**  
5:00 PM

**Venue:**  
Zoom - Online

**Enquiries:**  
brad.clarke@unimelb.edu.au

**Bookings:**  
EnviSMART.eventbrite.com.au/

Free for members of affiliate organisations and students

### ***New PhD opportunities***

Prof. Dr. Susanne Heise at the Hamburg University of Applied Sciences has two PhD positions (duration: 36 months) available in **aquatic ecotoxicology of rare earth elements**, hosted at their university in Hamburg as part of the Marie-Curie Programme PANORAMA (an international training network).

[Ph.D. in Ecotoxicology, ITN MSCA H2020, PANORAMA \(offer 8\)](#) (EURAXESS Job Offer id: 515876)

[Ph.D. in Ecotoxicology, ITN MSCA H2020, PANORAMA \(offer 9\)](#) (EURAXESS Job Offer id: 515879)

Apart from the requirements with regard to skills and scientific focus, the following rules apply: "Recruiting is in accordance with the European rules for Marie Curie Initial Training Networks. Early-stage researchers (ESR) can be of **any nationality**. They must be, at the time of recruitment by the host organization, **in the first four years** (full-time equivalent) of their research careers and have not yet been awarded a doctoral degree. The research career starts after the degree that enables a student to proceed with a PhD (usually, the Master degree). At the time of the recruitment by the first host institution, the **ESRs must not have resided or carried out their main activity (work, studies, etc.) in the country of their first host institution** (which in this case is Germany, of course) for more than 12 months in the 3 years immediately before the recruitment date. Short stays such as holidays and/or compulsory national service are not taken into account."

Please make anyone who you think may be interested of these positions.

# SETAC AU Mentor Programme



## Why a SETAC AU Mentor Programme?

The Society of Environmental Toxicology and Chemistry (SETAC) Australasia Mentor Programme aims to foster a collegiate society by improving the technical and career development of members by establishing mentor relationships

## Who is eligible to join the programme?

Any financial member of SETAC AU may take part in the Mentor Programme. All members from early-, mid-, late- or even post-career tracks are welcome to register for the programme

## What are the benefits for the mentee?

- Assist in the transition from study to work
- Obtain guidance with regards to career direction
- Learn from your mentor's professional and personal experience and knowledge
- Grow your professional network

## What are the benefits for the mentor?

- Exposure to students as potential employees
- Give back to your professional community by sharing your insights and experience
- Stay on top of emerging science through engaging in research-based discussions with your mentee

## How do I find out more?

For a Mentor Programme outline or a registration form, please contact  
[Tom.Cresswell@ansto.gov.au](mailto:Tom.Cresswell@ansto.gov.au)



# Australasian Bulletin of Ecotoxicology and Environmental Chemistry (ABEEC)

## Call for papers

We invite all SETAC AU members to submit new manuscripts to the *Australasian Bulletin of Ecotoxicology and Environmental Chemistry*. The *Bulletin* is a publication of the Australasian Chapter of the Society for Environmental Toxicology and Chemistry (SETAC AU), and is a regional publication dedicated to publishing original, scientifically-sound research dealing with all aspects of ecotoxicology and environmental chemistry relevant to Australasia. Papers published may be research reports, review papers, short communications, descriptions of new techniques and equipment, thesis abstracts, thesis literature reviews and comments on previously published papers.



All papers published in ABEEC will be made freely available through the website for SETAC AU. It will be an online publication only.

This is how the submission process works. Contributions should be submitted to the editor as a manuscript in the same manner as you would for any other journal. You also need to provide the name(s) of at least one reviewer to assess the manuscript. All manuscripts will be sent out for review by at least two experts in the field. After the review process, manuscripts will be sent back to authors for final revisions prior to online publication.

If you wish to submit a manuscript to *ABEEC* or would like to discuss publication of a manuscript, then please contact the editor. A copy of *Instructions to authors* is also available from the editor.

We look forward to receiving your manuscripts.

**Reinier M Mann** ([reinier.mann@des.qld.gov.au](mailto:reinier.mann@des.qld.gov.au))  
Editor – *ABEEC*

# Membership Details

## ***How to join SETAC Australasia***

Even if you are a SETAC member based in Australia, New Zealand or PNG, you may not be a member of SETAC Australasia. You can join SETAC Australasia by going to [www.setac.org](http://www.setac.org).

After logging in, go to the SETAC Australasia page and click 'Request Membership'. You can find this page by either searching 'Australasia' or going to the 'Get Involved' tab on the left of the page, then 'Regional Branches and Chapters', then 'Asia Pacific Chapters'. There are no additional fees attached to the SETAC Australasia chapter.

## ***Current SETAC Australasia Members***

To make sure you don't miss out on attending SETAC get-togethers in your state or territory or contributing your latest research to Endpoint, please update your SETAC profile to include your location so your regional rep can get in touch with you. You can do this by logging into [www.setac.org](http://www.setac.org) and selecting 'Manage Profile', then 'Edit Bio'.

**Suzanne Vardy** ([suzanne.vardy@des.qld.gov.au](mailto:suzanne.vardy@des.qld.gov.au))

SETAC AU Secretary

## **SETAC AU Membership Renewal**

A reminder that all membership renewal payments for SETAC members in Australasia should be made to SETAC Asia-Pacific, and not to the SETAC North America office in USA. The link to renew your membership, which is provided in the reminder email as your renewal date approaches, is <https://setacap.site-ym.com>.

Around 25% of members are still paying through SETAC North America and this causes several administrative problems including:

- Charges by the USA office for their staff time handling these wrongly made payments
- Currency exchange fee losses for AUD (or NZD) to USD then back to AUD
- Foreign transaction charges on the member's credit card (charged to the member by their credit card provider)
- It can take up to a year for wrongly paid renewal payments to reach SETAC AU via SETAC North America
- Members' expiry dates for their next membership renewal date may be set wrongly when they pay North America instead of Asia-Pacific
- Members may not get automatic reminders next time (the North America office does not send automatic reminders)
- The AU Treasurer has to waste his time untangling the administrative mess involving all of the above.

If a member does log in at [setac.org](http://setac.org) they can navigate to the Asia-Pacific payment page, but it is easier to use <https://setacap.site-ym.com>.

Also, a BIG NO NO is for a SETAC AU member to purchase a "combi-registration" at a SETAC Europe or SETAC North America conference (a "combi-registration" is a combined conference registration and membership payment). This causes total chaos in the membership system (all of the above plus others) and the membership fee may never reach AU, but instead is swallowed up in the conference.

A detailed guide to renewing your SETAC membership online can be found [here](#).

**Munro Mortimer** ([ase@hydrobiology.biz](mailto:ase@hydrobiology.biz)), Treasurer



### TECOmedical Group

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TECObio Pty. Ltd. ([www.tecobio.com](http://www.tecobio.com))

Contact: [britten@tecobio.com](mailto:britten@tecobio.com)

## Advertise in Endpoint

Do you or your organisation have a product, service or upcoming event that might be of interest to SETAC members? For example: technical services, vacant positions, meetings and workshops or student opportunities?

If so, you should consider advertising in Endpoint and on the SETAC AU webpage. The Endpoint newsletter goes out to a readership of >300 SETAC members across academia, industry and government, providing a great way to reach your target audiences.

### Details

- Advertising charges for Endpoint AND the webpage are \$100 half page, \$200 per full page.
- A Standing Committee with membership determined by Council will vet (by majority vote) all adverts on the basis of appropriateness of material relative to the aims & objectives of SETAC AU.

## Social Media

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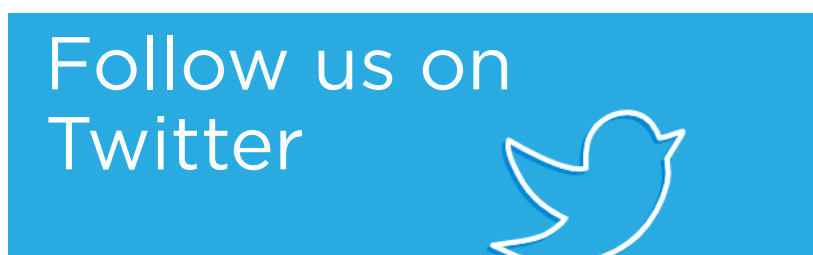
<https://www.facebook.com/SETACAU/>

For those of you that are savvy with social media, SETAC AU has both a Facebook page and Twitter handle. We encourage all members to use these media tools for communication and research dissemination through your networks.

If you are interested in using Twitter but don't know where to start, a SETAC AU guide to Twitter is available on the [SETAC AU website](#).



**Society of Environmental Toxicology and  
Chemistry Australasia - SETAC AU**



**@SETAC\_AU**



**SETAC Australasia**

**<https://www.linkedin.com/company/setac-au/>**



## Council Members (2019-2021)

Position	Elected Member
President	Andrew Harford (andrew.harford@environment.gov.au)
Immediate Past President	Anthony Chariton (anthony.chariton@mq.edu.au)
Vice Presidents	Kathryn Hassell (kathryn.hassell@rmit.edu.au) Tom Creswell (tom.creswell@ansto.gov.au)
Secretary	Suzanne Vardy (suzanne.vardy@des.qld.gov.au)
Treasurer	Munro Mortimer (ase@hydrobiology.biz)
Membership Officer	Chantal Lanctôt (chantal.lanctot@gmail.com)
Bulletin Editor	Reinier Mann (reinier.mann@des.qld.gov.au)
Communications Officer	Darren Koppel (darren.koppel@uts.edu.au)
Strategic Directions Officer	Katelyn Edge (Katelyn.Edge@epa.nsw.gov.au)
Student Representative	Gwilym Price (Gwilym.A.Price@student.uts.edu.au)

## Regional Representatives

Region	Elected Member
Australian Capital Territory	Julia Jasonsmith (Julia.jasonsmith@murrang.com.au)
New South Wales	Lisa Golding (lisa.golding@csiro.au)
Northern Territory	Ceiwen Pease (Ceiwen.Pease@environment.gov.au)
Queensland	Elissa O'Malley (e.omalley@uq.edu.au)
South Australia	Antony Lockyer (Lockyer.antony@electranet.com.au)
Tasmania	Cath King (cath.king@aad.gov.au)
Victoria	Jackie Myers (jackie.myers@rmit.edu.au)
Western Australia	Monique Gagnon (m.gagnon@curtin.edu.au)
Papua New Guinea	Kundo Hundang (guba.hundang@gmail.com)
New Zealand (North Island)	Karen Thompson (Karen.Thompson@niwa.co.nz)
New Zealand (South Island)	Sally Gaw (sally.gaw@canterbury.ac.nz)