Resume - Dr. Tom Cresswell

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Published research scientist in Aquatic Ecotoxicology. Highly motivated, reliable and committed. A strong team member with excellent communication skills and an eye for detail. Passion for understanding the impacts of human actions on the aquatic environment.

Current Employment (since August 2012)

Research Scientist, Aquatic Ecotoxicology, and Water Resources Sustainability Research Program Manager; Australian Nuclear Science and Technology Organisation (ANSTO)

Employed as a research scientist within the Aquatic Ecosystems research group. Use radioisotopes to track contaminant (metal, radionuclides, nanoparticles, nutrients) bioaccumulation and regulation by live plants and animals from simulated environments at environmentally-relevant concentrations. Use cutting-edge imaging tools (e.g. autoradiography and synchrotron XFM) at the conclusion of exposures to determine the localisation of bioaccumulated contaminants within the organism. Leading the development of live aquatic animal radioisotope tracing methods in research. Manager of research program with duties including staff mentoring, objective setting and end of year assessment. Responsible for contributing to the development and implementation of ANSTO's Environment research theme objectives through implementation of research plans, targets and activities to deliver research outcomes. Provide oversight of projects within assigned research program by review and reporting on project plans, coordination and allocation of resources and shared responsibility for budget control and expenditure. Foster a culture of high-performance that encourages innovation, improves productivity and promotes teamwork and collaboration.

Peer-Reviewed Publications

- Lanctôt, C. M., Al-Sid-Cheikh, M., Catarino, A. I., **Cresswell, T.**, Danis, B., Karapanagioti, H. K., Mincer, T., Oberhänsli, F., Swarzenski, P., Tolosa, I. and Metian, M. (2018). Application of nuclear techniques to environmental plastics research. Journal of Environmental Radioactivity; 192: 368-375 https://doi.org/10.1016/j.jenvrad.2018.07.019. (IF: 2.39)
- Johansen, M. P., Prentice, E., **Cresswell, T.** and Howell, N. (2018). Initial data on adsorption of Cs and Sr to the surfaces of microplastics with biofilm. *Journal of Environmental Radioactivity*; 190–191: 130-133. https://doi.org/10.1016/j.jenvrad.2018.05.001. (IF: 2.39).
- Corry, M., Harasti, D., Gaston, T., Mazumder, D., **Cresswell, T.** and Moltschaniwskyj, N. (2018). Functional role of the soft coral *Dendronephthya australis* in the benthic food web of temperate estuaries. *Marine Ecology Progress Series*; 593: 61-72. http://doi.org/10.3354/meps12498. (IF: 2.29).
- Hortal, S., Plett, K., Plett, J., **Cresswell, T**., Johansen, M., Pendall, E. and Anderson, I. 2017. Role of plant-fungal nutrient trading and host control in determining the competitive success of ectomycorrhizal fungi. *ISME Journal.* 11. 2666-2676. http://dx.doi.org/10.1038/ismej.2017.116. (IF: 9.66).
- **Cresswell, T**., Metian, M., Golding, L. A. and Wood, M. D. 2017. Aquatic live animal radiotracing studies for ecotoxicological applications: Addressing fundamental methodological deficiencies. *Journal of Environmental Radioactivity*. 178-179. 435-460. https://doi.org/10.1016/j.jenvrad.2017.05.017. (IF: 2.39).
- Lanctôt, C., **Cresswell, T**. and Melvin, S. D. 2017. Uptake and tissue distributions of cadmium, selenium and zinc in striped marsh frog tadpoles exposed during early post-embryonic development. *Ecotoxicology and Environment Safety*. 144, 291-299. http://dx.doi.org/10.1016/j.ecoenv.2017.06.047. (IF: 3.74).
- Lanctôt, C. M., **Cresswell, T.**, Callaghan, P.D., Melvin, S. D. 2017. Bioaccumulation and biodistribution of selenium in metamorphosing tadpoles. *Environmental Science & Technology*. 51, 5764-5773. http://dx.doi.org/10.1021/acs.est.7b00300. (IF: 6.198).
- **Cresswell, T.**, Mazumder, D., Callaghan, P.D., Nguyen, A., Corry, M., Simpson, S.L., 2017. Metal transfer among organs following short- and long-term exposures using autoradiography: cadmium bioaccumulation by the freshwater prawn *Macrobrachium australiense*. *Environmental Science & Technology*. 51. 4054-4060. http://dx.doi.org/10.1021/acs.est.6b06471. (IF: 6.198).
- Lanctôt, C. M., Melvin, S. D., **Cresswell, T.** 2017. Selenium speciation influences bioaccumulation in *Limnodynastes peronii* tadpoles. *Aquatic Toxicology*. 187, 1-8. http://dx.doi.org/10.1016/j.aquatox.2017.03.009. (IF: 4.129).
- Fowdar, H.S., Hatt, B.E., **Cresswell, T.**, Harrison, J.J., Cook, P.M.L., Deletic, A. 2017. Phosphorous fate and dynamics in greywater biofiltration systems. *Environmental Science & Technology*. 51, 2280-2287. http://dx.doi.org/10.1021/acs.est.6b04181. (IF: 6.198).
- Lee, J.H., Birch, G.F., **Cresswell, T**., Johansen, M.P., Adams, M.S., Simpson, S.L., 2015. Dietary ingestion of fine sediments and microalgae represent the dominant route of exposure and metal accumulation for Sydney rock oyster (*Saccostrea glomerata*): A biokinetic model for zinc. *Aquatic Toxicology.* 167, 46-54. http://dx.doi.org/10.1016/j.aquatox.2015.07.020. (IF: 4.129).
- **Cresswell, T.,** Simpson, S.L., Mazumder, D., Callaghan, P.D., Nguyen, A.P. 2014. Bioaccumulation kinetics and organ distribution of cadmium and zinc in the freshwater decapod crustacean *Macrobrachium australiense*. *Environmental Science & Technology,* 49, 1182-1189. http://dx.doi.org/10.1021/es505254w. (IF: 6.198).

- Sun, D., Hussain, H., Yi, Z., Siegele, R., **Cresswell, T**., Kong, L. and Cahill, D. 2014. Uptake and cellular distribution, in four plant species, of fluorescently labelled mesoporous silica nanoparticles. *Plant Cell Reports.* 33, 1389-1402. http://dx.doi.org/10.1007/s00299-014-1624-5. (IF: 2.869).
- **Cresswell, T**., Smith, R.E.W., Nugegoda, D., Simpson, S.L. 2014. Comparing trace metal bioaccumulation characteristics of three freshwater decapods of the genus *Macrobrachium*. *Aquatic Toxicology*, 152, 256-263. http://dx.doi.org/10.1016/j.aquatox.2014.04.015. (IF: 4.129).
- **Cresswell, T**., Simpson, S.L., Smith, R.E.W., Nugegoda, D., Mazumder, D. and Twining, J. 2014. Bioaccumulation and retention kinetics of cadmium from water and food by the freshwater decapod crustacean *Macrobrachium australiense*. *Aquatic Toxicology,* 148, 174-183, http://dx.doi.org/10.1016/j.aquatox.2014.01.006. (IF: 4.129).
- **Cresswell, T**., Smith, R.E.W. and Simpson, S.L. 2014. Challenges in understanding the sources of bioaccumulated metals in biota inhabiting turbid river systems. *Environmental Science and Pollution Research,* 21, 1960-1970, http://dx.doi.org/10.1007/s11356-013-2086-y. (IF: 2.741).
- **Cresswell, T**., Smith, R.E.W., Nugegoda, D. and Simpson, S.L. 2013. Challenges with tracing the fate and speciation of mine-derived metals in turbid river systems: implications for bioavailability. *Environmental Science and Pollution Research,* 20, 7803-7814, http://dx.doi.org/10.1007/s11356-013-2066-2. (IF: 2.741).
- **Cresswell, T**., Richards, J.P., Glegg, G. and Readman, J. 2006. The impact of legislation on the use and environmental concentration of Irgarol 1051 in UK coastal waters. *Marine Pollution Bulletin*, 52, 1169-1175. http://dx.doi.org/10.1016/j.marpolbul.2006.01.014. (IF: 3.146).

Book Chapters

- **Cresswell, T**. 2018. Reducing uncertainties in live monitoring of radiation in wildlife. In: Biomarkers of Radiation in The Environment. Springer. *In preparation.*

Expert Witness Roles

- **Cresswell, T.** Review of environmental effects of heavy metals in a sediment plume i.e. potential for acute and chronic ecotoxic response of aquatic biota as a result of proposed iron sand mining off the South Taranaki Bight, New Zealand. Attended expert conferencing and answered questions in public hearing from marine consents and marine discharge consents decision making committee. Consulted as expert witness on behalf of the New Zealand Environmental Protection Agency (NZ-EPA). December 2016-March 2017.

Commercial Reports

- Johansen, M., Child, D., **Cresswell**, **T**., Davis, E., Harrison, J., Hotchkis, M., Thiruvoth, S. Radiological dose rates to sea turtles at the Montebello Islands former nuclear test sites, with radiological protection advice to turtle researchers. In-confidence Report to the Department of Biodiversity, Conservation and Attractions, Government of Western Australia. June 2018. 52 pp.
- **Cresswell, T.** and Johansen, M. Report to Micromet Pty Ltd on testing of electrolytic water treatment system. December 2015. 16 pp.
- **Cresswell, T.,** Hughes, C., Johansen, M., Mazumder, D., Peterson, M., Hollins, S. Review of the water quality monitoring and assessment studies undertaken for the Haywards Bay Development. A report prepared for the Wollongong City Council. September 2014. ANSTO/C-1388. 41 pp.

Invited Presentations

- **Cresswell, T.** 2018. How rad is your science? Using nuclear techniques to enhance environmental toxicology. Future Industries Institute, University of South Australia. 30 August. Invited seminar.
- **Cresswell, T.** 2018. Applied physics at ANSTO: An introduction to ANSTO and using Nuclear Physics in Environmental Research. University of South Australia 4th year Applied Physics undergraduate course. 29 August. Guest lecture.
- **Cresswell, T.**, 2017. How rad is your science? Using nuclear techniques in environmental toxicology. Science Teachers Association of New South Wales (STANSW) – Biology Earth & Environmental Science and Senior Science Teachers Conference. 24 March. Keynote Presentation.

Conference Papers

- **Cresswell, T**., Metian, M., Golding, L. A. and Wood, M. D. 2017. Reducing uncertainties in live monitoring of radiation in wildlife. NATO Advanced Research Workshop: Biomarkers of Radiation in the Environment. Yerevan, Armenia: Platform presentation. Workshop organising committee and scientific program organising committee.

- **Cresswell, T.**, Prentice, E., Callaghan, P., Williams, Z., Nguyen, A.P., Howell, N., Johansen, M.P. 2017. Investigating the bioaccumulation kinetics and internal distribution of the radionuclides caesium and strontium under environmental conditions by the mangrove crab *Paragrapsus laevis*. International Conference of Radioecology and Environmental Radioactivity. 2-8 September. Berlin, Germany: Platform Presentation.
- **Cresswell, T.**, Johansen, M.P., Prentice, E., Nguyen, A.P., Williams, Z., Howell, N., Golding, L.A., Vinod, D., Lanctôt, C., Hull, R., Callaghan, P. 2016. Advances in radioisotope tracing of contaminants in ecotoxicology. EmCon/WiOW Conference. 21-23 September. Sydney, Australia: Poster Presentation.
- **Cresswell, T.**, Prentice, E., Callaghan, P., Williams, Z., Nguyen, A.P., Howell, N., Johansen, M.P. 2016. Investigating the bioaccumulation kinetics and internal distribution of the radionuclides caesium and strontium under environmental conditions. SPERA Conference. 7-9 September. Bali, Indonesia: Platform Presentation.
- **Cresswell, T**., Metian, M., Golding, L.A., Wood, M.D. 2016. Live animal radiotracing studies for ecotoxicological applications: Addressing fundamental methodological deficiencies. SPERA Conference. 7-9 September. Bali, Indonesia: Platform Presentation.
- **Cresswell, T.** 2016. Trends in Environmental Sample Preparation Workshop: Methods for live animal radioanalysis in tracer studies. SPERA/SERIR Workshop. 6 September. Bali, Indonesia: Platform Presentation.
- **Cresswell, T.,** Simpson, S.L., Mazumder, D., Callaghan, P., Nguyen, A.P., Corry, M. 2015. Radioisotope techniques and aquatic ecotoxicology: understanding kinetics and organ distribution of metals. SETAC Europe Conference. 3-7 May; Barcelona, Spain: Platform Presentation.
- **Cresswell, T.**, Simpson, S.L., Mazumder, D., Callaghan, P., Nguyen, A.P., Corry, M. 2014. Investigating the kinetics of Cd transport between internal organs of the freshwater decapod *Macrobrachium australiense*. SETAC-AP/AU Adelaide Conference. 14-17 September; Adelaide, Australia: Platform Presentation.
- Twining, J & **Cresswell, T**. 2014. Multiple pathway uptake and loss of cadmium by a crustacean, Macrobrachium australiense. Presented at an IAEA Training Mission. RAS/7/021 - Establishment of Transfer Factors and Dose Assessment for Marine Organisms from Contaminants Released from Nuclear Activities. Malaysian Nuclear Agency, 11-22 Aug: Platform Presentation.
- **Cresswell, T**., Smith, R.W., Nugegoda, D., Simpson, S. 2013. Sources and mechanisms of metal bioaccumulation in the Lagaip and Strickland Rivers, Papua New Guinea. SETAC-AU Madang Workshop. 11-12 Nov; Madang, Papua New Guinea: Platform Presentation.
- **Cresswell, T**., Simpson, S.L., Mazumder, D., Callaghan, P., Nguyen, A. 2013. Where do the metals go? Investigating uptake, retention and spatial distribution of cadmium and zinc using radiotracers within a freshwater decapod crustacean. SETAC-AU Melbourne Conference. 1-3 Oct; Melbourne, Australia: Platform Presentation.
- **Cresswell, T**., Simpson, S.L., Twinning, J., Mazumder, D., Smith, R.E.W. and Nugegoda, D. 2012. Sources and mechanisms of cadmium bioaccumulation by the freshwater decapod crustacean *Macrobrachium australiense*. 6th SETAC World Congress. Berlin, 20-24th May: Platform Presentation.
- **Cresswell, T**., Simpson, S.L., Smith, R.E.W. and Nugegoda, D. 2012. Sources of cadmium bioaccumulation by the freshwater decapod crustacean *Macrobrachium australiense*. AINSE Radiation 2012 Conference. Sydney, 15-17th February: Platform Presentation.

Academic Qualifications:

PhD in Aquatic Chemistry and Ecotoxicology, CSIRO Land and Water and RMIT University, Australia, 2013
Three and a half year PhD program, funded by an Endeavour International Postgraduate Research Scholarship (IPRS) and Commonwealth Science and Industry Research Organisation (CSIRO) Top-Up Scholarship. Thesis entitled *"Sources and mechanisms of metal bioaccumulation in the Lagaip and Strickland Rivers, Papua New Guinea"* aimed at understanding trace metal accumulation by a freshwater prawn species in a highly turbid, tropical river system impacted by gold mining.

MSc Applied Marine Science (High Distinction), University of Plymouth, UK, 2005
One-year postgraduate course providing scientific understanding of the coastal environment and the pressures placed on it, developing the skills required to assimilate knowledge over a wide range of disciplines and applying it to environmental analyses. Specialised in marine chemistry, marine pollution and marine ecotoxicology. Published manuscript from MSc Thesis 2006.

BSc (1st Class Hons.) Ocean Science, University of Plymouth, UK, 2003
Three-year degree course combining oceanography with marine biology and chemistry majoring in marine environmental protection and management.

Professional Associations

- Vice President, SETAC-AU (Society of Environmental Toxicology and Chemistry – Australasia), Sep 2015-present. Role includes engaging early career researchers through the development and running of a Mentor Programme within the society.
- NSW State Representative, SETAC-AU, Sep 2014-Sep 2015.
- Secretary, SPERA (South Pacific Environmental Radioactivity Association), Sep 2016-present.
- Member, IUR (International Union of Radioecology), Jan 2015-present.
- Affiliate Researcher, CSIRO, Jun 2015-present.
- Research Fellow, The University of Melbourne, Mar 2018-present).
- External Postgraduate Student Supervisor, UTS (Mar 2015-present), Griffith University (Jan 2017-present). The University of Melbourne (Jun 2018-present).

Funding and Awards

- 2016 – University of Wollongong/ANSTO Collaborative Seed Project Grant of AUD$6,000. Study title: Naturally occurring radioactive materials in the ocean: radiological and ecotoxicological effects on benthic marine organisms.
- 2013-2016 – ANSTO co-investigator of seven successful Australian Institute of Nuclear Science and Engineering (AINSE) research awards totalling AUD$68,995.
- 2011 – AINSE Research Award for 2011. AUD$14,750 to conduct radiotracer work in collaboration with RMIT University, CSIRO Land and Water and ANSTO Environment as part of PhD research.
- 2009 – Endeavour International Postgraduate Research Scholarship (IPRS) to conduct PhD.

Key Skills

Student supervision and mentoring:

- Current Co-supervisor for 5 PhD students and 2 BSc (Hons). students during their collaborative research at ANSTO.
- Co-supervisor of 3 completed PhD and 1 completed BSc (Hons) as of 2018.
- Supervisor of 2 ANSTO graduates 2013-2017.
- Career mentor for 2 postgraduate students and 2 undergraduate students from RMIT University.
- AINSE WISE school mentor for 3 undergraduate students.

Laboratory:

- Extensive use of radiotracers with freshwater and marine fauna including alga, snails, prawns, crabs, oysters, ascidians, amphibians\ and terrestrial flora to determine kinetics of element/nutrient bioaccumulation from a range of sources. Trained to meet ARPANSA and international standards for handling unsealed radiation sources and registered with ANSTO dosimetry monitoring service (including full body scans).
- Heavily involved in live-animal radiotracer method development.
- Use of autoradiographic imaging techniques to determine location of internalised contaminants within flora and fauna to understand effects and potential for bioaccumulation through the food chain.
- Trained AQIS Quarantine Accredited Person (QAP) for handling and disposal of quarantined samples.
- Ultra-trace sample handling and analysis techniques learned to minimise contamination and achieve sub-ppb metal detection limits.
- Analysis of waters, particulates, plants and aquatic invertebrates for total and exchangeable fractions of trace metals.
- Analysis for ultra-trace organic compounds in environmental samples.
- Analytical equipment used includes ICP-AES, ICP-MS, GC-MS, GF-AAS, F-AAS, LaBr Gamma Spectrometer.

Field:

- 8 days in 2015 working in the remote Montebello Islands at former nuclear weapons test sites. Safety officer for the trip ensuring all staff were protected from radiological exposure and inhalation of radioactive particles during sampling. Collected terrestrial and marine samples to understand the radiological effects to marine life in the archipelago.
- 30 days in 2009/2010 collecting trace metal samples from PNG. Samples collected from helicopter and aluminium long boat. Entailed processing samples in the field without a 'clean' laboratory as well as observing 'clean' techniques to avoid contamination during sampling and processing at the mine site. Personally planned field trip and organised/dispatched all field gear and liaised with mine staff to plan sampling campaign.
- In 2005, collected water samples from the south coast of the UK, processed using a liquid-liquid extraction method before being analysed by GC-MS. Care was taken at all times to minimise contamination as target compound (booster biocide Irgarol-1051) was in ng/L range.
- Analysis of copper concentrations in the Fowey Estuary, UK, establishing a link to antifouling paints.
- Analytical equipment used included YSI 6600 CTD probes, Valeport Oceanographic Current Meters

Additional Skills

Science Communication and Community Engagement:

- Part of panel discussion for the Australia Museum's 'Culture Up Late' series February 2018 discussing global environmental issues to a broad spectrum of the public.
- Routinely provide ANSTO communications with science stories from personal, collaborator's and student's research.
- Participate in AINSE events such as Winter School, PGRA 'O Week', WISE School.
- Engaged in the CSIRO Scientists in Schools and paired with a local high school to engage students in environmental science.
- Regularly participate in "Meet an Expert" videoconferences organised by ANSTO to engage rural high school students from across the country in Nuclear Science and to answer their questions on careers in Environmental Science.
- Presented on ANSTO Plastics Project to high school students at the Australian Museum for National Science Week 2015.
- Participated in several community science engagements (e.g. 'Pint of Science', 'Nerd Night', and 'Profs and Pints') to a wide range of ages and audiences in Sydney and Perth.
- Gave talk on my science career at the National Youth Science Forum (NYSF) event in 2015 for NSW students prior to them traveling to Canberra.
- Presented to high school students at the Taronga Zoo Youth Enviro Forum 2015 about plastic pollution in oceans.

Improvisation:

- Ten months sailing a 16 m yacht across the South Pacific Ocean in 2006 required constant improvisation in order to maintain the yacht in remote islands without adequate facilities, e.g. repairing a broken boom using local timber and tools from a small island in French Polynesia.