Curriculum Vitae

Dr RACHAEL SMITH

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Profile

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Personal mission statement

My mission is to deliver scientific evidence to impact-makers for positive environmental change.
From design to uptake, I focus on impact driven science: an expert in water quality, pesticide ecotoxicology and environmental risk assessment; an experienced science liaison for delivering evidence needs for environmental decision-makers; and a special interest in trust in science, communicating and translating science for science end-users and the broader public.

Expertise

Environment and water quality:

- ecological risk assessments and ecosystem intervention risk assessment
- pesticide ecotoxicology
- mixture toxicity and multiple stressors
- water quality guideline development
- agricultural contaminants and urban stormwater pollution
- Great Barrier Reef and catchments
- scientific method development and experimental design
- chlorophyll-a fluorescence techniques
- monitoring and evaluation, field and laboratory techniques
- statistical and mathematical analysis

Evidence for environmental policy and management:

- review and synthesis of evidence for policy end-users
- Great Barrier Reef socio-ecological systems
- science-based project management and governance
- Management of expert panels for review and oversight
- science research prioritisation, impact and investment
- quality assessment and interpretation of data
- critical thinking and problem solving

Communicating and translating science

- evaluation, translation and communication of scientific evidence for policy and management decision-making

- end-user and stakeholder engagement, co-design and needs identification
- science communication for media, stakeholders and policy

Affiliations

- C2O Consulting, Affiliated Scientist
- James Cook University, Adjunct Research Associate
- Whitsunday Conservation Council, Affiliated Member

Education, training and awards

Degrees

2018 Masters of Applied Science (Research), awarded by Queensland University of Technology (QUT)

2011 Doctor of Philosophy awarded by University of Technology, Sydney (UTS)

2001 Bachelor of Science with Honours (Environmental Science), University of Technology, Sydney (UTS)

Short Courses and training

Good2Great Performance Leadership training. October 2022, 2inspire International

EZRA Career and Leadership Coaching. March - June 2022, online. EZRA Coaching.

Science Communication: The Essentials. February 2022, online. Alan Alda Centre for Science Communication, Stonybrook University.

Evidence Synthesis (on demand). UK Centre for Ecology and Hydrology

iActivate (Social Enterprise short course), Central Queensland University

Writing Technical Documents in Plain English. 6th February, 2018, Brisbane. Department of Environment and Science.

Journal Paper Writing Workshop. 13th – 17th October, 2014. Peter Hairsine.

Continuing professional education in contaminated site assessment, remediation and management. Module B: Planning effective site assessment. University of Technology, Sydney, 28 – 30 May, 2009.

Achievement Awards

Premier's Award for Excellence 2020 to the Paddock to Reef Program and Reef Report Card for the category 'Protect the Great Barrier Reef'.

Empower People Award to Sandy Creek Intensive Monitoring Project team (2016), Queensland Department of Science, Information Technology and Innovation's

Highly Commended Award to the Water Quality and Investigations team for Performance and Productivity (2013), Queensland Department of Science,

Information Technology, Innovation and the Arts'.

Early Career Researcher Award (2012), Department of Environmental and Resource Management Award to attend the Australian Academy of Science's Science at the Shine Dome event on 2-4 May 2012 in Canberra.

Employment & research experience

Scientist

C2O Consulting (Coasts, Climate, Oceans)
March 2025 – Current

Summary

Job Description:

The role involves synthesising and interpreting multidisciplinary scientific evidence on the condition, impacts and management of water quality associated with the Great Barrier Reef and its catchments to develop strategic management and investment guidance for government and regional decision-makers.

Main Tasks:

- Synthesising scientific evidence and analysing data on pesticide risk in catchments and the inshore marine zone for the Wet Tropics, Burdekin, Mackay Whitsunday and Fitzroy regions
- Synthesising evidence on management practice behaviour change, stewardship and social monitoring for the Wet Tropics, Burdekin, Mackay Whitsunday and Fitzroy regions.
- Collating data and information for a regional prioritisation of nutrients, sediment and pesticides for the Wet Tropics, Burdekin and Mackay Whitsunday regions.
- Collating data and information for the development of basin-level management strategies, using systems and values-based approaches.

Senior Scientific Officer & Acting Principal Project Officer

Office of the Great Barrier Reef
Department of Environment and Science
Queensland State Government

2017 – 2025 (full time and part time)

Summary

Job Description:

Coordination, interpretation and communication of scientific and technical information for policy and management decision-making and the delivery of scientific evidence to underpin the Reef 2050 Water Quality Improvement Plan. This included the assessment of pesticide risk and the development of a management framework to spatially prioritise actions and interventions to improve water quality for the Great

Barrier Reef. In addition to the coordination and translation of evidence collected through the Paddock to Reef Integrated Monitoring, Modelling and Reporting (Paddock to Reef) Program, synthesized evidence from Reef Scientific Consensus Statement and broader Reef Water Quality science priorities.

Main Tasks:

Working within a team to assess the risk of pollutants (sediments, nutrients and pesticides) on Great Barrier Reef marine and freshwater habitats, I lead the assessment of pesticide risks and worked with the team to develop a management response framework that tied multidisciplinary lines of evidence together to produce strategic guidance for investment and implementation of management interventions.

More generally, the role involved research, review, analysis, synthesis, translation and communication of scientific evidence for decision-makers. Some major projects included managing the delivery of the Reef 2022 Scientific Consensus Statement, Reef Water Quality Research and Development Strategy, Reef Water Quality Targets, and Reef Water Quality report cards.

Day-to-day operations included engagement with internal and external stakeholders and science and research providers. Translation of highly technical information into accurate and effective plain English responses. Contributing to the coordination and delivery of monitoring and science programs for the Office of the Great Barrier Reef.

Responsible for: Sourcing, translating and communicating science evidence for reports, briefing notes, media enquiries and correspondence relating to the Reef 2050 Water Quality Improvement Plan, Paddock to Reef Program and other science needs. Providing technical support and advice for executive committees, working groups and expert panels, including the Reef 2050 Executive Steering Committee, the Reef Water Quality Independent Science Panel, Reef 2050 Independent Expert Panel, Queensland Chief Scientist and Paddock to Reef program leaders.

Highlights:

- Project Manager for the Queensland Government to deliver the 2022 Reef Scientific Consensus Statement. This has involved working with an independent science team to ensure the delivery of transparent and robust scientific evidence to underpin the update of the Reef 2050 Water Quality Improvement Plan. Through my project management I have ensured the Scientific Consensus Statement has transitioned to an international standard of evidence synthesis and will provide evidence to policy and management decision-makers that is accessible, transparent and robust and will help to improve trust in the science from stakeholders.
- Leading an ecological risk assessment of pesticide mixtures to inform investment prioritisation for water quality management of the Great Barrier Reef.
- Working within the team leading the evaluation and collation of the scientific evidence provided for a Senate Inquiry and State Parliamentary Committee Hearing.
- Collaborating with social science experts (University of Melbourne and CSIRO) on misinformation and public trust of science, including organizing a large workshop with Dr John Cook (University of Melbourne) to teach skills to science

and government representatives in countering misinformation, and co-authoring a publication on community trust in Great Barrier Reef related science.
- Project lead on the Reef Water Quality Research Development and Innovation Strategy that involved translating knowledge gaps from the 2017 Scientific Consensus Statement into research priorities for improving water quality for the Great Barrier Reef. This process involved engaging and collaborating with policy and management, stakeholders and science experts.
- Assist researchers with grant applications to ensure the science outcomes will have uptake and use by end-users
- Provide advice on research funding and development of strategies to improve research impact for government policy needs.
- Science communication, addressing misinformation and doubt in scientific evidence and science quality,
- Convened a workshop with Great Barrier Reef experts to identify future science challenges for Reef Water Quality

Research projects and tasks: Co-supervisor of PhD candidates, bibliometrics study for evaluating the scientific evidence base supporting the Reef 2050 Water Quality Improvement Plan, Great Barrier Reef Foundation Citizen Science project, National Environment Science Program Tropical Water Quality Hub conceptual models, contribution to scientific publications (see list below), reviewing of publications/technical reports.

Risk Review Researcher

Reef Restoration and Adaptation Program
Australian Institute for Marine Science

2023 – 2025 (0.8 FTE)

Summary

Job Description: supporting the Reef Restoration and Adaptation Program's (RRAP) risk assessment of reef interventions for restoring and increasing resilience of coral reefs to climate change impacts in the Great Barrier Reef, including supporting an international expert group's independent oversight.

Main Tasks: development of a novel method for assessing the risk of deploying large-scale coral reef interventions for the Great Barrier Reef Marine Park that considers the potential for, and management of, genetic, ecological, social and cultural risks. Methods for risk assessment include quantitative and qualitative approaches, including expert elicitation methods. I also participate in secretariat tasks to support the independent oversight and quality assurance roles of an independent expert group, the Intervention Risk Review Group. This has included the organization and delivery of a week-long workshop for national and international experts.

Scientist (Pesticides)

Water Quality and Investigations
(Former) Department of Science, Information Technology and Innovation
Queensland State Government

2010 - 2017

Summary

Job description: Coordinator of a large-scale pesticide monitoring program to assess pesticide pollution transported to the Great Barrier Reef from agricultural areas. The program covers fifteen catchments in tropical Queensland and has been in operation since 2009. The program is a subsidiary of the Great Barrier Reef Catchment Loads Monitoring Program, a component of the Paddock to Reef Program that is jointly funded by the Australian Federal and Queensland State governments instated to measure and report on the goal and targets of the Reef Water Quality Improvement Plan.

Main tasks: manage a small team of scientists, coordinate pesticide sample collection, manage sample analysis and data collation, ensure quality assurance/ quality control of data, assess data and report incidences of concern, collation and quality checking of pesticide exposure data, mathematical and statistical analysis, data preparation for model validation, and communicating results through stakeholder reporting, peer-reviewed scientific publications, workshops and conferences.

Responsible for: ensuring annual pesticide monitoring targets for spatial and temporal coverage are met, improving and enhancing the pesticide program monitoring design, advising stakeholders on pesticide toxicity and pesticide fate, training Natural Resource Management and State Government personnel on pesticide sampling methodology, collaborating with partners of associated programs, data management and data provision.

Research Projects: Pesticide risk assessment for the 2017 Scientific Consensus Statement; Mackay Whitsunday Regional Water Quality Improvement Plan; Deriving Australian and New Zealand water quality guidelines for priority pesticides; Development of ecologically relevant pesticide targets for the Great Barrier Reef (Masters); Pesticide transport, fate and exposure in the Great Barrier Reef and its coastal ecosystems; Probabilistic ecological risk assessments for pesticide mixtures; Developing a method for calculating pesticide toxic loads; Influence of climate on pesticide pollution in the Great Barrier Reef catchments; Toxicity of photosystem II herbicides to tropical phototrophic species; Estrogenic activity associated with agricultural pesticides; Examining relationships of pesticides and endocrine disruption in Barramundi.

Research collaborations: Collaborations with universities and government departments have included; James Cook University, University of Technology Sydney, Australian Catholic University, University of Queensland, Queensland University of Technology, Griffith University, CSIRO, Department of Natural Resources and Management, the Department of Premiers and Cabinet and the Department of Environment and Heritage Protection.

Highlights

- Developed new pesticide targets for the Reef 2050 Water Quality Improvement Plan and a pesticide risk metric to measure progress towards these targets based on a multisubstance and multi-species ecological risk approach, in conjunction with my Master's Research Degree. This method is still currently in use and reported through the Reef Water Quality report cards.

- Advised on pesticides (e.g. water quality monitoring, chemistry and ecological risk) to the Water 2050 Quality Improvement Plan's Independent Science Panel, Paddock to Reef Coordination and Advisory Group, regional groups for the generation of Water Quality Improvement Plans and regional report cards.
- Developed a new method for determining toxicity-based pesticide loads which provides an assessment of the relative toxicity of the load to aquatic biota. This method replaced the original load-based method for measuring pesticide reductions from improved agricultural management practices and was implemented into the QLD Government's annual Reef Water Quality report card reporting and incorporated into the Paddock to Reef water quality modeling for the Great Barrier Reef Water Quality Improvement Plan.
- Instrumental in aligning the monitoring and reporting of two separate pesticide monitoring programs; the GBR Catchment Loads Monitoring Program and the Great Barrier Reef Marine Park Authorities Pesticide Marine Monitoring Program.
- Worked with a team to derive new ANZECC/ARMCANZ water quality guideline values for twenty-eight pesticides for the revision of the Australian and New Zealand Water Quality Guidelines. This process provided experience in quality checking of ecotoxicity data, generating species sensitivity distributions according to the revised methods of the Australian and New Zealand water quality guidelines, and database development and management. These guidelines will be submitted as part of the revision of the Australian and New Zealand water quality guidelines.
- Engaged with farmers and stakeholders in the Sandy Creek catchment area to deliver a citizen science project for monitoring pesticides in Sandy Creek, Mackay.

Research Scientist

Charles Darwin Foundation
Santa Cruz, Galapagos Islands

2015 - 2016

Summary
Assessed the potential ecological risk of three herbicides used for the control of blackberry bush in Galapagos National Park, Los Gemelos, Santa Cruz.

Masters degree by research (Mathematics and Statistics)

School of Mathematics and Statistics
Queensland University of Technology

2014 - 2018

Summary
Working under the supervision of Professor Kerrie Mengersen to develop a mathematical method that quantifies reductions in pesticides transported to the Great Barrier Reef to align with the long-term goals of the Australian and Queensland Government's Reef Plan; "ensure that by 2020 the quality of water entering the reef

from broadscale land use has no detrimental impact on the health and resilience of the Great Barrier Reef."

PhD Candidature
Department of Environmental Sciences
University of Technology, Sydney

2002-2011

Summary

Working under the supervision of Professor Peter Ralph to develop a method for identifying pesticides and pesticide mixtures in water samples using chlorophyll a fluorescence.

Teaching Assistant
Department of Environmental Sciences
University of Technology, Sydney
2004-2010

School of Arts and Science,
Australian Catholic University, Sydney
2010

Science consultant – water and sediment quality
Logic Space Consulting, Sydney
Department of Environmental Science, UTS
2001-2002

Researcher – Behavioural Ecology
Staatsbosbeheer and RIZA, Holland
2000-2001

List of publications, presentations & awarded research funding

Peer-reviewed publications and reports

1. Curnock, M.I., Nembhard, D., Smith, R., Sambrook, K., Hobman, E.V., Mankad, A., Pert, P.L. and Chamberland, E., 2024. Finding common ground: Understanding and engaging with science mistrust in the Great barrier reef region. *Plos one*, *19*(8), p.e0308252.
2. Parikh, A., Pansu, J., Stow, A., Warne, M.S.J., Chivas, C., Greenfield, P., Boyer, F., Simpson, S., **Smith, R.**, Gruythuysen, J. and Carlin, G., 2024. Environmental DNA highlights the

influence of salinity and agricultural run-off on coastal fish assemblages in the Great Barrier Reef region. Environmental Pollution, p.123954.

3. Hook, S.E., **Smith, R.A.,** Waltham, N. and Warne, M.S.J., 2024. Pesticides in the Great Barrier Reef catchment area: Plausible risks to fish populations. Integrated Environmental Assessment and Management.
4. Skerratt, J., Baird, M.E., Mongin, M., Ellis, R., **Smith, R.A.**, Shaw, M. and Steven, A.D., 2023. Dispersal of the pesticide diuron in the Great Barrier Reef. Science of The Total Environment, 879, p.163041.
5. Warne, M.S.J., Neelamraju, C., Strauss, J., Turner, R.D.R., **Smith, R.A.** and Mann, R.M., 2023. Estimating the aquatic risk from exposure to up to twenty-two pesticide active ingredients in waterways discharging to the Great Barrier Reef. Science of the Total Environment, 892, p.164632.
6. King, O.C., van de Merwe, J.P., Brown, C.J., Warne, M.S.J. and **Smith, R.A.**, 2022. Individual and combined effects of diuron and light reduction on marine microalgae. Ecotoxicology and Environmental Safety, 241, p.113729.
7. Warne, M.S.J., Turner, R.D., Davis, A.M., **Smith, R.** and Huang, A., 2022. Temporal variation of imidacloprid concentration and risk in waterways discharging to the Great Barrier Reef and potential causes. Science of The Total Environment, 823, p.153556.
8. King OC**, Smith RA,** Warne MSJ, van de Merwe JP, Connolly RM, Brown CJ, 2021. Combined impacts of photosystem II-inhibiting herbicides and light availability on seagrass and marine microalgae. Mar Ecol Prog Ser 668:215-230. https://doi.org/10.3354/meps13717
9. Warne, M.S.J., **Smith, R.A.** and Turner, R.D.R., 2020. Analysis of pesticide mixtures discharged to the lagoon of the Great Barrier Reef, Australia. Environmental Pollution, 265, p.114088.
10. MStJ, W., Neelamraju, C., Strauss, J., **Smith, R.A.,** Turner, R.D.R. and Mann, R.M., 2020. Development of a method for estimating the toxicity of pesticide mixtures and a Pesticide Risk Baseline for the Reef 2050 Water Quality Improvement Plan. Brisbane: Department of Environment and Science, Queensland Government, p.3.
11. Negri, A.P., **Smith, R.A.**, King, O., Frangos, J., Warne, M.S.J. and Uthicke, S., 2019. Adjusting tropical marine water quality guideline values for elevated ocean temperatures. Environmental science & technology, 54(2), pp.1102-1110.
12. Warne, M.S.J., King, O. and **Smith, R.A.**, 2018. Ecotoxicity thresholds for ametryn, diuron, hexazinone and simazine in fresh and marine waters. Environmental Science and Pollution Research, pp.1-19.
13. Huggins, R., Wallace, R., Orr, D.N., **Smith, R.A.**, Taylor, O., King, O.C., Gardiner, R., Wallace, S., Ferguson, B., Preston, S. and Simpson, S., 2018. Total suspended solids, nutrient and pesticide loads (2015–2016) for rivers that discharge to the Great Barrier Reef–Great Barrier Reef Catchment Loads Monitoring Program.
14. Hook, S.E., Mondon, J., Revill, A.T., Greenfield, P.A., **Smith, R.A.**, Turner, R.D., Corbett, P.A. and Warne, M.S.J., 2018. Transcriptomic, lipid, and histological profiles suggest changes in health in fish from a pesticide hot spot. Marine environmental research, 140, pp.299-321.
15. Star, M., Rolfe, J., McCosker, K., **Smith, R.**, Ellis, R., Waters, D. and Waterhouse, J., 2018. Targeting for pollutant reductions in the Great Barrier Reef river catchments. Environmental Science & Policy, 89, pp.365-377.
16. Waterhouse, J., Brodie, J., Tracey, D., **Smith, R.**, Vandergragt, M., Collier, C., Petus, C., Baird, M., Kroon, F., Mann, R., Sutcliffe, T., Waters, D., Adame, F., 2017. Scientific Consensus Statement 2017: A synthesis of the science of land-based water quality

impacts on the Great Barrier Reef, Chapter 3: The risk from anthropogenic pollutants to Great Barrier Reef coastal and marine ecosystems. State of Queensland, 2017

17. Bartley, R., Waters, D., Turner, R., Kroon, F., Wilkinson, S., Garzon-Garcia, A., Kuhnert, P., Lewis, S., **Smith, R.**, Bainbridge, Z., Olley, J., Brooks, A., Burton, J., Brodie, J., Waterhouse, J., 2017. Scientific Consensus Statement 2017: A synthesis of the science of land-based water quality impacts on the Great Barrier Reef, Chapter 2: Sources of sediment, nutrients, pesticides and other pollutants to the Great Barrier Reef. State of Queensland, 2017.
18. Brodie, J., Baird, M., Waterhouse, J., Mongin, M., Skerratt, J., Robillot, C., **Smith, R.**, Mann, R., Warne, M., 2017. Development of basin-specific ecologically relevant water quality targets for the Great Barrier Reef. TropWATER Report No. 17/38, James Cook University, Published by the State of Queensland, Brisbane, Australia. 68 pp.
19. O. C. King, **R. A. Smith**, R. M. Mann and M. St. J. Warne. 2017. Proposed aquatic ecosystem protection guideline values for pesticides commonly used in the Great Barrier Reef catchment area: Part 1 (amended) - 2,4-D, Ametryn, Diuron, Glyphosate, Hexazinone, Imazapic, Imidacloprid, Isoxaflutole, Metolachlor, Metribuzin, Metsulfuron-methyl, Simazine, Tebuthiuron. Department of Environment and Science. Brisbane, Queensland, Australia. 296 pp.
20. O. C. King, **R. A. Smith**, M. St. J. Warne, J. S. Frangos and R. M. Mann. 2017. Proposed aquatic ecosystem protection guideline values for pesticides commonly used in the Great Barrier Reef catchment area: Part 2 - Bromacil, Chlorothalonil, Fipronil, Fluometuron, Fluroxypyr, Haloxyfop, MCPA, Pendimethalin, Prometryn, Propazine, Propiconazole, Terbutryn, Triclopyr and Terbuthylazine. Department of Science, Information Technology and Innovation. Brisbane, Queensland, Australia.
21. King OC, **Smith RA** and Warne MStJ. 2017a. Proposed Default Guideline Values for Toxicants: Diuron – Freshwater. Department of Science, Information Technology and Innovation, Brisbane, Queensland, Australia, 56 pp.
22. King OC, **Smith RA** and Warne MStJ. 2017b. Proposed Default Guideline Values for Toxicants: Diuron – Marine. Department of Science, Information Technology and Innovation, Brisbane, Queensland, Australia, 37 pp.
23. Hook, S.E., Kroon, F.J., Greenfield, P.A., Warne, M.StJ., **Smith, R.A.**, Turner, R.D., 2017. Hepatic transcriptomic profiles from barramundi, Lates calcarifer, as a means of assessing organism health and identifying stressors in rivers in northern Queensland. Marine Environmental Research, 129, pp. 166-179.
24. Hook, S.E., Kroon, F.J., Metcalfe, S., Greenfield, P.A., Moncuquet, P., McGrath, A., **Smith, R.**, Warne, M.S.J., Turner, R.D., McKeown, A. and Westcott, D.A., 2017. Global transcriptomic profiling in barramundi (Lates calcarifer) from rivers impacted by differing agricultural land uses. Environmental toxicology and chemistry, 36(1), pp.103-112.
25. **Smith, R.A.**, Warne, M.S.J., Mengersen, K. and Turner, R.D., 2016. An improved method for calculating toxicity-based pollutant loads: Part 1. Method development. Integrated Environmental Assessment and Management, 13(4), pp.746-753.
26. **Smith, R.A.**, Warne, M.S.J., Mengersen, K. and Turner, R.D., 2016. An improved method for calculating toxicity-based pollutant loads: Part 2. Application to contaminants discharged to the Great Barrier Reef, Queensland, Australia. Integrated Environmental Assessment and Management, 13(4), pp.754-764.
27. Uthicke, S., Fabricius, K., De'ath, G., Negri, A., Warne, M., **Smith, R.**, Noonan, S., Johansson, C., Gorsuch, H. and Anthony, K. (2016) Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for

management: Final Report Project 1.6. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (144pp.).

28. Kroon, F.J., Berry, K.L.E., Brinkman, D.L., Davis, A., King, O., Kookana, R., Lewis, S., Leusch, F., Makarynskyy, O., Melvin, S., Muller, J., Neale, P., Negri, A., O'Brien, D., Puotinen, M., **Smith, R.**, Tsang, J., van de Merwe, J., Warne, M., Williams, M. (2015). Identification, impacts, and prioritisation of emerging contaminants present in the GBR and Torres Strait marine environments. Report to the National Environmental Science Programme. Reef and Rainforest Research Centre Limited, Cairns (138pp.).
29. Van den Brink, P.J., Choung, C.B., Landis, W., Mayer-Pinto, M., Pettigrove, V., Scanes, P., **Smith, R.** and Stauber, J., 2016. New approaches to the ecological risk assessment of multiple stressors. Marine and Freshwater Research, 67(4), pp.429-439.
30. Wallace, R., Huggins, R., Smith, R.A., Thomson, B., Orr, D., King, O.C., Taylor, C., Turner, R. and Mann, R., 2016. Sandy Creek Sub-catchment Water Quality Monitoring Project 2015-2016. Department of Science, Information Technology and Innovation.
31. O'Brien, D., Lewis, S., Davis, A., Gallen, C., **Smith, R.**, Turner, R., Warne, M., Turner, S., Caswell, S., Mueller, J.F. and Brodie, J., 2016. Spatial and temporal variability in pesticide exposure downstream of a heavily irrigated cropping area: application of different monitoring techniques. Journal of agricultural and food chemistry, 64(20), pp.3975-3989.
32. Devlin, M., Lewis, S., Davis, A., **Smith, R.**, Negri, A., Thompson, M. and Poggio, M., 2015. Advancing Our Understanding of the Source, Management, Transport and Impacts of Pesticides on the Great Barrier Reef 2011–2015. A Report for the Queensland Department of Environment and Heritage Protection, p.134.
33. Kroon F.J., Hook S., Jones D., Metcalfe S., Henderson B., **Smith R.**, Warne M.St.J., McKeown A., Westcott D.A. (2015). Altered transcription levels of endocrine associated genes in two fisheries species collected from the Great Barrier Reef catchment and lagoon. Marine Environmental Research, 104:51-61.
34. **Smith RA**, Turner RDR, Vardy S, Huggins R, Wallace R, Warne MStJ. (2014). An evaluation of the prevalence of alternate pesticides of environmental concern in Great Barrier Reef catchments. Department of Science, Information Technology, Innovation and the Arts. Brisbane. Report provided to DEHP. 62pp
35. Vardy S, Turner R, Lindemann S, Orr D, **Smith R**, Huggins R, Gardiner R, Warne MStJ. (2014). Pesticides and nutrients in groundwater and their transport to rivers from sugar cane cropping in the lower Burdekin. Department of Science, Information Technology, Innovation and the Arts. Brisbane. Report provided to DEHP. 81 pp.
36. Wallace R, Huggins R, **Smith RA**, Turner RDR, Vardy S, Warne MStJ. (2014 *a*). Total suspended solids, nutrients and pesticide loads (2012–2013) for rivers that discharge to the Great Barrier Reef – Great Barrier Reef Catchment Loads Monitoring Program 2012–2013. Department of Science, Information Technology, Innovation and the Arts, Brisbane, Queensland, 99pp.
37. Wallace R., Turner R., Huggins R., **Smith R.,** Vardy S. and Warne M.St.J. (2014 *b*). Total suspended solids, nutrient and pesticide loads for rivers that discharge to the Great Barrier Reef: Great Barrier Reef Loads Monitoring 2011-2012. Water Sciences Technical Report, Volume 2013, Number 1. Department of Science, Information Technology, Innovation and the Arts, Brisbane, Queensland, Australia. 53p. ISSN 1834-3910. ISBN 978-1-7423-0996. http://www.reefplan.qld.gov.au/measuring-success/paddock-to-reef/catchment-loads-monitoring.aspx
38. Delaney K, **Smith RA**, Turner RDR, Wallace R, Huggins R, Warne MStJ. 2014. Risk Assessment and catchment prioritisation for suspended solids, nutrients and pesticides in the Mackay Whitsunday Region and recommendations for future water quality

monitoring. Department of Science, Information Technology, Innovation and the Arts. Brisbane. 231pp.

39. Turner R.D.R., **Smith R.A.**, Huggins R.L., Wallace R.M., Warne M.St.J. and Waters D.K. (2013). Monitoring to enhance modelling - A loads monitoring program that is fundamental to validating catchment models. In MODSIM 20th International Congress on Modelling and Simulation. Modelling and Simulation Society of Australia and New Zealand.
40. Waterhouse, J., Maynard, J., Brodie, J., Randall, L., Zeh, D., Devlin, M., Lewis, S., Furnas, M., Schaffelke, B., Fabricius, K., Collier, C., Brando, V., McKenzie, L., Warne, M.St.J., **Smith, R.,** Negri, A., Henry, N., Petus, C., da Silva, E., Waters, D., Yorkston, H., Tracey, D. (2013). Section 2: Assessment of the risk of pollutants to ecosystems of the Great Barrier Reef including differential risk between sediments, nutrients and pesticides, and among NRM regions. In: Brodie *et al.,* Assessment of the relative risk of water quality to ecosystems of the Great Barrier Reef. A report to the Department of the Environment and Heritage Protection, Queensland Government, Brisbane. TropWATER Report 13/28, Townsville, Australia. http://reefplan.qld.gov.au/about/scientific-consensus-statement.aspx
41. Lewis, S., **Smith, R.**, O'Brien, D., Warne, M.St.J., Negri, A., Petus, C., da Silva, E., Zeh, D. Turner, R.D.R., Davis, A., Mueller, J., Brodie, J.(2013). Chapter 4: Assessing the risk of additive pesticide exposure in Great Barrier Reef ecosystems. In: Assessment of the relative risk of water quality to ecosystems of the Great Barrier Reef: Supporting Studies. A report to the Department of the Environment and Heritage Protection, Queensland Government, Brisbane. TropWATER Report 13/30, Townsville, Australia. http://reefplan.qld.gov.au/about/scientific-consensus-statement.aspx
42. Kroon, F., Turner, R.D.R., **Smith, R.**, Warne, M.St.J., Hunter, H., Bartley, R., Wilkinson, S., Lewis, S., Waters, D., Carroll, C. (2013). Chapter 4: Sources of sediment, nutrients, pesticides and other pollutants in the Great Barrier Reef catchment. Reef Water Quality Scientific Consensus Statement 2013. Department of the Premier and Cabinet, Queensland Government, Brisbane. http://reefplan.qld.gov.au/about/scientific-consensus-statement.aspx
43. Turner R., Huggins R., Wallace R., **Smith R.**, Vardy S and Warne M.St.J. (2013 *a*). Total suspended solids, nutrient and pesticide loads for rivers that discharge to the Great Barrier Reef: Great Barrier Reef Loads Monitoring 2010–2011. Water Sciences Technical Report, Volume 2013, Number 1. Department of Science, Information Technology, Innovation and the Arts, Brisbane, Queensland, Australia. 53p. ISSN 1834-3910. ISBN 978-1-7423-0996. http://www.reefplan.qld.gov.au/measuring-success/paddock-to-reef/catchment-loads-monitoring.aspx
44. Turner R., Huggins R., Wallace R., **Smith R.**, Vardy S. and Warne M.St.J. (2013 *b*). Sediment, nutrient and pesticide loads: Great Barrier Reef Loads Monitoring 2009–2010. Water Sciences Technical Report, Volume 2012, Number 14. Department of Science, Information Technology, Innovation and the Arts, Brisbane, Queensland, Australia. 53p. ISSN 1834-3910. ISBN 978-1-7423-0994. http://www.reefplan.qld.gov.au/measuring-success/paddock-to-reef/catchment-loads-monitoring.aspx
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Conference and Workshop Presentations

1. **Smith, R.A.,** Warne, M.StJ., 2018. Monitoring and modelling water quality discharged to the Great Barrier Reef. Oral Presentation. Predictive Environmental Monitoring Workshop. CSIRO, Oceans and Atmosphere, 26th-27th March, Hobart, Australia.
2. **Smith, R.A.,** Henry, N. 2017. Knowledge to Support Delivery. Oral presentation and session facilitator. Great Barrier Reef Water Quality Science Synthesis Workshop, 21-23rd November, Townsville, Australia.
3. **Smith, R.A.,** Warne, M.St.J., King, O.K., Turner, R.D.R., Shaw, M., and Mann, R. Ecologically Relevant Pesticide Targets for the Reef Water Quality Protection Plan 2017. SETAC Australasia Conference, September 2017, Gold Coast, Australia.
4. Turner, R., Mann, R., Wallace, R., Gardiner, R., Huggins, R., Thomson, B., Ferguson, B., Orr, D., King, O., Taylor, C., **Smith, R.**, Preston, S. Great Barrier Reef Catchment Loads Monitoring Program – Wet Tropics. Paddock to Reef Roadshow, November 2016.
5. **Smith R.A.,** Warne M.St J., Mann R., Turner RDR, Mengersen K. (2016). Quantifying and communicating the ecological risk of pesticides for the Reef Water Quality Protection Plan. Oral presentation, SETAC Australasia Conference, 4–7 October, Hobart, Australia.
6. **Smith R.,** Delaney K., Turner R. D.R., Vardy S., Rogers B., Arango C., Seery C., Pradella N., Warne M.St.J. (2014). Proposed Guideline Values for Pesticides Threatening the Great Barrier Reef. Oral presentation, SETAC Australasia Conference – Advancing Science for a sustainable environment, 14–17 September, Adelaide, Australia.
7. **Smith R.,** Delaney K., Turner R., Mengersen., Warne M.St.J. (2014) Pesticide Toxic Loads. Presentation to the Reef Water Quality Protection Plan Independent Science Panel, 1st August, Brisbane, Australia.
8. **Smith R.**, Warne M.St.J., Turner R., Vardy, S., Wallace R., Huggins R. and Orr D. (2014). Monitoring Alternative Pesticides in Great Barrier Reef Catchments. Cane Working Group, 26th June 2014, Townsville.
9. **Smith R.**, Warne M.St.J., Turner R., Wallace R. and Huggins R. (2013). Risk of pesticides to riverine ecosystems of tropical Queensland. Oral presentation, SETAC Australasia Conference – Multidisciplinary approaches to managing environmental pollution. 1–3 October, Melbourne, Australia.
10. **Smith R.** and Ralph P. (2013) Chlorophyll a fluorescence as a bioanalytical tool for pollutant identification. Poster presentation, SETAC Australasia Conference – Multidisciplinary approaches to managing environmental pollution. 1–3 October, Melbourne, Australia.

11. **Smith R.,** Turner R., Vardy S. and Warne M.St.J. (2012). Determining the pesticide toxicity load transported to the Great Barrier Reef: A multi-species, toxic equivalency approach. SETAC Australasia 2012, 4th – 6th July, Brisbane, Australia.
12. **Smith R.,** Turner R., Vardy S. and Warne M.St.J. (2012). Pesticide contamination in Queensland catchments. SETAC Australasia 2012, 4th – 6th July, Brisbane, Australia.
13. **Smith, R.,** Turner, R., Huggins, R., Vardy, S., Warne, M.St.J. (2011). International Conference on Deriving Environmental Quality Standards for the Protection of Aquatic Ecosystems (2011), The University of Hong Kong – "Real world conditions vs laboratory studies: how the tropical north differs from the laboratory".
14. **Smith, R.,** Turner, R., Vardy, S., & Warne, M.St.J. (2011). Using a convolution integral model for assessing pesticide dissipation time at the end of catchments. 19th International Congress on Modelling and Simulation, 12–16 December, Perth, Australia.
15. **Smith, R.,** Turner, R., Vardy, S., & Warne, M.St.J. (2011). Real world conditions vs. Laboratory studies: How the tropical north differs from the laboratory. EnviroTox2011, SETAC Australasia, 17–20 April, Darwin, Australia.
16. **Smith R**, Middlebrook R, Turner R, Huggins R and Vardy S. (2010). Large-scale pesticide monitoring across Great Barrier Reef Catchments. Challenges in Environmental Science & Engineering, CESE-2010, 26th September – 1st October, Cairns, Australia.
17. **Smith R.,** Ralph P. and Wong D. (2009). Fluorescence Fingerprinting: fast, accurate and cost-effective herbicide identification. Australian Society for Ecotoxicology Conference, 20–23 September, Adelaide, Australia.
18. **Smith, R.** and Ralph, P. (2004). The use of nutrient induced fluorescent transients (NIFTs) for assessing nutrient bioavailability in stormwater. Interact 2004, ASE/ Royal Australian Chemical Institute (RACI), 5–8 July, Gold Coast, Australia.
19. **Smith, R.** and Ralph, P. (2003). Applying an algal fluorescence bioassay to examine the toxicity of heavy metals. SETAC AP/Australasian Society of Ecotoxicology (ASE) Symposium, 28 September – 1st October, Christchurch, New Zealand.
20. **Smith, R.** and Ralph, P. (2002). Ecotoxicity assessment of stormwater using a fluorescence-based algal bioassay. Interact 2002, Australasian Society of Ecotoxicology (ASE)/ Royal Australian Chemical Institute (RACI), 21–25 July, Sydney, Australia.

Awarded Research Funding

2015-17 Graeme Batley, Jenny Stauber, John Chapman, Michael Warne, Stuart Simpson Anu Kumar, Lisa Golding, Merrin Adams and **Rachael Smith**.
Provision of a Consultancy to Undertake Derivation of Toxicant Guideline Values for the Revision of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
Department of the Environment, Commonwealth of Australia.
$74,475.50

2016-17 Michael Warne, **Rachael Smith,** Ryan Turner, Olivia King, Andrew Negri.
Derivation of Water Quality Guidelines for Selected High Priority Pesticides Discharged to the Great Barrier Reef.
Queensland Department of Environment and Heritage Protection.
$160,373

2015-16 Uthicke, S., Fabricius, K., De'ath, G., Negri, A., Warne, M., **Smith, R.**, Noonan, S., Johansson, C., Gorsuch, H. and Anthony, K. Multiple and cumulative impacts on the GBR: assessment of current status and development of improved approaches for manage.
National Environmental Science Programme (NESP).

	$99,944
2015-16	Frederieke Kroon, Kathryn Berry, Diane Brinkman, Aaron Davis, Olivia King, Rai Kookana, Stephen Lewis, Frederic Leusch, Oleg Makarynskyy, Steven Melvin, Jochen Müller, Peta Neale, Andrew Negri, Dominique O'Brien, Marji Puotinen, Rachael Smith, Jeffrey Tsang, Jason van de Merwe, Michael Warne and Mike Williams. Identification, impacts, and prioritisation of emerging contaminants present in the GBR and Torres Strait marine environments. National Environmental Science Programme (NESP). $100,000
2011-13	Michael Warne, Ryan Turner, Susi Vardy, Rachael Smith. Investigation of the concentrations and loads of replacements for diuron in rivers that discharge to the Great Barrier Reef. Reef Policy, Reef Protection Plan - QLD Government $120,000
2011-13	Susi Vardy, Ryan Turner, Michael Warne, Rachael Smith. Quantifying suspended solids, nutrients and pesticides in groundwater in the Lower Burdekin River, Queensland. Reef Policy, Reef Protection Plan - QLD Government $100,000