

Tel: +61-407 127 030
Email: j.brodie@c2o.net.au
www.c2o.net.au

Dr Jon Edward Brodie

Partner & Senior Scientist
C₂O Consulting



coasts | climate | oceans

Professorial Research Fellow
ARC Centre for Excellence for Coral Reef Studies, James Cook University

OVERVIEW

Jon Brodie is an experienced environmental scientist and manager and a leader in the field of watershed research and management programs and monitoring programs to evaluate management success. He has expertise in the design and implementation of marine and freshwater biological and water quality monitoring programs in the Pacific island region, Australia and South-East Asia.

EMPLOYMENT HISTORY (SELECT)

2001 – 2015 Chief Research Scientist
Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER), James Cook University

1998 – 2001 Director, Water Quality & Coastal Development Group
Great Barrier Reef Marine Park Authority

1995 – 1999 Senior Environmental Impact Assessment and Monitoring
Hassall & Associates/Australian Marine Science & Technology Ltd consortium for the Protection of Marine Ecosystems of the Red Sea Coast of Yemen. United Nations Development Programme

1993–1998 Director, Research & Monitoring
Great Barrier Reef Marine Park Authority, Townsville, Australia

1990–1994 Assistant Director, Research & Monitoring
Great Barrier Reef Marine Park Authority, Townsville

1988–1990 Research Fellow (Senior Chemist)
Australian Centre for Tropical Freshwater Research, James Cook University

RELEVANT EXPERIENCE

Jon Brodie has spent the last 45 years working in the area of water quality and pollution management. This has included positions with industry (RioTinto); Universities (University of the South Pacific, QUT, James Cook University) and specific environmental research and management institutions of these universities. For example, the Institute of Applied Science (USP), the Australian Centre for Tropical

Freshwater Research (JCU) and the Centre for Tropical Water and Aquatic Ecosystem Research (JCU) as leader of the Catchment to Reef Research Group; the Great Barrier Reef Marine Park Authority (Queensland) as Director, Research and Monitoring and Director, Water Quality and Coastal Development; and most recently, a consulting environmental science and management organization (C2O). This experience has included responsibility for a wide range of duties ranging from completing water quality monitoring programs, design of regional monitoring programs, development of natural resource policy and strategic direction, and project management and reporting.

QUALIFICATIONS

2017–2018 Doctor of Philosophy (Science) – Water Quality in the Great Barrier Reef
James Cook University of North Queensland, Townsville, Australia

1976–1977 Master of Science (Research) – Environmental Chemistry
James Cook University of North Queensland, Townsville, Australia

1971 Technical Teacher Training Certificate
Sydney Teachers College, NSW, Australia

1964–1968 Bachelor of Science (Hons) – Inorganic Chemistry with third-year major in mathematics
University of Sydney, NSW, Australia

SELECTED RECENT PUBLICATIONS

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.

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Fabricius K. E., Logan, M., Weeks S. J., Lewis S. E., Brodie J. 2016. Changes in water clarity related to river discharges on the Great Barrier Reef continental shelf: 2002-2013. *Estuarine, Coastal and Shelf Science*

O'Brien, D., Lewis, S., Davis, A., Gallen, C., Smith, R., Turner, R., Warne, M., Turner, S., Caswell, S., Mueller, J., Brodie, J. 2016. Spatial and temporal variability in pesticide exposure downstream of a heavily irrigated cropping area: the application of different monitoring techniques. *Journal of Agricultural and Food Chemistry*

Bainbridge Z., Lewis S., Smithers S., Wilkinson S., Douglas G., Hillier S., Brodie J. 2016. Clay mineral source tracing and characterisation of Burdekin River (NE Australia) and flood plume fine sediment. *Journal of Soils and Sediments* 16, 687 – 706.

Davis, A., Pearson, R., Brodie, J., Butler, B. 2016. Review and conceptual models of agricultural impacts and water quality in tropical and sub-tropical waterways of the Great Barrier Reef catchment area. *Marine and Freshwater Research*

- Chaiechi, T., Stoeckl, N., Jarvis, D., Lewis, S., Brodie, J. In press. Assessing the impact of price changes and extreme climatic events on sediment loads in a large river catchment near the Great Barrier Reef. *Australian Journal of Agricultural and Resource Economics*
- Clark, T., Leonard, N., Zhao, J., Brodie, J., McCook, L., Wachenfeld, D., Nguyen, A., Markham, H., Pandolfi, J. 2016. Historical photographs revisited: A case study for dating and characterizing recent loss of coral cover on the inshore Great Barrier Reef. *Scientific Reports* 6, 19285.
- Wooldridge, S.A., Brodie, J.E., Kroon, F.J., Turner, R. 2015. Ecologically relevant targets for dissolved inorganic nitrogen (DIN) discharge from the drainage basins of the Wet Tropics Region, Great Barrier Reef. *Marine Pollution Bulletin*. 97, 262 - 272
- Hughes, T.P., Day, J., Brodie, J. 2015. Securing the Future of the Great Barrier Reef. *Nature Climate Change*, 5, 508 - 511.
- Weeks, S.J., Magno-Canto, M.M., Jaine, F.R.A., Brodie, J., Richardson, A.J. 2015. Unique Sequence of Events Triggers Manta Ray Feeding Frenzy in the Southern Great Barrier Reef, Australia. *Remote Sensing* 7, 3138-3152.
- Connolly, N. Pearson, R., Loong, D., Maughan, M., Brodie, J. 2015. Water quality variation along streams with similar agricultural development but contrasting riparian vegetation. *Agriculture, Ecosystems and the Environment* 213, 11–20
- Waterhouse, J., Brodie, J., Audas, D., Lewis, S. 2015. Land-sea connectivity, ecohydrology and management of the Great Barrier Reef catchment. *Ecohydrology and Hydrobiology*
- Wooldridge, S., Brodie, J. 2015. Environmental triggers for primary outbreaks of crown-of-thorns starfish on the Great Barrier Reef, Australia. *Marine Pollution Bulletin* 101, 805 – 815.
- Devlin, M., Caroline Petus, Eduardo da Silva, Dieter Tracey, Nicholas Wolff, Jane Waterhouse and Jon Brodie. 2015. Water quality and river plume monitoring in the Great Barrier Reef: an overview of methods based on ocean colour satellite data. *Remote Sensing*, 7, 12909-12941.
- Álvarez-Romero, J.G., Pressey, R.L., Ban, N.C., Brodie, J. 2015. Advancing Land-Sea Conservation Planning: Integrating Modelling of Catchments, Land- Use Change, and River Plumes to Prioritise Catchment Management and Protection. *PLoS ONE* 10(12): e0145574.
- Wenger A.S., Fabricius, K.E., Jones, G.P., Brodie J.E. 2015. Effects of sedimentation, eutrophication, and chemical pollution on coral reef fishes. Chapter 15 in: Mora, C. (ed.) *Ecology of Fishes on Coral Reefs*. Cambridge University Press.
- Brodie, J., Burford, M., Davis, A., da Silva, E., Devlin, M., Furnas, M., Kroon, F., Lewis, S., Lønborg, C., O'Brien, D., Schaffelke, B., Bainbridge, Z. 2015. The relative risks to water quality from particulate nitrogen discharged from rivers to the Great Barrier Reef in comparison to other forms of nitrogen. *TropWATER Report 14/31*, Centre for Tropical Water & Aquatic Ecosystem Research, James Cook University, Townsville, 98 pp.
- Brodie, Jon, Stephen Lewis, Aaron Davis, Zoe Bainbridge, Dominique O'Brien, Jane Waterhouse, Michelle Devlin, and Colette R. Thomas. 2015. "Management of Agriculture to Preserve Environmental Values of the Great Barrier Reef, Australia." *Ecosystem Services and River Basin Ecohydrology* (2015): 275 - 292.

- Bainbridge Z, Lewis S, Smithers S, Kuhnert P, Henderson B, Brodie J 2014. Fine suspended sediment and water budgets for a large, seasonally-dry tropical catchment: Burdekin River catchment, Queensland, Australia. *Water Resources Research* 50, 9067–9087
- Bartley R, Bainbridge Z, Lewis S, Kroon F, Brodie J, Wilkinson S, Silburn M 2014. Relating sediment impacts on coral reefs to watershed sources, processes and management: A review. *Science of the Total Environment* 468–469, 1138–1153
- Fabricius, K., Logan, M., Weeks, S., Brodie, J. 2014. The effects of river run-off on water clarity across the central Great Barrier Reef. *Marine Pollution Bulletin* 84, 191 - 200.
- Davis, A.M., Lewis, S.E., Brodie, J.E., Benson, A. 2014. The potential benefits of herbicide regulation: A cautionary note for the Great Barrier Reef catchment area. *Science of the Total Environment* 490, 81 - 92.
- Brodie, J. 2014. Dredging the Great Barrier Reef: Use and misuse of science. *Estuarine, Coastal and Shelf Science* 142, 1 - 3.
- Brodie, J., Lewis, S., Wooldridge, S., Bainbridge, Z., Waterhouse, J. 2014. Ecologically relevant targets for pollutant discharge from the drainage basins of the Wet Tropics Region, Great Barrier Reef. TropWATER Report 14/33. Centre for Tropical Water & Aquatic Ecosystem Research (TropWATER), James Cook University, Townsville, 45 pp.
- Oliver, D.P., Anderson, J.S., Davis, A., Lewis, S., Brodie, J. Kookana, R. 2014. Banded applications are highly effective in minimizing herbicide migration from furrow-irrigated sugar cane. *Science of the Total Environment* 466–467, 841–848
- Dale, A., Vella, K., Pressey, R.L., Brodie, J., Yorkston, H., Potts, R. 2013 Risk analysis across governance systems: A Great Barrier Reef case study. *Environmental Letters*. 8
- Tsatsaros, J.H., Brodie, J.E., Bohnet, I.C., Valentine, P. 2013. Water quality degradation of coastal waterways in the Wet Tropics, Australia. *Water, Air and Soil Pollution* 224, 1443.
- Butler, J.R., Wong, G.Y., Metcalfe, D.J., Honzák, M., Pert, P.L., Rao, N., van Grieken, M.E., Lawson, T., Bruce, C., Kroon, F.J. & Brodie, J.E. 2013. Applying an ecosystem services framework to identify catchment to reef trade-offs in water quality regulation in the Great Barrier Reef, Australia. *Agriculture Ecosystems and Environment* 180, 176 - 191.
- Davis, A.M., Thorburn, P.J., Lewis, S.E., Bainbridge, Z.T., Attard, S.J., Milla, R. & Brodie, J.E. 2013. Herbicide run-off dynamics of furrow irrigated sugarcane farms and associated drainage systems on the Burdekin River Floodplain, north-eastern Australia. *Agriculture, Ecosystems and the Environment* 180, 123 - 135.
- O'Brien, D., Davis, A., Nash, M., DiBella, L., Turner, R., Reghenzani, J., Brodie, J. 2013. Water quality within the Herbert River catchment associated with specific land use. *Proceedings of the Australian Society of Sugar Cane Technologists* 35.
- Karim, F. Palmer, A., Brodie, J. 2013. Hydrodynamic modelling of floodplain flow residence time in a wet tropical catchment, north eastern Australia. *Proceedings of MODSIM 2013, Adelaide, Australia, December, 2013.*
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Brodie, J., Waterhouse, J., Schaffelke, B., Furnas, M., Maynard, J., Collier, C., Lewis, S., Warne, M., Fabricius, K., Devlin, M., McKenzie, L., Yorkston, H., Randall, L., Bennett, J., Brando, V. 2013b. 2013 Scientific Consensus Statement. Chapter 3: Relative risks to the Great Barrier Reef from degraded water quality. The State of Queensland. Published by the Reef Water Quality Protection Plan Secretariat, July 2013. <http://www.reefplan.qld.gov.au/about/scientific-consensus-statement/>

King, J., Alexander, F., Brodie, J., 2013. Regulation of pesticides in Australia: the Great Barrier Reef as a case study for evaluating effectiveness. *Agriculture, Ecosystems & Environment* 180, 54 - 67.

Bainbridge, Z., Wolanski, E., Lewis, S., Brodie, J., 2012. Fine sediment and nutrient dynamics related to particle size and floc formation in a Burdekin River flood plume, Australia. *Marine Pollution Bulletin* 65, 236–248.

Brodie, J., Waterhouse, J. 2012. A critical review of environmental management of the 'not so Great' Barrier Reef. *Estuar. Coast. Shelf Sci.*, vol. 104–105, 1–22.

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- Brodie, J., Waterhouse, J. 2012. A critical assessment of environmental management of the 'not so Great' Barrier Reef. *Estuarine, Coastal and Shelf Science* 104-105, 1-22.
- Davis, A.M., Lewis, S.E., Bainbridge, Z.T., Brodie, J.E., Glendenning, L., Turner, R. 2012. Dynamics of herbicide transport and partitioning under event flow conditions in the lower Burdekin region, Australia. *Marine Pollution Bulletin* 65, 182 – 193.
- Devlin, M., Brodie, J., Wenger, A., da Silva, E., Alvarez- Romero, J.G., Waterhouse, J. McKenzie, L. 2012. Extreme weather conditions in the Great Barrier Reef: Drivers of change? Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia.
- Kennedy, K., Devlin, M., Bentley, C., Lee-Chue, K., Paxman, C., Carter, S., Lewis, S., Brodie, J., Guy, E., Vardy, S., Martin, K., Jones, A., Packett, R., Mueller, J., 2012. The influence of a season of extreme wet weather events on exposure of the World Heritage Area Great Barrier Reef to pesticides. *Marine Pollution Bulletin* 64, 1495–1507.
- Kroon, F.J., Kuhnert, K.M., Henderson, B.L., Wilkinson, S.N., Kinsey-Henderson, A., Brodie, J.E., Turner, R.D.R. 2012. River loads of suspended solids, nitrogen, phosphorus and herbicides delivered to the Great Barrier Reef lagoon. *Marine Pollution Bulletin* 65, 167-181.
- Lewis, S.E., Schaffelke, B., Shaw, M., Bainbridge, Z.T., Rohde, K.W., Kennedy, K.E., Davis, A.M., Masters, B.L., Devlin, M.J., Mueller, J.F., Brodie, J.E. 2012. Assessing the risks of PS-II herbicide exposure to the Great Barrier Reef. *Marine Pollution Bulletin* 65, 280-291.
- Waterhouse, J., Brodie, J., Lewis, S., Mitchell, A. 2012. Quantifying the sources of pollutants to the Great Barrier Reef. *Marine Pollution Bulletin* 65, 394 - 406.