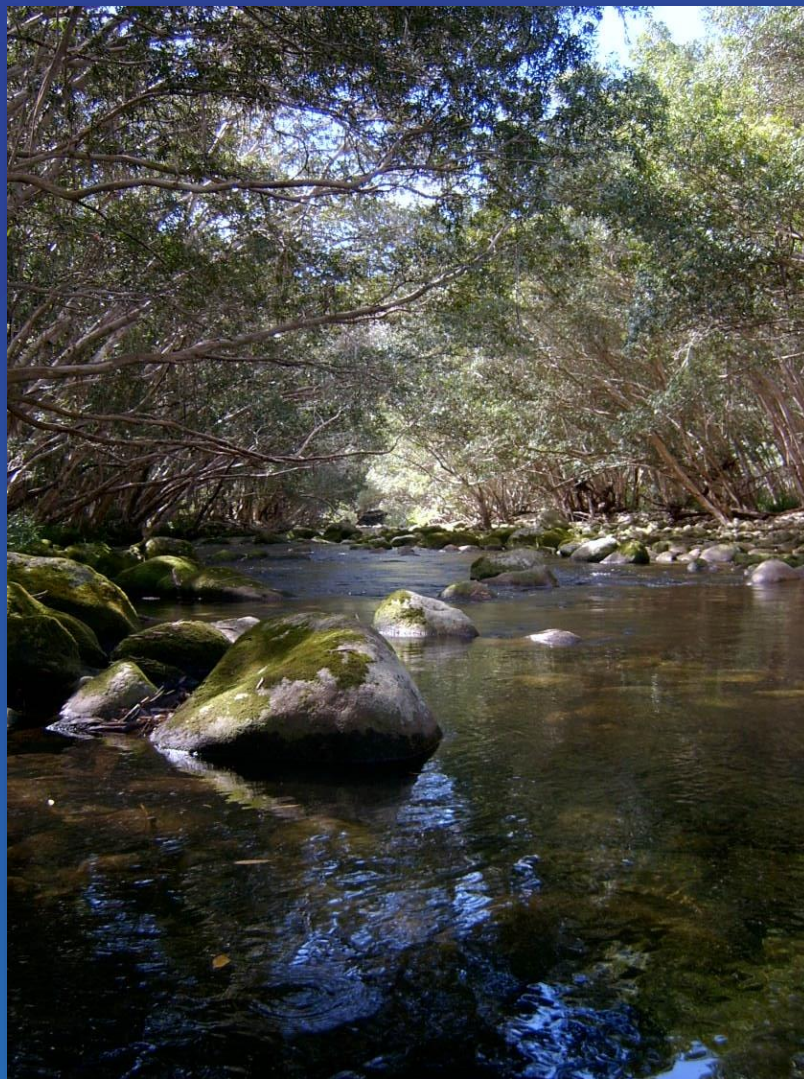


Water quality monitoring project metadata statements related to James et al. *Compilation of riverine water quality data from the Great Barrier Reef catchment area, northeastern Australia.*  
*Scientific Data* - December 2024.



**Project Metadata Statements** related to James et al. Compilation of Riverine water quality data from the Great Barrier Reef catchment area, northeastern Australia. Supplementary Information - Metadata statements. *Scientific Data* SDATA-24-01538.

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Front cover image: Behana Creek, 2005

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This workbook records individual metadata statements for each project/program included in the historical data collation (James et al. 2024). Metadata statements were reviewed where possible by the individual data custodians. While every effort has been made to ensure the accuracy and completeness of the information contained, no guarantee is given, nor responsibility taken for errors or omissions. To the extent permitted by law, TropWATER (including its employees and consultants) excludes all liability to any person for any consequences, including but not limited to all losses, damages, costs, expenses and any other compensation, arising directly or indirectly from using this publication (in part or in whole) and any information or material contained in it.

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<a href="#">Acronyms</a>				
<a href="#">General Sampling and Analytical References</a>				
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<a href="#">E_EPAGBR</a>	EPA GBR river water quality	GBR	1992-2022	Queensland Government Department of Environment, Science & Innovation
<a href="#">E_LAXTGBR</a>	Laxton GBR river water quality	GBR	1998-2003	J.H. & E.S. Laxton - Environmental Consultants P/L
<a href="#">E_SCUGBR</a>	Southern Cross University GBR DIC study	Johnstone, Herbert, Burdekin, Fitzroy	2014-2017	Southern Cross University
<a href="#">E_HECNR</a>	HEC Normanby catchment water quality	Normandy	2006-2018	Howley Environmental Consulting
<a href="#">E_HECAR</a>	HEC Annan and Jeannie catchments water quality	Annan, Jeannie	2002-2012	Howley Environmental Consulting
<a href="#">E_SCUEST</a>	SCU Annan and Daintree estuarine water quality study	Annan, Daintree	1995	Southern Cross University
<a href="#">E_DSWQIP</a>	Douglas Shire Water Quality Improvement Plan	Mossman, Daintree	2003-2004	Commonwealth Scientific and Industrial Research Organisation (CSIRO)
<a href="#">E_NHTBR</a>	NHT Barron River water quality	Barron	1992-1999	Queensland Department of Resources/Department of Environment, Science and Innovation
<a href="#">E_GBRMPA</a>	GBRMPA Barron Russell-Mulgrave water quality	Barron, Russell-Mulgrave	1997-2000	Great Barrier Reef Marine Park Authority (GBRMPA)
<a href="#">E_ECOTOUR</a>	Wet Tropics Ecotourism study	Mulgrave, Russell, Mossman, Black, Murray	January - April 1995	TropWATER, James Cook University
<a href="#">E_PROJ25</a>	NESP Project 25 Russell-Mulgrave water quality	Russell, Mulgrave	2016-2020 (project on-going)	TropWATER, James Cook University
<a href="#">E_NHTJR</a>	NHT Johnstone River water quality	Johnstone	1991-1998	Queensland Department of Natural Resources and Mines
<a href="#">E_WTMIP</a>	Wet Tropics Major Integrated Project	Tully, Johnstone	2018-2023 (project on-going)	Terrain Natural Resource Management on behalf of the Wet Tropics Major Integrated Project (WTMIP) consortium.
<a href="#">E_TWQIP</a>	Tully Water Quality Improvement Plan	Tully, Murray	2005-2007	TropWATER, James Cook University
<a href="#">E_HYDRO</a>	Tully-Millstream Hydroelectric Scheme	Tully, Herbert	1990	TropWATER, James Cook University
<a href="#">E_MTSRF7</a>	MTSRF Tully-Murray floodplain wetlands	Tully, Murray	2008-2009	TropWATER, James Cook University; Australian Rivers Institute, Griffith University
<a href="#">E_DPIFOR</a>	Whitfield Creek DPI Forestry	Murray	2004-2007	TropWATER, James Cook University
<a href="#">E_KYAMBUL</a>	CSIRO Kyambul Lagoon water quality	Murray	2007-2009	CSIRO

<b>Table Of Contents</b>	<b>Project file name</b>	<b>Basins</b>	<b>Collection period</b>	<b>Data custodian</b>
<a href="#">E_CSIROHR</a>	Lower Herbert River water quality	Herbert	1992-1995	CSIRO
<a href="#">E_HWQMP</a>	Herbert Water Quality Monitoring Program	Herbert	2011-2017	TropWATER, James Cook University; Terrain NRM; Herbert Cane Productivity Services Limited (HCPSL)
<a href="#">E_BRWQIP</a>	Black Ross Water Quality Improvement Plan	Black, Ross	2006-2008	TropWATER, James Cook University
<a href="#">E_TCCWEIR</a>	Townsville City Council weir water quality	Black, Ross	2013-2023 (project on-going)	Townsville City Council (TCC)
<a href="#">E_CSIROWW</a>	CSIRO Wheel Weany event water quality	Burdekin	2000-2017	CSIRO
<a href="#">E_NHTBKN</a>	Townsville Burdekin Dry Tropics region water quality	Burdekin, Don, Haughton, Ross, Black	2001-2002	TropWATER, James Cook University
<a href="#">E_BCWQ</a>	Burdekin community water quality	Burdekin, Haughton, Don	2003-2011	TropWATER, James Cook University
<a href="#">E_MYUNA</a>	CSIRO Bowen River water quality at Myuna	Burdekin	2003-2008	CSIRO; TropWATER, James Cook University; North Queensland (NQ) Dry Tropics
<a href="#">E_LDCBBB</a>	LDC Bowen River community water quality monitoring	Burdekin	2018-2022 (project on-going)	TropWATER, James Cook University
<a href="#">E_LWRRBAR</a>	LWRR Barratta Wetlands study	Haughton	1991-1993	TropWATER, James Cook University
<a href="#">E_RRRDBAR</a>	RRRD Barratta intensive pesticide and nutrient study	Haughton	2012-2013	University of Queensland; TropWATER, James Cook University
<a href="#">E_LBWQIP</a>	Lower Burdekin River Water Quality Improvement Plan	Burdekin, Haughton	2004-2011	TropWATER, James Cook University
<a href="#">E_WRICMA</a>	Coast and Clean Seas Whitsunday Rivers	Proserpine, O'Connell	2000-2002	TropWATER, James Cook University
<a href="#">E_MWHW03</a>	Mackay Whitsundays Healthy Waterways 2003	Plane, Pioneer	2002-2003	Queensland Department of Natural Resources and Mines
<a href="#">E_MWHW08</a>	Mackay Whitsundays Healthy Waterways 2005-2008	Proserpine, O'Connell, Plane	2005 -2008	Queensland Department of Natural Resources and Water
<a href="#">E_LAXTSAR</a>	Laxton Sarina and Broomsound shires water quality	Plane	1989-1993	J.H. & E.S. Laxton - Environmental Consultants P/L
<a href="#">E_NAPFR</a>	NAP Fitzroy River water quality	Fitzroy	1994-1998; 2002-2008	Queensland Department of Natural Resources and Water
<a href="#">E_FBAFR</a>	Fitzroy Priority Neighbourhood Catchments	Fitzroy	2006-2010	Fitzroy Basin Association Inc.
<a href="#">E_P2RGOR</a>	Gordonstone Creek paddock to reef study	Fitzroy	2000-2021	Queensland Department of Natural Resources and Mines
<a href="#">E_BCCANBR</a>	BCCA North Burnett water quality – post TC Oswald	Burnett	2014-2017	Burnett Catchment Care Association
<a href="#">E_SCCMR</a>	Sunshine Coast Council Mary Catchment water quality	Mary	2019-2020	Sunshine Coast Council
<a href="#">E_GRUMR</a>	Griffith Mary Catchment water quality	Mary	1994-1997	Australian Rivers Institute, Griffith University

## Acronyms

Acronym	Meaning
AAC	Advanced Analytical Centre
ACTFR	Australian Centre for Tropical Freshwater Research (now TropWATER)
AIMS	The Australian Institute of Marine Science
APHA	American Public Health Association
ASTM	American Society for Testing and Materials
BCCA	Burnett Catchment Care Association
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DERM	Department of Environment and Resource Management
DESI	Department of Environment, Science and Innovation
DETSI	Department of the Environment, Tourism, Science and Innovation
DNR	Department of Natural Resources
DPI	Department of Primary Industries
FBA	Fitzroy Basin Association Inc.
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
HCPSL	Herbert Cane Productivity Services Limited
LDC	Landholders Driving Change
MTSRF	Marine and Tropical Sciences Research Facility
MWHW	Mackay Whitsunday Healthy Waterways
NAP	National Action Plan
NESP	National Environmental Science Program
NHT	Natural Heritage Trust
NRM	Natural Resources Management
PQL	Practical Quantifiable Limit
QHFS	Queensland Health Forensic and Scientific Services
RRRD	Reef Rescue Research & Development
SCC	Sunshine Coast Council
SCU	Southern Cross University
SCU ARL	Analytical Research Laboratory, Southern Cross University
TropWATER	The Centre for Tropical Water and Aquatic Ecosystem Research
TCC	Townsville City Council
TLC	Townsville Laboratory Services
WQIP	Water Quality Improvement Plan
WRICMA	Whitsunday Rivers Integrated Catchment Management Association
WTMIP	Wet Tropics Major Integrated Project

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## E\_AIMSGBR

Metadata record	
<b>Project Name</b>	AIMS GBR river water quality
<b>Project Description</b>	Nutrient data collected between 1986 and 2000 from 33 sites within the lower reaches of a number of streams discharging into the Great Barrier Reef Lagoon.
<b>Project Code</b>	E_AIMSGBR
<b>Funding</b>	AIMS
<b>Collection period (years)</b>	1986-2000
<b>Data custodian</b>	The Australian Institute of Marine Science
<b>Licence</b>	Creative Commons — Attribution-NonCommercial 3.0 Australia — CC BY-NC 3.0 AU
<b>Laboratory</b>	AIMS Laboratory (Townsville)
<b>Technical details</b>	<p>Water samples were collected for the analysis of particulate nitrogen (PN), particulate phosphorus (PP), dissolved inorganic nutrients and total suspended solids (TSS). Water samples for nutrient analysis were collected from mid channel near the water surface. For dissolved inorganic nutrients four replicate aliquots of water from each sample were pressure filtered through a glass fibre filter (Whatman GF/F, nominal pore size of 0.7 µm) with a plastic syringe into clean, acid-soaked, screw-capped plastic test tubes and stored frozen until analysis. Standard methods were used for the analysis of dissolved inorganic nutrients, implemented on a Skalar segmented-flow analyser. Samples were pressure filtered through a glass fibre filter (Whatman GF/F). PN was determined by high-temperature combustion using a nitrogen analyser. PP was determined colorimetrically as inorganic phosphate after digestion in hot, acid persulfate. Note that the methods employed are designed for the low particulate concentrations more typical of tropical seawater. TSS concentrations were determined gravimetrically using Nucleopore filters (nominal pore size of 0.45 µm), dried overnight at 60°C and re-weighed. Further details can be found at <a href="https://apps.aims.gov.au/metadata/view/610f9ac0-4ade-11dc-8f56-00008a07204e">https://apps.aims.gov.au/metadata/view/610f9ac0-4ade-11dc-8f56-00008a07204e</a>.</p>

<b>Use Limitations / notes</b>	Data provided in moles for nutrients and converted to grams. Dissolved organic nitrogen and dissolved organic phosphorus have been removed because AIMS laboratory had been employing the UV-oxidation method for seawater samples (7-8 hours irradiation), after finding that other oxidative methods (e.g. Kjeldahl digestion) tended to contaminate the relatively low levels of organic N and P in tropical sea water. In order to be consistent with these seawater water quality data, the same method was adopted for these riverine samples, though using longer irradiation times. There is now some concern that despite the 16-hour irradiation, total oxidation of all of the dissolved organic material, particularly the highly refractive compounds, may not occur (Mitchell et al. 2007). Nutrient values presented here generally represent the average of either two or four subsamples determined for each nutrient species. Early on in the data collection period data below reporting limits were assigned zero in the database. This was later changed to reporting them as half the reporting limit. However, reporting limits were calculated individually for each analytical run depending on the run baseline. Hence the reporting limit (and therefore half the reporting limit) varied and it is not clear which values have been halved. To accommodate this, we have taken the present-day analytical detection limits for the AIMS laboratory and assigned these to all data recorded as zero in the historical dataset. All other values have been left as provided. Note that the method used for determining TSS differs from that more commonly used in freshwater applications in terms of filter porosity and drying temperature.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Citation</b>	<a href="https://apps.aims.gov.au/metadata/view/610f9ac0-4ade-11dc-8f56-00008a07204e">Australian Institute of Marine Science (AIMS). (2007) Nutrient data from rivers discharging into the Great Barrier Reef lagoon. https://apps.aims.gov.au/metadata/view/610f9ac0-4ade-11dc-8f56-00008a07204e, accessed 09-Aug-2023</a>
<b>Project references</b>	Furnas, M.J. (2003) Catchments and Corals: Terrestrial Runoff to the Great Barrier Reef. Australian Institute of Marine Science & CRC Reef Research Centre. 334 pp. Furnas, M., Mitchell, A.W. and Skuza, M. (1995) Nitrogen and Phosphorus Budgets for the Central Great Barrier Reef Shelf. Great Barrier Reef Marine Park Authority. Mitchell, A., Reghenzani, J., Furnas, M., De'ath, G., Brodie, J. and Lewis, S. (2007) Nutrients and suspended sediments in the Tully River: Spatial and temporal trends. ACTFR Report No. 06/06 for Far North Queensland NRM Ltd. ACTFR, JCU, Townsville and AIMS, Townsville. 115 pp.



## E\_EPAGBR

Metadata record	
<b>Project Name</b>	EPA GBR river water quality
<b>Project Description</b>	Water quality data collected from 1992 to 2022 at 39 sites within the Great Barrier Reef catchments by the Queensland Government Department of Environment, Science and Innovation. Data include physico-chemical and nutrients.
<b>Project Code</b>	E_EPAGBR
<b>Funding</b>	Queensland Government
<b>Collection period (years)</b>	1992-2022
<b>Data custodian</b>	Queensland Government Department of the Environment, Tourism, Science and Innovation
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS
<b>Technical details</b>	Field readings and water samples were taken at a depth of 0.2m. Instruments used for the measurement of <i>in-situ</i> water quality indicators were calibrated and operated in accordance with EPA quality assurance procedures. Samples were collected for the analysis of total suspended solids (TSS), chlorophyll <i>a</i> , total nitrogen (TN), total phosphorus (TP) and dissolved inorganic nutrients. Water samples for nutrient analysis were collected from mid channel near the water surface. Samples for dissolved nutrients were filtered on site through a 0.45 µm filter. Samples for both dissolved and total nutrients were initially refrigerated and frozen within 24 hours before analysis at the QHFSS Laboratory. Other analytes were collected, stored and delivered in accordance with the EPA Water Quality Sampling Manual 3rd Edition and analysed using standard methods (APHA 1998). Prior to 1999 it is assumed that the TN value represents a calculated value of total Kjeldahl nitrogen plus nitrogen oxides (NO <sub>x</sub> ) as the QHFSS laboratory was not using the alkaline persulfate digestion procedure before 1999. In 1999 analytical methods changed at the QHFSS laboratory to the persulfate digestion procedure and hence data from 1999 onwards is assumed to be a direct measure of TN. TP was assumed to be analysed by Kjeldahl digestion prior to 1999 with a method change to the alkaline persulfate digestion from 1999 onwards. Analyses for filterable reactive phosphorus, NO <sub>x</sub> and ammonia were performed simultaneously using a flow injection system using standard APHA methods. Chlorophyll <i>a</i> was determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration. TSS was analysed following standard APHA method 2540 D.
<b>Use Limitations / notes</b>	Zero values recorded for turbidity readings were replaced with the minimum resolution for the instrument (YSI 6920) to < 0.1. Downstream estuarine sites associated with this dataset were not included in this compilation as they were considered outside the scope (not freshwater).
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.

<b>Project references</b>	<p>Cox, M.E., Moss, A. and Smyth, G.K. (2005) Water quality condition and trend in North Queensland waterways. Marine Pollution Bulletin 51. 89-98.</p> <p>Moss, J.M. (1994) Water quality data for the Mary River. Internal environmental report. Queensland Department of Environment and Heritage.</p>
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## E\_LAXTGBR

Metadata record	
<b>Project Name</b>	Laxton GBR river water quality
<b>Project Description</b>	Water quality data from pristine sections of rivers of Eastern Australia draining to the Tasman Sea. Data provided here are from 22 sites that fall within the Great Barrier Reef catchments. Data include physico-chem and nutrients.
<b>Project Code</b>	E_LAXTGBR
<b>Funding</b>	Privately funded
<b>Collection period (years)</b>	1998-2003
<b>Data custodian</b>	J.H. & E.S. Laxton - Environmental Consultants P/L
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	J.H. & E.S. Laxton - Environmental Consultants P/L (Laxton)
<b>Technical details</b>	<p>Field measurements of water temperature, conductivity, pH and turbidity were made using a calibrated field meter. Water samples were collected for the analysis of total suspended solids (TSS), volatile suspended solids (VSS), chlorophyll <i>a</i>, total Kjeldahl nitrogen (TKN), total Kjeldahl phosphorus (TKP) and dissolved inorganic nutrients. Laboratory analysis were undertaken by J.H. &amp; E.S. Laxton - Environmental Consultants P/L in their in-house laboratory. Laxton et al. (1994) includes the following references to standard laboratory methods (Major et al. 1972, Dal Pont et al. 1974). Ammonia was analysed on unfiltered water samples using the indophenol blue spectrophotometric method of Dal Pont et al. (1974). Nitrogen oxides were determined on filtered water samples according to the method of Major et al. (1972) by cadmium reduction. Filterable reactive phosphorus (FRP) was determined according to the method of Major et al. (1972). TKN and TKP were determined using the Kjeldahl digest procedure and the resultant digestant analysed for ammonia and FRP using standard colorimetric procedures as described above. PN and PP were determined using a Kjeldahl digestion procedure. A known volume of water was filtered through a AP402405 glass fibre filter paper previously heated to 500°C. The filter paper was subsequently halved, and one half used to determine PN and the other half used to determine PP. Particulate analysis largely followed that of the TKN and TKP although in the case of the latter a precipitate always developed and the sample had to be filtered prior to reading the absorbance. TSS concentrations were determined gravimetrically using pre-weighed glass fibre filters (Millipore cat. no. AP4004705) with nominal pore size of 0.7 µm. Filters were dried at 45°C for at least 24 hours before re-weighing. VSS was determined after heating the TSS filter papers to 550°C for 60 minutes and re-weighing. Chlorophyll <i>a</i> was determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration.</p>

<b>Use Limitations / notes</b>	Data were provided with month and year (no date and time were given). A datetime stamp was created by assuming that sampling was undertaken on the 15 <sup>th</sup> of the month with a midnight time stamp. Some estuarine sites/tidally influenced sites have been included to keep the dataset complete, these sites include the Mary River at Maryborough, the Burrum River at the Bruce Highway crossing, the Isis River at the Bruce Highway crossing and the Daintree River at the wharf. Reporting limits were not provided in the reports (values were attributed a zero in the reports). Zero values have been replaced with the lowest value recorded for that analyte and an '<' operator. The raw data for TKN was not supplied so was determined from the calculated estimates of total nitrogen and nitrogen oxides.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, timestamps, procedures, analytical methods or data handling processes.
<b>Project references</b>	Laxton, J.H. and Gittins, R. (2004) Water Quality of Pristine Sections of Rivers of Eastern Australia Draining to the Tasman Sea. Private Report.

## E\_SCUGBR

Metadata record	
<b>Project Name</b>	Southern Cross University GBR DIC study
<b>Project Description</b>	Alkalinity and dissolved inorganic carbon exports from five tropical and subtropical river catchments discharging to the Great Barrier Reef.
<b>Project Code</b>	E_SCUGBR
<b>Funding</b>	The Great Barrier Reef Foundation's Resilient Reefs Successfully Adapting to Climate Change Program and Australian Research Council grants DP160100248, and LP150100519.
<b>Collection period (years)</b>	2014-2017
<b>Data custodian</b>	Southern Cross University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Southern Cross Analytical Research Services, Southern Cross University, Lismore (SCU ARL)
<b>Technical details</b>	Water samples were collected just above the tidal limit over a range of flows. Samples for total alkalinity were filtered through 0.45 µm filters into 30 ml plastic vials leaving no headspace. Samples were stored refrigerated and returned to the laboratory for analysis of pH, total alkalinity and dissolved inorganic carbon (DIC). Total alkalinity was determined via gran titration using a Metrohm Titrando automatic titrator, pH electrode and pre-standardised 0.01 mol/L HCl as the titrant. River DIC was then determined from total alkalinity, pH, water temperature and salinity using the freshwater option (K1, K2, and KW from Millero 1979) in the CO2sys programme (Pierrot et al. 2006). Daily water temperatures and conductivity data (used to derive salinity) were obtained from the closest government water monitoring stations. (Johnstone River stations: 112004A, 112101B; Herbert River station: 116006B; Burdekin River stations: 120006B, 120015A; Fitzroy River station: 130005A, Water and Monitoring Information Portal (WMIP), Queensland Department of Natural Resources and Mines).
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Rosentreter, J.A. and Eyre, B.D. (2020) Alkalinity and dissolved inorganic carbon exports from tropical and subtropical river catchments discharging to the Great Barrier Reef, Australia. Hydrological Processes 34:1530–1544. <a href="https://doi.org/10.1002/hyp.13679">https://doi.org/10.1002/hyp.13679</a>

## E\_HECNR

Metadata record	
<b>Project Name</b>	HEC Normanby catchment water quality
<b>Project Description</b>	Water quality data collected from nine sites in the Normanby and Laura River catchments. Data include nutrients, pesticides and metals collected across 2006 to 2018.
<b>Project Code</b>	E_HECNR
<b>Funding</b>	Natural Heritage Trust (NHT2), Caring For Our Country (CFOC), Australian Government Reef Rescue Program, Queensland Department of Science, Information Technology and Infrastructure GBR Loads Program, Balkanu Cape York Development Corporation, South Cape York Catchments and the South Endeavour Trust.
<b>Collection period (years)</b>	2006-2018
<b>Data custodian</b>	Howley Environmental Consulting
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS (nutrients); DES Chemistry Centre (nutrients); ALS (metals, pesticides); DERM Water Quality & Aquatic Ecosystem Health division (chlorophyll a and phaeophytin); Griffith University Environmental Forensics Laboratory (SSC)
<b>Technical details</b>	<p>Water temperature, pH, electrical conductivity, dissolved oxygen and turbidity measurements were made in the field using instruments calibrated following the manufacturer's instructions. Samples were field filtered (0.45 µm filter) where appropriate. Between 2006 and 2012 samples were analysed at QHFSS for total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP) and dissolved inorganic nutrients using APHA standard methods (4500-P J for TN and TP; 4500-P G for filterable reactive phosphorous (FRP); 4500 NH3 H for ammonium/ammonia (NH<sub>4</sub>/NH<sub>3</sub>); 4500-NO3 I for nitrogen oxides (NO<sub>x</sub>). TN, TP, TDN and TDP were determined using an alkaline persulfate technique and the resulting solution simultaneously analysed for oxidised nitrogen (NO<sub>x</sub>) and filterable reactive phosphorus (FRP). Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration. From 2014 to 2018 samples were analysed at the Queensland DES Chemistry Centre for total suspended solids (TSS), total and dissolved Kjeldahl nitrogen (TKN and DKN), NH<sub>4</sub>/NH<sub>3</sub>, NO<sub>x</sub>, TP, TDP and FRP according to standard APHA (2005) methods (4500-N<sub>org</sub> D, 4500-NH3, 4500-NO3, and 4500-P B and 4500-P G). During 2013 samples were analysed predominantly by the DES Chemistry Centre (as described above) but for some limited periods (May-June 2013) samples were analysed by QHFSS (as above). Analysis for metals and pesticides were undertaken at the ALS Laboratory. Total and dissolved metals were analysed by ALS by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and, total and dissolved mercury by FIMS-400 Flow-Injection Mercury-Atomic Absorption Spectrometer using standard methods (APHA 2005). Suspended sediment concentrations (SSC) were initially (2011 to 2014) analysed at the Griffith University Environmental Forensics Laboratory using filtration method ASTM D 3977-97. Later (2014-2018) suspended solids were analysed as TSS by APHA (2005) Method 2540 D at the Queensland DES Chemistry Centre gravimetrically by weighing the fraction remaining on a pre-weighed</p>

	Whatman GF/C filter membranes (nominally 1.2 µm pore size). Technical details taken from Howley (2020).
<b>Use Limitations / notes</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Howley, C.M. (2020) Natural and Anthropogenic Drivers of Water Quality in the Normanby Basin and the Princess Charlotte Bay, Cape York Peninsula, Australia. PhD Thesis. Howley, C., Shellberg, J., Olley, J., Brooks, A., Spencer, J. and Burford, M. (2021) Sediment and nutrient sources and sinks in a wet-dry tropical catchment draining to the Great Barrier Reef. Marine Pollution Bulletin 165. Howley, C., Devlin, M. and Burford, M. (2018) Assessment of water quality from the Normanby River catchment to coastal flood plumes on the northern Great Barrier Reef, Australia. Marine and Freshwater Research 69, 859-873.



## E\_HECAR

Metadata record	
<b>Project Name</b>	HEC Annan and Jeannie catchments water quality
<b>Project Description</b>	Water quality data collected from five sites in the Annan River and a single freshwater site in the Jeannie River. Data include nutrient and metals collected across 2002-2012.
<b>Project Code</b>	E_HECAR
<b>Funding</b>	Initial funding for monitoring equipment came from the Great Barrier Reef Marine Park Authority (GBRMPA). Envirofund and Bundaberg Rum (2005), Natural Heritage Trust (NHT2) and Caring For Our Country (CFoC) (2006 - 2009), Queensland Environmental Protection Agency (DERM) and CFoC Reef Rescue Program.
<b>Collection period (years)</b>	2002-2012
<b>Data custodian</b>	Howley Environmental Consulting
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS (nutrients); DERM Water Quality & Aquatic Ecosystem Health division (chlorophyll <i>a</i> and phaeophytin); ALS Laboratory (metals)
<b>Technical details</b>	Water temperature, pH, dissolved oxygen, turbidity and electrical conductivity were measured in the field using instruments calibrated following the manufacturer's instructions on a daily basis. Samples were collected for the analysis of total nitrogen (TN), total phosphorus (TP), dissolved inorganic nutrients, chlorophyll <i>a</i> , phaeophytin and selected total and soluble metals. Samples for dissolved inorganic nutrients were filtered on site through a 0.45 µm filter. Samples for nutrients were stored on ice in the field and frozen prior to sending to the laboratory for analysis. Samples were analysed using standard APHA methods (4500-P J for TN and TP; 4500-P G for FRP; 4500 NH <sub>3</sub> H for ammonium/ammonia (NH <sub>4</sub> /NH <sub>3</sub> ); 4500-NO <sub>3</sub> I for nitrogen oxides (NO <sub>x</sub> ). TN and TP were analysed by simultaneous persulfate digestion and the resulting solution analysed for nitrogen oxides (NO <sub>x</sub> ) and filterable reactive phosphorus (FRP). Dissolved inorganic nutrients (NO <sub>x</sub> , ammonia and FRP) were determined by flow-injection analysis. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration. Total and dissolved metals were analysed by ALS by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) and, total and dissolved mercury by FIMS-400 Flow-Injection Mercury-Atomic Absorption Spectrometer using standard methods (APHA 2005).
<b>Use Limitations / notes</b>	Note that some dissolved metals were removed as contamination from filters was suspected.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Howley, C.M., Olley, J.M. and Carroll, J. (2012) Annan and Endeavour River Freshwater and Estuarine Water Quality Report: An Assessment of Ambient Water Quality and Effects of Land Use 2002 – 2009. Cooktown, Queensland: CYMAG Environmental Inc.; 2012 p. 115.

## E\_SCUEST

Metadata record	
<b>Project Name</b>	SCU Annan and Daintree estuarine water quality study
<b>Project Description</b>	Water quality data collected from one site each on the Annan and Daintree Rivers during a flood event.
<b>Project Code</b>	E_SCUEST
<b>Funding</b>	Southern Cross University Grant
<b>Collection period (years)</b>	1995
<b>Data custodian</b>	Southern Cross University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Centre for Coastal Biogeochemistry Laboratory, Southern Cross University (SCU CBL)
<b>Technical details</b>	<p>Water samples were collected from mid-stream at a depth of one metre or mid-column where shallower. Samples were filtered immediately on-site using pre-weighed 0.45 µm cellulose acetate filters. Five replicate filters were collected for analysis of particulate nutrients and suspended sediments. The filtrate was retained for the analysis of dissolved nutrients. Separate unfiltered samples were collected for the determination of total nutrients. Samples were stored on ice in the dark and frozen within 12 hours of collection. Total suspended solids were measured gravimetrically by weighing the fraction remaining on a pre-weighed filter membrane following the method of Strickland and Parson (1972). Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard colorimetric methods implemented on a Lachat Flow Injection Analyser. For the determination of total nitrogen, total dissolved nitrogen, total phosphorus and total dissolved phosphorus, water samples were first digested in an autoclave using a persulfate oxidation technique (following the method of Valderrama 1981) and the resulting solution also analysed using standard inorganic nutrient methods. Silicate was determined using the method of Lachat (1994). Sampling and analytical methods were modified for brevity from Davies and Eyre (2005).</p>
<b>Use Limitations / notes</b>	Note that particulate nitrogen and phosphorus data were determined by subtracting the total dissolved nutrients from the total nutrients.
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>
<b>Project references</b>	Davies, P. and Eyre, B.D. (2005) Estuarine modification of nutrient and sediment exports to the Great Barrier Reef Marine Park from the Daintree and Annan River catchments. Marine Pollution Bulletin 51, 174-185.

## E\_DSWQIP

Metadata record	
<b>Project Name</b>	Douglas Shire Water Quality Improvement Plan
<b>Project Description</b>	Event water quality monitoring for nutrients and sediment using automated samplers from five sites in the Daintree and Mossman River catchments across 2003 to 2004. Also includes in situ turbidity and conductivity data.
<b>Project Code</b>	E_DSWQIP
<b>Funding</b>	Coastal Catchments Initiative Program within the Australian Government's Natural Heritage Trust Program; CSIRO.
<b>Collection period (years)</b>	2003-2004
<b>Data custodian</b>	CSIRO
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Cairns Water (TSS, turbidity), QHFSS (nutrients)
<b>Technical details</b>	Samples were collected for the analysis of electrical conductivity, turbidity, total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved nitrogen (TDN) and dissolved nutrients. Sampling was undertaken using ISCO 3700 refrigerated automated water quality monitoring stations established at each site. Sampling and analysis for nutrients, TSS and turbidity was undertaken using standard protocols consistent with EPA sampling protocols at sites within the same catchment. Samples for TN, TDN, TP and TDP were digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution simultaneously analysed for oxidised nitrogen (NO <sub>x</sub> ) and filterable reactive phosphorus (FRP) with a segmented flow auto-analyser. The analyses of NO <sub>x</sub> , ammonia and FRP were also conducted using segmented flow auto-analysis techniques following standard methods (APHA 1998). TSS was determined by Cairns Water (see notes below regarding method used for TSS determination).
<b>Use Limitations / notes</b>	The data provider determined from correspondence that the samples were most likely analysed at Cairns Water (TSS and turbidity) and QHFSS (nutrients) using approaches consistent with the EPA GBR Rivers project for the same time period. This information was confirmed by the report of Kroon et al. (2006). Kroon et al. (2006) also identified issues with retrieving samples from the autosamplers from some locations during events with some samples being left in refrigeration for up to 48 hours prior to filtering, handling and analysis. Whilst this is longer than the time recommended by Queensland DESI protocols, this is not uncommon under event conditions in more remote regions. Zero values in the dataset were replaced by the detection limits retrieved from other datasets for the same time period also analysed at QHFSS. The standard method for suspended solids utilised by Cairns Water Laboratory is not detailed in reporting but may be the standard method APHA 2540 B using evaporation and drying.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.

<b>Project references</b>	<p>McJannet , D., Fitch, P., Henderson, B., Harch, B., and Bartley, R. (2005) Douglas Shire Council Water Quality Monitoring Strategy - Final Report. A report to Douglas Shire Council and the Department of the Environment and Heritage.</p> <p>Kroon, F., Bradley, P. and Roberts, B. (2006) Strengths and weaknesses in the development and delivery of the Douglas Shire Water Quality Improvement Plan. CSIRO Sustainable Ecosystems, Atherton. 29 pp.</p>
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## E\_NHTBR

Metadata record	
<b>Project Name</b>	NHT Barron River water quality
<b>Project Description</b>	Physico-chemical and nutrient data collected from multiple sites across the Barron River catchment across 1992 to 1999: an initiative of the Barron River Integrated Catchment Management Association.
<b>Project Code</b>	E_NHTBR
<b>Funding</b>	The Natural Landcare Program of the National Heritage Trust
<b>Collection period (years)</b>	1992-1999
<b>Data custodian</b>	QLD Department of Resources/Department of Environment, Science and Innovation
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Mareeba Department of Natural Resources Analytical Chemistry laboratory (DNR Mareeba)
<b>Technical details</b>	<p>Dissolved oxygen, water temperature, pH and conductivity were measured in the field using instruments calibrated following the manufacturer's instructions. Water samples were collected either manually or by automatic samplers for the analysis of total suspended solids (TSS), turbidity, total Kjeldahl nitrogen (TKN), dissolved Kjeldahl nitrogen (DKN), total Kjeldahl phosphorus (TKP), dissolved Kjeldahl phosphorus (DKP) and dissolved inorganic nutrients. On return to the laboratory, TSS and turbidity were analysed immediately and then the samples frozen. TSS was analysed by filtering a measured volume of water through a pre-weighed glass fibre filter paper (nominal pore size 0.7 µm) but see notes below. Samples were analysed for TKN, TKP, DKN and DKP using the Kjeldahl digest procedure, and the resultant digestant analysed for ammonia and filterable reactive phosphorus (FRP) simultaneously using automated continuous flow colorimetric methods (APHA 1989). The analyses of ammonia, FRP and nitrogen oxides were conducted using automated continuous flow colorimetric methods. Between 1992 and 1995, event sampling was undertaken using a Sigma 1350 automatic pump with the sample frequency adjusted as required to cover each event (see Cogle et al. 1998 for further details). Monthly temporal sampling was also undertaken during this same period using either a depth integrated sampler or as a single manual grab sample. Data from this period may represent a combination of both sampling methods. Between November 1998 and March 1999, event sampling was undertaken using a Sigma 910 automatic pump sampler at two sites: Barron River off Bilwon Road (refrigerated autosampler) and Barron River at Kuranda (non-refrigerated autosampler). Details on the event sampling regime is given in Cogle et al. (1998, 2000).</p>

<b>Use Limitations / notes</b>	Information is provided in Cogle et al. (1998, 2000) reports regarding limits of detection and how values below these were dealt with. Note that many of the values for the analytes in the dataset are below the reported detection limits. These data have been left as provided for the data compilation to be used at the user's discretion. Prior to 1998, limits of detection were 0.002 mg L <sup>-1</sup> for phosphate-P, 0.01 mg L <sup>-1</sup> for ammonium-N and nitrate-N, 0.05 mg L <sup>-1</sup> for TKP and 0.17 mg L <sup>-1</sup> for TKN. After 1998, lower detection limits were reported of 0.001 mg L <sup>-1</sup> for phosphate-P, 0.001 mg L <sup>-1</sup> for ammonium-N and nitrate-N, 0.002 mg L <sup>-1</sup> for TKP and 0.17 mg L <sup>-1</sup> for TKN. The pore size of the filter papers used for the TSS analysis was described as 0.7 mm in Cogle et al. (2000) but we suggest that this should read 0.7 µm. Filter type and pore size for dissolved nutrients is not provided in the report. Also note that randomised samples are duplicates and are clearly identified within the dataset as they are taken from the same location one minute apart. It is unknown whether event sampling undertaken using automatic pumps has been included in the compiled data for the period 1992 to 1995 and for the wet season period November 1998 to April 1999 (at Barron River off Bilwon Road and Barron River at Kuranda sites only for the latter period). Where time stamps were not provided it is suspected that some of the results could represent daily mean event concentrations.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.
<b>Project references</b>	Cogle, L., Gourley, J., Herbert, B. and Best, E. (1998) Nutrient Control Strategy for Tropical Catchments. Final Report of National Landcare Program. Department of Natural Resources, Mareeba. 275pp. Cogle, A.L., Langford, P.A., Kistle, S.E., Ryan, T.J., McDougall, A.E., Russell, D.J. and Best, E.K. (2000) Natural Resources of the Barron River Catchment 2. Water quality, land use and land management interactions. Queensland Department of Primary Industries: Brisbane.

## E\_GBRMPA

Metadata record	
<b>Project Name</b>	GBRMPA Barron Russell-Mulgrave water quality
<b>Project Description</b>	Program involving intensive sampling of nutrients and total suspended solids during first flush and also extreme flow and post flood conditions at 19 sites in the Russell Mulgrave and Barron River basins between 1997 and 2000.
<b>Project Code</b>	E_GBRMPA
<b>Funding</b>	Great Barrier Reef Marine Park Authority (GBRMPA)
<b>Collection period (years)</b>	1997-2000
<b>Data custodian</b>	GBRMPA
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	AIMS Laboratory (Townsville)
<b>Technical details</b>	<p>Samples were collected for the analysis of total suspended solids (TSS), silica, particulate nitrogen (PN), particulate phosphorus (PP) and dissolved nutrients. Samples for dissolved nutrients were filtered using disposable membrane filters (0.45 µm). Samples were all stored on ice and later frozen (with the exception of silica which was stored at room temperature). The analyses of nitrogen oxides, ammonia and filterable reactive phosphorus were also conducted using standard procedures implemented on a Skalar segmented-flow analyser. PN and PP were analysed directly through filtering a known volume of water through pre-combusted GF/F glass fibre membranes (0.7 µm). PN was determined by high-temperature combustion of the filter paper using a nitrogen analyser. PP was determined colorimetrically as inorganic phosphate after digestion of the filter paper in hot, acid persulfate. Note that the methods employed are designed for the low particulate concentrations more typical of tropical seawater. TSS concentrations were determined gravimetrically using Nucleopore filters (nominal pore size of 0.45 µm), dried overnight at 60°C and re-weighed.</p>
<b>Use Limitations / notes</b>	<p>Some sites lacked detailed location information. Where sites could not be located with reasonable confidence after discussion with the data custodian, they were removed from the dataset.</p> <p>Data were provided in moles for nutrients and converted to grams. Dissolved organic nitrogen and dissolved organic phosphorus were removed because AIMS had been employing the UV-oxidation method for seawater samples (7-8 hours irradiation), after finding that other oxidative methods (e.g. Kjeldahl digestion) tended to contaminate the relatively low levels of organic N and P in tropical sea water. In order to be consistent with these seawater water quality data, the same method was adopted for these riverine samples, though using longer irradiation. There is now some concern that despite the 16-hour irradiation, total oxidation of all of the dissolved organic material, particularly the highly refractive compounds, may not occur (Mitchell et al. 2007). Note that zero values have been replaced with contemporary reporting limits as provided by AIMS. All other values (even those less than current day reporting limits) have not been changed. Note that the method used for determining TSS differs from that</p>



	more commonly used in freshwater applications in terms of filter porosity and drying temperature.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.
<b>Project references</b>	Devlin, M., Waterhouse, J. and Brodie, J.E. (2001) Community and Connectivity: Summary of a Community Based Monitoring Program Set Up to Assess the Movement of Nutrients and Sediments Into the Great Barrier Reef During High Flow Events. Water Science & Technology 43(9): 121-31. Mitchell, A., Reghenzani, J., Furnas, M., De'ath, G., Brodie, J. and Lewis, S. (2007) Nutrients and suspended sediments in the Tully River: Spatial and temporal trends. ACTFR Report No. 06/06 for Far North Queensland NRM Ltd. Australian Centre for Tropical Freshwater Research, James Cook University, Townsville and the Australian Institute of Marine Science, Townsville. 115 pp.

## E\_ECOTOUR

Metadata record	
<b>Project Name</b>	Wet Tropics Ecotourism study
<b>Project Description</b>	A study of the water quality impacts of human bathing at five sites in the Wet Tropics. Nutrient and sediment water quality monitoring was conducted over two periods in 1995.
<b>Project Code</b>	E_ECOTOUR
<b>Funding</b>	Australian Department of Tourism, the Cooperative Research Centre for Tropical Rainforest Ecology and Management, and the Australian Centre for Tropical Freshwater Research (now TropWATER), James Cook University.
<b>Collection period (years)</b>	January - April 1995
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	Water temperature, pH and electrical conductivity were measured in the field using instruments calibrated following the manufacturer's instructions. Water samples were collected from 20 to 30 cm below the water surface. Samples were collected for the analysis of total suspended solids (TSS), total nitrogen (TN) and total phosphorus (TP), dissolved inorganic nutrients, chlorophyll <i>a</i> , phaeophytin and true colour. Samples for dissolved inorganic nutrients were field filtered using Sartorius 0.45 µm cellulose acetate filters, then stored in gamma-sterilised plastic tubes and snap frozen upon arrival at the laboratory. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1992). Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1992) implemented on a segmented flow auto-analyser. For the determination of TN and TP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration.
<b>Use Limitations / notes</b>	This study design collected samples upstream and downstream of swimmers but associated with a single set of coordinates for each sampled site. We have added the upstream and downstream annotation to the comments column of the dataset. Further details on the study design are provided in Butler et al. (2021).
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Butler, B., Pearson, R.G. and Birtles, R.A. (2021) Water-quality and ecosystem impacts of recreation in streams: Monitoring and management. Environmental Challenges 5: 100328. Butler, B.M., Birtles, A., Pearson, R.G., and Jones, K. (1996) Ecotourism, water quality and Wet Tropics streams. ACTFR Report No. 96/11.

## E\_PROJ25

Metadata record	
<b>Project Name</b>	NESP Project 25 Russell-Mulgrave water quality
<b>Project Description</b>	A NESP Water Quality Hub water quality monitoring program conducted across the Russell-Mulgrave catchment ( <a href="https://eatlas.org.au/nesp-twq-4/on-farm-decision-making-4-8">https://eatlas.org.au/nesp-twq-4/on-farm-decision-making-4-8</a> ). Metadata: <a href="https://storymaps.arcgis.com/stories/a2b9582ba4b54247b46bc5075806f1c4">https://storymaps.arcgis.com/stories/a2b9582ba4b54247b46bc5075806f1c4</a>
<b>Project Code</b>	E_PROJ25
<b>Funding</b>	National Environmental Science Program (Tropical Water Quality Hub 2.1.7 and 4.8)
<b>Collection period (years)</b>	2016-2020 (project on-going)
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory, James Cook University
<b>Technical details</b>	<p>Samples were collected for the analysis of total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), urea and dissolved nutrient species. Sampling at all sites was conducted on a monthly or bimonthly basis during dry-season low flows. Sampling frequency increased to daily or greater during wet season flood events, particularly during early wet season 'first-flush' events. Wet season sample frequency was extended to approximate weekly collection during larger, more sustained events during later stages of the wet season. Samples were manually collected by project scientists, or support staff trained in the correct sampling and quality assurance procedures. Water samples were collected in pre-rinsed 1 L polypropylene bottles using an extendable sampling pole for TSS, unfiltered nutrient samples were subsampled into 60 mL polypropylene vials, with filterable nutrients filtered on-site through pre-rinsed filter modules (Sartorius Minisart 0.45 µm cellulose acetate) into sterile polypropylene vials. Samples were stored on ice in eskies following sampling and on-site processing, for transport to the laboratory. Samples for TN, TDN, TP and TDP were digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution simultaneously analysed for oxidised nitrogen (NO<sub>x</sub>) and filterable reactive phosphorus (FRP) with a segmented flow auto-analyser. The analyses of NO<sub>x</sub>, ammonia and FRP were also conducted using segmented flow auto-analysis techniques following standard methods (APHA 2012). A specific urea assay was also conducted to quantify the urea component of dissolved organic nitrogen using a segmented flow analyser modification of the procedures developed by Marsh et al. (1965). TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman Grade 934AH filter membrane (nominally 1.5 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA, 2012).</p>
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.

<b>Project references</b>	<p>Davis, A.M., Taylor, B. and Fielke, S. (2020) 'Project 25': Engaging with farmers and demonstrating water quality outcomes to create confidence in on-farm decision-making. Report to the National Environmental Science Program. Reef and Rainforest Research Centre Limited, Cairns (83pp.)</p> <p>Davis, A. M., Webster, A. J., Fitch, P., Fielke, S., Taylor, B. M., Morris, S., et al. (2021) The changing face of science communication, technology, extension and improved decision-making at the farm water quality interface. Mar. Pollut. Bull. 169, 112534.</p>
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## E\_NHTJR

Metadata record	
<b>Project Name</b>	NHT Johnstone River water quality
<b>Project Description</b>	Water quality assessment at 30 sites within the Johnstone Basin. Data were collected between 1991 and 1998 and include sediments, nutrients, physico-chemical and pesticides.
<b>Project Code</b>	E_NHTJR
<b>Funding</b>	Queensland Government and the Natural Heritage Trust
<b>Collection period (years)</b>	1991-1998
<b>Data custodian</b>	Queensland Department of Natural Resources and Mines
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	DESI Chemistry Centre, Brisbane (formerly Queensland Department of Natural Resources and Mines' Natural Resource Sciences Laboratories, Indooroopilly)
<b>Technical details</b>	<p>Samples were collected for the analysis of electrical conductivity, pH, turbidity, total suspended solids (TSS), total Kjeldahl nitrogen (TKN), dissolved Kjeldahl nitrogen (DKN), total Kjeldahl phosphorus (TKP), dissolved Kjeldahl phosphorus (DKP), dissolved inorganic nutrients, total organic carbon (TOC), dissolved organic carbon (DOC), major cations and anions, hardness, total dissolved ions and selected metals and pesticides. Samples were collected manually or using refrigerated, automatic samplers (on Fisher and Taylor Creeks). Samples collected manually were filtered on-site using pre-combusted, acid-washed Whatman GF/F (glass fibre, ca. 0.7 µm pore size) filters for dissolved nutrient fractions. As samples from the automatic samplers could not be filtered immediately after collection, they were frozen unfiltered. TKN, TKP, DKN and DKP were determined using the Kjeldahl digest procedure and the resultant digestant analysed for ammonia and filterable reactive phosphorus (FRP) simultaneously using automated (segmented flow) colorimetric procedures following standard methods (APHA 1989). The analyses of nitrogen oxides (NO<sub>x</sub>), ammonia and FRP were also conducted using automated (segmented flow) procedures following standard methods (APHA 1989). Samples taken by refrigerated automatic samplers were analysed for TSS, TKN, TKP and NO<sub>x</sub>. TSS was measured gravimetrically following standard methods (APHA 1989). Analysis of metals was undertaken by ICP-OES. Pesticide residue was determined by selected ion monitoring using gas chromatography or high performance liquid chromatography.</p>
<b>Use Limitations / notes</b>	For nutrients, pesticides and most other variables detection limits were recorded in the various reports. However, there were additional analytes (e.g. soluble metals, turbidity, dissolved organic carbon) where detection limits were not reported and details on collection were not provided. In these cases, the values below detection have been set to the lower boundary of the available data for that analyte within this dataset. Some estuarine sites/tidally influenced sites have been retained with this dataset to keep the dataset complete, including North Johnstone River at Geraldton Bridge, Nind Creek upstream of Sewage Plant and Nind Creek at Croquette Point. Note that the TSS method states 240 (D) but is likely an error and should read standard method 2540 D.

<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	<p>Hunter, H.M. (1993) Fluxes of nitrogen, phosphorus and suspended solids in the Johnstone River system: April 1991 - March 1993. Land use and Fisheries, Department of Primary Industries. Unpublished Report ACU93.19.</p> <p>Hunter, M.J., Sologinkin, S.J. Choy, S., Hooper, A.R., Allen, W.S., Raymond, M.A.A. and Peeters, J. (2001) Water Management in the Johnstone Basin. NHT Project No. 952194. The State of Queensland, Department of Natural Resources and Mines, Queensland, Australia.</p> <p>Hunter, H.M and Walton, R.S. (2008) Land-use effects on fluxes of suspended sediment, nitrogen and phosphorus from a river catchment of the Great Barrier Reef, Australia. Journal of Hydrology 356: 131-146.</p>

## E\_WTMIP

Metadata record	
<b>Project Name</b>	Wet Tropics Major Integrated Project
<b>Project Description</b>	Baseflow and event flow water quality monitoring at seven sites in waterways draining representative land uses across the Tully and Johnstone basins from 2018. Data collected include sediments, nutrients, pesticides and physico-chemical.
<b>Project Code</b>	E_WTMIP
<b>Funding</b>	Reef Water Quality Program (Queensland Government) Project TF8.3.1
<b>Collection period (years)</b>	2018-2023 (project on-going)
<b>Data custodian</b>	Terrain Natural Resource Management on behalf of the Wet Tropics Major Integrated Project (WTMIP) consortium.
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Cairns Regional Council (CRC) Water Laboratory (with additional pesticides analysed by QHFSS).
<b>Technical details</b>	<p>Analytes monitored during events are consistent with those monitored during routine sampling, except for the physico-chemical analytes, which are not measured on every sampling occasion during each event. Flow events are sampled using a combination of manual grab sampling and rising stage samplers in order to capture as many samples as possible on the rise, peak and fall of the hydrograph. Water sampling methods align with the Queensland Monitoring and Sampling Manual (DES 2018) in accordance with Standard Operating Procedure (SOP) manuals available: <a href="https://mip.terrain.org.au/resources/">https://mip.terrain.org.au/resources/</a>. Nutrient, sediment and pesticide sample collection, preservation and storage are described in WTMIP SOP 002 and WTMIP SOP 003. Physico-chemical analytes are measured with a hand-held water quality meter according to WTMIP SOP 005. Total nitrogen and total phosphorus were analysed at the CRC Laboratory using persulphate oxidation with nitrogen oxides (NOx) and filterable reactive phosphorus (FRP) measured by flow injection analyser using standard methods. The total dissolved (&lt;0.45 µm) nitrogen and phosphorus constituents were analysed as above. The dissolved (&lt;0.45 µm) inorganic constituents (NOx, ammonium and FRP) were analysed by discrete analyser using standard methods. Urea concentrations in filtered water samples was analysed by an auto-analyser using the diacetyl monoxime method. Total Suspended Solids were determined by filtration of the sample through a pre-weighed micro fibre filter paper with 1.5 µm pore size which was dried at 104°C for at least 3 hours and then weighed again. Pesticides were analysed by Liquid Chromatography Mass Spectrometry (LC/MS).</p>
<b>Use Limitations / notes</b>	The user should be aware that the nutrient analysis undertaken was intended to inform growers and the reporting limits are therefore relatively high and may not be suitable for some applications. Additional measurements of nitrate undertaken in the field were removed.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.



<b>Project references</b>	WTMIP (2023) Wet Tropics Major Integrated Project – Local Scale Monitoring – Final Technical Report. For the reporting period October 2018 to March 2021. Report prepared by the Wet Tropics Major Integrated Project delivery team for the Queensland Government, Office of the Great Barrier Reef. January 2023, pp 641 (Confidential Report).
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## E\_TWQIP

Metadata record	
<b>Project Name</b>	Tully Water Quality Improvement Plan
<b>Project Description</b>	Water quality monitoring of waterways draining representative land uses across the Tully Murray basins during high flow event conditions from 2005 to 2007. Data collected include sediments, nutrients and pesticides.
<b>Project Code</b>	E_TWQIP
<b>Funding</b>	Tully Water Quality Improvement Plan via Terrain NRM
<b>Collection period (years)</b>	2005-2007
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR) (nutrients, TSS); QHFSS (pesticides)
<b>Technical details</b>	<p>Samples were collected for the analysis of electrical conductivity, total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), dissolved inorganic nutrients and selected pesticides. Surface water samples (top 50 cm of the water column) were collected in a triple rinsed bucket. Sub-samples were then collected from the well-mixed bucket for TSS, total and filterable nutrients and pesticides. Samples for dissolved nutrients were filtered on-site through 0.45 µm cellulose acetate Sartorius Minisart micropore filters into sterile polypropylene vials. Samples for nutrient analysis were then frozen. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. The standard suite of PSII herbicides were analysed using liquid chromatography mass spectrometry (LC/MS) at QHFSS. Sampling and analytical methods are modified for brevity from Faithful et al. (2008).</p>
<b>Use Limitations / notes</b>	Note some nutrient values provided are below the laboratory reporting limits, e.g. ammonia and phosphate (1 µg/l) and hence these lower values may be unreliable. For some applications it may be appropriate to replace these values with the detection limits (or apply half the detection limit).
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>

<b>Project references</b>	<p>Faithful, J., Brodie, J., Bainbridge, Z., Schaffelke, B., Slivkoff, M., Maughan, M. Liessmann, L. and Sydes, D. (2008) Water quality characteristics of water draining different land uses in the Tully/Murray rivers region - Edition 2. Report for the Terrain Natural Resources Management Tully Water Quality Improvement Plan. ACTFR Report No. 08/03.</p> <p>Bainbridge, Z.T., Brodie, J.E., Faithful, J.W., Sydes, D.A. and Lewis, S.E. (2009) Identifying the land-based sources of suspended sediments, nutrients and pesticides discharged to the Great Barrier Reef from the Tully-Murray Basin, Queensland, Australia. Marine and Freshwater Research 60: 1081-1090.</p>
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## E\_HYDRO

Metadata record	
<b>Project Name</b>	Tully-Millstream Hydroelectric Scheme
<b>Project Description</b>	Water quality monitoring during 1990 for the Tully-Millstream Hydroelectric Scheme. Sampling at 21 sites in the Tully and Herbert River basins. Data collected include nutrients and physico-chemical.
<b>Project Code</b>	E_HYDRO
<b>Funding</b>	Tully-Millstream Hydro Electric Scheme
<b>Collection period (years)</b>	1990
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University; Australian Assay Laboratory (selected metals)
<b>Technical details</b>	<p>Water temperature, dissolved oxygen, specific conductivity and pH were measured in the field using instruments calibrated following the manufacturer's instructions. Turbidity was determined in the field using a spectrophotometer following the approach of Palin (1955). Samples were collected for the analysis of total nitrogen (TN), total phosphorus (TP), dissolved inorganic nitrogen and phosphorus nutrients (i.e., ammonia, nitrite and nitrate, and filterable reactive phosphorus [FRP]), major cations and anions and selected metals. Water samples for nutrients were refrigerated immediately and frozen as soon as possible after collection. Nitrate and nitrite (NO<sub>x</sub>) were determined using standard approaches (APHA 1975) with a Lachat Flow Injection Analyser. Ammonia and FRP were determined manually using standard colorimetric methods (APHA 1975). Samples for TN and TP were digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution simultaneously analysed for NO<sub>x</sub> and FRP. Iron and manganese were analysed using atomic absorption spectroscopy. Total iron and manganese were digested with silica-distilled nitric acid prior to analysis. Total chromium, copper and arsenic were determined by the Australian Assay Laboratories after pre-concentration and digestion of the samples. Cations were analysed by adding a caesium ionization suppressant and a strontium releasing agent and then directly determined using flame atomic absorption spectroscopy. Sulfate was determined using standard methods (APHA 1975) and measured spectrophotometrically. Chloride was determined using an ion selective electrode. Bicarbonate was measured by Gran titration.</p>
<b>Use Limitations / notes</b>	Latitudes and longitudes approximated from maps in available reports and the site descriptions. Locations were then confirmed with the data provider. Dates are missing time stamps.
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>

<b>Project references</b>	<p>Faithful, J.W. and Brodie, J. (1990) Water quality sampling and testing program - post wet season monitoring program. Tully-Millstream hydroelectric scheme. ACTFR Report No. 90/09.</p> <p>Faithful, J. (1990) Tully-Millstream hydroelectric scheme. Water quality sampling and testing program dry season monitoring program. ACTFR Report No. 90/14.</p>
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## E\_MTSRF7

Metadata record	
<b>Project Name</b>	MTSRF Tully-Murray floodplain wetlands
<b>Project Description</b>	Water quality data collected from 10 Tully-Murray floodplain wetlands between 2008 and 2009 under MTSRF Program 7. Data collected include nutrients, physico-chemical and pesticides.
<b>Project Code</b>	E_MTSRF7
<b>Funding</b>	Department of the Environment, Water and Heritage and the Arts through the Marine and Tropical Sciences Research Facility (MTSRF Program 7, Project 3.7.3) through the RRRC
<b>Collection period (years)</b>	2008-2009
<b>Data custodian</b>	TropWATER, James Cook University; Australian Rivers Institute, Griffith University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University; QHFSS (pesticides)
<b>Technical details</b>	<p>Water temperature, dissolved oxygen, electrical conductivity and pH were measured in the field using instruments calibrated following the manufacturer's instructions. The concentration of water column chlorophyll <i>a</i> and nutrients were measured in both open water and adjacent to structural habitat in two habitat transects (a and c). We generated representative open water quality samples for the database compilation by averaging the two open water samples for each sampled location and date. A single composite water sample was collected for analysis of Photosystem II herbicides in each wetland on each sampled date. A composite one-litre water sample comprising approximate 0.25 L of water was collected from the same four positions within each wetland (open water and littoral for transects a and c) as the nutrient and chlorophyll measurements. Samples were collected for the analysis of chlorophyll <i>a</i>, phaeophytin, total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), dissolved inorganic nutrients and selected pesticides. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration. Herbicides were analysed using liquid chromatography mass spectrometry at QHFSS.</p>

<b>Use Limitations / notes</b>	Multiple samples were taken on each sampling occasion and the location and habitat details are provided in the comments column of the database. The water quality sampling design for the MTSRF study involved sampling at up to three locations per lagoon (designated 'a', 'b' or 'c' in the spreadsheet). At locations 'a' and 'c', nutrient samples were both at the lagoon margin (indicated by '1' in the spreadsheet) and at mid-lagoon ('2' in the spreadsheet); the '1' and '2' samples were typically separated by about 10 to 20 metres. In most cases the mid-lagoon sample ('2') was taken from an area of open water (as a function of the middle part of the lagoon being deeper and distant from the vegetated margins).
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Pearson, R. G., Arthington, A. H. and Godfrey, P. C. (2010) Ecosystem Health of Wetlands of the Great Barrier Reef Catchment: Tully-Murray Floodplain Case Study. Final Project Report prepared for the Marine and Tropical Sciences Research Facility (MTSRF) with contributions from J. Wallace, F. Karim and M. Ellison. Published by the Reef & Rainforest Research Centre Ltd, Cairns (126pp.).



## E\_DPIFOR

Metadata record	
<b>Project Name</b>	Whitfield Creek DPI Forestry
<b>Project Description</b>	Water quality monitoring of runoff from pine plantation and also native forest and agricultural crops between 2004 and 2007 in the Whitfield Creek catchment. Data collected include nutrients and sediments.
<b>Project Code</b>	E_DPIFOR
<b>Funding</b>	Natural Heritage Trust (Reef and Rainforest CRC's); Queensland Department of Primary Industries – Forestry
<b>Collection period (years)</b>	2004-2007
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>Water samples were collected for the analysis of total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP) and dissolved inorganic nitrogen and phosphorus nutrients (i.e., ammonia, nitrite and nitrate, and filterable reactive phosphorus [FRP]). Water sampling was conducted using a combination of automated samplers (HACH Sigma 800) and manual grab sampling. Automated event samples were collected in the channel pool directly behind a constructed weir after flow event actuation. Automated samples were collected after being triggered by specific flow conditions during storm flows at hourly intervals during the rising and falling stages of the flow. Autosampler stations were checked and maintained at least once a month coinciding with monthly grab samples, when no flow events were occurring or during sample collection after high flow events. Water samples were collected as soon as possible (within 24 hours) after the flow events were triggered. Samples for dissolved inorganic nutrients were field-filtered using Sartorius 0.45 µm cellulose acetate filters. Samples for TSS were stored on ice until they were returned to the laboratory, and the nutrient samples were frozen as soon as possible after collection. TSS was measured gravimetrically in the laboratory by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Dissolved inorganic nutrient concentrations were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser.</p>
<b>Use Limitations / notes</b>	Zero values in this dataset have been changed to the detection limits reported from other TropWATER datasets for the same time period. Note some nutrient concentrations provided are below the laboratory reporting limits, e.g. TP and TDP (0.005 mg/l) and hence these lower concentrations may be unreliable. For some applications it may be appropriate to replace these concentrations with the detection limits (or half the limit).

<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Faithful, J., Brodie, J., Armstrong, C., Frayne, P. and Bubb, K. (2005) Water quality of runoff from pine plantation, native forest and agricultural crops in the Whitfield Creek catchment, located in the Wet Tropics of Northern Queensland, Australia in the 2003/04 wet season. ACTFR Report No. 05/02.

## E\_KYAMBUL

Metadata record	
<b>Project Name</b>	CSIRO Kyambul Lagoon water quality
<b>Project Description</b>	Water quality data collected from the Kyambul Lagoon on the Tully and Murray floodplain. Sampling conducted over a 3-year period. Data collected include nutrients and sediments.
<b>Project Code</b>	E_KYAMBUL
<b>Funding</b>	Healthy Water Ecosystems theme - CSIRO Water for a Healthy Country Flagship.
<b>Collection period (years)</b>	2007-2009
<b>Data custodian</b>	CSIRO
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>The fluxes of sediment and nutrients into and out of Kyambul Lagoon were measured using refrigerated automated water quality samplers located at the inlet and outlet of the lagoon. Further samples were taken as manual grab samples or using rising stage samplers. Samples were collected by the automatic sampler each time 35 MI passed either the inlet or the outlet station. This was adjusted in the dry season to trigger sampling at least once per week. Further details of the sampling strategy are provided in McJannet et al. (2012). Water samples were collected for the analysis of total suspended solids (TSS), dissolved organic carbon (DOC), chlorophyll <i>a</i>, phaeophytin, electrical conductivity, turbidity, total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP) and dissolved inorganic nutrients. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were in use. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration.</p>
<b>Use Limitations / notes</b>	Some bore water quality samples were also collected as part of this project, but these have been excluded from the data compilation.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	McJannet, D., Wallace, J., Keen, R., Hawdon, A., and Kemei, J. (2012) The filtering capacity of a tropical riverine wetland: II. Sediment and nutrient balances. <i>Hydrological Processes</i> 26: 53-72.

## E\_CSIROHR

Metadata record	
<b>Project Name</b>	Lower Herbert River water quality
<b>Project Description</b>	Water quality monitoring sites for several freshwater streams of the lower Herbert River catchment area from 1992 to 1995. Data collected include physico-chemical, nutrients and sediments.
<b>Project Code</b>	E_CSIROHR
<b>Funding</b>	CSIRO (Coastal Zone Program)
<b>Collection period (years)</b>	1992-1995
<b>Data custodian</b>	CSIRO
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	CSIRO Davies Laboratory, Townsville (closed)
<b>Technical details</b>	Samples were collected for the analysis of electrical conductivity, pH, total suspended solids (TSS), total Kjeldahl nitrogen (TKN), particulate nitrogen (PN), total Kjeldahl phosphorus (TKP), particulate phosphorus (PP), dissolved inorganic nutrients, potassium and soluble iron. Water samples were collected as surface grab samples from either a bridge or by wading into the stream. Samples were filtered through GF/F grade filters (nominally 0.7 µm pore size) and analysed using standard US EPA methods implemented on a segmented flow analyser. A further filtered sample was digested using the Kjeldahl acid digestion for Kjeldahl N (DKN) and Kjeldahl P (DKP) and the resultant digestant analysed for ammonia and filterable reactive phosphorus (FRP) implemented on a segmented flow auto-analyser. The particulate fractions for N and P (PN and PP) were measured directly using the filter papers by the same Kjeldahl digestion procedure. All chemical analysis was carried out in duplicate and checked against the analysis of blanks and certified reference materials. TSS was determined by gravimetric measurement of the particulate material retained on a 0.45 µm cellulose acetate filter paper.
<b>Use Limitations / notes</b>	Site locations were georeferenced by cross-checking maps and site name/descriptions (often including creek name and road crossing details) provided in Bramley & Muller (1999) and Bramley & Roth (2002). All analysis was carried out in duplicate (Bramley and Roth 2002). The data provider suggests that the duplication was with respect to the laboratory analysis only with the duplicate samples both taken from the same single larger sample. Results are therefore assumed to be an average of the two sub samples.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Bramley, R.G.V. and Muller, D.E. (1999) Water quality in the lower Herbert River - The CSIRO dataset. Report No. 16/99, CSIRO Land and Water, Aitkenvale, QLD. Bramley, R.G.V. and Roth, C.H. (2002) Land use impact on water quality in an intensively managed catchment in the Australian humid tropics. Marine and Freshwater Research 53, 931–940. Muller, D.E., Wilson, B.R. and Campbell, S.K. (1995) Protocols for water quality monitoring in the Herbert River catchment. Technical Memorandum No 36/1995, CSIRO Division of soils, Adelaide.

## E\_HWQMP

Metadata record	
<b>Project Name</b>	Herbert Water Quality Monitoring Program
<b>Project Description</b>	Water quality monitoring of waterways draining representative land uses across the Herbert River basin during high flow event conditions between. Data collected from 2011 to 2017 and include sediments, nutrients, metals and pesticides.
<b>Project File Code</b>	E_HWQMP
<b>Funding</b>	SRDC, Sugar Research Australia, local government (Tablelands Regional Council and Hinchinbrook Shire Council) and the Queensland Government (DAFF, DERM).
<b>Collection period (years)</b>	2011-2017
<b>Data custodian</b>	TropWATER, James Cook University; Terrain NRM; HCPSL
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory, James Cook University; DESI Chemistry Centre, Brisbane (formerly Queensland Department of Natural Resources and Mines' Natural Resource Sciences Laboratories, Indooroopilly) (metals); QHFSS (pesticides)
<b>Technical details</b>	<p>Concentrations of pollutants were measured by manual sampling at all sites as often as practical (ideally 5-10) over the hydrograph of first flush and major events during the wet season, while ambient concentrations were collected bi-monthly. Project Staff were all provided with training from TropWATER in collecting samples in accordance with QA/QC protocols provided with sampling equipment, including gloves and detailed instructions of the procedures to ensure minimal contamination and degradation of samples before analysis. Samples were collected for the analysis of electrical conductivity, pH, turbidity, total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), total Kjeldahl nitrogen (TKN), total Kjeldahl phosphorus (TKP), dissolved inorganic nutrients, metals and pesticides. Note TKN and TKP were analysed between 2011 and 2016 and after this TN and TP were measured directly (2017). Unfiltered water samples were collected from the water surface (top 0.5 m) in pre-rinsed 1 L polypropylene bottles (obtained from TropWATER analytical laboratory) for TSS; 60 ml Sarstedt sterile polypropylene vials for total nitrogen and total phosphorus analysis and into 1 L amber glass bottles for pesticide analysis. Filtered samples were collected onsite into six 10 ml Sarstedt polypropylene vials using pre-rinsed filter modules (Sartorius Minisart 0.45 µm cellulose acetate). All samples were immediately placed on ice following collection. Nutrient samples were frozen as soon as possible (within 6-24 hours) and TSS and pesticide samples were stored at 4°C prior to analysis. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman Grade 934AH filter membrane (nominally 1.5 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1989, 1998) implemented on a segmented flow auto-analyser. TKN and TKP were analysed using the Kjeldahl digestion procedure and the resultant digestant</p>

	analysed for NH <sub>4</sub> and FRP simultaneously using a segmented flow auto-analyser following standard methods (APHA 1989). For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser.
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	<p>O'Brien, D., Nash, M., Di Bella, L. and Brodie, J. (2015) Reef Plan Herbert Water Quality Monitoring Program (HWQMP) Final report for monitoring undertaken between 2011 and 2014. TropWATER Report No. 15/18.</p> <p>O'Brien, D., Nash, M., Di Bella, L., Davis, A., Royle, A. and Brodie, J. (2016) Herbert Water Quality Monitoring Program (HWQMP) Sugarcane specific monitoring 2014-2016 (Project NEMO) Progress Report 2015-2016.</p> <p>O'Brien, D., Davis, A. M., Nash, M., Di Bella, L., Turner, R., Reghenzani, J. R. and 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.</p> <p>Nash, M., O'Brien, D., Di Bella, L., Royle, A., Davis, A. and Brodie, J. (2016) Herbert Water Quality Monitoring Program (HWQMP) Sugarcane specific monitoring 2014-2016 (Project NEMO) Final Report 2015-2016. Report prepared by Terrain Natural Resource Management, TropWATER James Cook University and Herbert Cane Productivity Services Ltd. 93pp.</p>

## E\_BRWQIP

Metadata record	
<b>Project Name</b>	Black Ross Water Quality Improvement Plan
<b>Project Description</b>	Water quality monitoring of waterways draining representative land uses across the Black Ross basins during high flow event conditions from 2006 to 2008. Data collected include sediments, nutrients, metals and pesticides.
<b>Project Code</b>	E_BRWQIP
<b>Funding</b>	Creek to Coral Ross Black Water Quality Improvement Plan
<b>Collection period (years)</b>	2006-2008
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University; Advanced Analytical Centre (AAC), James Cook University (metals); QHFSS (pesticides)
<b>Technical details</b>	<p>Manual grab samples were collected by TropWATER staff or trained volunteers from the centre of the channel in the main flow and away from any backwash where possible. An automated ISCO sampler (non-refrigerated) was also used to sample water from Stuart Creek during a flow event. The autosampler was programmed to collect samples at hourly intervals and the samples from the auto sampler were transported on ice back to the laboratory where they were subsampled within 12 hours of collection. Samples were collected for the analysis of electrical conductivity, total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), dissolved inorganic nutrients, total suspended solids (TSS) and selected trace metals and pesticides. Nutrient samples from manual grab samples were filtered at the time of sampling using 0.45 µm Sartorius Minisart filters into sterile polypropylene vials and stored on ice with the unfiltered nutrient samples before being frozen back at the laboratory. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 2005). Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 2005) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP and TDP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Pesticide samples were collected in amber glass bottles and stored on ice before being transported to QHFSS for analysis by liquid chromatography mass spectrometry. Trace metals were measured by Inductively Coupled Plasma Mass Spectrometry at the AAC.</p>
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>

<b>Project references</b>	<p>Liessmann, L., Lewis, S., Bainbridge, Z., Butler, B., Brodie, J., Faithful, J. and Maughan, M. (2007) Event-based water quality monitoring of the Ross and Black River Basins during the 2006/07 wet season. ACTFR report No. 07/09.</p> <p>Lewis, S., Bainbridge, Z., Brodie, J., Butler, B. and Maughan, M. (2008) Water quality monitoring of the Black Ross basins: 2007/08 Wet season. Interim report for the Black Ross Water Quality Improvement Plan. ACTFR Report No. 08/04.</p>
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## E\_TCCWEIR

Metadata record	
<b>Project Name</b>	Townsville City Council weir water quality
<b>Project Description</b>	Water quality monitoring data collected by Townsville City Council between 2013 and 2023 for selected weirs. Measured analytes include physico-chemical, nutrients, cations and anions, and total metals.
<b>Project Code</b>	E_TCCWEIR
<b>Funding</b>	Townsville City Council (TCC)
<b>Collection period (years)</b>	2013-2023 (on-going)
<b>Data custodian</b>	Townsville City Council (TCC)
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	Townsville Laboratory Services (TLC)
<b>Technical details</b>	Field sampling procedures followed standard operating practices with the methods referenced from the Australian standard (AS5667). Water temperature, pH, dissolved oxygen, salinity, turbidity and electrical conductivity measurements were made in the field using instruments calibrated following the manufacturer's instructions. Samples were collected variously for the analysis of colour, major cations and anions, alkalinity, hardness, dissolved organic carbon (DOC), total nitrogen (TN), total phosphorus (TP), dissolved inorganic nutrients, selected total and soluble metals and PFAS (note that PFAS is not included in the database at present). Grab samples were typically filtered for dissolved nutrients and metals back at the laboratory. Laboratory analysis was undertaken at the Townsville Laboratory Services NATA accredited laboratory using standard internationally recognised methods. TN was analysed by alkaline persulfate digestion then subsequent analysis by CFA (APHA 4500 N C). TP was measured by acidic persulphate digestion with subsequent analysis on a discrete analyser (APHA 4500 P B G). Dissolved inorganic nutrients (nitrogen oxides, ammonia and orthophosphate) were measured by standard methods (EPA 103, 104, 129; APHA 4500 NO3 I). Other variables (cations, anions, metals) were measured using standard methods.
<b>Use Limitations / notes</b>	Some values reported are below the Practical Quantifiable Limit (PQL) given in the datasheets. For some applications, it may be advisable to amend these values to the PQL or use half the PQL. PQL are given in mg/L (note that PQL for Paluma Dam differ in some instances from the other TCC datasets and are designated with a *). Ammonia as N: 0.02, Oxidised nitrogen as N: 0.01, Phosphate as P: 0.01, TN: 0.1, TP: 0.02 (0.1*), silica as SiO <sub>2</sub> : 0.1, Aluminium: 0.01, Calcium 0.7 (0.2*), Copper: 0.002, Iron: 0.002 (0.005*), Magnesium: 0.5 (0.2*), Manganese: 0.0003 (0.001*), Potassium: 0.5 (0.2*), Sodium: 1.2 (0.2*), Zinc: 0.001, Chloride: 0.5, Sulfate: 0.5, Fluoride: 0.02.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Citation</b>	Data to be cited as Townsville City Council, 2023.

## E\_CSIROWW

Metadata record	
<b>Project Name</b>	CSIRO Wheel Weany event water quality
<b>Project Description</b>	High event flow water quality data from two grazed catchments in the Upper Burdekin collected between 2000 to 2017. Data collected include nutrients and sediments.
<b>Project Code</b>	E_CSIROWW
<b>Funding</b>	Australian Government's National Environmental Science Program (NESP Projects 2.1.4 and 5.9), Tropical Water Quality Hub, Paddock to Reef Program; Meat and Livestock Australia (NAP3.224), CSIRO
<b>Collection period (years)</b>	2000-2017
<b>Data custodian</b>	CSIRO
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>Water samples were collected with non-refrigerated automatic ISCO water samplers with the water intake positioned 30 cm above the bed. Unfiltered water samples were analysed in accordance with APHA standards (APHA 1998-2012) at the TropWATER laboratory. Samples were collected for the analysis of total suspended solids (TSS), total nitrogen (TN) and total phosphorus (TP). TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample. Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were in use. TN and TP were only analysed if less than 14 days had elapsed between sampling and samples being frozen for later laboratory analysis (typically the time elapsed between sample collection and return to the laboratory was less than three days). For the determination of TN and TP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution analysed on a segmented flow auto-analyser following standard methods (APHA 1998-2012).</p>
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>
<b>Project references</b>	<p>Bartley, R., Corfield, J.P., Hawdon, A.A., Kinsey-Henderson, A.E., Abbott, B.N., Wilkinson, S.N. and Keen, R.J. (2014) Can changes to pasture management reduce runoff and sediment loss to the Great Barrier Reef? The results of a 10-year study in the Burdekin catchment, Australia. <i>The Rangeland Journal</i> 36(1): 67-84.</p> <p>Koci, J., Sidle, R.C., Kinsey-Henderson, A.E., Bartley, R., Wilkinson, S.N., Hawdon, A.A., Jarihani, B., Roth, C.H. and Hogarth, L. (2020) Effect of reduced grazing pressure on sediment and nutrient yields in savanna rangeland streams draining to the Great Barrier Reef. <i>Journal of Hydrology</i> 582: 12452.</p>

## E\_NHTBKN

Metadata record	
<b>Project Name</b>	Townsville Burdekin Dry Tropics region water quality
<b>Project Description</b>	Monthly water quality sampling at six locations within the Burdekin and Townsville region of the Dry Tropics between September 2001 and August 2002. Data collected include physico-chemical, sediments and nutrients.
<b>Project Code</b>	E_NHTBKN
<b>Funding</b>	Natural Heritage Trust Project (Conservation Volunteers Australia) (project code 2002153)
<b>Collection period (years)</b>	2001-2002
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>Water temperature, specific conductivity, dissolved oxygen and pH were measured in the field using instruments calibrated following the manufacturer's instructions. Water samples were collected as grab samples for the analysis of chlorophyll <i>a</i>, phaeophytin, total suspended solids (TSS), turbidity, total nitrogen (TN), total phosphorus (TP) and dissolved inorganic nutrients (i.e., ammonia, nitrite and nitrate (NO<sub>x</sub>), and filterable reactive phosphorus [FRP]). Water samples were collected from a depth of 20 to 30 cm below the water surface as far as possible from the bank. Samples for dissolved inorganic nutrients were field filtered using Sartorius 0.45 µm cellulose acetate filters. All collected nutrient samples were immediately stored on ice after collection and frozen within 18 hours of collection. Water samples for chlorophyll <i>a</i> were stored cool, filtered on return to the laboratory and the resultant filters frozen within 18 hours of sample collection. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration. Samples for TSS analysis were kept cool and filtered within 24 h of return to the laboratory. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Dissolved inorganic nutrient concentrations were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN and TP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser.</p>
<b>Use Limitations / notes</b>	Note some nutrient concentrations provided are below the laboratory reporting limits and hence these lower concentrations may be unreliable. For some applications, it may be appropriate to replace these concentrations with the detection limits or half the detection limit.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.

<b>Project references</b>	Faithful, J. (2002) Water Quality in the Townsville / Burdekin Dry Tropics Region. A Report to Conservation Volunteers Australia, Townsville Branch. ACTFR Report No. 02/12.
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## E\_BCWQ

Metadata record	
<b>Project Name</b>	Burdekin community water quality
<b>Project Description</b>	Wet season flow event suspended sediment and nutrient data collected across 29 tributaries and major basin locations of the Burdekin, Haughton and Don River basins between 2003 and 2011. Data collected includes physico-chemical, nutrients and pesticides.
<b>Project Code</b>	E_BCWQ
<b>Funding</b>	North Queensland Dry Tropics (Burdekin Rangeland to Reef Initiative, National Action Plan for Salinity and Water Quality)
<b>Collection period (years)</b>	2003-2011
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR); QHFSS (limited pesticides)
<b>Technical details</b>	Water samples were analysed for total suspended solids (TSS), total nitrogen (TN) and phosphorus (TP), total dissolved nitrogen (TDN) and total dissolved phosphorus (TDP) and dissolved inorganic nutrients. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 2005). Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were in use. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 2012) implemented on a segmented flow auto-analyser. For the determination of TN, TP, TDN and TDP water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Limited pesticide samples were analysed at QHFSS for the standard suite of PSII herbicides using liquid chromatography (LC/MS).
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.

<b>Project references</b>	<p>Bainbridge, Z.T., Lewis, S.E., Smithers, S.G., Kuhnert, P.M., Henderson, B.L. and Brodie, J.E. (2014) Fine-suspended sediment and water budgets for a large, seasonally dry tropical catchment: Burdekin River catchment, QLD, Australia. WRR, 50(11), pp.9067-9087.</p> <p>Bainbridge, Z., Lewis, S., Smithers, S., Wilkinson, S., Douglas, G., Hillier, S. and Brodie, J. (2016) Clay mineral source tracing and characterisation of Burdekin River (NE Australia) and flood plume fine sediment. JSS, 16, pp.687-706.</p> <p>Lewis, S.E., Bainbridge, Z.T., Kuhnert, P.M., Sherman, B.S., Henderson, B., Dougall, C., Cooper, M. and Brodie, J.E (2013) Calculating sediment trapping efficiencies for reservoirs in tropical settings: A case study from the Burdekin Falls Dam, NE Australia. WRR, 49(2), pp.1017-1029.</p> <p>Brodie, J., Faithful, J. and Cullen, K. (2004) Community Water quality monitoring in the Burdekin River Catchment and Estuary, 2002-2004. ACTFR Report No. 04/15 for BDTNRM. ACTFR, JCU, Townsville.</p> <p>Bainbridge, Z., Brodie, J., Lewis, S., Faithful, J., Duncan, I., Furnas, M. &amp; Post, D. (2006) Event based Water Quality Monitoring in the Burdekin Dry Tropics region: 2004/2005 Wet Season. ACTFR Report No. 06/01 for BDTNRM. ACTFR, JCU, Townsville. 83pp.</p> <p>Bainbridge, Z., Lewis, S., Brodie, J., Faithful, J., Maughan, M., Post, D., O'Reagain, P., Bartley, R., Ross, S., Schaffelke, B., McShane, T. and Baynes, L. (2006) Monitoring of sediments and nutrients in the Burdekin Dry Tropics region: 2005/2006 wet season. ACTFR Report No. 06/13 for BDTNRM. ACTFR, JCU, Townsville. 97pp.</p> <p>Bainbridge, Z., Lewis, S. and Brodie, J. (2007) Event-based community water quality monitoring in the Burdekin Dry Tropics region: 2006-2007 (Vol 1 &amp; 2). ACTFR Report No. 07/22 for BDTNRM. ACTFR, JCU, Townsville.</p> <p>Bainbridge, Z., Lewis, S., Davis, A. and Brodie, J. (2008) Event-based community water quality monitoring in the Burdekin Dry Tropics NRM Region: 2007/08 wet season update. ACTFR Report No. 08/19 for NQDT. ACTFR, JCU, Townsville.</p>
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## E\_MYUNA

Metadata record	
<b>Project Name</b>	CSIRO Bowen River water quality at Myuna
<b>Project Description</b>	A compilation of water quality data collected from 2003 to 2008 at the Bowen River Myuna gauge autosampler site in the Burdekin basin. Data collected include turbidity, sediments, nutrients and metals.
<b>Project Code</b>	E_MYUNA
<b>Funding</b>	Burdekin Rangeland to Reef Initiative (DPI); National Action Plan for Salinity and Water Quality; Burdekin Dry Tropics NRM through the Regional Investment Strategy; CSIRO.
<b>Collection period (years)</b>	2003-2008
<b>Data custodian</b>	CSIRO; TropWATER, James Cook University; North Queensland Dry Tropics
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	CSIRO Davies Laboratory (now closed) and TropWATER Laboratory (formerly ACTFR), James Cook University variously between 2003-2004; QHFSS (nutrients) 2004-2006; TropWATER Laboratory 2004-2007 (TSS only); Advanced Analytical Centre (AAC), James Cook University (metals)
<b>Technical details</b>	<p>Water samples were collected manually or using an ISCO automatic water sampler under a number of different programs. Samples were collected variously for the analysis of electrical conductivity, pH, turbidity, total suspended solids (TSS), total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), total Kjeldahl nitrogen (TKN), total Kjeldahl phosphorus (TKP), dissolved inorganic nutrients and metals. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998, 2005). Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were in use. Samples for dissolved nutrient fractions were field filtered using a syringe and sterile 0.45 µm filters and frozen as soon as possible after collection. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) analysed at the TropWATER laboratory were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN and TP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser.</p> <p>During January-February 2004 nutrient samples were analysed at the CSIRO Davies laboratory using the Kjeldahl digest procedure.</p>

<b>Technical details</b>	Between December 2004 and January 2006 nutrient samples were analysed at QHFSS. Total nutrients were analysed using the Kjeldahl digestion procedure and the resultant digestant analysed for ammonia and FRP simultaneously using a segmented flow auto-analyser following standard methods (APHA 1998). For TKN, NH <sub>3</sub> was analysed based on APHA standard method 4500-NH <sub>3</sub> H (it should be noted sodium salicylate was used in lieu of phenol). For TKP, the analysis was based on the standard method for FRP (APHA 1998 – 4500-P). Periodically samples were also analysed for TN and TP using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution simultaneously analysed for NO <sub>x</sub> and FRP using standard methods (APHA 1998). The analyses of dissolved inorganic nutrients (FRP, NO <sub>x</sub> and ammonia) were performed simultaneously using a flow injection system following standard methods (APHA 1998). Trace metals were measured by Inductively Coupled Plasma Mass Spectrometry at the AAC.
<b>Use Limitations / notes</b>	For some data years assumptions had to be made regarding analytical laboratory, with implications for nutrient analytical method.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.
<b>Project references</b>	<p>Key reference for sediment (TSS) data use only: Bainbridge, Z., Olley, J., Wilkinson, S., Bartley, R., Lewis, S., Dougall, C., Khan, S., Kuhnert, P. and Burton, J. (2023) Refining fine sediment source identification through integration of spatial modelling, concentration monitoring and source tracing: A case study in the Great Barrier Reef catchments. Science of the Total Environment, p.164731.</p> <p>Please cite all references for nutrient data use:</p> <p>Loong, D., Dowe, J., Brodie, J., Post, D. and Butler, B. (2004) Riparian case study and community water quality monitoring in the Bowen-Broken catchment. Report to the Burdekin Dry Tropics Board. ACTFR Report No. 04/11.</p> <p>Brodie, J., Faithful, J. and Cullen, K. (2004) Community water quality monitoring in the Burdekin River catchment and estuary, 2002-2004. ACTFR Report No. 04/15.</p> <p>Bainbridge, Z., Brodie, J., Lewis, S., Duncan, I., Post, D., Faithful, J. and Furnas, M. (2006) Event-based water quality monitoring in the Burdekin Dry Tropics Region: 2004/05 wet season. ACTFR Report No. 06/01 for the Burdekin Dry Tropics NRM.</p> <p>Bainbridge, Z., Lewis, S., Brodie, J., Faithful, J. and Maughan, M. (2006) Monitoring of sediments and nutrients in the Burdekin Dry Tropics Region: 2005/06 Wet Season. ACTFR Report No. 06/13.</p> <p>Bainbridge, Z., Lewis, S. and Brodie, J. (2007) Event-based community water quality monitoring in the Burdekin Dry Tropics Region: 2006-2007 (Vol 1). ACTFR Report No. 07/22 for the Burdekin Dry Tropics NRM.</p> <p>Bartley, R., Hawdon, A. and Keen, R. (2007) Sediment and nutrient loads at the Myuna Gauge in the Bowen catchment (2006-2007). CSIRO Client Report to ACTFR and the Burdekin Dry Tropics Board.</p>



## E\_LDCBBB

Metadata record	
<b>Project Name</b>	LDC Bowen River community water quality monitoring
<b>Project Description</b>	Wet season flow event water quality monitoring across Bowen Broken Bogie tributaries (Burdekin basin) between 2018 and 2022. Data collected include sediments and nutrients.
<b>Project Code</b>	E_LDCBBB
<b>Funding</b>	Landholders Driving Change (LDC) implemented by North Queensland Dry Tropics (Burdekin Major Integrated Project funded by the Queensland Government through the Reef Water Quality Program); additional funding from the Australian Government's Reef Trust and Great Barrier Reef Foundation
<b>Collection period (years)</b>	2018-2022 (project ongoing)
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory
<b>Technical details</b>	Nine tributary water sampling sites were established across the Bowen and Bogie catchments. Water samples were collected for the analysis of total suspended solids (TSS), turbidity, total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP) and dissolved inorganic nutrients. Multiple water samples were collected during each runoff event over four wet seasons (November to April) from 2018 to 2022. The landholders were trained to collect surface 'grab' samples (top 0.5 m of water column) directly into pre-rinsed 1 L polypropylene bottles (and sterile 120 ml polypropylene vials for nutrients) from as close to the centre of the stream channel as possible. In particular, landholders were requested to collect samples that targeted the rising (ideally 2-3 samples), peak (1 sample) and falling (2-3 samples) stages of runoff events. Once collected, each sample was placed in the fridge (and freezer for nutrients) and then transported cold to the laboratory. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman Grade 934AH filter (nominally 1.5 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 2012). Nutrient samples were filtered upon defrosting, immediately prior to laboratory analysis, for method consistency i.e. all samples filtered in the lab due to multiple samplers and the extreme sediment concentrations (i.e. > 3g/L). Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 2012) implemented on a segmented flow auto-analyser. For the determination of TN, TP, TDN and TDP water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser.
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.

<b>Project references</b>	Bainbridge, Z., Olley, J., Wilkinson, S., Bartley, R., Lewis, S., Dougall, C., Khan, S., Kuhnert, P. and Burton, J. (2023) Refining fine sediment source identification through integration of spatial modelling, concentration monitoring and source tracing: A case study in the Great Barrier Reef catchments. Science of The Total Environment, p.164731.
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## E\_LWRRBAR

Metadata record	
<b>Project Name</b>	LWRR Barratta Wetlands study
<b>Project Description</b>	Water quality data from tropical floodplain wetlands from the lower Burdekin floodplain between 1991 and 1993. Data collected include nutrients, physico-chemical and, cations and anions.
<b>Project Code</b>	E_LWRRBAR
<b>Funding</b>	LWRRDC Research and Development Project JCU1/QWRC Partnership grant
<b>Collection period (years)</b>	1991-1993
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>Water temperature, dissolved oxygen, pH and electrical conductivity were measured in the field using instruments calibrated following the manufacturer's instructions. Samples were collected for the analysis of chlorophyll <i>a</i>, phaeophytin, total nitrogen (TN), total phosphorus (TP), dissolved inorganic nutrients, total suspended solids (TSS) and major cations. Samples for nutrients were initially collected in sealable, sterilised polyethylene bags until November 1992 and subsequently with sterile polypropylene tubes. Samples for chlorophyll <i>a</i> and TSS were collected in 1 L bottles and stored in the cool and dark until filtered. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1989). Chlorophyll <i>a</i> was determined using solvent extraction and measured spectrophotometrically. Until July 1992, filterable reactive phosphorus and ammonia were determined using standard manual colorimetric methods and nitrite/nitrate were determined using a Lachat Quickchem flow injection analyser. Samples for TN and TP determination were digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution simultaneously analysed for oxidised nitrogen (NO<sub>x</sub>) and FRP. From August 1992, a segmented flow auto-analyser was used to simultaneously determine the dissolved inorganic nutrients as well as TN and TP in the digested samples. Cations were determined by atomic adsorption spectrophotometry.</p>
<b>Use Limitations / notes</b>	The data collated are a small subset of the full dataset; representing a small number of sites for which a considerable body of water quality data are available through different programs. Unfortunately, much of the raw data presented in the referenced report has not been traced at the time of the database collation.
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>
<b>Project references</b>	Congdon, R.A., Lukacs, G.P., Nolen, J.A. and Pearson, R.G. (1993) Limnology and classification of tropical floodplain wetlands, with particular reference to the effects of irrigation drainage. Milestone Report No. 2. QWRC Partnership Project, ACTFR Report No. 93/08.

## E\_RRRDBAR

Metadata record	
<b>Project Name</b>	RRRD Barratta intensive pesticide and nutrient study
<b>Project Description</b>	University of Queensland PhD pesticide and nutrient study. High temporal resolution sampling of pesticides and dissolved nutrients in Barratta Creek during the 2012-2013 wet season.
<b>Project Code</b>	E_RRRDBAR
<b>Funding</b>	Australian Government Reef Rescue R&D Program (Project RRRD038)
<b>Collection period (years)</b>	2012-2013
<b>Data custodian</b>	University of Queensland; TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS (pesticides); TropWATER Laboratory (nutrients)
<b>Technical details</b>	<p>Samples were collected for the analysis of dissolved inorganic nutrients and selected pesticides. Water samples captured first major rainfall event of the season. Samples were collected at 15-min intervals to match the corresponding flow measurements for the first 34 hours. Due to occupational health and safety aspects associated with flood sampling, two extended periods were not sampled for two consecutive nights. Sampling frequency decreased to half-hourly and hourly intervals for the last 15 hours of sampling. In total, 258 samples were collected over a 100 hour period. Samples were collected from midstream for both nutrients and pesticides. Most samples were processed immediately after collection while all were processed within 24 hours of collection. For nutrients, two aliquots (60 ml each) of the collected sample were pre-filtered using a sterile 1.2 µm filter (Sartorius Stedim Biotech) and then filtered using a sterile 0.45 µm filter (Sartorius Stedim Biotech) into sterile polypropylene vials. For pesticides, an aliquot (3 ml) was filtered using a 0.45 µm regenerated cellulose filter (Phenomenex). Aliquots (1 ml) were then transferred into 2 mL amber glass vials (Agilent Technologies) and spiked with atrazine-d5 as an internal standard. All samples were immediately stored on ice and then transported for pesticide samples to be stored at 4°C and nutrient samples to be frozen (-20°C) prior to analysis. Water samples were analysed for oxidised nitrogen, ammonia and filterable reactive phosphorus using segmented flow auto-analysis techniques following standard methods (APHA 2005). The pesticides were analysed at QHFSS. Further analytical details are provided in the supplementary material associated with Novic et al. (2018).</p>
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	<p>Novic, A.J., Ort, C., O'Brien, D.S., Lewis, S.E., Davis, A.M. and Mueller, J.F. (2018) Understanding the uncertainty of estimating herbicide and nutrient mass loads in a flood event with guidance on estimator selection. <i>Water Research</i>, 132: 99-110.</p> <p>Novic, A.J. O'Brien, D.S. Kaserzon, S.L. Hawker, D.W. Lewis, S.E. and Mueller, J.F. (2017) Monitoring herbicide concentrations and loads during a flood event: a comparison of grab sampling with passive sampling. <i>Environmental Science and Technology</i> 51: 3880-3891.</p>

## E\_LBWQIP

Metadata record	
<b>Project Name</b>	Lower Burdekin River Water Quality Improvement Plan
<b>Project Description</b>	Pesticide and nutrient monitoring of Lower Burdekin waterways across multiple wet seasons and low flow conditions from 2004 to 2011.
<b>Project Code</b>	E_LBWQIP
<b>Funding</b>	North Queensland Dry Tropics with funding from the Burdekin Water Quality Improvement Plan and CFoC Reef Rescue Program
<b>Collection period (years)</b>	2004-2011
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR); QHFSS (pesticides)
<b>Technical details</b>	<p>Water samples were analysed for total suspended solids (TSS), total nitrogen (TN) and phosphorus (TP), total dissolved nitrogen (TDN) and total dissolved phosphorus (TDP) and dissolved inorganic nutrients. Surface water samples were collected from the top 50 cm of the water column. Nutrient samples were filtered on collection using a 0.45 µm sterile filter cartridge (Sartorius Minisart) and stored on ice with the unfiltered nutrient samples (frozen within 24 hours of collection). TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 2005). Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were used. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 2012) implemented on a segmented flow auto-analyser. For the determination of TN, TP, TDN and TDP water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Pesticide samples were analysed at QHFSS. The samples were analysed by liquid chromatography (LC/MS) and gas chromatography (GC/MS) mass spectrometry. Organochlorine, organophosphorus and synthetic pyrethroid pesticides, urea and triazine herbicides and polychlorinated biphenyls were extracted with dichloromethane and quantified by GCMS and LCMS (US EPA method 8141). Phenoxyacid herbicides (in selected Burdekin–Townsville catchment samples only) were extracted with diethyl-ether after acidification, methylated and analysed by GC/MS.</p>
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	<p>910 - Good</p> <p>Sampling location, procedures, analytical methods, and data handling processes are well documented.</p>

<b>Project references</b>	<p>Bainbridge, Z., Brodie, J., Lewis, S., Faithful, J., Duncan, I., Furnas, M. and Post, D. (2006a) Event based Water Quality Monitoring in the Burdekin Dry Tropics region: 2004/2005 Wet Season. ACTFR Report No. 06/01 for BDTNRM. ACTFR, JCU, Townsville. 83pp.</p> <p>Bainbridge, Z., Lewis, S., Brodie, J., Faithful, J., Maughan, M., Post, D., O'Reagain, P., Bartley, R., Ross, S., Schaffelke, B., McShane, T. and Baynes, L. (2006b) Monitoring of sediments and nutrients in the Burdekin Dry Tropics region: 2005/2006 wet season. ACTFR Report No. 06/13 for BDTNRM. ACTFR, JCU, Townsville. 97pp.</p> <p>Bainbridge, Z., Lewis, S. and Brodie, J. (2007) Event-based community water quality monitoring in the Burdekin Dry Tropics region: 2006-2007 (Vol 1 &amp; 2). ACTFR Report No. 07/22 for BDTNRM. ACTFR, JCU, Townsville.</p> <p>Bainbridge, Z., Lewis, S., Davis, A. and Brodie, J. (2008) Event-based community water quality monitoring in the Burdekin Dry Tropics NRM Region: 2007/08 wet season update. ACTFR Report No. 08/19 for NQDT. ACTFR, JCU, Townsville.</p> <p>Lewis, S.E., Brodie, J.E., Bainbridge, Z.T., Rohde, K., Davis, A., Masters, B., Maughan, M., Devlin, M., Mueller, J. and Schaffelke, B. (2009) Herbicides: a new threat to the Great Barrier Reef. <i>Environ. Pollut.</i> 157, 2470–2484.</p> <p>Davis, A.M., Lewis, S.E., Bainbridge, Z.T., Glendenning, L., Turner, R. and Brodie, J.E. (2012) Dynamics of herbicide transport and partitioning under event flow conditions in the lower Burdekin region, Australia. <i>Mar Pollut Bull</i> 65:182–193.</p> <p>Davis, A.M., Thorburn, P.J., Lewis, S.E., Bainbridge, Z.T., Attard, S.J., Milla, R. and Brodie, J.E. (2013) Environmental impacts of irrigated sugarcane production: Herbicide run-off dynamics from farms and associated drainage systems. <i>AEE</i>, 180, pp.123-135.</p>
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## E\_WRICMA

Metadata record	
<b>Project Name</b>	Coast and Clean Seas Whitsunday Rivers
<b>Project Description</b>	Water quality monitoring of waterways within the Whitsunday region from December 2000 to August 2002. Sampling undertaken at 17 sites. Data collected include physico-chemical, sediments and nutrients.
<b>Project Code</b>	E_WRICMA
<b>Funding</b>	Whitsunday Rivers Integrated Catchment Management Association (WRICMA) (Coast and Clean Seas Initiative)
<b>Collection period (years)</b>	2000-2002
<b>Data custodian</b>	TropWATER, James Cook University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER Laboratory (formerly ACTFR), James Cook University
<b>Technical details</b>	<p>Water temperature, salinity/specific conductivity, dissolved oxygen and pH were measured in the field using instruments calibrated following the manufacturer's instructions. Water samples were collected for the analysis of total suspended solids (TSS), total nitrogen (TN), total phosphorus (TP), dissolved inorganic nitrogen and phosphorus nutrients (i.e., ammonia, nitrite and nitrate, and filterable reactive phosphorus [FRP]), and chlorophyll <i>a</i> and phaeophytin. Water samples were taken at a depth of 20 to 30 cm below the water surface as far from the bank as possible. Samples for dissolved inorganic nutrients were filtered on site through 0.45 µm cellulose-acetate filter membranes. All samples collected for nutrient analysis were kept cool immediately following their collection and frozen within 18 hours of collection. Dissolved inorganic nutrient concentrations were determined following standard methods (APHA 1998) using a segmented flow auto-analyser. For the determination of TN and TP, water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. Samples for TSS were kept cool until they were returned to the laboratory and filtered. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman GF/C filter membrane (nominally 1.2 µm pore size), that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Samples for chlorophyll <i>a</i> and phaeophytin analysis were kept cool after collection and filtered at the end of the day. Chlorophyll <i>a</i> and phaeophytin were determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration.</p>
<b>Use Limitations / notes</b>	Data from some estuarine sites/tidally influenced sites have been retained in this dataset in order to keep the dataset complete (although those sites are considered outside the database scope), including Proserpine River Boat Ramp and O'Connell River Mouth via Magee Road. Note some nutrient concentrations provided are below the laboratory reporting limits, nitrate, nitrite and ammonia (1.0, 0.5 and 1.0 µg/l, respectively) and hence these lower concentrations may be unreliable. For some applications it may be appropriate to replace these concentrations with the detection limits or use half the detection limit.

<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Faithful, J. (2003) Coast and clean seas project. Water quality in the Whitsunday Rivers catchment. Surface water quality - December 2000 to August 2002. Volume 1 - Main Report. A Report to Whitsunday Rivers Integrated Catchment Management Association, Proserpine, Queensland. ACTFR Report No. 02/13.



## E\_MWHW03

Metadata record	
<b>Project Name</b>	Mackay Whitsunday Healthy Waterways 2003
<b>Project Description</b>	Mackay Whitsunday Healthy Waterways sub-catchment nutrient and pesticide monitoring program during high flow events conducted in coastal streams in the Mackay Whitsunday region during 2002 and 2003.
<b>Project Code</b>	E_MWHW03
<b>Funding</b>	Mackay Whitsunday Natural Resource Management Group; QLD Dept. Natural Resources and Mines
<b>Collection period (years)</b>	2002-2003
<b>Data custodian</b>	Queensland Department of Natural Resources and Mines
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	DESI Chemistry Centre (formerly Queensland Department of Natural Resources and Mines' laboratory, Indooroopilly)
<b>Technical details</b>	Samples were collected variously for the analysis of total suspended solids (TSS), total Kjeldahl nitrogen (TKN), dissolved Kjeldahl nitrogen (DKN), total Kjeldahl phosphorus (TKP), dissolved Kjeldahl phosphorus (DKP), dissolved inorganic nutrients, major cations and anions and selected pesticides. Water samples were collected using DNRM sampling protocols (Alexander 2000). Where possible, samples were taken from the centre of the stream otherwise they were taken from off the bank. Samples for dissolved nutrients were filtered on collection through 0.45 µm filters. Water samples were analysed for TKN, DKN, TKP and DKP at the DESI Chemistry Centre using the Kjeldahl digest procedure following standard methods (APHA 1998). TSS was measured gravimetrically following standard methods (APHA 1998).
<b>Use Limitations / notes</b>	Site sample locations are provided in Mitchell et al (2005) as being within 500 m of the gauge. A laboratory report in White et al. (2002) indicates that samples were analysed using the Kjeldahl digestion procedure and that the TN values provided in Mitchell et al. (2005) are calculated values. Raw data are only available for a subset of the data and hence the derived values (total nitrogen, particulate nitrogen and particulate phosphorus) have also been included in the dataset. Pesticide samples were assumed to have been analysed at the Queensland Department of Natural Resources and Mines' laboratory.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	White, I., Brodie, J. and Mitchell, C. (2002) Pioneer River catchment event-based water quality sampling. Healthy waterways Program, Mackay-Whitsunday Regional Strategy Group. Mitchell, C., Brodie, J. and White, I. (2005) Sediments, nutrients and pesticide residues in event flow conditions in streams of the Mackay Whitsunday Region, Australia. Marine Pollution Bulletin 51: 23-36.

## E\_MWHW08

Metadata record	
<b>Project Name</b>	Mackay Whitsunday Healthy Waterways 2005-2008
<b>Project Description</b>	Water quality monitoring of waterways draining representative land uses across the Mackay Whitsunday region during base flow and event flow conditions from 2005 to 2008. Data collected include sediments, nutrients and pesticides.
<b>Project Code</b>	E_MWHW08
<b>Funding</b>	Funding provided by the Mackay Whitsunday Natural Resource Management Group, through the Natural Heritage Trust and Coastal Catchments Initiative
<b>Collection period (years)</b>	2005-2008
<b>Data custodian</b>	Queensland Department of Natural Resources and Water
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	TropWATER (formerly ACTFR), James Cook University; QHFSS (pesticides)
<b>Technical details</b>	<p>Freshwater sampling within the catchments was conducted by trained community volunteers and project staff. Field measurements for the baseline monitoring program (Galea et al. 2008) were measured in the field using instruments calibrated following the manufacturer's instructions prior to each sampling trip. For both the Event (Rohde et al. 2006, 2008) and Baseline (Galea et al. 2008) monitoring components, water samples were collected from the top 50 cm of the water column with samples preferably collected from flowing water where possible. Samples were collected for the analysis of total suspended solids (TSS), electrical conductivity, total nitrogen (TN), total dissolved nitrogen (TDN), total phosphorus (TP), total dissolved phosphorus (TDP), dissolved inorganic nutrients, total organic carbon (TOC) and selected pesticides. Water samples were collected into pre-rinsed 1 L polypropylene bottles for TSS, unfiltered nutrient samples were subsampled into 60 ml polypropylene vials, with filterable nutrients filtered on-site through pre-rinsed filter modules (0.45 µm Sartorius Minisart) into sterile 10 ml polypropylene vials. Nutrient samples were stored frozen prior to transport to the laboratory. TSS, pesticides and TOC were kept dark and refrigerated until analysis. Samples for TSS, nutrients and TOC were analysed at the TropWATER Laboratory. TSS was measured gravimetrically by weighing the fraction remaining on a pre-weighed Whatman filter membrane, that was dried at 103–105°C for 24 h, after vacuum filtration of a measured volume of sample (APHA 1998). Whatman GF/C filter membranes (nominally 1.2 µm pore size) were used until 2007 by the TropWATER Laboratory, and from 2007 onwards Whatman Grade 934AH filter membranes (nominally 1.5 µm pore size) were in use. Dissolved inorganic nutrient concentrations (ammonia, nitrogen oxides and filterable reactive phosphorus) were determined following standard methods (APHA 1998) implemented on a segmented flow auto-analyser. For the determination of TN, TDN, TP, and TDP water samples were first digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo 1987) and the resulting solution also analysed on a segmented flow auto-analyser. TOC was determined using combustion at 660°C with a TOC Analyser. Pesticides were analysed using gas chromatography mass spectrometry and liquid chromatography mass spectrometry at QHFSS.</p>

<b>Use Limitations / notes</b>	Site locations were derived from maps in available reports listed below and the site descriptions. Monitoring sites were located adjacent to NRW hydrographic gauging stations where possible.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	<p>Rohde, K., Masters, B., Brodie, J., Faithful, J., Noble, R. and Carroll, C. (2006) Fresh and Marine Water Quality in the Mackay Whitsunday Region 2004/2005. Mackay Whitsunday Natural Resource Management Group, Mackay, Australia.</p> <p>Rohde, K., Masters, B., Fries, N., Noble, R., and Carroll, C. (2008) Fresh and Marine Water Quality in the Mackay Whitsunday Region 2004/05 to 2006/07. Queensland Department of Natural Resources and Water for the Mackay Whitsunday Natural Resource Management Group, Australia.</p> <p>Galea, L., Pepplinkhouse, D., Loft, F., and Folkers, A. (2008) Mackay Whitsunday Healthy Waterways Baseline Monitoring Program Regional Report 2008. Queensland Department of Natural Resources and Water for the Mackay Whitsunday Natural Resource Management Group, Australia.</p>

## E\_LAXTSAR

Metadata record	
<b>Project Name</b>	Laxton Sarina and Broadsound shires water quality
<b>Project Description</b>	Water quality results from a study of 10 freshwater creek sites conducted in Sarina and Broadsound Shires in Central Queensland. Data collected include physico-chemical, sediments and nutrients.
<b>Project Code</b>	E_LAXTSAR
<b>Funding</b>	Privately funded
<b>Collection period (years)</b>	1989-1993
<b>Data custodian</b>	J.H. & E.S. Laxton - Environmental Consultants P/L
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	J.H. & E.S. Laxton - Environmental Consultants P/L (Laxton)
<b>Technical details</b>	<p>Water temperature, pH, dissolved oxygen and conductivity were measured at each station using a submerged datalogger. Data were collected every 30 minutes for three consecutive days. Results presented in this dataset are the means over the three-day period. Samples were collected for the analysis of total suspended solids (TSS), chlorophyll <i>a</i>, total Kjeldahl nitrogen (TKN), total Kjeldahl phosphorus (TKP), particulate nitrogen (PN), particulate phosphorus (PP), and dissolved inorganic nutrients. Laboratory analyses were undertaken by J.H. &amp; E.S. Laxton - Environmental Consultants P/L in their in-house laboratory. Laxton et al. (1994) includes the following references to standard laboratory methods (Major et al., 1972, Dal Pont et al., 1974). Ammonia was analysed on unfiltered water samples using the indophenol blue spectrophotometric method of Dal Pont et al. (1974). Nitrogen oxide was determined on filtered water samples according to the method of Major et al. (1972) by a cadmium reduction. Filterable reactive phosphorus (FRP) according to the method of Major et al. (1972). TKN and TKP were determined using the Kjeldahl digest procedure and the resultant digestant analysed for ammonia and filterable reactive phosphorus (FRP) using standard colorimetric procedures as described above. PN and PP were determined using a Kjeldahl digestion procedure. A known volume of water was filtered through a AP402405 glass fibre filter paper previously heated to 500 ° C. The filter paper was subsequently halved, and one half used to determine PN and the other half used to determine PP. Subsequent analysis largely followed that of the TKN and TKP, although in the case of the latter a precipitate always developed and the sample had to be filtered prior to reading the absorbance.</p> <p>TSS concentrations were determined gravimetrically using pre-weighed glass fibre filters (Millipore cat. no. AP4004705) with nominal pore size of 0.7 µm. Filters were dried at 45°C for at least 24 hours before re-weighing. Chlorophyll <i>a</i> was determined spectrophotometrically after solvent extraction of the particulate material remaining after sample filtration.</p>
<b>Use Limitations / notes</b>	Data were provided with month and year, but no date and time were given. A datetime stamp was created by assuming that sampling was undertaken on the 15 <sup>th</sup> of the month with a midnight time stamp. Site locations were estimated from the maps provided in the Laxton et al. (1994) report. Reporting limits were not provided in the reports (values below detection were attributed a zero). Zero values have been replaced with the lowest value recorded and an '<' operator.

<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, date time stamp, procedures, analytical methods or data handling processes.
<b>Project references</b>	Laxton, J. H., Hansen, M.M. and Duell, J.D. (1994) Ecology of Creeks in Sarina and Broadsound Shires, Central Queensland (1989 - 1993). Part 1- Water Quality.

## E\_NAPFR

Metadata record	
<b>Project Name</b>	NAP Fitzroy River water quality
<b>Project Description</b>	Water quality data collected at five sites across the Fitzroy catchment between 1994 and 2008. Data collected include physico-chemical, sediments and nutrients.
<b>Project Code</b>	E_NAPFR
<b>Funding</b>	Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management, the Queensland Department of Natural Resources and Water and the National Action Plan (NAP) for Salinity and Water Quality
<b>Collection period (years)</b>	1994-1998; 2002-2008
<b>Data custodian</b>	Queensland Department of Natural Resources and Water
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS
<b>Technical details</b>	Samples were collected for the analysis of total suspended solids (TSS), total Kjeldahl nitrogen (TKN), dissolved Kjeldahl nitrogen (DKN), total Kjeldahl phosphorus (TKP), dissolved Kjeldahl phosphorus (DKP), dissolved inorganic nutrients, total organic carbon (TOC) and dissolved organic carbon (DOC). Surface water samples were collected from a depth of 20 cm below the water surface. Nutrient samples were chilled in the field and frozen on return to the laboratory. Standard sampling protocols were followed (NRM 2000). Analysis was undertaken by QHFSS with TKN, DKN, TKP and DKP assumed to be analysed using the Kjeldahl digestion procedure and the resultant digestant analysed for NH <sub>4</sub> and FRP simultaneously using a segmented flow auto-analyser following standard methods (APHA 1989). The analyses of dissolved inorganic nutrient concentrations (NO <sub>x</sub> , ammonia and FRP) were performed simultaneously using a flow injection system following standard methods (APHA 1989).
<b>Use Limitations / notes</b>	All total nutrients are assumed to be Total Kjeldahl Nitrogen (TKN) and Total Kjeldahl Phosphorus (TKP). According to QHFSS (Gary Prove, pers. comm.) where total suspended solids (TSS) were greater than approximately 50 mg/l, persulfate was typically replaced with the Kjeldahl digestion procedure. This was at the discretion of the laboratory staff doing the analysis and was not reported with the resulting water quality data. Because event mean concentrations for TSS in this dataset are generally greater than this value, TKN and TKP have been assumed.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.
<b>Project references</b>	<p>Packett, R., Dougall, C., Rhode, K. and Noble, R. (2009) Agricultural lands are hot-spots for annual runoff polluting the southern Great barrier Reef Lagoon. <i>Marine Pollution Bulletin</i> 58: 976-986.</p> <p>Waters, D. and Packett, R. (2007) Sediment and nutrient generation rates for Queensland rural catchments – an event monitoring program to improve water quality modelling. In Wilson, A.L., Dehaan, R.L., Watts, R.J., Page, K.J., Bowmer, K.H., &amp; Curtis, A. eds. <i>Proceedings of the 5th Australian Stream Management Conference</i>. Australian rivers: making a difference. Charles Sturt University, Thurgoona, New South Wales.</p>

## E\_FBAFR

Metadata record	
<b>Project Name</b>	Fitzroy Priority Neighbourhood Catchments
<b>Project Description</b>	Water quality data collected at 19 sites across Fitzroy priority neighbourhood catchments. Data collected over consecutive wet seasons from mid 2005 to mid 2009. Data include physico-chemical, sediments and nutrients.
<b>Project Code</b>	E_FBAFR
<b>Funding</b>	National Action Plan for Salinity and Water Quality, a joint initiative between the Australian and State Governments, as well as the Australian Government's National Landcare Program and Caring for our Country.
<b>Collection period (years)</b>	2006-2010
<b>Data custodian</b>	Fitzroy Basin Association (FBA) Inc.
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS
<b>Technical details</b>	Samples were collected for the analysis of electrical conductivity, pH, turbidity, total suspended solids (TSS), total Kjeldahl nitrogen (TKN) and total Kjeldahl phosphorus (TKP). Samples were collected manually at each site using an extended pole and HDPE bottles supplied by QHFSS. Samples were preserved following the Queensland Sampling Guidelines (Queensland Government 1999) and according to the FBA's field sampling guidelines. Samples for TKN and TKP were frozen and samples for turbidity, pH and electrical conductivity were refrigerated. Conductivity, pH and turbidity were measured from samples using a calibrated field or bench top meter. TKN was measured using APHA method 4500-N (Kjeldahl digestion with cadmium reduction). TKP was determined using APHA method 4500-P E. TSS was determined using standard method 2540 C as total dissolved solids dried at 180°C (APHA 2005).
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Fitzroy Basin Association Inc (2009) Priority Neighbourhood Catchments Water Quality Monitoring Program; 2005-09 Water Quality Monitoring Report. Fitzroy Basin Association Inc. Fitzroy Basin Association Inc (2010) Fitzroy Basin Priority Neighbourhood Catchments Water Quality Monitoring: 2009-10 Wet Season, Fitzroy Basin Association Inc.

## E\_P2RGOR

Metadata record	
<b>Project Name</b>	Gordonstone Creek paddock to reef study
<b>Project Description</b>	Sub-catchment scale water quality monitoring of Gordonstone Creek in the Fitzroy catchment at three sites to provide information on the impacts of land management between 2000 and 2021. Data collected include sediments, pesticides and nutrients.
<b>Project Code</b>	E_P2RGOR
<b>Funding</b>	Queensland and Australian Governments
<b>Collection period (years)</b>	2000-2021
<b>Data custodian</b>	Queensland Department of Natural Resources and Mines (DNRM)
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS (nutrients 2000-2010, 18 <sup>th</sup> -21 <sup>st</sup> April 2011), total suspended solids 2008, pesticides 2009-2021); DESI Chemistry Centre (formerly Queensland Department of Natural Resources and Mines' laboratory, Indooroopilly) (nutrients 2010-2021, total suspended solids 2017-2021); DNR Emerald (pH, turbidity, electrical conductivity and total solids 2000-2017).
<b>Technical details (2000-2009)</b>	Methods from 2000 until 2009 were taken from a draft report prepared by Dougall et al. (unpublished). Samples were collected using ISCO 3700 automatic samplers from a fixed inlet which varied between 200 and 2000 mm above the stream bed. At the 280 km <sup>2</sup> catchment site (Wyuna Road) the autosampler was refrigerated from October 2007; the other ISCO samplers were non-refrigerated. Prior to the 2004/2005 sampling season, water quality samples were composited with up to four subsamples. From July 2006 onwards each sample represents just one subsample per bottle. Sample bottles were collected as soon as possible following runoff events. Samples were then subsampled to allow analysis of both total solids and nutrients with the nutrient samples subsequently frozen and transported overnight to the laboratory for analysis. Suspended sediment concentrations were determined in-house at the DNRM Emerald laboratory using the total residue method, where the entire raw sample was placed in the oven, and dried at 105°C, thus providing a measure most accurately termed Total Solids (TS). This method was sometimes modified to aid flocculation with the filtrate subsequently siphoned off. In 2008 a limited number of samples were also analysed for total suspended solids (TSS) at QHFSS using the standard gravimetric method 2540D (APHA 2005). Nutrients were analysed by QHFSS for total nitrogen (TN) by simultaneous persulfate digestion. Given that TN was analysed by the persulfate method, it is assumed that TP was also analysed using the same digestion procedure.



<b>Technical details (2009-2012)</b>	<p>Methods for 2009-2012 are taken from Rogusz et al. (2013). Samples were collected as discrete manual grab samples or using autosamplers. At the 50 km<sup>2</sup> gauging station site (Gregory Highway), composite water samples for nutrients and pesticides were collected using a refrigerated ISCO Avalanche sampler (fitted with four bottles) and discrete water samples for sediment concentrations were collected using a 24-bottle base non-refrigerated ISCO sampler. At the 80 km<sup>2</sup> gauging station site (Amah Road), discrete water samples for sediment concentration only were collected using a 24-bottle base non-refrigerated ISCO sampler. At the 280 km<sup>2</sup> gauging station site (Wyuna Road), discrete water samples were collected for nutrient, pesticide and sediment analysis using a 12-bottle base Baron refrigerated autosampler. Total solids were determined in-house at the DNRM Emerald laboratory as described above. In the 2009/2010 wet season, nutrients were determined at the QHFSS laboratory using equivalent APHA methods for total nitrogen and total dissolved nitrogen by simultaneous persulfate digestion and the resulting solution analysed for oxidised nitrogen (NO<sub>x</sub>) by flow injection analysis. Total phosphorus (TP) was analysed by method 13800 (simultaneous persulfate or Kjeldahl digestion) with the subsequent analysis of TP as filterable reactive phosphorus (FRP) using standard methods. Dissolved inorganic nutrients (NO<sub>x</sub>, ammonia and FRP) were analysed by flow injection analysis using standard APHA methods.</p> <p>During the 2010/2011 and 2011/2012 wet seasons, nutrients were analysed at the DESI Chemistry Centre using standard APHA (2005) methods (note that during April 2011 a limited number of samples were sent to QHFSS for nutrient analysis using the above methods). Dissolved inorganic nutrient concentrations (ammonia, NO<sub>x</sub> and FRP) were determined following standard methods (APHA 2012) implemented on a segmented flow auto-analyser. Samples were analysed for total Kjeldahl nitrogen, dissolved Kjeldahl nitrogen (DKN), total Kjeldahl phosphorus and dissolved Kjeldahl phosphorus (DKP) using methods 4500-N<sub>org</sub> D and 4500-P B (APHA AWWA). DKN and DKP were measured on samples filtered with a 0.45 µm syringe filter. Pesticide analysis was undertaken at QHFSS using gas chromatography/liquid chromatography mass spectrometry.</p>
<b>Technical details (2013-2021)</b>	<p>Methods between 2013 and 2016 are taken from Rogusz and Burger (2017) and Rogusz (2019). At the 50 km<sup>2</sup> gauging station site (Gregory Highway), composite water samples for nutrients and pesticides were collected using a refrigerated ISCO Avalanche sampler (fitted with four bottles). Discrete water samples for sediment concentrations were collected using a 24-bottle base non-refrigerated ISCO sampler. At the 80 km<sup>2</sup> gauging station site (Amah Road), discrete runoff water samples for sediment concentration only were collected using a 24-bottle base non-refrigerated ISCO sampler. At the 280 km<sup>2</sup> gauging station site (Wyuna Road), discrete runoff water samples for nutrient, pesticide and suspended sediment analysis were collected using a 12-bottle base Baron refrigerated sampler. Between 2013 and 2017 total solids were determined at the DNRM laboratory at Emerald using the same method as described above. From 2017, samples were analysed for total suspended solids (TSS) at the DESI Chemistry Centre using standard gravimetric method 2540D (APHA 2012). Nutrients were determined at the DESI Chemistry Centre following standard methods (APHA 2012) as described above. Pesticide analysis was undertaken at QHFSS using liquid chromatography mass spectrometry.</p>

<b>Use Limitations / notes</b>	Users should note the different laboratory methods used (i.e. TS versus TSS and different nutrient digestion procedures).
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	<p>Dougall, C., Neilsen, S., Stevens, S., Burger, P., Carroll, C. and Rohde, K. (unpublished) NRW Focus Neighbourhood Catchments Technical Report Part B. A comparison of runoff and constituent generation rates from two differing upland Fitzroy Basin subcatchments - 1999-2009. Incomplete DRAFT.</p> <p>Rogusz, D. J. (2019) Paddock to sub-catchment scale water quality monitoring of dryland grain cropping and grazing land uses. Gordonstone Creek catchment monitoring – Fitzroy Region. Final Report. 2016–2018. Department of Natural Resources, Mines and Energy, Queensland.</p> <p>Rogusz, D. J. and Burger, P. (2017) Paddock to Reef water quality monitoring from dryland grains cropping and grazing land use within a nested catchment design. Final Report. 2013-2016 wet seasons. Fitzroy Region, Emerald. Department of Natural Resources and Mines, Emerald, Queensland.</p> <p>Rogusz, D., Rohde, K., Carroll, C. and Burger, P. (2013) Paddock to Sub-catchment Scale Water Quality Monitoring from dryland grains cropping and grazing. Final Report 2009-2012 Wet Seasons, Fitzroy Region, Emerald. Department of Natural Resources and Mines, Queensland Government for Fitzroy Basin Association.</p>

## E\_BCCANBR

Metadata record	
<b>Project Name</b>	BCCA North Burnett water quality - post TC Oswald
<b>Project Description</b>	Water quality data collected from 10 sites within the North Burnett subcatchments following Tropical Cyclone Oswald across 2014 to 2017. Data collected include physico-chemical, cations and anions, nutrients, metals and pesticides.
<b>Project Code</b>	E_BCCANBR
<b>Funding</b>	'Everyone's Environment' grant from the Department of Environment & Heritage, Queensland Government.
<b>Collection period (years)</b>	2014-2017
<b>Data custodian</b>	Burnett Catchment Care Association
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS
<b>Technical details</b>	Water samples were collected from each site using an extended pole with samples decanted into a triple rinsed bucket. Each sample was a composite of discrete samples collected from the surface, middle and bottom layers of the water column at each site. Water samples for standard water analysis (e.g. analysis of major cations and anions, silica, total nitrogen (TN), total phosphorus (TP), dissolved inorganic nutrients), pesticides and metals were removed from the bucket for later laboratory analysis using standard protocols. The remaining water in the bucket was used for the measurement of the field analytes (water temperature, electrical conductivity, pH, and turbidity). All samples were placed in an esky and then refrigerated until transported to the laboratory. TN was analysed by simultaneous persulfate digestion and the resulting solution analysed for oxidised nitrogen (NO <sub>x</sub> ) by flow injection analysis. TP was analysed by method 13800 (simultaneous persulfate or Kjeldahl digestion). Given that TN was analysed by the persulfate method, it is assumed that TP was also analysed using the same procedure with subsequent analysis of TP as filterable reactive phosphorus (FRP) using standard methods. Dissolved inorganic nutrients (NO <sub>x</sub> , ammonia and FRP) were analysed by flow injection analysis using standard methods. Total metals were analysed by ICP-MS. Pesticides for December 2014, December 2015 and February 2016 by Solid Phase Extraction (SPE)/LC-MS/MS. Pesticides for December 2016, January 2017 and March 2017 were analysed by Direct Injection LC-MS/MS.
<b>Use Limitations / notes</b>	Some samples for dissolved inorganic nutrients required additional filtering at the QHFSS laboratory.
<b>Data quality code</b>	920 - Fair Most components of the sampling are well documented, with one to two minor issues identified in relation to sampling location, procedures, analytical methods or data handling processes.
<b>Project references</b>	Denholm, M. (2017) Following the flood. Identifying sources of environmental contaminants in North Burnett subcatchments post Cyclone Oswald. Final Report to the Burnett Catchment Care Association.

## E\_SCCMR

Metadata record	
<b>Project Name</b>	Sunshine Coast Council Mary Catchment water quality
<b>Project Description</b>	Water quality data collected on an approximate monthly basis from September 2019 to December 2020 at nine sites in the Mary River catchment. Data collected include physico-chemical and nutrients.
<b>Project Code</b>	E_SCCMR
<b>Funding</b>	Sunshine Coast Council
<b>Collection period (years)</b>	2019-2020
<b>Data custodian</b>	Sunshine Coast Council
<b>Licence</b>	Data supplied by Sunshine Coast Council (2023). While every care is taken to ensure the accuracy of the data, Sunshine Coast Council makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.
<b>Laboratory</b>	Unitywater, Morayfield
<b>Technical details</b>	Specific conductance, pH, turbidity and water temperature were measured in the field using instruments calibrated following the manufacturer's instructions. All water sampling and measurements were in accordance with the Queensland Monitoring and Sampling Manual (DES 2018) following the Sunshine Coast Council's standard operating procedures for water quality monitoring. Water samples were collected for the analysis of dissolved inorganic nutrients (i.e., ammonia, nitrite and nitrate (NO <sub>x</sub> ), and filterable reactive phosphorus [FRP]), total nitrogen (TN) and total phosphorus (TP) at the Unitywater NATA accredited laboratory using standard methods. Samples for dissolved inorganic nutrients were filtered in the field using a syringe and 0.45 µm filter attachment. All water samples were chilled immediately after collection and transported to the laboratory for analysis. TN and TP were analysed following persulfate digestion and the resulting solution analysed for NO <sub>x</sub> and filterable reactive phosphorus (FRP) using flow injection analysis. Dissolved inorganic nutrients were analysed by photochemical methods using a flow injection analyser.
<b>Use Limitations / notes</b>	NA
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Citation</b>	Sunshine Coast Council, 2023. Mary River Nutrient study across 2019-2020.

## E\_GRUMR

Metadata record	
<b>Project Name</b>	Griffith Mary Catchment water quality
<b>Project Description</b>	Water quality data collected from 21 sites in the Mary River catchment by Griffith University. Data collected include physico-chemical, cations and anions and nutrients.
<b>Project Code</b>	E_GRUMR
<b>Funding</b>	Land and Water Resources Research & Development Corporation (GRU-10, GRU-19)
<b>Collection period (years)</b>	1994-1997
<b>Data custodian</b>	Australian Rivers Institute, Griffith University
<b>Licence</b>	CC BY <a href="#">Deed - Attribution 4.0 International - Creative Commons</a>
<b>Laboratory</b>	QHFSS
<b>Technical details</b>	Water temperature, pH, dissolved oxygen, turbidity and electrical conductivity were measured in the field at a depth of 0.5 m. Water samples were taken at a depth of 0.1 m. Samples were collected for the analysis of major cations and anions, total suspended solids (TSS), turbidity, colour, selected dissolved metals and total Kjeldahl nitrogen (TKN) and total Kjeldahl phosphorus (TKP). Samples for total nutrient analysis were frozen as soon as possible after collection. Analysis was undertaken using standard and internationally recognised methods (APHA 1989). TKN and TKP were analysed using the Kjeldahl digestion procedure and the resultant digestant analysed for ammonia and filterable reactive phosphorus (FRP) using standard colorimetric methods. TSS was analysed at QHFSS following standard gravimetric methods.
<b>Use Limitations / notes</b>	Water quality data were collected at multiple sites within some stream reaches. On the advice of the data provider where multiple samples have been collected within a reach on the same sample date, the data have been averaged to provide a single sample/GPS location for that date. Water samples taken within the same stream reach were usually chemically similar, differing slightly in turbidity or concentrations of particular ions.
<b>Data quality code</b>	910 - Good Sampling location, procedures, analytical methods, and data handling processes are well documented.
<b>Project references</b>	Arthington, A.H., Pusey, B.J., Mackay, S.J. and Kennard, M.J. (1998) Water quality data collected through projects funded by the Land and Water Resources Research and Development Corporation (LWRRDC). Australian Rivers Institute, Griffith University. Kennard, M.J., Pusey, B.J., Arthington, A.H., Harch, B.D. and Mackay, S.J. (2006) Development and Application of a Predictive Model of Freshwater Fish Assemblage Composition to Evaluate River Health in Eastern Australia. <i>Hydrobiologia</i> 572, 33–57. Mackay, S.J., Arthington, A.H., Kennard, M.J. and Pusey, B.J. (2003) Spatial variation in the distribution and abundance of submersed macrophytes in an Australian subtropical river. <i>Aquatic Botany</i> 77: 169–186. Pusey, B.J., Kennard, M.J. and Arthington, A.H. (2004) <i>Freshwater Fishes of North-Eastern Australia</i> . CSIRO Publishing, Collingwood. 684pp. ISBN: 0643069666.