

Water quality monitoring dataset for Russell-Mulgrave catchment from 2016-2018. (NESP TWQ 2.1.7, JCU)


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Date	2019-05-20
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Abstract

This dataset consists of one data file from 3 year water quality monitoring program conducted across the Russell-Mulgrave catchment (south of Cairns). Data is the result of discrete 'grab' samples analysed at TropWATER JCU laboratory for nutrients and sediments. Samples were collected throughout the year at nine sites that capture a range of different landuse types across the catchment including sugarcane, bananas, natural rainforest and urban influences.

*This data is under an embargo period until the end of the extension project

The aim of this study dataset was to characterise the water quality impacts and relative signatures of a range of distinct landuse types found across the Russell-Mulgrave catchment, and quantify the sugarcane industry's specific role in end-of-catchment water quality. Subcatchment waterway sites were selected to represent the major land uses of the region, and were classed as sugarcane, urban, banana, or natural rainforest land use categories. Sites were also selected based on wet season accessibility to the site and the size of the waterway. A total of 9 sites were selected for the monitoring program through the period 2016-2018.

Monitoring focused primarily on nutrient (nitrogen and phosphorus) and sediment water quality parameters, as these are typically identified as the most important management challenges for north Queensland industries, and considered most relevant to Great Barrier Reef water quality issues.

Methods:

Sampling at all sites was conducted on a monthly or bimonthly basis during dry-season low flows. Sampling frequency increased to daily (and occasionally several samples a day) during wet season flood events, particularly during early wet season 'first-flush' events to capture initial high concentration run-off dynamics from the immediate catchment area. 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 individually in the correct sampling and quality assurance procedures developed in conjunction with the TropWATER Water Quality Laboratory. Water samples were collected in pre-rinsed 1-L polypropylene bottles using an extendable sampling pole for total suspended solids (suspended sediments), unfiltered nutrient samples were subsampled into 60-mL polypropylene vials (Sarstedt, Germany), with filterable nutrients filtered on-site through pre-rinsed filter modules (MiniSart 0.45 µm cellulose acetate, Sartorius, Germany) into six 10-mL polypropylene vials (Sarstedt, Australia). Samples were stored on ice in eskies following sampling and on-site processing, for transport to the laboratory for subsequent analysis.

Site water samples were analysed for total nitrogen (TN), ammonium nitrogen (AN), oxidised nitrogen (ON: nitrate + nitrite), filterable reactive phosphorus (FRP) and total suspended solids (TSS). Samples for TN were digested in an autoclave using an alkaline persulfate technique (modified from Hosomi and Sudo, 1987) and the resulting solution simultaneously analysed for ON by segmented flow auto-analysis using an OI Analytical (Texas, USA) Flow

Solution IV. The analyses of ON, AN and FRP were also conducted using segmented flow auto-analysis techniques following standard methods (APHA, 2005).

A specific urea assay was also conducted to quantify the urea component of DON using a segmented flow analyser modification of the procedures developed by Marsh et al. (1965). Samples for TSS analyses were filtered through pre-weighed Whatman (England) GF/C filter membranes (nominally 1.2 mm pore size) and oven-dried at 103–105 °C for 24 h and reweighed to determine the dry TSS weight as described in APHA (2005).

Format:

Data consists of an excel spreadsheet with all samples collected at each of the nine sites listed sequentially (by date of collection) on separate, named spreadsheet tabs. Additional information related to unique laboratory sample and job-batch numbers is also listed for QA/QC purposes. Duplicate samples were also collected on occasion at some sites for analytical QA/QC purposes. These samples are identified in a separate column. Grey cell fill indicated a particular parameter was not assessed for that sample.

References:

APHA., 2005. Standard Methods for the Examination of Water and Wastewaters. American Public Health Association, American Waterworks Association and Water Environment Federation: Washington, USA.

Hosomi, M., Sudo, R., 1987. Simultaneous determination of total nitrogen and total phosphorus in freshwater samples using persulfate digestion. Internat. J. Environ. Stud. 27, 267-275. Liaw A., Wiener M., 2002. Classification and regression by randomForest. R News 2, 18–22.

Marsh, W.H., Fingerhut, B., Miller, H., 1965. Automated and manual direct methods for the determination of blood urea. Clin. Chem. 11, 624–627.

Data Location:

This dataset is filed in the eAtlas enduring data repository at: data\2016-18-NESP-TWQ-2\2.1.7_Engaging-farmers-WQ

Metadata language	eng
Character set	UTF8
Hierarchy level	Dataset

OnLine resource

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Protocol	WWW:LINK-1.0-http--metadata-URL
Linkage	https://nesptropical.edu.au/index.php/round-2-projects/project-2-1-7/
Protocol	WWW:LINK-1.0-http--related
Linkage	https://eatlas.org.au/data/uuid/71127e4d-9f14-4c57-9845-1dce0b541d8d
Protocol	WWW:LINK-1.0-http--related
Linkage	https://eatlas.org.au/nesp-twq-2/engaging-farmers-wq-2-1-7
Protocol	WWW:LINK-1.0-http--related

Point of contact

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Role	Point of contact
Topic category	Biota

Extent

Description	Russell-Mulgrave catchment, Australia
File identifier	aeb7c1a8-81f8-47cd-bb14-8cb1699a65e9
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Metadata author	
Individual name	eAtlas Data Manager
Organisation name	Australian Institute of Marine Science (AIMS)
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