

Darwin- Palmerston and Estuary

Summary

Water quality at the Darwin-Palmerston upper estuary monitoring sites was in excellent condition. Water quality at the freshwater monitoring sites in 2011 was in excellent condition. The water-bug community at the biological monitoring sites was assessed as significantly impaired at one site and severely impaired at the second site.



Nature of system

- Long residence time and poor flushing in the tidal creeks
- Light limitation is possible in the upper reaches of estuarine creeks during the wet season due to high turbidity
- A large proportion of the catchment has been cleared and urbanised














Potential sources of pollution

- Sewage treatment plants with wastewater discharge from Darwin at Blesers Creek and Palmerston at Myrmidon Creek
- High sediment, nutrient and other human-related pollutant loads during the wet season from established areas or recent urban developments



New suburban development of Johnston

Darwin-Palmerston freshwater and marine water quality

Indicator and units	Water quality objective freshwater	Compliance freshwater	Water quality objective marine	Compliance Darwin-Palmerston marine	Compliance Myrmidon Ck marine
 Electrical conductivity (µS/cm)	<200	83.5 ✓	NA		
 Turbidity (NTU)	<20	11.3 ✓	NA		
 pH	6.0–7.5	6.1–6.8 ✓	6–8.5	7.1–7.9 ✓	7.3–8 ✓
 Dissolved oxygen (%)	50–100	54–81 ✓	80–100	*	*
 Total suspended solids (mg/L)	<5	3 ✓	<10	*	*
 Chlorophyll a (µg/L)	<2	0.3 ✓	<4	1 ✓	1 ✓
 NOx (µg N/L)	<8	2.2 ✓	<20	3 ✓	5 ✓
 Ammonia (µg N/L)	NA		<20	8 ✓	16 ✓
 Total nitrogen (µg N/L)	<230	145 ✓	<300	210 ✓	190 ✓
 Total phosphorus (µg P/L)	<10	10 ✓	<30	15 ✓	30 ✓
 Filterable reactive phosphorus (µg P/L)	<5	4.5 ✓	<10	4 ✓	6 ✓
Number of samples		2		16	10–13
2011 rating					**
2010 rating (2009 data)		A		A	
2009 rating (2001–2008 data)		A		B	

Note¹: (nd). Limited or no data available. Note²: (NA). Not applicable, no WQO developed * WQO currently under revision.

** This year the Myrmidon Creek estuary has not been given a water quality rating. The Myrmidon Creek estuary water quality is highly variable in terms of its spatial variability of indicators and hydrodynamic flow. It is considered to be well flushed. For example, nutrient and chlorophyll values were highly variable even though several additional sites were sampled on several occasions on a short-term basis. A sampling protocol is currently being developed to better represent the high spatial variability of this system to better represent an appropriate rating.

The Myrmidon Creek estuary is influenced by the treated wastewater discharged from the Palmerston sewage treatment plant outfall. The treatment plant is subject to a Waste Discharge Licence. The licensed mixing zone is yet to be fully determined. It is possible that the monitoring sites are located within the discharge mixing zone, and that the water quality objectives may not apply. The wastewater is treated by waste stabilisation lagoons utilising a combination of sunlight, micro-organisms and algae to break down the raw wastewater. The presence of elevated concentrations of chlorophyll in Myrmidon Creek estuary may be largely due to the algae present in the treated wastewater discharge.

Biological health using the AUSRIVAS score

Site	2009	2010	Change
DW23	A	C	Change
DW41	B	B	No change