Northern Territory Government

Shoal Bay and Buffalo Creek report card 2009

Water quality in outer Shoal Bay is in excellent condition and complies with water quality objectives. Several water quality indicators at some Shoal Bay upper estuary and freshwater monitoring sites do not comply with water quality objectives. The water-bug community at the Howard River biological monitoring site is significantly impaired.

Estuarine water quality at the monitoring site in Buffalo Creek is in very poor condition. Of the sites monitored, this site has the most degraded water quality in the Darwin Harbour region.

Nature of system

- Shallow embayment
- Series of sandbars changing with tides
- Light limitation during the wet season
- Perennial freshwater inflows from Howard River, typically most years in the wet and the dry seasons

Sources of pollution

- Wet season diffuse source loads are received from the Howard and Shoal Bay sub-catchments
- Sediment and nutrient loads are high with runoff during the wet season
- Sewage treatment plant wastewater discharge at Buffalo Creek

Crocodile in the Hope Inlet, Shoal Bay. Photo by Tony Boland

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Map of Shoal Bay catchment

Shoal Bay catchment showing subcatchments, features and monitoring sites.

Shoal Bay catchment ambient freshwater quality

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	<200	102	9	✓
	Turbidity (NTU)	<20	2.9	9	✓
	pH	6.0 – 7.5	5.8 – 7.0	9	✗
	Dissolved oxygen (%)	50 – 100	33 – 56	5	✗
	Total suspended solids (mg/L)	<5	4	6	✓
	Chlorophyll a (µg/L)	<2	0.3	5	✓
NOx	NOx (µg N/L)	<8	12	7	✗
AM	Ammonia (µg N/L)	NA	12	6	
TN	Total nitrogen (µg N/L)	<230	174	7	✓
TP	Total phosphorus (µg P/L)	<10	10	7	✓
FRP	Filterable reactive phosphorus (µg P/L)	<5	2	7	✓
Period sampled for current condition is 2001-2005. NA Not available					

C

Shoal Bay upper area marine ambient water quality

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	NA	41200	13	
	Turbidity (NTU)	NA	13.0	13	
	pH	6-8.5	8.1-8.5	13	✓
	Dissolved oxygen (%)	80-100	74-92	13	✗
	Total suspended solids (mg/L)	<10	12	3	✗
	Chlorophyll a (µg/L)	<4	8	9	✗
NOx	NOx (µg N/L)	<20	4	13	✓
AM	Ammonia (µg N/L)	<20	2	7	✓
TN	Total nitrogen (µg N/L)	<300	311	9	✗
TP	Total phosphorus (µg P/L)	<30	30	11	✓
FRP	Filterable reactive phosphorus (µg P/L)	<10	3	13	✓
Period sampled for current condition is 2004-2005. NA Not available					

C

Shoal Bay outer area marine ambient water quality

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	NA	51200	13	
	Turbidity (NTU)	NA	2.7	13	
	pH	7.0-8.5	8.3-8.5	13	✓
	Dissolved oxygen (%)	80-100	86-95	13	✓
	Total suspended solids (mg/L)	<10	3	3	✓
	Chlorophyll a (µg/L)	<2	0.8	9	✓
NOx	NOx (µg N/L)	<20	2	13	✓
AM	Ammonia (µg N/L)	<20	2	7	✓
TN	Total nitrogen (µg N/L)	<270	166	8	✓
TP	Total phosphorus (µg P/L)	<20	10	11	✓
FRP	Filterable reactive phosphorus (µg P/L)	<5	3	11	✓
Period sampled for current condition is 2004-2005. NA Not available					

A

Shoal Bay catchment loads and event-mean concentrations

Symbol	Indicator and units	Howard subcatchment current condition event-mean concentration
	Total suspended solids (mg/L)	9.3
TN	Total nitrogen (µg N/L)	432
TP	Total phosphorus (µg P/L)	9.6
	Subcatchment area (ha)	14960
Wet season sampled for current condition is 2006-2007		
Symbol	**Shoal Bay whole catchment load for an average wet season**	
	Total suspended solids load (tonnes/year)	15200
TN	Total nitrogen (tonnes/year)	288
TP	Total phosphorus (tonnes/year)	18.6
	Total catchment area (ha)	76170

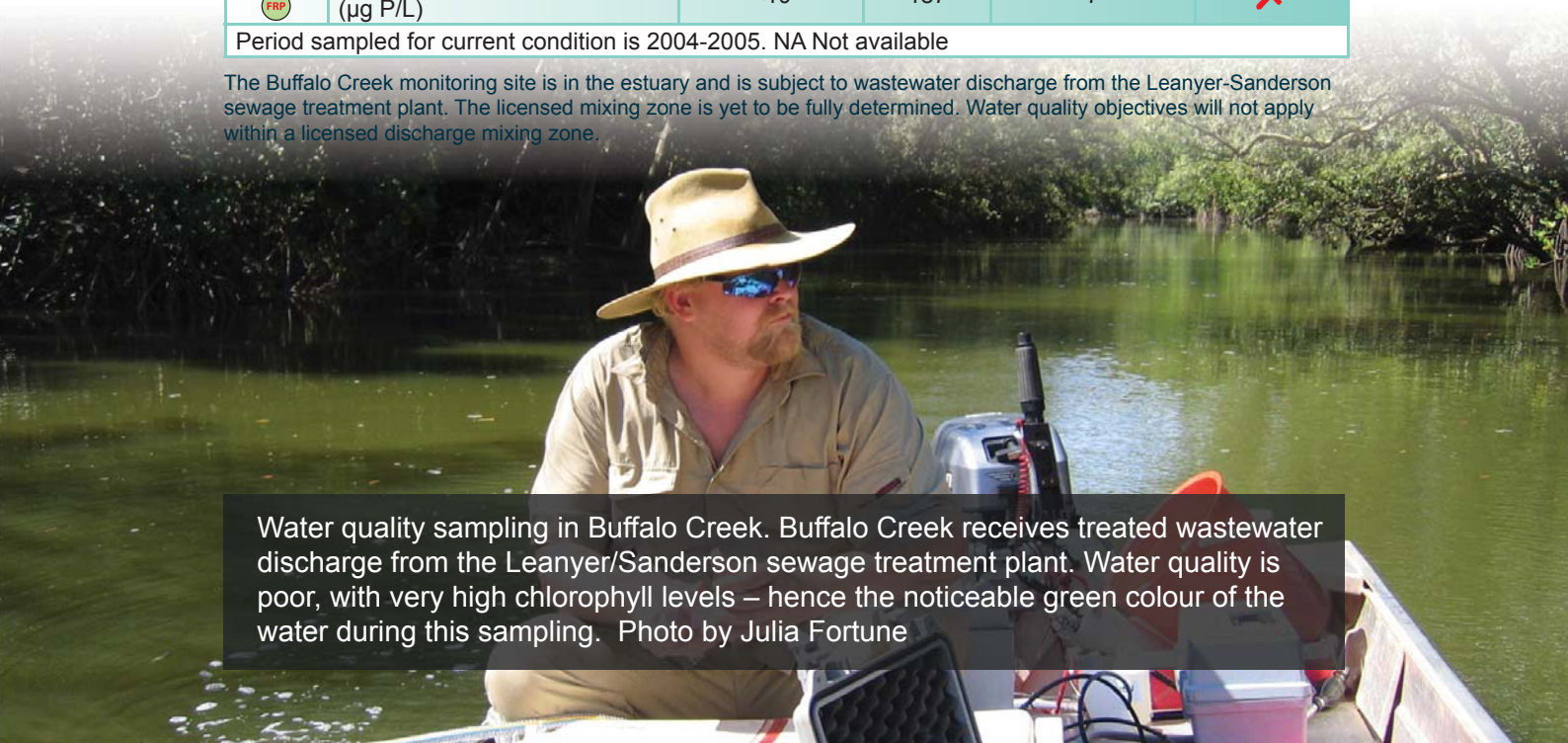
Biological health using the AUSRIVAS score

Site number	2001	2002	2003	2004	2005	2006	2007
DW43	B	B	B	B	B	B	

Buffalo Creek marine ambient water quality

Symbol	Indicator and units	Water quality objective	Current condition	Sample number for current condition	Compliance
	Electrical conductivity (µS/cm)	NA	37400	7	
	Turbidity (NTU)	NA	29.5	7	
	pH	6-8.5	8.0-8.4	7	✗
O_2	Dissolved oxygen (%)	80-100	39-112	7	✗
	Total suspended solids (mg/L)	<10	30	2	✗
	Chlorophyll a (µg/L)	<4	146	5	✗
NO_x	NOx (µg N/L)	<20	17	7	✓
AM	Ammonia (µg N/L)	<20	15	4	✓
TN	Total nitrogen (µg N/L)	<300	1630	5	✗
TP	Total phosphorus (µg P/L)	<30	600	6	✗
FRP	Filterable reactive phosphorus (µg P/L)	<10	187	7	✗
Period sampled for current condition is 2004-2005. NA Not available					

The Buffalo Creek monitoring site is in the estuary and is subject to wastewater discharge from the Leanyer-Sanderson sewage treatment plant. The licensed mixing zone is yet to be fully determined. Water quality objectives will not apply within a licensed discharge mixing zone.



Water quality sampling in Buffalo Creek. Buffalo Creek receives treated wastewater discharge from the Leanyer/Sanderson sewage treatment plant. Water quality is poor, with very high chlorophyll levels – hence the noticeable green colour of the water during this sampling. Photo by Julia Fortune