

Results of the Seasonal Kendall Test for water quality trends in the Southern WCZ, 1986 – 2005									
Monitoring Station		SM1	SM2	SM3	SM4	SM5	SM6	SM7	SM9
Monitoring Period		1986 2005	1986 2005	1986 2005	1986 2005	1986 2005	1986 2005	1986 2005	1988 2005
Parameter	Water Depth								
Temperature (°C)	Surface	↗	-	↗	↗	↗	↗	↗	↗
	Middle	-	-	↗	↗	↗	↗	↗	↗
	Bottom	↗	↗	↗	↗	↗	↗	↗	↗
	Average	-	-	↗	↗	↗	↗	↗	↗
Salinity	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Dissolved Oxygen (mg/L)	Surface	↘	↘	↘	↘	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	↘	-	-	-	-
	Average	↘	-	↘	↘	-	-	-	-
Dissolved Oxygen (%)	Surface	↘	-	↘	↘	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	↘	-	-	-	-
pH	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Secchi disc depth (m)		-	-	-	-	-	-	-	-
Turbidity (NTU)	Surface	↗	↗	↗	↗	↗	↗	↗	↗
	Middle	↗	↗	↗	↗	↗	↗	↗	↗
	Bottom	↗	↗	↗	↗	↗	↗	↗	↗
	Average	↗	↗	↗	↗	↗	↗	↗	↗
Suspended Solids (mg/L)	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	↗	-	-	↗	-	-
	Average	-	-	-	-	-	-	-	-
Total volatile solids (mg/L)	Surface	-	-	-	↘	-	-	-	-
	Middle	-	↘	-	-	-	-	-	-
	Bottom	-	-	-	↘	-	-	-	-
	Average	↘	↘	-	↘	-	-	-	-
5-day Biochemical Oxygen Demand (mg/L)	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Ammonia nitrogen (mg/L)	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Nitrite nitrogen (mg/L)	Surface	↗	-	-	-	-	-	↗	-
	Middle	↗	↗	-	-	-	-	-	↗
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Nitrate nitrogen (mg/L)	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	-
Total inorganic nitrogen (mg/L)	Surface	-	-	-	-	-	-	-	↗
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	↗
Total Kjeldahl nitrogen (mg/L)	Surface	↘	↘	↘	↘	↘	↘	↘	↘
	Middle	↘	↘	↘	↘	↘	↘	↘	↘
	Bottom	↘	↘	↘	↘	↘	↘	↘	↘
	Average	↘	↘	↘	↘	↘	↘	↘	↘
Total nitrogen (mg/L)	Surface	↘	↘	↘	↘	↘	↘	↘	↘
	Middle	↘	↘	↘	↘	↘	↘	↘	↘
	Bottom	↘	↘	↘	↘	↘	↘	↘	↘
	Average	↘	↘	↘	↘	↘	↘	↘	↘
Orthophosphate phosphorus (mg/L)	Surface	-	-	-	-	-	-	-	-
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	↘
Total phosphorus (mg/L)	Surface	↘	↘	↘	↘	↘	↘	↘	↘
	Middle	↘	↘	↘	↘	↘	↘	↘	↘
	Bottom	↘	↘	↘	↘	↘	↘	↘	↘
	Average	↘	↘	↘	↘	↘	↘	↘	↘
Silica (mg/L)	Surface	-	-	-	-	-	-	-	↘
	Middle	-	-	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-	↘
Chlorophyll- <i>a</i> (µg/L)	Surface	-	-	-	-	-	-	-	↗
	Middle	-	-	-	-	↗	-	-	↗
	Bottom	-	-	-	-	-	-	-	↗
	Average	-	-	-	-	-	-	-	↗
<i>E. coli</i> (cfu/100mL)	Surface	-	↗	-	↗	-	-	↗	↗
	Middle	-	-	-	↗	-	-	↗	↗
	Bottom	-	-	-	↗	-	-	↗	↗
	Average	-	-	-	↗	-	-	↗	↗
Faecal coliforms (cfu/100mL)	Surface	-	↗	↗	↗	-	-	↗	↗
	Middle	-	↗	-	↗	-	-	↗	↗
	Bottom	-	-	-	↗	↗	-	↗	↗
	Average	-	↗	↗	↗	↗	↗	↗	↗

Note: 1. Results of the Seasonal Kendall Test statistically significant at $p < 0.05$
2. - indicates no significant trend
3. NA (Not Applicable) indicates the measurement was not made due to shallow water
4. Test applied to past 20 years' data from each station unless stated otherwise
5. SM20 has seven years' data only, which is insufficient to perform Seasonal Kendall Test
6. ↗ significant increase
7. ↘ significant decrease

Results of the Seasonal Kendall Test for water quality trends in the Southern WCZ, 1986 – 2005 (continued)

Monitoring Station		SM10	SM11	SM12	SM13	SM17	SM18	SM19
Monitoring Period		1986 2005	1986 2005	1986 2005	1986 2005	1989 2005	1989 2005	1989 2005
Parameter	Water Depth							
Temperature (°C)	Surface	↗	↗	-	-	↗	↗	-
	Middle	NA	↗	-	-	-	↗	-
	Bottom	↗	↗	-	-	-	↗	↗
	Average	↗	↗	-	-	-	↗	-
Salinity	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	-	-	-	↗	-	-
	Average	-	-	-	-	-	-	-
Dissolved Oxygen (mg/L)	Surface	↘	-	-	-	-	-	↘
	Middle	NA	-	-	-	-	-	↘
	Bottom	-	-	-	-	-	-	↘
	Average	-	-	-	-	-	-	↘
Dissolved Oxygen (%)	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-
pH	Surface	-	-	-	-	-	-	-
	Middle	NA	-	↘	-	-	-	-
	Bottom	-	-	-	-	-	-	-
	Average	-	-	↘	-	-	-	-
Secchi disc depth (m)	-	-	-	-	-	-	-	-
Turbidity (NTU)	Surface	↗	↗	↗	↗	↗	↗	↗
	Middle	NA	↗	↗	↗	↗	↗	↗
	Bottom	↗	↗	↗	↗	↗	↗	↗
	Average	↗	↗	↗	↗	↗	↗	↗
Suspended Solids (mg/L)	Surface	-	-	-	↗	-	-	-
	Middle	NA	-	-	↗	-	↗	-
	Bottom	-	-	-	↗	↗	↗	↗
	Average	-	-	-	↗	↗	-	↗
Total volatile solids (mg/L)	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	-	-	-	↗	-	-
	Average	-	-	-	-	-	-	-
5-day Biochemical Oxygen Demand (mg/L)	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-
Ammonia nitrogen (mg/L)	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	↗	-	-	-	-	-
	Average	-	-	-	-	-	-	-
Nitrite nitrogen (mg/L)	Surface	↗	↗	↗	↗	↗	-	-
	Middle	NA	↗	↗	↗	-	-	-
	Bottom	↗	↗	↗	↗	-	-	-
	Average	↗	↗	↗	↗	↗	-	-
Nitrate nitrogen (mg/L)	Surface	↗	↗	↗	↗	-	-	-
	Middle	NA	↗	↗	↗	-	-	-
	Bottom	↗	↗	↗	↗	-	-	-
	Average	↗	↗	↗	↗	-	-	-
Total inorganic nitrogen (mg/L)	Surface	↗	↗	↗	↗	-	↘	-
	Middle	NA	↗	↗	↗	-	↘	-
	Bottom	↗	↗	↗	↗	-	↘	-
	Average	↗	↗	↗	↗	-	↘	-
Total Kjeldahl nitrogen (mg/L)	Surface	↘	-	-	-	↘	↘	↘
	Middle	NA	-	-	↘	↘	↘	↘
	Bottom	↘	-	-	-	↘	↘	↘
	Average	↘	-	-	-	↘	↘	↘
Total nitrogen (mg/L)	Surface	-	-	-	-	-	↘	↘
	Middle	NA	-	-	-	↘	↘	↘
	Bottom	-	-	-	-	↘	↘	↘
	Average	-	-	-	-	↘	↘	↘
Orthophosphate phosphorus (mg/L)	Surface	-	-	-	-	↘	↘	↘
	Middle	NA	-	-	-	↘	↘	↘
	Bottom	-	-	-	-	↘	↘	↘
	Average	-	-	-	-	↘	↘	↘
Total phosphorus (mg/L)	Surface	↘	↘	↘	↘	↘	↘	↘
	Middle	NA	-	-	↘	↘	↘	↘
	Bottom	↘	-	-	↘	↘	↘	↘
	Average	↘	↘	-	↘	↘	↘	↘
Silica (mg/L)	Surface	-	-	-	-	-	↘	-
	Middle	NA	-	-	-	-	↘	-
	Bottom	-	-	-	-	-	↘	-
	Average	-	-	-	-	-	↘	-
Chlorophyll- <i>a</i> (µg/L)	Surface	↗	-	-	↗	↗	-	↗
	Middle	NA	-	↗	↗	-	-	-
	Bottom	↗	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-
<i>E. coli</i> (cfu/100mL)	Surface	↘	-	-	-	-	-	-
	Middle	NA	-	-	-	-	-	-
	Bottom	-	-	-	-	-	-	-
	Average	-	-	-	-	-	-	-
Faecal coliforms (cfu/100mL)	Surface	-	-	-	-	-	-	-
	Middle	NA	-	-	↗	-	-	-
	Bottom	-	-	-	↗	-	-	-
	Average	-	-	-	↗	-	-	-

Note: 1. Results of the Seasonal Kendall Test statistically significant at $p < 0.05$
2. - indicates no significant trend
3. NA (Not Applicable) indicates the measurement was not made due to shallow water
4. Test applied to past 20 years' data from each station unless stated otherwise
5. SM20 has seven years' data only, which is insufficient to perform Seasonal Kendall Test
6. ↗ significant increase
7. ↘ significant decrease