

## Results of the Seasonal Kendall Test for water quality trends in the Mirs Bay WCZ, 1986 – 2005

Monitoring Station		MM1	MM2	MM3	MM4	MM5	MM6	MM7
Monitoring Period		1991 2005	1991 2005	1991 2005	1991 2005	1991 2005	1991 2005	1991 2005
Parameter	Water Depth							
	Surface							
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. Test applied to past 20 years' data from each station unless stated otherwise

4. ↗ significant increase

5. ↘ significant decrease

Results of the Seasonal Kendall Test for water quality trends in the Mirs Bay WCZ, 1986 – 2005 (continued)							
Monitoring Station		MM8	MM13	MM14	MM15	MM16	MM17
Monitoring Period		1991 2005	1991 2005	1994 2005	1994 2005	1994 2005	1986 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. Test applied to past 20 years' data from each station unless stated otherwise  
4. MM19 has five years' data only, which is insufficient to perform Seasonal Kendall Test  
5. ↗ significant increase  
6. ↘ significant decrease