Water Quality Study Report

Introduction:

Although determination of water quality can involve many tests, in this study you will base your study of water quality on temperature, conductivity and pH.

Water temperatures in aquatic habitats can vary according to time of the year ie seasonal variation. Cooler water in a lake or stream is generally considered healthier than warmer water. Problems generally occur when changes in water temperature are noted along one water body on the same day.

Conductivity values in lakes and streams are generally in the range of 100 to 500µS/cm. Where water is very hard or high salinity, values may be as high as 1000µS/cm. Drinking water usually has conductivity in the range 50µS/cm to 1000µS/cm. (1µS = 1 microsecond)

Although the pH value of streams and lakes is usually between 7.0 and 8.0, hard water will often have pH value between 7.5 and 8.5. The optimum pH range for most aquatic organisms is between 6.5 and 8.2.

AIM: utilise data collected using datalogging equipment to compare the water quality at different points of water body being tested.

NB: this activity can be a one off experiment, or can be repeated over a specified period of time to enable comparisons to be made of water quality at different times of the yea, as data builds up throughout the year(s).

Materials:

Either

Using secondhand data: access to ADC Moodle site http://dlb.sa.edu.au/adcmoodle

Or

Collecting own data from your water body:

- CBL2 Interface
- TI Graphics Calculator
- DataMate Program
- Vernier probes – conductivity, pH,Temperature, turbidity

Procedure:

If using secondhand data presented on ADC Moodle site http://dlb.sa.edu.au/adcmoodle

Click on Tintinara/Keith datalogging project

Click on data collected

Or

If collecting own data from your water body:

Refer ADC Moodle for procedure using dataloggers. http://dlb.sa.edu.au/adcmoodle

Summary of procedure using dataloggers:

- Attach CBL2 to calculator and turn calculator on – ensure cable is attached
- Press APPS button
- Press 6:DataMate
- Attach relevant probe to Channel 1 of CBL2 interface
- Screen will show "Checking for Sensor"
- Mode screen will appear
- Press 1: Setup
- Press down arrow to Mode, enter
- Select either 4: Single Point OR 2: Time Graph
- If time graph selected, add time interval (1 second increments) and number of samples ie. time interval:1; Number of samples: 60 will give recordings every second for 1 minute
- Press 1: OK if satisfied OR 2: Change Time Settings if incorrect
- Press 1: OK to start recording
- To save results, Press 5: Tools then 1: Store latest run
- 4: return to main screen
- 6: Quit

1 Select the appropriate probe eg. temperature, conductivity, pH

2 Either measure directly from the water body OR collect a sample by filling a plastic container with water taken from below the surface of the water.

If measuring directly from the water, ensure that the top of the probe is not immersed ie only immerse to the word Vernier otherwise you will damage the probe.

3 Measure temperature, conductivity and pH at 2 or more sites.

When measuring conductivity, set the conductivity probe on 0-2000µS/cm

4 Note the clarity of the water at each site.

5 Observe and record other observations (weather conditions, presence of algae, flow rate, etc) that could relate to water quality at that site.

NB If using secondhand data, refer to video taken on the day of data collection.

Data And Observations:

Present data in tabular form.

Indicate site, Temperature (°C), Conductivity (µS/cm), pH, Water Clarity, Visual Observations (eg colour of water, algae, plants, water animals, flow rate, etc)

Analysing The Data:

Comparing the water quality at the different sites

1 What differences did you find? Explain the differences.

2 What similarities did you find? Explain the similarities.

3 At which site was the "best" water? Explain why it was the best.

4 How else could you determine the water quality of the water body under study?

5 How do the weather conditions affect the quality of water? How did you come to this conclusion?

Comment on whether the surrounding environmental conditions have affected water quality. Explain your answer.

Look for sources of pollution, runoff, animals, etc

6 If data is available from measurements taken at other times, compare the results and give reasons for your observations.

Conclusions:

What conclusions about the quality of water at Lake Indawarra (or at your site) can you make from this study at this point in time?

WATER QUALITY DATA							
TINTINARA							
		13/03/09					
DATE	**TEST**	**PLOT 1**	**PLOT 2**	**PLOT 3**	**PLOT 4**	**PLOT 5**	**PLOT 6**
13/03/09	Av Temperature (°C)	26.94	28.14	26.44	23.12	27.3	25.32
	Conductivity (Salinity)	289.65	298.81	281.61	284.93	289.95	289.92
	pH	10	10	10	10	10	10
	Nitrates (mg/L N)	0.05	0.05	0.05	0.05	0.05	0.05
	Phosphate-P (mg/L P)	0.4	0.4	0.4	0.4	0.4	0.4
	Turbidity(NTU)	10	10	10	10	10	10
	Chloride (mg/L Cl^-) /Salinity						
	Total Dissolved Solids (µS/cm)						
	Dissolved Oxygen (mg/L)						
	Calcium (mg/L as Ca^{2+})						
27/03/09	Av Temperature (°C)	27.03	27.99	26.99	23.54	27.25	25.56
	Conductivity (Salinity)	289.76	298.49	282.21	284.57	289.23	289.34
	pH	10	10	10	10	10	10
	Nitrates (mg/L N)	0.05	0.05	0.05	0.05	0.05	0.05
	Phosphate-P (mg/L P)	0.4	0.4	0.4	0.4	0.4	0.4
	Turbidity(NTU)	10	10	10	10	10	10
	Chloride (mg/L Cl^-) /Salinity						
	Total Dissolved Solids (µS/cm)						
	Dissolved Oxygen (mg/L)						
	Calcium (mg/L as Ca^{2+})						

EC (ms/cm)									
	BASE RATE								
	37.9								
DATE	TINTINARA							KEITH	
	PLOT 1	PLOT 2	PLOT 3	PLOT 4	PLOT 5	PLOT 6		PLOT 1	PLOT 2
13/03/09	37.5	35.4	35.7	36.1	36.4	36.4			