

River classification examples



Source: The Star
Class V: Sungai Pinang



Class I: Upper reaches
of Sungai Pencala



Class III-IV: Sungai Way



Source:
<http://geogmalaysia.blogspot.com>
Class IV: Sungai Klang

Lastly, the WQI is useful tool to summarise the quality of a body of water and can be used for comparison purposes (e.g. is River A more polluted than River B). However, a drawback of using an index is that it shows less detail than a full scientific report, and, in our case, it only measures six parameters of water quality when in reality, some other constituents can be polluting the river which are not measured.

Inspired to do something for our rivers? Wondering what YOU can do? Become a RIVER RANGER!

Under the River Ranger Programme, YOU will be given the skills and tools to be a 'Protector of Our Rivers'. This programme is open to all communities as well as schools. It's fun and you can be assured you are doing something.
(www.riverranger.net)

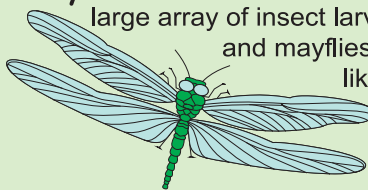


Be a VOLUNTEER!

We are always open to volunteers, whether it is helping to clean up a river, raise funds or even taking care of our resource centre, you can be sure that YOU are making a difference. (www.gecnet.info)



Did you know that clean rivers are home to a large array of insect larvae like dragonflies and mayflies? Sensitive species like the mayfly will not be able to survive in polluted waters.



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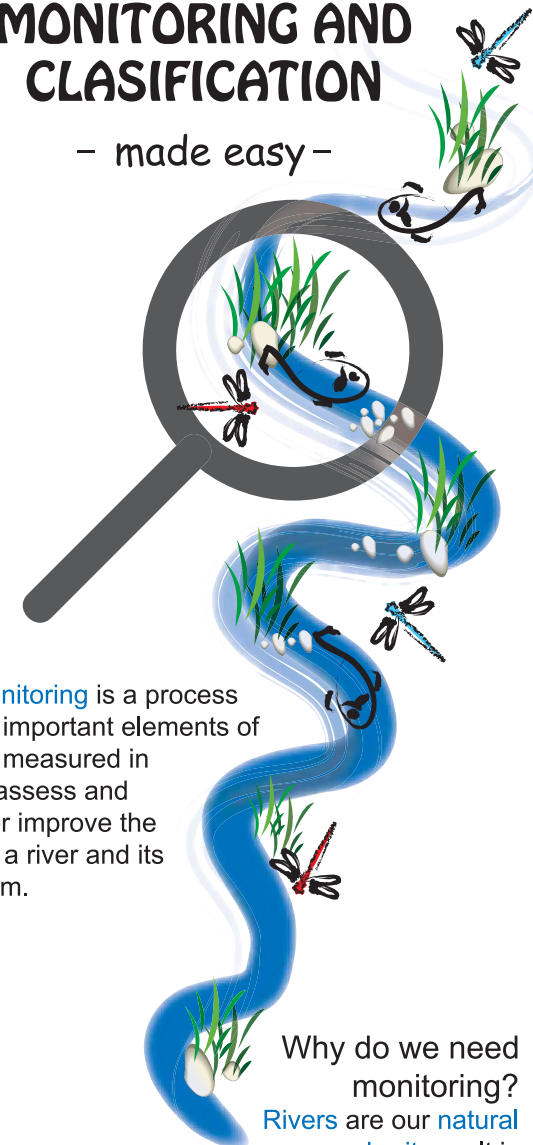


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DANIDA

RIVER WATER QUALITY MONITORING AND CLASIFICATION

– made easy –



River monitoring is a process whereby important elements of a river is measured in order to assess and sustain or improve the health of a river and its ecosystem.

Why do we need monitoring?
Rivers are our natural heritage. It is mankind's second

most important resource and is the main source of our drinking water. As the main stakeholders of rivers, HUMANS CAUSE AND RECEIVE all the impacts from pollution and mismanagement.

Water Quality Monitoring

Water Quality is a phrase to describe the chemical, physical and biological characteristics of water. Defining 'good' or 'bad' water quality is not as simple as it seems because it depends on the context in which it is used. A simple example would be that water good enough to wash your car may not be good enough for drinking. However, in general there are some standard ways for measuring water quality.

Things To Look Out For:

Physical, chemical and biological observations are important indicators of the quality of a river. They add up to give a full "picture" of the state of a river.

Physical observations

Physical observation data will be able to tell us how a river has been modified from its original state. Some things to look out for are :

- Presence of lush riparian buffers and wildlife
- Water colour and odour
- Landuse and human activities nearby
- In-stream measurements e.g. flow speed, depth

Biological monitoring

Shows the functional quality of the stream. Number and type of fauna and flora in a river will give clues as to whether the river has been impacted by human activities.

Chemical monitoring

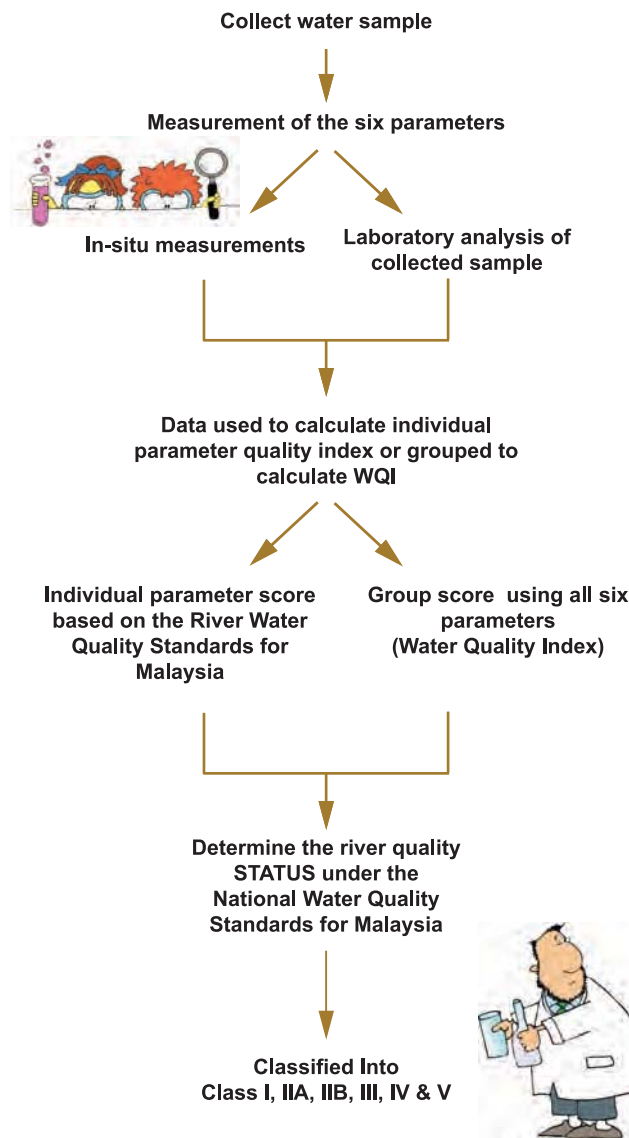
In Malaysia, six chemical parameters are measured as a standard to determine the river water quality using a Water Quality Index (WQI).

Parameters	What it indicates
pH	Indicates contamination and acidification.
Biochemical Oxygen Demand (BOD)	Procedure for determining how fast biological organisms use of oxygen in a body of water.
Chemical Oxygen Demand (COD)	Indicates the amount of organic pollutants in water.
Ammonical Nitrogen (AN)	Indicates nutrient status, organic enrichment and health of the waterbody
Suspended Solid (SS)	Small solid particles which remain in suspension in water as a colloid or due to the motion of water.
Dissolved Oxygen (DO)	Measures the amount of oxygen dissolved or carried in the water.

The Water Quality Index (WQI)

Water Quality Index (WQI) is a tool for evaluating the quality of river water. Firstly, the water is tested for the six chemical parameters mentioned in the previous page. Then, the water quality data is compared with the National Water Quality Standards for Malaysia (NWQS) to determine their status.

Process for calculating WQI



WQI CALCULATION

The six resulting values are then entered into an established formula to arrive at the WQI score:

$$\text{WQI} = 0.22 \times \text{SI DO} + 0.19 \times \text{SI BOD} + 0.16 \times \text{SI COD} + 0.15 \times \text{SI AN} + 0.16 \times \text{SI SS} + 0.12 \times \text{SI pH}$$

(where SI = sub-index) for details please visit <http://www.doe.gov.my/en/content/river-water-quality-status>

100 is the highest possible score and denotes a pristine river and zero is the lowest. The WQI score can then be used to categorize a particular water body into one of five classes

RIVER CLASSIFICATION

a) Class Based (DOE Water Quality Index Classification)

PARAMETER	UNIT	I	II	CLASS III	IV	V
Biochemical Oxygen Demand	mg/l	< 1	1 - 3	3 - 6	6 - 12	> 12
Chemical Oxygen Demand	mg/l	< 10	10 - 25	25 - 50	50 - 100	> 100
Ammonical Nitrogen	mg/l	< 0.1	0.1 - 0.3	0.3 - 0.9	0.9 - 2.7	> 2.7
Dissolved Oxygen	mg/l	> 7	5 - 7	3 - 5	1 - 3	< 1
pH		> 7	6 - 7	5 - 6	< 5	< 5
Total Suspended Solid	mg/l	< 25	25 - 50	50 - 150	150 - 300	> 300
WQI		>92.7	76.5 - 92.7	51.9 - 76.5	31.0 - 51.9	<31.0

b) Pollution Status Based (DOE Water Quality Classification Based On WQI)

WQI	River Status
0-59	Polluted
60-80	Slightly Polluted
81-100	Clean

WATER QUALITY CLASSES & USES (NATIONAL WATER QUALITY STANDARDS FOR MALAYSIA)

Class 1	Conservation of natural environment, Water Supply I - practically no treatment necessary, Fishery I - very sensitive aquatic species.
Class IIA	Water supply II - conventional treatment required, Fishery II - sensitive aquatic species.
Class IIB	Recreational use with body contact.
Class III	Water supply III - extensive treatment required, Fishery III - common, of economic value and tolerant species; livestock drinking.
Class IV	Irrigation
Class V	None of the above