The Interim Queensland River Classification Scheme

To manage rivers effectively it is necessary to understand their diversity and how they function. The Interim Queensland River Classification Scheme (QRCS) provides a standardised approach to describing and categorising the physical, biological and chemical attributes of rivers. The QRCS can be applied to describe river types for specific purposes, rather than trying to force an existing typology to fit a purpose it was not designed for. The approach underpinning the QRCS is consistent and integrated with the classification approach for all aquatic ecosystems in Queensland.

The need for river classification

The rivers (water channels) of Queensland have varied geomorphology, ecology, hydrology and water chemistry. For example, not all rivers are in a single channel that meanders across a floodplain. They may be in several channels, feature an extensive floodplain, a floodplain inset in a much larger channel, or there may be no floodplain at all. Flow may be intermittent, ephemeral, or perennial, with differing contributions from groundwater, throughflow and overland flow. Some rivers run to the sea, while others flow to internal drainage basins that terminate inland.

The QRCS provides a standardised and comprehensive river classification scheme that can be used throughout Queensland for multiple purposes. It integrates with the Aquatic Ecosystem Rehabilitation Process and the Queensland River Rehabilitation Management Guideline. These decision support tools are underpinned by the Whole-of-System, Values-Based Framework and facilitate a transparent, scientifically robust and uniform approach to management, decision-making and research.

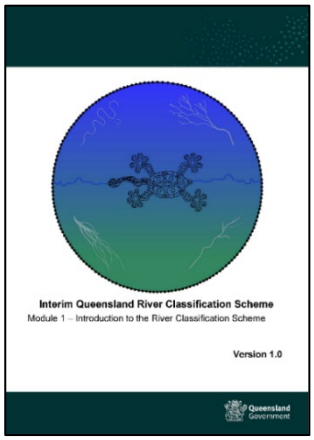
Queensland contains a wide variety of natural water channels including: (A) single channel and (B) multi-channel systems, and rivers that (C) flow to the sea, and (D) flow inland. Photos by Gary Cranitch © Queensland Museum.

What ecosystems are covered?

The QRCS includes all water channels in Queensland and is applicable to single and multichannel systems. It extends to the limit of tidal influence for those rivers that flow into the sea (exorheic), as well as to channels that have no outflows and end inland (endorheic).

Advantages of the scheme

- Provides a common language within a structured framework.
- Enables synthesis and understanding of river systems based on similar characteristics.
- Integrates with and complements other classifications and mapping schemes at the state and national scale.
- Enables a transparent, scientifically robust and uniform approach to classification.
- Consolidates knowledge into a consistent platform.
- Develops a synthesis of current understanding and knowledge of river system components.
- Provides foundation to identify vital aquatic refugia and habitats.
- Facilitates communication about values and management with technical and non-technical audiences.



Cover of QRCS featuring a long-neck freshwater turtle, a sacred animal that connects the land and water together, as one whole functioning ecosystem. The sacred animal reminds us all to protect and care for Country for the future generations. By John Locke and Trent Munns.

Australian Government | Reef Trust | Queensland Wetlands Program | Queensland Government

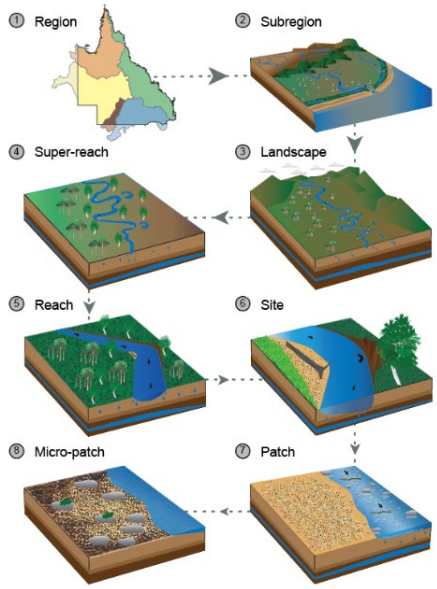
Principles and concepts

The QRCS provides a consistent set of measurable physical, biological and chemical components or processes (termed **attributes**) of rivers and is based on existing attribute-based classification schemes for other aquatic ecosystems in Queensland. Riverine specific attributes were identified through extensive literature review (including existing wetland/aquatic ecosystem classification schemes for Queensland) and consultation.

Attributes are grouped across 8 broad **themes**: climate, terrain, geology, substrate (physical and chemical), hydrology (physical and chemical), and biota. Attributes are also divided into **categories**. **Metrics** are classes or measurements used to further describe an attribute. For example, the attribute of precipitation in the climate theme may have categories going from extremely low to extremely high, with a metric of millimetres per annum.

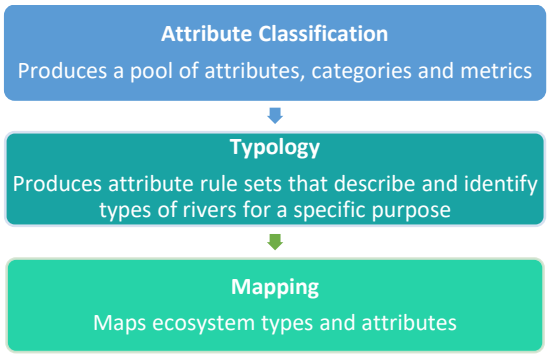
Attributes may be used at different spatial **levels**. Eight levels have been defined that are related to both spatial and temporal scales of change in river systems. This allows to classify the different components and processes in riverine ecosystems at the regional, subregional, landscape, super-reach, reach, site, patch and micro-patch scales. In the example of precipitation, levels may be used to describe regional variations in precipitation across Queensland if required for the specified purpose.

Ecosystems are dynamic due to natural variation or anthropogenic pressures. **Qualifiers** can be applied to attributes to describe this variability, such as naturalness or trend. An ENSO decadal drought cycle might be described for precipitation using the qualifier of period.



The eight levels used to describe different spatial scales of river systems.

The approach separates attribute classification, types and mapping into three stages:



The benefit of these stages are:

1. Attribute classification: All useful attributes are listed even if datasets are not currently available. This identifies important data gaps. It also means data collection (**inventory**) can be guided so that data is consistent and useful.

2. Typology: Types can be created in a consistent manner for each particular purpose. This means that, when a new typology is being developed, the relevant information from existing typologies can be reused. Types should include all attributes that are relevant, even if they currently have no available data.

3. Mapping: The data, or its surrogates, that currently exist can be selected to deliver a product that is mappable.

Further information

If you would like to know more about the QRCS or have relevant data or research to share, please visit: https://wetlandinfo.des.qld.gov.au/

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The QRMP is enabling adaptive integration and coordination of research and development, decision support, communication and knowledge transfer. Its objective is to enhance the impact and efficiency of river management policies, programs and responses to extreme events, long-term trends (e.g., climate change) and other impacts.

Contact: wetlands@des.qld.gov.au