

Rainfall and climate

Rainfall in general is largely driven by climatic factors. The Fitzroy Basin in Central Queensland, experiences a predominantly subtropical climate with distinct wet and dry seasons. It falls within a semi-arid to arid region and is characterised by hot temperatures, limited rainfall, and variable weather patterns.

The Fitzroy Basin experiences a distinct wet season and a prolonged dry season. The wet season occurs during the Australian summer, usually from November to March. This is when the region receives the majority of its annual rainfall, often in the form of heavy but sporadic thunderstorms.

The dry season extends from April to October, with historically very limited rainfall during these months. However, the region's climate can be highly variable from year to year. El Niño and La Niña events in the Pacific Ocean can influence rainfall patterns, with El Niño tending to bring drier conditions and La Niña bringing wetter conditions.

Based on this climate variability, waterways can be ephemeral in the Fitzroy Basin. Ephemeral waterways are characterized by streams or rivers that experience sporadic or temporary flow in response to rainfall events.

Measuring water quality in both high and low flow conditions provides an understanding of the dynamics of aquatic systems and assessing the health of water bodies. Different measurements and sampling strategies are often required to account for the variations in water quality that occur during different flow periods.

Fitzroy Partnership for River Health measures each indicator against high and low flow cutoffs specific to each catchment, to account for the variability. Community members can download data for each catchment and year, which shows scores for both high and low flow.

Impacts of rainfall on water quality

Rainfall can have significant effects on water quality, particularly in natural bodies of water like rivers, lakes, and oceans, as well as in urban environments where rainwater runoff can interact with pollutants. The impact of rainfall on water quality can be understood through various processes:

1. Dilution and Mixing: Rainfall can dilute pollutants present in water bodies by adding a large volume of relatively clean water. This can temporarily lower the concentration of pollutants, making the water appear cleaner. However, if pollutants are persistent or if the rainfall is not substantial, dilution might not be enough

to mitigate their effects.

2. Runoff and Erosion: One of the most significant impacts of rainfall on water quality occurs when rainwater runs over surfaces, picking up pollutants and sediments along the way. This is known as runoff. Urban areas with impervious surfaces like roads, parking lots, and rooftops can lead to increased runoff, carrying pollutants such as oil, heavy metals, fertilizers, pesticides, and debris into water bodies. Agricultural areas can also contribute sediment, nutrients, and pesticides to water bodies through runoff and erosion.

Please see our **Sediment Factsheet** for more information.

3. Nutrient Loading: Rainfall can carry excess nutrients, such as nitrogen and phosphorus, from agricultural land, lawns, and gardens into water bodies. These nutrients can lead to eutrophication—a process where excessive nutrients stimulate the growth of algae and aquatic plants. As these organisms die and decompose, they consume oxygen, leading to oxygen-depleted zones harmful to aquatic life.



4. Chemical Transport:

Rainwater can transport chemicals and contaminants from various sources into water bodies. For example, atmospheric pollutants can be dissolved in rainwater and deposited into aquatic systems, affecting water quality.

5. Temperature and Turbidity Changes:

Heavy rainfall can alter water temperature and increase turbidity due to sediment runoff. Drastic temperature changes can stress aquatic organisms, affecting their health and reproduction.

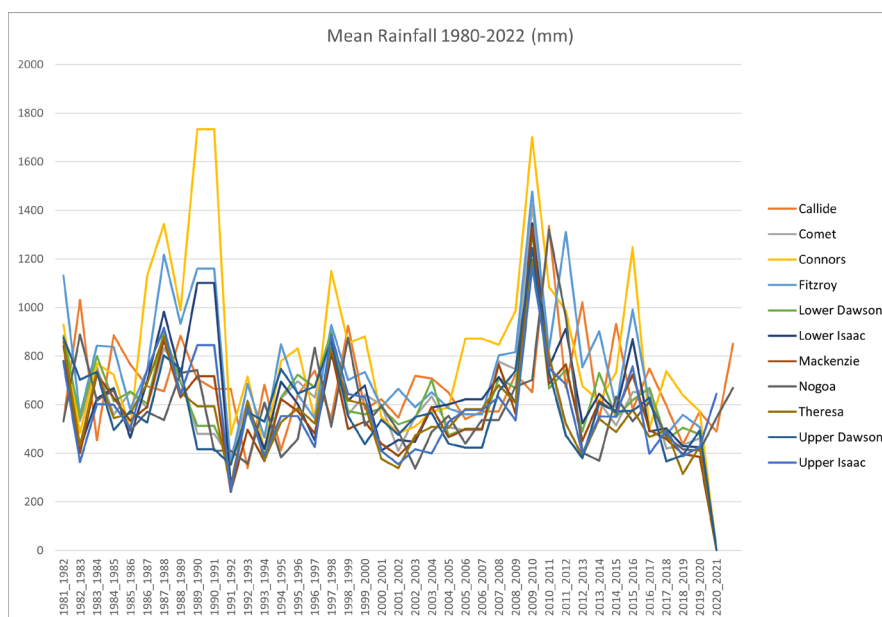
6. Altered pH Levels: Rainfall can have a mild acidifying effect on water bodies due to the presence of naturally occurring acids in the atmosphere, such as sulfuric and nitric acids. This can affect the pH balance of aquatic systems, potentially harming aquatic life adapted to specific pH ranges.



7. Habitat Disturbance: Intense rainfall events can cause erosion, sedimentation, and alteration of aquatic habitats. Excessive sedimentation can smother aquatic habitats and limit light penetration, affecting aquatic plant growth and other organisms.

Average Rainfall

The Fitzroy Partnership measures physical-chemical, nutrients, toxicants and ecology indicators. As mentioned above, many indicators are influenced by rainfall which in turn can affect the overall Report Card results. During dryer years, the overall grades tend to be higher whereas in years with higher rainfall, the grades tend to be lower. When looking at results at a site-specific level, rainfall has a much more complex influence on the indicators. If you would like to explore more about rainfall average for each catchment in the Fitzroy Basin, please visit our website at: https://riverhealth.org.au/report_card/additional-info/rainfall. Data to create the rainfall averages is derived from the Bureau of Meteorology and rainfall gauging stations throughout the Basin.



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