

# Water quality snapshot: Leschenault Estuary 2021–22

Understanding estuary condition and monitoring for change helps to guide how we manage our estuaries

Through Healthy Estuaries WA, the Department of Water and Environmental Regulation monitors water quality fortnightly in the estuary and the surrounding catchment. This snapshot provides some insights from our water quality monitoring in 2021, comparing the very wet rainfall year in 2021 with a drier year in 2019.

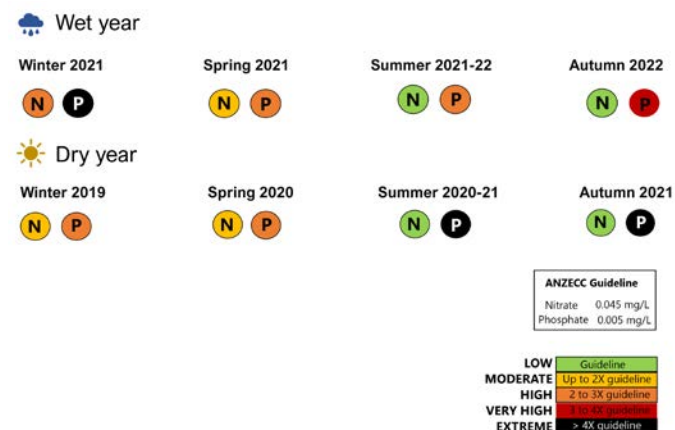
The Leschenault catchment had above-average rainfall during winter 2021 (963.8 mm). Compared with a typical year, the higher rainfall in winter 2021 resulted in higher than usual nutrient concentrations, especially for phosphorus.

Nutrients (nitrogen and phosphorus) in high concentrations can promote algal growth in waterways. Rainfall washes nutrients and organic matter from the surrounding land into the rivers so we normally find higher nutrient concentrations following winter rains. Fortunately, this did not result in increased algal productivity.

## Nutrients

In winter 2021, average concentrations of both nitrogen and phosphorus were higher than usual, and above guideline levels.<sup>1</sup>

However, the prolonged river flows from the winter rainfall in 2021 helped flush the nutrients out towards the ocean. As a result, the average phosphorus concentrations in summer 2021–22 were lower than in the dry year 2019, where there was less river flow.



<sup>1</sup> Nutrient concentrations are compared with ANZECC and ARMCANZ (2000) water quality guidelines for estuaries in south-west Australia. Available from [www.waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000](http://www.waterquality.gov.au/anz-guidelines/resources/previous-guidelines/anzecc-armcanz-2000)

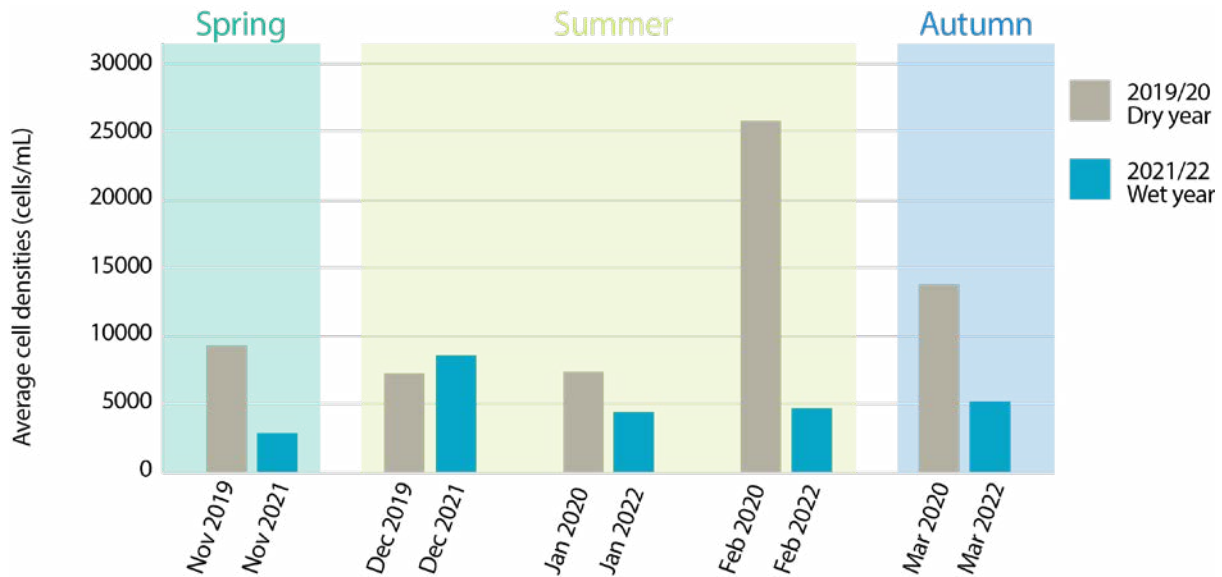
## Algal productivity

While algae are a natural part of aquatic ecosystems, excessive algal growth can make waterways unsightly and smelly, and can have negative impacts on aquatic life such as fish. Microalgae can be harmful if present at high cell densities ('blooms') or if toxic. Microalgae grow rapidly under well-lit, warm, nutrient-rich conditions.

Despite excessive nutrients in the estuary in winter 2021, there was not a significant algal growth response. This is likely because prolonged river

flows well into spring helped flush nutrients towards the ocean. Microalgal growth may also have been inhibited by cool spring temperatures and reduced light availability because of the darker, tannin-stained, organic matter-rich water from the catchment.

In contrast, during the warmer months that followed a dry winter in 2019–20, algal productivity was higher. This is likely because lower flow conditions combined with warm temperatures and good light availability created conditions more favourable for algal growth.



Density of microalgae at the Lower Collie River site in summer 2021–22 following the high winter rainfall, compared with the lower rainfall year in 2019–20.

## Summary

The high rainfall in winter 2021 washed more nutrients from the catchment into the estuary than is typical for a dry year. However, river flow and climatic conditions helped prevent excess algal growth in the Leschenault Estuary during the subsequent spring and summer months.

Nutrient concentrations are still elevated in the Leschenault catchment, so there remains risks of algal blooms occurring in the future. Compared with the high winter rainfall in 2021, years with low winter flows or short-lived inflows from unseasonal summer storms have greater potential to fuel undesirable algal blooms. This is because nutrients are not flushed out towards the ocean, or they arrive when temperature, light and reduced water movement favour rapid algal growth.

Improving the health of Leschenault Estuary and building its resilience to climate change relies on continuing work in the catchment. Managing land use appropriately and reducing nutrient inputs remain essential to protect the Leschenault Estuary.



## More information

[estuaries.dwer.wa.gov.au/estuary/leschenault-estuary](https://estuaries.dwer.wa.gov.au/estuary/leschenault-estuary)

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