Outcome

Environment and Cultural Heritage

Measure 2
Marine and freshwater quality

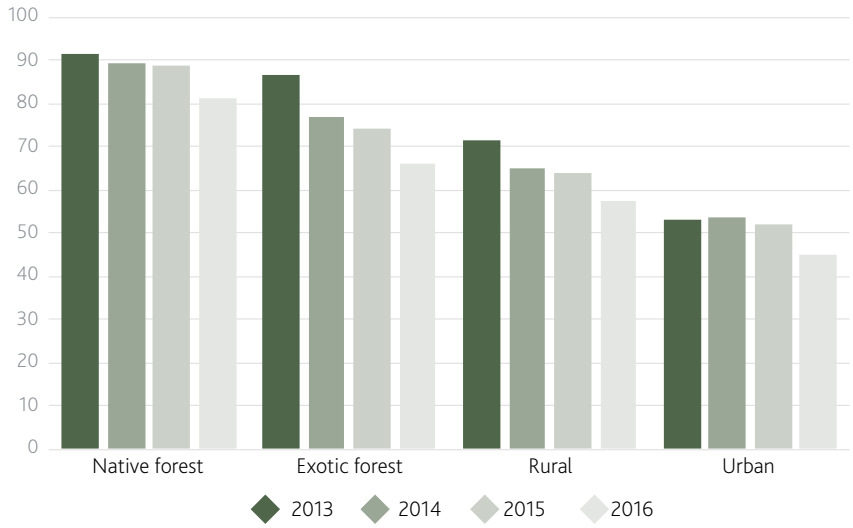
Composite measure explanation - The Auckland Region is surrounded by water and has a complex coastline with many harbours, estuaries and islands. The region is also home to many streams, natural and artificial lakes, and aquifers.

Water quality and quantity are both significant issues that will escalate as the population grows and the impacts of climate change become increasingly apparent.

In both urban and rural areas, water quality has declined, and freshwater environments have been compromised. This composite measure covers:

- Fresh water quality:
  - Rivers
  - Lakes
- Marine water quality

Measure 2a.
Stream water quality



Data
Water quality index.

Source
Stream water quality monitoring programme.

Availability
Annually.

Frequency
monitored annually reported trend 5 yearly.

Notes
The average water quality index from 0 (worst) to 100 (best) for broad land cover types in the Auckland Region (2013-2016) and the 2016 water quality class. The data was gathered from across 36 sites.

Relevance
Stream water quality is largely influenced by catchment landuse. In general streams with an urban catchment are heavily impacted by contaminants and have poor water quality. Streams within rural catchments generally have good water quality but specific sites are impacted by nutrients and sediment. Streams with a native forest catchment generally have little to no human impact and thereby excellent water quality.

Baseline (2016)
The current baseline is set against 2016 data as per the analysis below:

Native forest - Good Exotic forest - Fair
Rural - Fair Urban - Poor

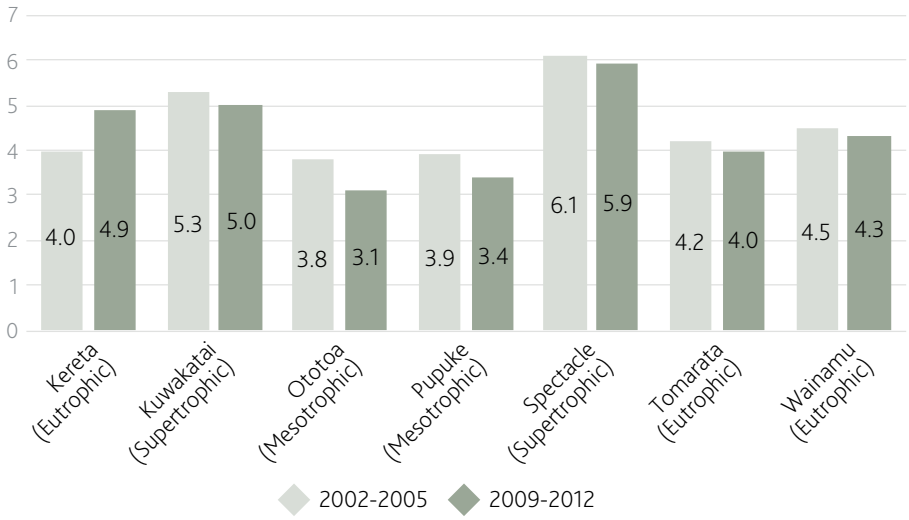
Analysis

Over the time period monitored all catchments have demonstrated a decline in water quality. The water quality index gave the four catchments the following ratings: Native forest – Good, Exotic forest – Fair, Rural – Fair, Urban – Poor.

(✓) Trend

From 2013 to 2016 decreasing trend.

Measure 2b.
Lake water quality - trophic level



Data

Trophic level index (TLI).

Source

Lake water quality monitoring programme

Availability

Monitored monthly and reported periodically.

Frequency

Monitored annually reported trend 5 yearly.

Notes

The TLI is used to place lakes into nutrient-enrichment categories known as trophic states:

- microtrophic (TLI < 2; very good) lakes are very clean and often have snow or glacial sources.
- oligotrophic (TLI 2–3; good) lakes are clear and blue, with low concentrations of nutrients and algae.
- mesotrophic (TLI 3–4; average) lakes have moderate concentrations of nutrients and algae.
- eutrophic (TLI 4–5; poor) lakes are murky, with high concentrations of nutrients and alga.
- supertrophic or hypertrophic (TLI > 5; very poor) lakes have extremely high concentrations of phosphorus and nitrogen, and are overly fertile; they are rarely suitable for recreation and lack habitats for desirable aquatic species.

Relevance

When nitrogen and phosphorus accumulate in lakes (referred to as 'nutrient enrichment') above certain concentrations, they can stimulate the growth of algae and cyanobacteria. Chlorophyll-a is a measure of the phytoplankton (algae) biomass. Lakes with very high concentrations of nutrients and algae are rarely suitable for recreation and provide poor habitats for aquatic species, particularly through reduction in dissolved oxygen concentrations. Ammoniacal nitrogen and nitrate-nitrogen can be toxic to aquatic life if concentrations are high enough. Water clarity is a measure of underwater visibility in lakes.

Baseline (2012)

Kereta (Eutrophic)
Kuwakatai (Supertrophic)
Ototoa (Mesotrophic)
Pupuke (Mesotrophic)
Spectacle (Supertrophic)
Tomarata (Eutrophic)
Wainamu (Eutrophic).

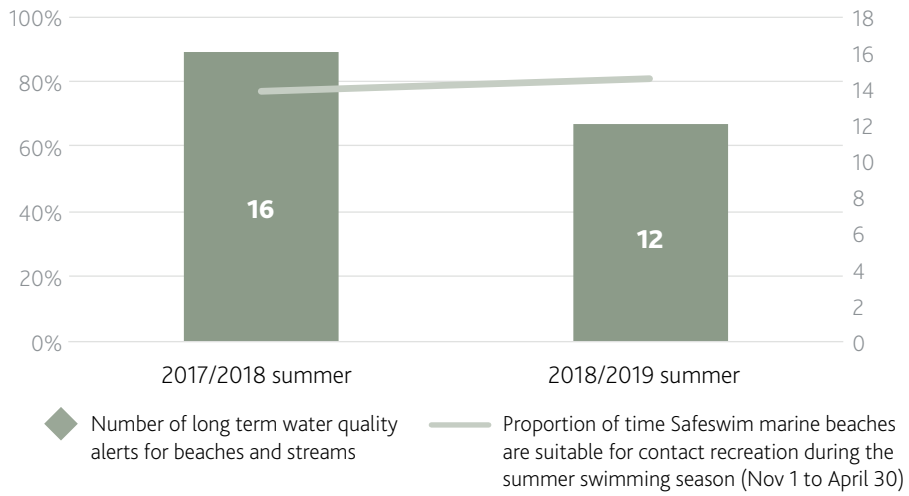
Analysis

The lakes monitored range from supertrophic/very poor (kuwakatai) to mesotrophic/average (Ototoa). Some of Auckland's monitored lakes have poor water quality, but showed improving trends over the period 1993 to 2012.

(✓) Trend

From 2002 to 2012 decreasing positive trend.

Measure 2c.
Beach swimming safety



Data
Number of long term water quality alerts for beaches and streams. Proportion of time Safeswim marine beaches are suitable for contact recreation during the summer swimming season (Nov 1 to April 30).

Source
https://www.safeswim.org.nz

Frequency
Annually.

Availability
https://www.safeswim.org.nz

Notes
The Water Quality categories relate to the amount of bacteria in the water. Safeswim uses thresholds that are set by the Ministry for the Environment and Ministry of Health, and published in national Microbiological Water Quality Guidelines.

Relevance
Health risks are also evident at popular beaches, to varying degrees, where the majority of swimming takes place. In urban areas, this is typically the result of wastewater overflows and contaminated stormwater during rainstorms. Rural streams generally have better water quality, although they also face problems with elevated levels of nutrients, sediment and E. coli in some areas of more intensive agriculture and towns with aging or improperly maintained septic systems.

Baseline (2018)
The 2018 baseline for long-term water quality alerts was 12. The proportion of time safeswim marine beaches were suitable for contact recreation during the summer swimming season 2018/2019 was 77%.

Analysis
There has been a decrease in water quality beach alerts between summer swimming seasons from 16 to 12. The percentage of time that Safeswim marine beaches are suitable for contact recreation has also increased over this time.

(^) **Trend**
From 2017/2018 to 2018/2019 increasing positive trend.