

Excellence
NZQA Intended for teacher use only

Title: Map showing the Taruheru River and Waimata River and the different characteristics of the environment in the catchment areas.

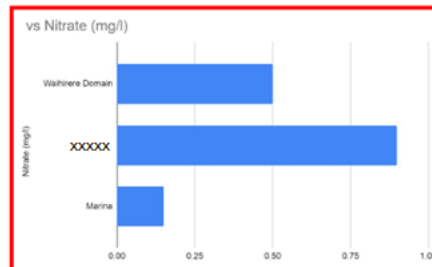
Location

- = The yellow line is from the start of the Taruheru River to the end where the data was collected.
- = The red line is the start to the Waimata River where information wasn't collected

This map shows how the environment surrounding our rivers can be quite different. The Taruheru river meanders through farmland, suburban and urban environments. Whereas the Waimata passes through more like a rural environment.



Nitrate Data

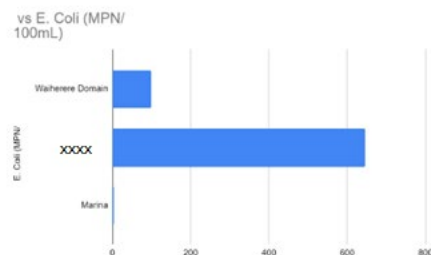


High nitrate levels can significantly affect on the quality of the water. Nitrate acts as a nutrient for aquatic plants and algae. When there is too much nitrate it can cause an eutrophication, which is a process that causes organisms to grow faster than usual. This excessive growth allows less oxygen in the water, which forms oxygen poor conditions that can harm fish and other aquatic life. Also the when algae blooms, it can badly affect the water clarity, taste, and odor, Making water bodies less enjoyable.

The nitrate readings show variation in the nitrate levels in water across the three locations. The lowest nitrate level of 0.15 was recorded at the Marina, the highest was at XXXXX at 0.9 and the middle reading was at the Waihiere Domain at 0.5. This shows a peak pattern in nitrate level.

From this information we can see that XXXXX has the highest nitrate level with the difference from the highest nitrate level and the lowest nitrate level is 0.75 mg/L. We can tell that at XXXXX the Taruheru River has the worst water quality according to its nitrate level data.

E.Coli Data



High levels of E. coli in water show that there is possibly harmful pathogens and contaminated with poo. If people come into contact with water that has these pathogens in it, they can get sick. Swallowing or even just being in contact with contaminated water can lead to symptoms like stomach ache, diarrhea, and more severe illnesses. E. coli contamination can harm aquatic ecosystems. Having high amounts of E.Coli in water, it can disrupt the natural balance of the water and can badly affect the health of fish, amphibians, and other aquatic lives. This can decrease the biodiversity and population for species that are sensitive to E. coli.

The E.Coli readings show variation in the E.Coli levels in the water across the three locations. The lowest E.Coli level of 4 was recorded at the Marina, the highest was at the XXXXX at 645 and the middle reading was at the Waihere Domain at 99. This shows a peak pattern in E.Coli level.

From this information we can see that XXXXX has the highest E.Coli level with the difference from the highest E.Coli level and the lowest water flow level is 641 MPN/100mL. We can tell that at XXXXX the Taruheru River has the worst water quality according to its E.Coli data.

How does the data help us understand changes in stream health?

According to the data, the health of the river does change as we move downstream. However the data indicated that the worst health is found in the middle reaches and slightly improved near the end. It is possible that the mixing of fresh seawater is a factor in the improved health at this location.

Based on the data above we can see that there is a significant change in e-coli and nitrate levels from the Waihere Domain to the XXXXX testing places along the Taruheru river. These changes come from the horticultural and agricultural jobs in that area. Livestock farming next to the riverbank of the Taruheru river can lead to effluent runoff, which increases the E.Coli and nitrate levels in those areas. Also the use of sprays and fertilizers they use in agriculture can also help the E.Coli and nitrate level. When it rains it causes these sprays and fertilizers to run off into the Taruheru River. This also increases the nitrate and e-coli levels. The Taruheru river flows through approximately 11,100 meters of farmland between the Waihere Domain and XXXXX (both testing points).

How can data help us understand the Taruheru river environment?

A small amount of qualitative data that I have used would help me understand the values associated with the Taruheru river. The Values of local Māori can show an indigenous and historical "perspective" on the river environment.

How can more data strengthen my understanding of this area?

1. It would have been beneficial to my understanding of the river environment if I could clearly identify the source of pollutants, such as nitrogen and phosphate, that are present in the water. Then any problems could be solved
2. Temporal data collection - seasonal or monthly or annual collections could show what is happening over a longer time.
3. A greater attempt to gather qualitative data would help me understand the values associated with the Taruheru river. Because the river has a strong cultural connection to local Māori, and this is not clearly shown when collecting quantitative and statistical data from the river like we did.
4. Comparative data - data from other regional waterways and data comparison with national baseline/average.

However, if we collected all this data then it could limit my understanding of this area because there might be too much to see and figure out what is happening with the river and why.

Strengths of this data as it relates to the findings

Collection Method

Data was collected using a SHMAK kit to measure the indicators of stream health. This was a strength to my data because, the kit has reliable tools to ensure that our results from using these tools are reliable then just guessing which meant that the data that was used was accurate. However, this data could limit our understanding of the environment if the kit is not used properly and gives us data which is not right.

Data Source

The data source that was used had come from three different locations; these three points covered the whole river as these locations ranged from the start of the river then to the middle then the end. Instead of picking three close spots a kilometer apart which would be unreliable and limit our understanding because all data locations ranged through different environments which gave us a different perspective on the changes of different data types.