



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TĀEA

Exemplar for Internal Achievement Standard Geography Level 1

This exemplar supports assessment against:

Achievement Standard 91933

Explore an environment using data

An annotated exemplar is a sample of student evidence, with a commentary, to explain key aspects of the standard. It assists teachers to make assessment judgements at the grade.

New Zealand Qualifications Authority

To support internal assessment

Grade: Achieved

For Achieved, the student needs to explore an environment using data.

This involves presenting processed data from primary and/or secondary sources. Findings about an environment using the presented data and how data can strengthen or limit understanding of the environment are then described.

Data about the waterfront environment has been processed into bar graphs, a pie graph, and maps. Some geographic conventions have been applied.

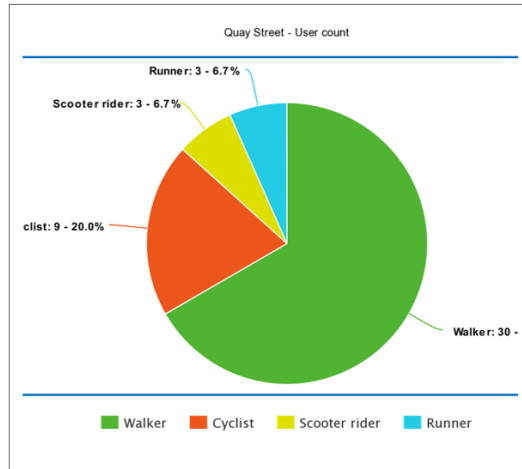
Using the presented data, findings about the waterfront environment are described. For example, the processed transport data shows that more vehicles are travelling west, and most people on Quay Street are walkers.

The student has described how the Auckland wide data can strengthen understanding of the waterfront environment.

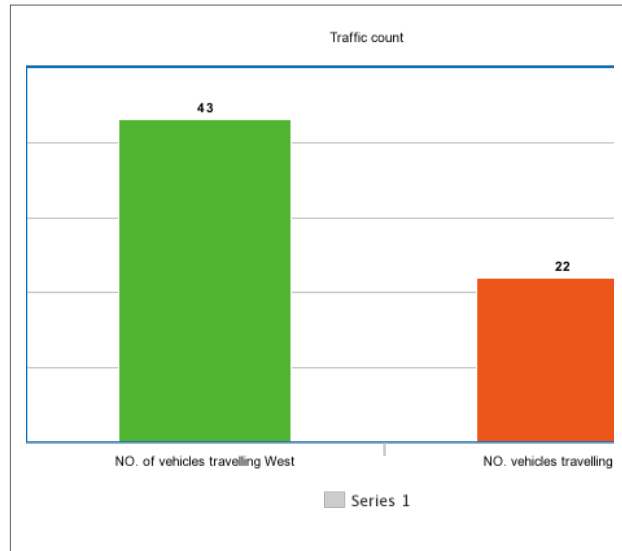
For Merit, the student should explain findings about the environment using the presented processed data. In addition, there should be an explanation of how data can strengthen and limit understanding of the environment.

At a word count of 947, this evidence is at the upper end of the expected response length.

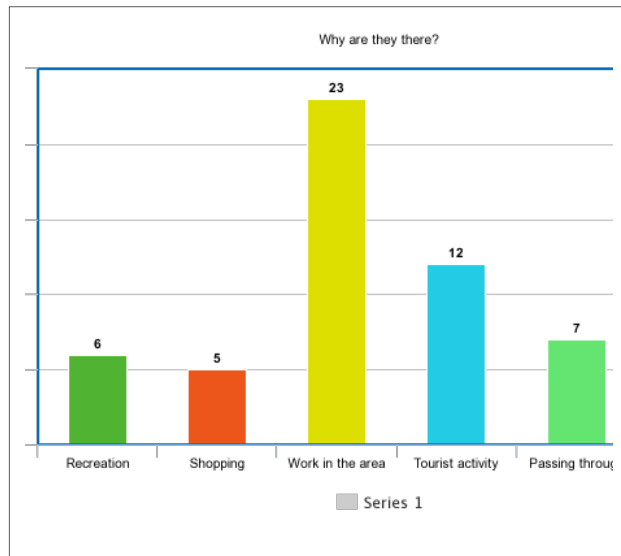
- In this pie chart we can see that majority of the people on Quay Street are walkers with 30% then the second most efficient way is cycling at 20% and then scooter riders and runners are tied at 6.7%.
- This data tells us that majority of the people on Quay ST are walkers and including my bar graph on slide 4 it shows a lot of people work in the area so lots of people may be walking around on their breaks to get lunch or just walking from a where their cars are parked to get to their work



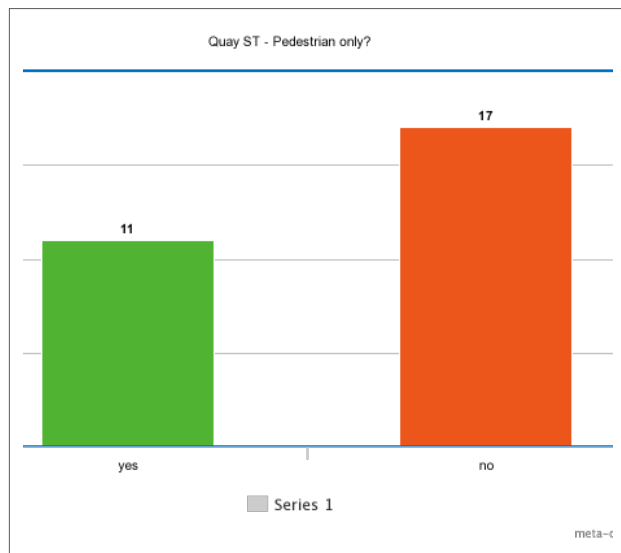
- Here in this bar graph we can see that the number of vehicles travelling West is more than the vehicles travelling South by 21 over 10 minute period. This data could have easily changed over the week/month as this data is from just 1 day.



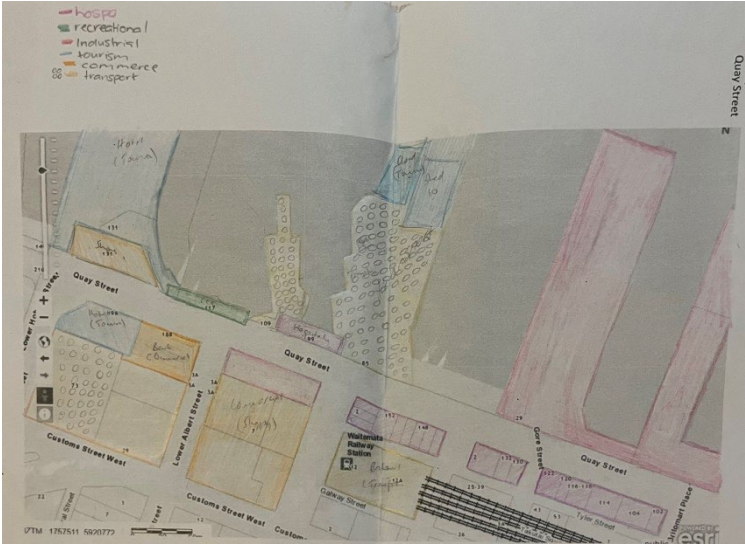
- Most of the people that are on Quay street are there for work because they work in the area and then the second most people that are there tourist activity with 12 people, next is people just passing through and that's 7 people then 6 people are there for recreational purposes, then the rest (5) people were there for shopping.
- This shows us that majority of the people here are for their jobs or the rest are tourists.



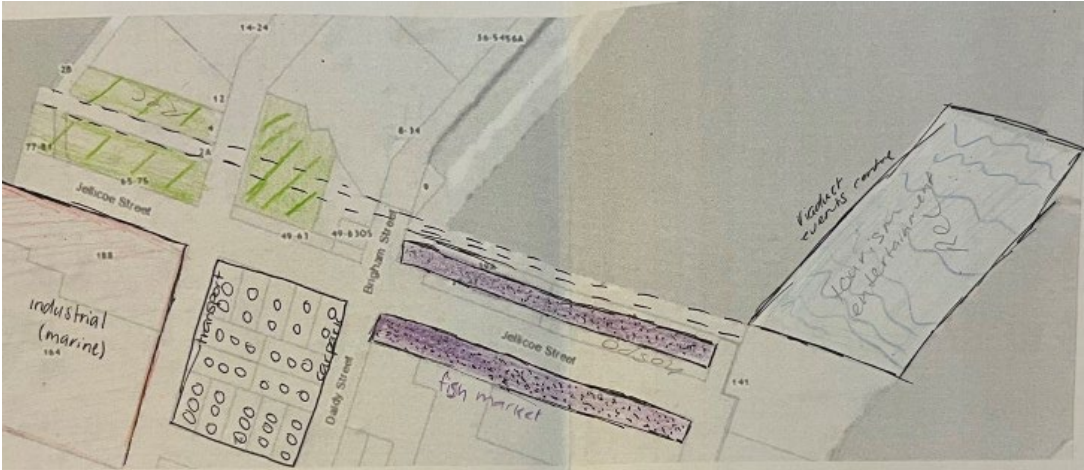
- The amount of people who think that Quay Street shouldn't be pedestrian only tops the amount of people who think it should by 6 people.
- Why people think Quay ST should not be pedestrian only? People who drive through Quay ST may find it easier to drive through and park somewhere if they are going to work or if they are going shopping. It can be a lot easier and more efficient to drive through instead of walking. Majority of the people think that Quay ST should not be pedestrian only
- Why people think it should be pedestrian only? People might want Quay ST just to stay pedestrian only because it would be a lot easier to cross streets if there no cars and would also free up traffic.



Map of the land use on Quay ST



Map of the land use in Wynyard Quarter



The differences between the two land use maps

- Some of the differences between the two maps are that..
- On Quay ST we can see that it includes shops, banks, transport, hospitality, hotels and compared to the Wynyard Quarter map it includes the marine, transport, the events centre, the fish market and hospitality. So both of these maps include at least hospitality and transport which can be quite handy to have both of these resources on both maps. I would say Quay ST definitely includes more Transport, Commerce, Tourism activities, Recreational buildings and Hospitality, therefore another reason to not make Quay ST pedestrian only, because there are more useful buildings on Quay ST rather than Wynyard Quarter

Strengths

- Some of the strengths that we have are we have data from Auckland transport which is very supporting because the data has come from people all over Auckland. This can give us more understanding about the waterfront because the data is from a big area. AT transport is a transport company that most Aucklanders use as a way to get around as a economic and cheaper way. Their main focus is to stop people from using cars as much and make it affordable so more people are enticed on using public transport.
- We are also lucky to have gone to Wynyard quarter and surveyed people who gave their honest opinion on the questions we asked. Since we had multiple students asking multiple people this helped us to get as much results as we could because we had a lot of data and can use this to tell us about the waterfront.

Limitations

- Some of the limitations that we faced is we didn't survey many people which means less data which leads to less accurate results.
- We didn't survey all people Quay St because there weren't a lot of people since we went in quite an unbusy time of day.
- We also didn't ask people in cars who were on Quay St and that leads us to quite inaccurate results since their answer for the survey on if Quay St should be pedestrian only or not, might have been different since they were driving cars on Quay St themselves.

Conclusion

- In these graphs it shows us all different data about Quay St and Wynyard Quarter. People go here a lot because it is quite convenient with there being hospitality so it's easy to go out for lunch for quick bite after doing some shopping. People also use lots of transport like ferries, trains, busses, lime scooters etc to get to these hospitality places or even to get to hotels or to people's jobs or even just to run errands. Auckland transport makes it super easy and affordable for people to get around Auckland.
- There are lots of shops down these streets and it makes the business for these companies to make profit especially when the streets get busy in the weekends.
- The data shows us that the mass of people who were Quay St agree that Quay St should not be pedestrian only and that could be for many different reasons. People may find it easier and more efficient for people to get through Wynyard Quarter while driving or it might be easier to park there for people working in the area or just having a quick lunch, shop or just a walk.
- In my opinion I think that Quay St should not be pedestrian only because I think that if Quay St was pedestrian only it could cause a lot of traffic in the area with that road being cut off and then would also make extra traffic for public transport like busses. Using the data from AT transport it shows around 20,000 people use busses so this could create a lot of disturbance for people who do use public transport and even the drivers of busses. In the data we have been giving it shows that this road is very slow and light already so there would be no need to get rid of the road. This is also a quick and easy street to pick up people from their ferries, trains, and busses where as if you couldn't drive through here it wouldn't be as efficient to pick people up. Making Quay St pedestrians only could also impact retail stores because there's a possibility less people would know that their stores were there if their main way of transport was a car and they couldn't drive down this road and see the shops.

Grade: Merit

For Merit, the student needs to interpret an environment using data.

This involves presenting processed data from primary and/or secondary sources. Findings about the environment (using the presented data) are then explained, and how data can strengthen and limit understanding of the environment.

Data about the waterfront environment has been processed into bar graphs, pie graphs, and maps. Some geographic conventions have been applied.

Using the presented data, findings about the waterfront environment are explained. For example, the map and pie graph show there is no industrial land use due to the economic reasons explained.

The student has also explained how the data can strengthen and limit understanding of the environment. For example, the explanation of how the Commercial Bay data could limit understanding, and how primary data can strengthen understanding.

For Excellence, a valid conclusion about the environment (using findings) should be drawn. The student should also discuss further how additional data could be used to improve understanding of the environment.

At 1171 words, this exemplar is at the upper end of the expected response length.

Land use survey and map

LAND USE SURVEY

The map on the following page is of the area you will be conducting your research. Complete the key below and map as instructed by your teacher.

LAND USE TYPE	KEY CODE/ COLOUR	WYNARD QUARTER	VIADUCT HARBOUR	COMMERCIAL BAY
INDUSTRIAL (warehouses / factories etc)	1 	≠	∅	∅
COMMERCIAL (office / business / banks etc)	2 	≠ ≡ 	≠	≠
RETAIL (cafes / shops / tourist facilities / restaurants etc)	3 	≠ ≡ ≡ ≡ ≡ ≡	≠ ≡ ≡	≠ ≡ ≡ ≡
RESIDENTIAL (apartments / houses etc)	4 		≠ ≡ ≡	∅
RECREATION (public space / play parks / sculptures / sitting areas etc)	5 	≠		
ACCOMMODATION (hotels, backpackers, motels)	6 			
CARPARK	7 	≠		
OTHER	8 		∅	(train station)

4

LAND USE MAP



5

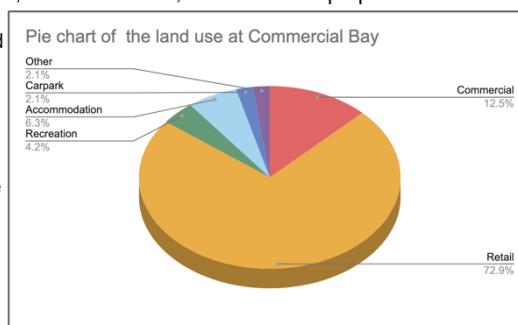
Findings

Land use at Commercial Bay

Commercial Bay is the one of the most visited areas in Auckland city as it has multiple features that have shaped what this area is used for. The data collected shows that 72.9% of the land around the Commercial Bay area is used for retail purposes. This is the majority of how the land is being used with most of these shops and restaurants

being inside of the Commercial Bay mall. This shows the pattern that most (72.9%) of the land is being used for retail purposes in comparison to only (27.1%) being used for other purposes such as commercial offices, accommodation, and recreation purposes.

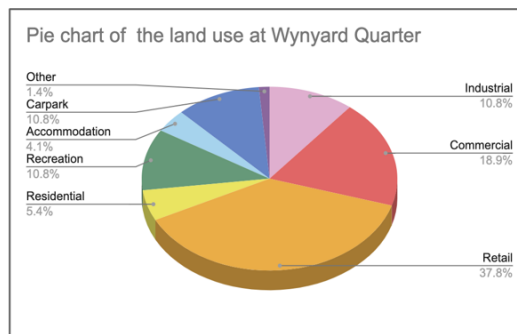
As shown on the graph there is no industrial uses or residential uses for land at Commercial Bay and very little, only 2.1% being used for car parks. This is because of the central location of the Commercial Bay precinct. The central location makes the land more desirable which therefore increases the price of the land. Many land uses such as industrial and residential cannot afford this land so they are driven to the cheaper areas of the city.



Land use at Wynyard Quarter

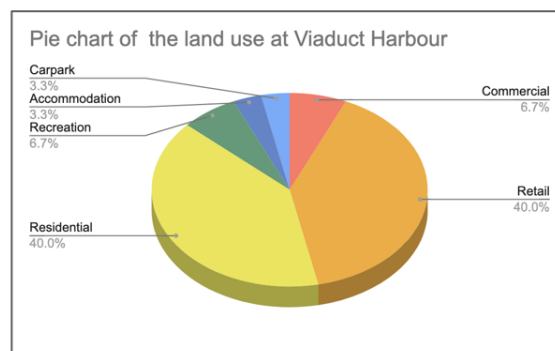
Land at Wynyard Quarter has the most diverse uses in comparison to Commercial Bay or the Viaduct Harbour. This is although it is still mostly used for retail purposes which are restaurants which is shown on the graph as Retail uses make up 37.8% of the land.

Wynyard Quarter was originally used as an area for ships to store supplies in the large silos that still remain around Wynyard Quarter but has since been transformed into a public space to host events such as the America's cup and the Rugby world cup. Land at Wynyard Quarter is more on the outskirts of the city, so it is more affordable. This allows there to be more variety in land uses such as Industrial areas and large recreational parks that are at Wynyard Quarter. This is shown in the data with there being 10.8% of the land being used for recreational uses such as parks and another 10.8% being used for industrial purposes.



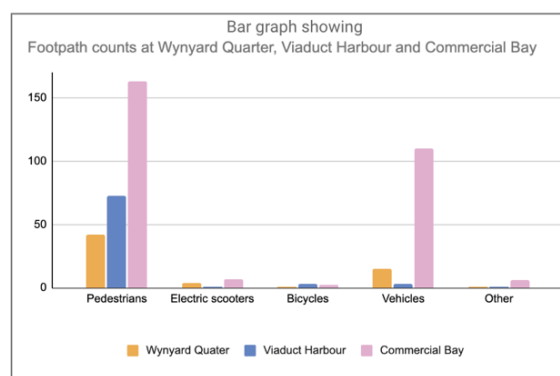
Land use at Viaduct Harbour

Viaduct Harbour has Retail and residential areas that each make up 40% of the land with the remaining 20% of the land being used for other purposes. The unique aspect of the marina being in the middle of the Viaduct Harbour makes this area nicer and more enticing of a place to live. Although Retail and Residential land uses make up 80% of the total land uses making them the two most popular land uses at this precinct, there are also some commercial offices and the public spaces that make up 6.7% of the land used. I think there are not many car parks with only making up 3.3% of the land in this area because the land is desirable to live in, so the land prices are too high for parking use.



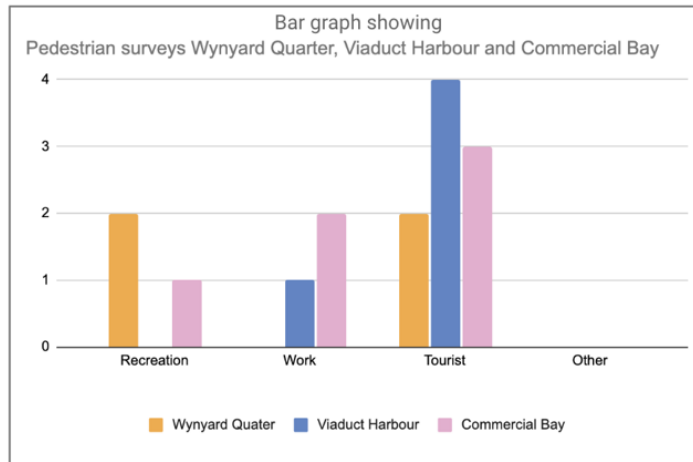
Footpath counts

This multi bar graph shows that the more central the area the more people it has travelling through it. This is why the amount of foot traffic and vehicles was significantly more at Commercial Bay than in comparison to Wynyard Quarter and Viaduct Harbour. For example, in Commercial Bay there were 90 more pedestrians than in viaduct and there were 121 more pedestrians in Commercial Bay than in Wynyard Quarter. Because most of the facilities in the city are within walking distance, in all three locations pedestrians were counted the most.



Pedestrian surveys

There are different reasons that people come into the city for whether it's for work, shopping or as a tourist exploring the city. The time that the responses were taken impacted the results, for example as on a Monday around midday, most of the people we asked were tourists. This is because most adults would be at work and children would be at school. At Commercial Bay there was the most variety of people with 40% being tourists, another 40% being for work reasons and 20% being for recreation purposes.



Evaluation

The collection of the data faced many limitations. A limitation that could have affected my understanding was that the group was not able to count the individual shops in the mall of Commercial Bay because of time restraints, however if Commercial Bay would have just been indicated as one cluster of Retail shops it would change the overall data, as having just one point on the graph would not show that the majority of the Commercial Bay precinct was Retail, as there would not be as many Retail data points on the graphs. This is why making an informed assumption was better,

although it is not truly accurate. So, this could have limited my understanding of Commercial Bay and the waterfront environment because the data was not accurate. Another limitation with the data which could have affected my understanding was that it didn't account for multilevel buildings that would have different uses on each floor such as Commercial Bay. The lower levels of Commercial Bay are used for Retail shops and Restaurants but higher up there are Commercial offices and a hotel is currently being built on top. As the land use map is only 2 dimensional it makes it difficult to account for these different uses which also makes the data less accurate and could have limited my understanding.

For the collection of the footpath path counts, the problem that was encountered was that they were only taken once in each location and at a random time in the day. This means that with a slight change of time or day of the week the results could have been completely different and limited my understanding. Such as if the data would have been collected early on the Monday morning there would have been many more people counted because of the work rush hour. Likewise, if the data would have been taken on the weekend there would be more people in each location for different reasons such as recreational shopping. So, more data from more times or days would strengthen my understanding of the waterfront because the little daily differences would not change the results of my overall understanding of the waterfront.

Although the data had many limitations, one of the consistent strengths is that the data is primary data. This guarantees that the collection of the data is consistent and fair throughout and could have strengthened my understanding of the waterfront environment. Another strength was that each footpath count was measured for the same amount of time.

To further improve the data, it could be compared to secondary data however it could be difficult to find data that is taken under the same conditions as the primary data.

Conclusion

In conclusion, the three precincts of Wynyard Quarter, Commercial Bay and the Viaduct Harbour along Auckland's waterfront have different land uses because of the different natural features that each area has to offer. In the three precincts Retail land uses make up most of the land, but in Wynyard Quarter Retail and Residential uses each make up 40%. This data comes to the conclusion that the more central the area the more densely used the land becomes.

Grade: Excellence

For Excellence, the student needs to analyse an environment using data.

This involves presenting processed data from primary and/or secondary sources. Findings about the environment using the presented data are then explained, and a valid conclusion drawn. The evidence should explain how data can strengthen and limit understanding of the environment, and also discuss how additional data could be used to improve understanding of the environment is discussed.

Data about the fluvial environment has been processed into bar graphs and a map. Most geographic conventions have been applied.

Findings about the fluvial environment using the presented data are explained, and a valid conclusion about the environment has been drawn using those findings. For example, variation in nitrates and e coli were due to the horticulture and agriculture in the area. The health of the river changes moving through the longitudinal river profile.

The student has explained how the data can strengthen and limit understanding of the environment. For example, more data could strengthen understanding through the identification of the source of pollutants, leading to a solution. The SHMAK kit could limit understanding if the data is incorrect.

How additional data could be used to improve understanding of the environment has also been discussed. For example, qualitative data could improve understanding of the environment though the understanding of cultural values.

At a word count of 1064, this exemplar is at the upper end of expected response length. The quantity of evidence initially presented exceeds the requirements of this standard, and therefore this student response has been reduced in volume to reflect an Excellence response within the expected length.

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.

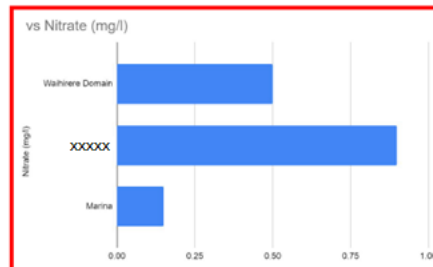
Location

- = 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

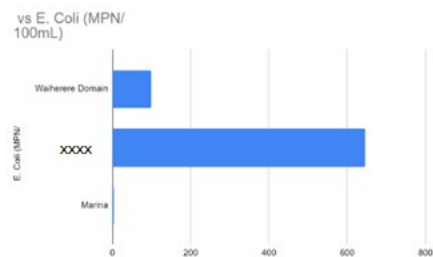


High nitrate levels can significantly affect on the quality of the water. Nitrate acts as a nutrient for aquatic plants and algae. When there is too much nitrate it can cause an eutrophication, which is a process that causes organisms to grow faster than usual. This excessive growth allows less oxygen 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.