



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

Exemplar for Internal Achievement Standard

Geography Level 3

This exemplar supports assessment against:

Achievement Standard 91431

Analyse aspects of a contemporary geographic issue

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 analyse aspects of a contemporary geographic issue.

This involves:

- explaining the nature of the contemporary geographic issue
- explaining how people's values and perceptions of the issue have led to their responses
- proposing a suitable course of action to address the issue and justifying the proposed solution.

The student has explained the nature of the geographic issue of bottom trawling in a New Zealand context.

The student identifies the values and perceptions of two groups, Greenpeace and the Sealord Fishing company. The values and perceptions of the issue are clearly linked to the different responses made. For example, the Greenpeace responses reflect the urgency and increasingly critical situation as they perceive bottom trawling as creating a critical stage in seabed damage and extinction of sea life. Whereas the Sealord responses balance economic and environmental perspectives to frame the issue as requiring a scientific and long-term response.

A suitable course of action is proposed and clearly explained. "*Managing fisheries to ensure sustainability*" is justified using the alternative course of action of "*banning bottom trawling*". The solution is justified through discussion of both the economic significance of fishing and strategies to protect the seabed. The justification clearly compares the economic impacts of both possible solutions, but also recognises that managing bottom trawling is needed.

To reach Merit, the student could include more specific detail in the explanation of the responses to the issue. Additionally, a detailed justification of the proposed solution ideally needs to consider more than one alternative solution.

Achieved

NZQA Intended for teacher use only

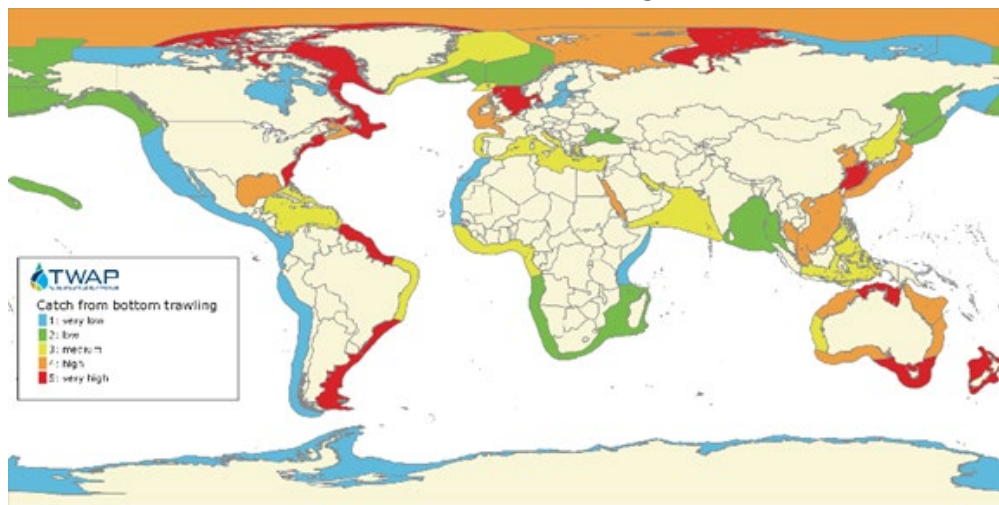
Bottom Trawling

Figure 1: bottom trawling around the world

Task 1

Bottom trawling is a NZ geographic issue because it is a major form of commercial fishing over a large part of the ocean and New Zealand's exclusive economic zone (EEZ) shown in the map above, with natural and cultural impacts.

What and where is bottom trawling

Bottom trawling is the process of trawling along the seafloor. This process is done by boats dragging large, weighted nets along the seabed, which allows the net to catch copious amounts of fish while ripping up the seabed. Bottom trawling is a common issue with different laws all around the world. In most countries it is illegal but in 7 countries, including New Zealand, Cook Islands, Faroe Islands, South Korea, and Spain, still allow for bottom trawling. This method tends to be liked by commercial companies as it can be used to catch copious quantities of fish. Fishermen tend to target popular species such as Orange Roughy, Hoki, and Schnapper, but since bottom trawling is done with a net, other fish can be caught as well. The trawling footprint for NZ has fallen about a third since 2007-8 from an estimated 92,000 km² to 68,000 km² but it is still affecting large areas of seabed and sea life.

Natural and cultural components

Natural: Bottom trawling is a large issue along the coastlines of many countries including New Zealand. Bottom trawling is a major natural issue as the weighted nets can drag along the seabed destroying coral, sea life and fish's natural habitat. In New Zealand, over 200 tonnes of coral were destroyed in a 13-year period. This process is also very destructive as it is unselective of what it captures. This can cause non targeted species to be caught, and the risk of too many targeted species caught. For example, bottom trawling has had a large effect on the decline of the Orange Roughy population. There are some bottom trawling techniques which can cause less environmental damage and sandy seabeds are less impacted. Many commercial fishing companies that continue to bottom trawl believe that they are not at fault of the damage as they were trained about different techniques and believe

they are not causing damage to the seabed's as they are bottom trawling safely without endangering the environments.

Cultural:

Figure 2: before and after images of sea floor due to bottom trawling.



Bottom trawling can have an incredibly positive cultural effect as it brings in over 25% of all caught fish throughout the world and about 69% of New Zealand's commercial catch. This means it provides fish for many countries and provides jobs for hundreds of thousands of people all around the world. Fishers can catch enough fish by bottom trawling less than five per cent of our oceans each year. Fishing grounds are comparable to a farmer's fields – they are used specifically for food production and limit the

effects of this production to a particular area. Bottom trawling can also have a large effect on the local communities by reducing the fish available for local fishermen and reducing total fish populations when the seabed environment is damaged.

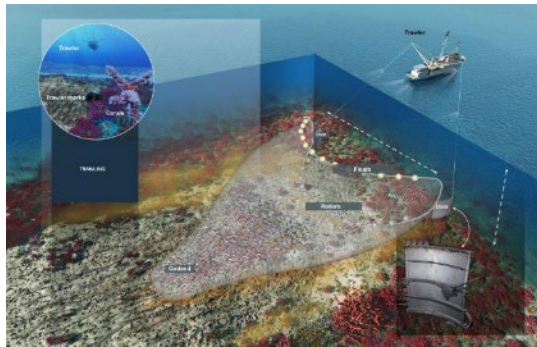


Figure 3: effects of bottom trawling

Task 2

Group 1- Greenpeace

“Bottom trawling is destructive fishing method that indiscriminately destroys marine life and precious ecosystems.” Greenpeace is a large, independent, global environmental organization. Their values focus on protecting the environment, which means they have a negative view of bottom trawling.

Greenpeace promotes 4 core values, personal responsibility and nonviolence, independence, promoting solutions, and no permanent friends or foes. Personal responsibility and nonviolence are about acting based on conscience, this means we take responsibility for our actions. They are committed to peacefulness, and everyone on a Greenpeace action is trained in nonviolence. Greenpeace is an independent operation which does not accept money from the government, corporations, or political parties, and only sources money from independent funding from donations etc (independence). Greenpeace believes that they must put their money where their mouth is, so they are developing and promoting concrete solutions towards a green and peaceful future (promoting solutions).

Greenpeace holds a staunch and unwavering stance against bottom trawling, categorizing it as an “ecologically detrimental fishing technique”. The organization is deeply concerned about the widespread consequences of this method, emphasizing its role in causing severe habitat destruction

and contributing to the overexploitation of vital fish populations. Greenpeace says that the indiscriminate dragging of heavy gear across the seafloor results in the disruption of delicate ecosystems, impacting not only targeted species but also non-targeted marine life. They highlight the urgency of adopting sustainable and responsible fishing practices to preserve the delicate balance of oceanic biodiversity. The urgency shown in their responses, such as demanding immediate and strict regulations on bottom trawling and campaigns to extend the areas of marine reserves, indicates the seriousness with which they perceive this issue. They realise that if action is too slow, the environmental impact will be irreversible. Their overall environmental goal is to safeguard marine ecosystems and promote the long-term health of our oceans.

Their values and perceptions of this issue have led Greenpeace to oppose bottom trawling. They have collaborated with other environmentalist groups such as the Deep Sea Conservation Coalition (DSCC), and Forest and Bird, to place a ban on bottom trawling on seamounts. The campaign includes a series of murals titled “Defend the Deep” displayed in public spaces, petitioning government departments, speaking at public forums etc. They are strong believers that bottom trawling on the seabed must be banned. If it is allowed, there will be people or companies that do it with no concern for the environment.

Group 2: Sealord

Sealord is a large company which supplies the largest number of frozen fish and seafood for New Zealand and Australia. While 50% of Sealord’s harvest comes from bottom trawling, they believe it can be a sustainable source of fish as it only occurs on less than 3% of our seabed. When compared to other food producers, they believe their footprint to be significantly smaller.

Sealord fishing company is 50% iwi owed. With the Māori fisheries treaty settlement, protection of the environment, and sustainable fishing, these values sit with the economic perspective which values profit.

Sealord has made an agreement with the iwi to provide growth and value for the business and its shareholders. This is the focus of the Māori fisheries treaty settlement. Sealord believes that the values of the Māori fisheries treaty settlement and iwi values of kaitiakitanga will help them encourage the use of safer modern fishing technology and reduce the impact from bottom trawling. Their values are simple; they wish to provide food for their customers and keep it sustainable. Sealord believes that bottom trawling can be done sustainably as long as regulations are followed and fishing technology continues to be developed. A major worldwide study calculated the effects of bottom trawling on the health of the seabed which shows New Zealand was in the top third of zones least affected by bottom trawling with 90% of the areas bottom trawled being unaffected compared to un-trawled areas. These statistics show that 10% of the area will be affected but this is a small cost. Fishing will always have some effect on the environment but with Sealord’s bottom trawling methods they maintain an efficient industry which would be very hard without bottom trawling. “Sealord is totally committed to a balance that errs on the side of marine life” which clearly shows that they value sustainability which is achieved by protecting the marine environment.

Sealord understands the risk of bottom trawling but perceive this issue as one that can be managed. They strongly believe there has been a large amount of misinformation spread over bottom trawling.

With the protests about banning bottom trawling, Sealord has had to fight to prove it is not as destructive as many people believe. In a submission from the industry group, which represents New Zealand's deepwater fishers, it says it strongly disagrees with the recommendation of a bottom trawling ban. "Not only because of a low risk to corals and seabed habitats as a result of careful and balanced management but doing so would be disproportional to the balance that is both intended and required by the Fisheries Act 1996". It is stated that seafood production is a large part of New Zealand's social and economic wellbeing and a balance between retaining natural ecosystems and designating areas for food production is essential. The companies GCE has repeatedly told the committee that the public must have the correct scientific information before any ban is made. Sealord's response to the request for a ban was to use scientific evidence to prove the ban is not necessary.

Task 3

There are several courses of action, some fully support total environmental protection, others protect commercial fishing companies. Based on the evidence below I think managing the fisheries to ensure sustainability is the best solution to the bottom trawling issue. This would mean the companies could still make money, but the environment would be increasingly protected. This is better than banning bottom trawling which some people argue is manageable and sustainable.

The chosen solution would be to continue to manage bottom trawling, which could mean temporary bans in some areas if needed, but it still maintains a fishing industry. Bottom trawling has been shown to prove that the risks are much lower than the reward which comes with it. If bottom trawling is managed better, it will allow for the fisheries to continue providing seafood for New Zealand, without the environmental damage. This solution may not make everyone happy, but due to the talks about it becoming banned many companies will make sure that bottom trawling is done safely to protect as much of the environment as possible. As bottom trawling techniques continue to be developed, it will reduce the impact on the environment while also allowing these companies to continue bringing in seafood. Managing bottom trawling better will benefit our society and our economy. Bottom trawling is an especially important part of New Zealand's economy. Seafood brings in over 1.5 billion dollars in exports and provides over 16000 people with employment. Removing this large amount of profit from our economy could be devastating and may cause a much larger problem in our society.

To place a ban on bottom trawling would mean all bottom trawling in New Zealand be halted or limited in area to allow for the environment to heal. This would be without the risk of being destroyed or fish to be unnecessarily killed or injured. Greenpeace, like many environmental groups, supports a total ban, but the economic impact of this decision needs to be measured. I think a total ban is an extreme action when closer monitoring of seabed environments and continued development of fishing technology would result in a better solution. Many countries around the world have banned bottom trawling completely e.g., Palau. Palau suffered from a large decrease in fish population which they believed was to do with bottom trawling, but this outcome can be avoided with regulation and development. While I support environmental views, I think it is possible to create a sustainable fishing environment with regulations which could involve occasionally banning bottom trawling in some places. This is why I believe placing bans on bottom trawling to some extent could be considered as part of the overall solution.

Grade: Merit

For Merit, the student needs to analyse, in depth, aspects of a contemporary geographic issue.

In addition to the Achieved criteria, this involves:

- explaining in detail how people's values and perceptions of the issue have led to their responses
- proposing a suitable course of action to address the issue and providing a detailed justification of the proposed solution. The justification demonstrates why the chosen course of action is better than alternatives.

The nature of the issue (Japan's declining population) is clearly explained, demonstrating understanding of the issue in a depth needed to support analysis.

Responses from both the Japanese Government and a sociologist are examined. Explicit linking to show how the values and perceptions of the issue influence the different responses supports depth of explanation. While both responses consider economic and social courses of action, the government responses reflect their perception that economic stability is the most critical, whereas the sociologist favours a more integrated approach with social, cultural and economic actions.

A suitable course of action is proposed and alternatives used to justify its selection. Understanding of the complexity of the issue and use of evidence regarding different responses demonstrates in depth analysis. Connection and relationships are identified and used to strengthen the explanation. For example, the relationship between declining birthrates and ageing population, leading to the need for labour and economic stability. Understanding and depth of analysis is continued through consideration of the implications of the immigration solution from a cultural and social perspective.

For Excellence, the student could further develop the evidence in their response. For example, including further explanation and supporting evidence for the traditional social values and the strain on health and welfare systems. Use of more additional statistical information or further detail regarding political actions would reflect a comprehensive analysis.

An Excellence response would include a full justification of the solution showing insight and using clarity of argument. The structure of the argument would effectively integrate the alternative courses of action to support the proposal. Solutions to this issue need both immediate actions and a long-term approach, which would be expected as a proposed solution in a comprehensive analysis.

Japan's Declining Population

Task 1

The rapid decline of Japan's population since the second baby boom in the 1970's is now a major social and cultural concern of the country, as it has severe economic and social repercussions. While Japan's population fluctuated in the middle of last century, it now displays a temporal pattern in which the population decreases at a rapid rate. With the demographic being a rapidly ageing society, and a decrease of the birth rate, Japan risks losing their global economic standing, as soon they will be unable to cope with the demand of their workforce due to lack of people. Consequently, Japanese society risks permanent recession with a decline in basic services, infrastructure, employment, decrease of population, and gross domestic product (GDP). Economic growth would be affected. In 2020, the International Monetary Fund predicted that 'the ageing and shrinking population will strain Japan's public finances, as age-related spending, such as on healthcare and pensions, rises while the tax base shrinks'. The aging population of Japan means that, along with fewer workers paying taxes, the costs of a retired population are becoming increasingly more difficult to meet. A study conducted in 2020 found that by 2040, Japan could be short of 11 million workers, a result of the ageing population and low birth rate. Already Japan's workforce relies on its older workers rather than younger people. These problems result from falling fertility rates. In the 1950's Japan's fertility rate was about 3.34 which had fallen to record lows of 1.15 to 1.2 in 2024. The significance of this is obvious when a fertility rate of 2.07 is needed to maintain a stable population. In comparison to the world's fertility rates, Japan is the 16th lowest.

As well as the declining population, more than 1 in 10 people in Japan are aged 80 or over. This is because of Japan's cultural environment. Traditional gender roles result in women being expected to assume primary responsibility for childcare, even if they work full time. The issues surrounding Japanese childcare include availability, affordability, and quality, which means that women who wish to not sacrifice their career for a family choose simply not to have children, contributing to the lowering birth rate. Women still face discrimination in the workforce, their participation in the Japanese labour industry has risen more than 10% from 2012 to 2022, as reported by the International Monetary Fund. This is a significant temporal change in Japan's culture. The decline in marriage rates throughout Japan have resulted in a lower birth rate. Economic pressures have contributed to financial instability, making people less likely to marry and begin a family they cannot support. Additionally, societal norms such as work culture, where jobs are prioritized over personal life, and the traditional expectation of marriage, have also led to lack of marriage due to people's changing social perspectives.

Japan's restrictive immigration policies are a further factor contributing to the issues their declining population could have on their economy. The number of foreigners in the total population in Japan is only around 3%, one of the lowest among the Organisation for Economic Cooperation and Development (OECD) countries.

Japan's rapidly declining population is occurring throughout the entirety of Japan. However, the issue is much more noticeable in rural areas as opposed to urban areas. An estimated 9 million homes are abandoned in rural areas, and some countryside towns face extinction. According to the World Bank, 92% of people live in urban areas in Japan. Farming and agriculture, which occur mainly in these rural areas, are now at risk due to a lack of people in these areas to work.

Task 2

Values and Perceptions leading to response

Group 1: The Japanese Government

The Japanese government's response to the declining population is strongly influenced by its perception of the threat this causes to the nation's economic stability. Economically, Japan is the fourth largest country in the world, in terms of nominal GDP. This is a success achieved by growth in industrial manufacturing and export sectors following the economic collapse from World War Two. However, Japan's economy relies heavily on their industrial sector, which in turn is dependent on its workers. Already the majority of Japan's workforce is between the ages of 45 and 54, and statistics note a 20% reduction in the workforce population. The Japanese government believes the issue of declining birthrate and Japan's rapidly aging population will drastically alter their economic development. This perception of economic risk led them to make policies that lower the costs of child-rearing and support family formation.

Traditional social values also shape the government's perception of the issue. Japanese leaders believe that a declining birthrate will put strain on health and welfare systems and weaken the community if there are too few young people to support an aging society. Because they value the stability of their society, they believe that as the government they must intervene with policies to address the issue.

The concerns of economic stability and their traditional values have led to the Japanese government to take an active response to the issue. The government has begun to make policies assisting childcare and encouraging their citizens to produce children. Prime Minister Fumio Kishida stated in January of 2023 that his government would spend approximately \$20 trillion yen, on measures to support young couples wishing to have more children. This includes paid parental leave, childcare subsidies, and an increase in child allowances. Also, as a response to the issue, cabinet minister Masanobu Ogura was appointed the Minister of State for Measures for Declining Birthrate in 2022. He submitted a proposal which focused on increasing financial assistance through more government subsidies for child rearing, greater access to childcare services, and increased student loans for higher education.

Group 2: Chisato Kitanaka

Chisato Kitanaka is a sociology professor at Hiroshima University who specialises in gender studies. She argues that Japan's declining birth rate is due to long established social attitudes. She observes that parenthood is socially tied to marriage in Japan, which stigmatizes single mothers and makes it hard for them to both earn an income and raise children. Because she perceives these attitudes as barriers, she concludes that the policies by the Japanese government will not resolve the issue of a declining population.

Kitanaka's commitment to gender equality has directly influenced her ideas on policies to resolve the issue. She views the slow progress on gender equality, including the unequal burden of care and limited support for working mothers, as a structural failure in society which has contributed to low fertility. Because of this, she advocates for an increase in welfare payments for families and reducing education costs. She argues that lowering the financial and caregiving pressures on women would make bringing up children more realistic and attractive. Her belief that systemic change is necessary explains why she publicly critiques the current government policies and speaks in interviews about building a more equal society to resolve the population decline.

Kitanaka also recognises that many Japanese people are reluctant to accept foreigners, which limits the role immigration can play in resolving the declining population. Consistent with her values of inclusion and equality, she supports expanding immigration and lowering education costs as solutions that could work together, aimed both at offsetting the population decline and

easing the financial burdens that prevent families from having children.

Overall, Kitanaka's values (equality, inclusion, structural fairness) and perceptions (restrictive social norms, stigma toward single mothers, resistance to immigration) clearly shape her response. She calls for deep social change, stronger family support, more affordable education, and a greater openness to immigration. Her media statements, including those made to Deutsche Welle (DW), reflect these beliefs and aim to shift the discussion toward issues of social structure and equity rather than straight economics.

Task 3

The recommended course of action to address Japan's declining population is to increase immigration, as this option directly raises population numbers while also resolving the country's critical labour shortage. I recommend this solution because it is the best way to solve the workforce problem and maintain economic growth.

Increasing immigration provides an immediate and measurable demographic impact. It increases the number of people living and working in Japan. Through targeted immigration policies, Japan could attract young, skilled, working-aged individuals who would contribute to both society and the economy. This solution is effective because Japan's economic challenges are closely tied to its shrinking workforce. With more than 9.1 million workers aged 65 or older making up a growing share of the labour force, and very few young people entering due to low fertility rates, Japan faces risks to its productivity and economic stability. A strength of this issue is that targeted immigration can provide an immediate solution to workforce issues, but alternatives like policies relating to childcare and financial support for parents etc would provide a long term solution.

Another reason why immigration is the better solution is because it brings more diversity, which has been shown to benefit countries both economically and socially. Research by Hong and Page found that groups with people from different backgrounds solve difficult problems better than groups where everyone is the same. This means that if Japan increases immigration, it wouldn't just help boost the population, it will also support innovation and improve productivity over time. These advantages show why immigration helps Japan build a more flexible and adaptable workforce, which is especially important as the population gets older.

There are some social challenges that come with increasing immigration to Japan. Japan has always valued having a very culturally similar population, which comes from its long history of isolation, such as the *sakoku* (closed country) policy. Even today, many people still hold onto these traditional beliefs, and Japan's strict rules make it hard for foreigners to settle there. Language can be a big barrier. A 2021 survey showed that 75% of Japanese companies require non-Japanese applicants to pass the highest level of the national language test, which makes finding work extremely difficult for immigrants. On top of this, many Japanese citizens worry that immigration could change or weaken Japanese culture.

Even though these issues make immigration more complicated, they don't mean it's not a good solution. Instead, they show why strong government action is needed. Changing immigration laws only requires political decision-making, whereas changing deep cultural beliefs would take much longer.

Other possible solutions include giving more funding to childcare facilities and increasing maternity and paternity leave, have already been introduced, and are expected to increase the birth rate. However, these are much weaker options because they won't solve the current economic issues related to workforce but with immigration they will rely on major changes in social attitudes. More childcare funding would cost the government a lot of money but doesn't guarantee that people will actually choose to have more children. It might also lead to higher taxes, which could cause frustration among people living in Japan. Increasing leave is even

harder because of Japan's strong gender expectations. Many women don't want to take long periods of leave because it could damage their careers, and men often face stigma in the workplace if they take paternity leave. These deep cultural beliefs make these solutions difficult to work, and they don't directly address the biggest cause of the population decline. However, they are needed to reduce population decline and social stability. Chisato Kitanaka suggests a wider approach as discussed in section two. This focuses on deep social change, stronger family support, more affordable education, and a greater openness to immigration, and her suggestions provide a range of alternative courses of action. However, when the course of action requires money, the economy needs to be growing.

Increasing immigration directly resolves Japan's workforce issues resulting from declining population. It boosts the population, fills gaps in the workforce, and helps support long-term economic growth. It is also easier to implement and more practical because it depends on government policy changes rather than convincing an entire society to shift its cultural views. While immigration still needs to be managed carefully, its effectiveness, affordability, and ability to meet Japan's immediate needs make it the best immediate solution.

Grade: Excellence

For Excellence, the student needs to analyse, comprehensively, aspects of a contemporary geographic issue.

In addition to the Merit criteria, this involves:

- fully explaining how people's values and perceptions of the issue have led to their responses
- proposing a suitable course of action to address the issue and providing a full justification of the solution, showing insight. The full justification is an in-depth response that uses clarity of argument and holistic understanding to demonstrate why one course of action is better than the alternatives.

The nature of the issue (South Dunedin flooding) is clearly explained, demonstrating understanding of the issue in a depth needed to support comprehensive analysis.

The student has fully explained how the values and perceptions held by Dave Cull and Eleanor Doig led to their responses. The selection has deepened the analysis by providing varied responses which demonstrate understanding of the nature of the issue, and its causes and impacts. This evidence has also strengthened the analysis, as it has clearly informed the student's decision making.

A suitable course of action is proposed by the student, through clearly arguing the need for a planned and voluntary managed retreat combined with long term flood mitigation development. The decision has been informed by the needs of both the council and the community, and clearly reflects understanding of the geography involved and how it will determine the final outcome for the flood risk areas of South Dunedin.

Contemporary Geographic Issue: South Dunedin Flooding**An explanation of the nature of the issue**

The issue I am investigating is the growing risk of flooding in South Dunedin, which is being intensified by climate change. Climate change is already causing Dunedin to experience more frequent and heavier rainfall events, and yearly rainfall is projected to increase by up to 6% by the end of the century. These more intense downpours have repeatedly overwhelmed South Dunedin's drainage system, a problem expected to worsen as such rainfall events become more common.

At the same time, sea-level rise around New Zealand is accelerating, and in Dunedin this rise is directly linked to rising groundwater levels beneath the city. As sea levels increase, the groundwater table is pushed upward, leaving the soil with far less capacity to absorb rain. This not only increases surface flooding but also creates the risk of flooding from below, where groundwater emerges at the surface or infiltrates buildings and infrastructure.

These climate driven pressures, heavier rainfall and rising seas, are amplified by South Dunedin's physical geography. The suburb sits in a large, flat coastal basin at the bottom of an urban catchment with no natural drainage to the ocean. Water from surrounding hills flows downward into the area, and because the groundwater table is already extremely shallow, even moderate rainfall or storm surges can rapidly lead to flooding.

Much of South Dunedin lies only about 50 cm above the high-tide mark, making it one of the lowest-lying urban areas in New Zealand. The area was originally a swamp known as "the flat", and when it was developed in the late 1800s, the land was filled with sand and other materials to support housing. At the time, the long-term impacts of climate driven rainfall changes and rising oceans were not understood, so many homes were built close to the water table and with limited engineering protection. This early land development, combined with coastal proximity, has left the suburb extremely vulnerable to modern climate pressures.

The severity of the problem was demonstrated on 3 June 2015, when South Dunedin received 142 mm of rain in 24 hours, roughly three months' worth of rainfall. Floodwaters reached about 50 cm deep in some areas, damaging around 1,200 homes and businesses and causing an estimated \$138 million in overall losses. This event exposed how unprepared the suburb is for the more extreme rainfall events that climate change is expected to bring.

Since then, concerns have grown as climate change continues to drive extreme weather events, like those seen during Cyclone Gabrielle in the North Island, and as sea levels continue to rise. The combination of more intense storms and higher groundwater levels greatly increases the probability of another severe flooding event. Without significant adaptation efforts, a major storm could cause damage equal to or worse than what occurred in 2015.

The map of the area below shows that large sections of South Dunedin, including St Kilda, Tainui, Musselburgh, and parts of St Clair, sit less than one metre above sea level, making thousands of residents vulnerable to both sudden flooding and long term sea level rise. These suburbs contain some of Dunedin's highest-density housing, meaning the social and economic impacts of future flooding could be widespread.



Areas of South Dunedin will be flooded, as seen in blue, in a sea-level rise scenario. Photo: Stuff

This issue has major impacts on both the environment and the people who live in South Dunedin. The area is home to more than 10,000 residents and contains billions of dollars worth of essential infrastructure. Local anxiety about flooding is widespread. Resident Eleanor Doig from low-lying Musselburgh explained that “you say the word ‘water’ around here and everyone gets anxious,” highlighting how deeply this issue affects daily life.

South Dunedin’s social and economic vulnerability makes the situation even more serious. Parts of the suburb rank within the bottom 10% nationally for socioeconomic wellbeing, and average personal income is already low, around \$20,100 in 2019, with some parts averaging below \$14,000. Much of the housing consists of rentals and council flats, meaning many residents do not own their homes, have limited financial stability, and may be unable to relocate easily. Lower income households are also less likely to have adequate insurance, increasing the long-term consequences of flood damage.

Social deprivation data of the area shows that much of South Dunedin is ranked highly for deprivation. Social deprivation refers to people being disconnected from society due to factors such as low income, disability, poor health, or limited access to resources. The suburb’s flat terrain, high proportion of rental housing, and accessibility make it a common home for people with disabilities or mobility needs. These conditions contribute to the high deprivation levels across the community.

While the flooding issue is concentrated locally, mainly affecting South Dunedin and neighbouring suburbs, the impacts can extend across the whole city. South Dunedin contains several major supermarkets, businesses, and services that the wider Dunedin population relies on. Additionally, any large-scale damage would require significant funding from the Dunedin City Council, potentially diverting resources away from other suburbs and projects.

Flooding also brings substantial environmental consequences. It can damage local ecosystems, contaminate water supplies, and accelerate erosion. Floodwaters often carry debris and pollutants into rivers, lakes, and the ocean, harming aquatic life and reducing water quality. Repeated flooding can strip soil, kill vegetation, and reshape

the landscape, reducing the area's natural resilience to future storms

A full explanation that details how a range of people's values and perceptions of the issue have led to their responses

Plan:

Person	Perception and values	Response
Eleanor Doig	= serious social and economic issue for the community. Values - resilience, creativity, and long-term community wellbeing	Community facilitator Hui organiser
Dave Cull	= an economic risk for council as the cost of flood management will be on going – can't afford. Values – honesty, openness and accountability	Proposed 'Managed retreat' but also encouraged discussion of other solutions. Created a public platform 'South Dunedin future'

After further research, I have found two people who have responded to this issue. One being Eleanor Doig who is trying hard to come up with a solution to the issue that isn't retreating as well as making sure the community gets to contribute their ideas to the big conversations about the issue. The other person is Dave Cull who was Dunedin's mayor from 2010 - 2019, who thinks that there may not be a good solution and proposed the idea that a managed retreat somewhere in the future may be the best option.

The Dunedin City Council (DCC) has played a major role in shaping the conversation around how South Dunedin should respond to the issue of an increasing flood risk. Former mayor Dave Cull, who served from 2010 to 2019, strongly supported the idea of managed retreat. His response was influenced by his responsibility to protect the long-term financial stability of the city. From an economic perspective, he believed it would be irresponsible to continue spending large amounts of money defending land which he perceives as being extremely vulnerable to climate change driven flooding, especially when those efforts might fail or require ongoing, expensive maintenance. Dave Cull perceives the cost of ongoing maintenance and flood protection schemes to be seriously beyond the ability of the City Council and an unnecessary burden on ratepayers.

Cull's values centred on ensuring that council spending benefited Dunedin as a whole. From this viewpoint, encouraging retreat and allowing low lying land to return to natural use could free up millions of dollars that might otherwise be used on temporary solutions. Those savings, in his view, could be better invested in infrastructure and services in areas that are not at such high risk.

Community tensions rose after the 2015 flood, when South Dunedin residents questioned whether the disaster was caused solely by extreme rainfall or whether it had been made worse by ageing infrastructure and poor maintenance. The council defended itself by arguing that the rainfall event, three months worth of rain in 24 hours, was the main cause. The day after the flood, Cull publicly stated that climate change was a key driver of the event and introduced managed retreat as a possible long-term solution. His response shows how his environmental awareness and

acceptance of climate science shaped his willingness to discuss retreat earlier than others.

To address community concerns, the DCC created South Dunedin Future, a platform designed to provide accessible information, explain the science, and keep the community updated. This action reflected Cull's belief in transparency and his value of keeping residents informed, especially when decisions could affect their homes and livelihoods.

Cull also spoke openly to the media about managed retreat, despite being told not to use the term. His statement "I didn't take any notice" shows that he valued honest public discussion over political caution. He believed that facing the reality of climate risk was more important than avoiding public backlash.

Although the DCC's stance has evolved, managed retreat remains one of the main long-term strategies being considered. The council has pushed for government funding to begin purchasing at risk properties, but these requests have so far been declined. In response to the complex nature of the issue, the DCC has developed 16 possible solutions, which were shared with the public to ensure community participation in the decision-making process. This reflects the council's values of democratic engagement and transparency.

Eleanor Doig strongly opposes the idea of a managed retreat from South Dunedin, and her response to the flooding issue is shaped by her deep social connection to the community. She approaches the issue from a social and community centred perspective, valuing stability, belonging, and the ability for residents to remain in the place many have lived for decades. As a long-time resident of low-lying Musselburgh, a suburb at risk, she personally understands the emotional, cultural, and practical challenges that relocating would create for local people. Because she shares the same risks and experiences as her neighbours, she feels closely aligned with their values of community cohesion and protection of place.

Her strong belief that the community should not be forced out of their homes has guided her actions. In response to the threat of retreat, Eleanor became a community facilitator, a role focused on empowering residents, improving engagement, and helping ensure that decisions about South Dunedin's future are not made without local input. She has organised multiple community hui to discuss sea level rise and future planning, including one meeting that attracted more than 130 attendees. These gatherings reflect her value of collective decision making and her determination to give residents a meaningful voice. As she stated, "What we're trying to do in these hui is say we are determined that no one sitting in Wellington, or at the city council, will make decisions without us being a part of that." This shows her commitment to community autonomy and her strong belief that solutions should be shaped with, not for, the people who live there.

Eleanor's perspective also influences the type of solutions she supports. Rather than relocating residents, she believes South Dunedin should be protected and improved through upgraded infrastructure and innovative urban design. Her statement, "We've got the opportunity to do some creative, innovative urban design," demonstrates her optimism that the suburb can be adapted to withstand climate change. This reflects her values of resilience, creativity, and long-term community wellbeing.

Ultimately, Eleanor Doig's response is rooted in her identity as a resident, her commitment to community empowerment, and her belief that South Dunedin should be strengthened rather than abandoned. Her actions, facilitating discussions, organising

community meetings, giving residents a platform, and advocating for upgraded infrastructure, are all direct expressions of these values and her determination to protect the place she and many others call home.

Solution

The most suitable course of action for South Dunedin is a planned and voluntary managed retreat combined with long term flood mitigation development. This approach allows the city to gradually reduce risk while avoiding sudden disruption to residents.

In 2023, the Dunedin City Council proposed a voluntary property-acquisition programme costing up to \$132 million over the first five years, based on buying around 65 houses per year. These homes could be rented out in the short term to maintain housing supply until the land is needed for adaptation projects. By purchasing land slowly over several decades, the council can create enough space for major flood-management infrastructure such as upgraded stormwater pipes, pumping stations, expanded parks, and new wetlands.

This option is far more cost-effective than waiting for disaster. The 2015 flood caused an estimated \$138 million in combined insurance, social, and economic losses, affecting around 1,200 homes and businesses. Choosing proactive retreat now prevents repeated cycles of damage and repair, which would ultimately cost more than a planned adaptation strategy. As current mayor Jules Radich explains, buying land early “gives us more options tomorrow,” because it makes space for whatever protective structures the area will eventually need.

Another advantage of managed retreat is that it aligns with scientific research on South Dunedin’s future. Studies show that as sea-level rise continues, the groundwater table will rise as well, reducing the soil’s ability to absorb rainfall and increasing the likelihood of both surface flooding and flooding from below. These groundwater related issues are predicted to become the dominant challenge over the next few decades. Creating new wetlands, open spaces, and engineered flood storage areas is one of the few ways to reduce this risk. This requires land, which the acquisition programme can provide gradually over time.

Alongside managed retreat, the councils have published a list of 16 possible adaptation approaches, ranging from drainage upgrades to ground strengthening and floodable parks. A final combined strategy is expected to be shaped with community input by 2026. One useful short-term option is to lower sports fields or playgrounds to act as temporary water storage basins during heavy rain. This reduces pressure on homes and businesses and is relatively inexpensive. However, this solution alone is limited by the small amount of recreational land available and cannot provide long-term protection as groundwater continues to rise.

Another alternative is reactive relocation, where people move only after a major disaster. While this protects residents during emergencies, it is highly disruptive and does not prevent repeated flooding. The 2015 event showed how stressful and damaging this can be. Relying on a response-only system would leave residents vulnerable whenever extreme rainfall occurs.

When comparing all options, planned managed retreat is the only approach that addresses long term risk, economic sustainability, and community wellbeing at the same time. It allows the council to gradually reshape the landscape for climate resilience, provides certainty to homeowners over decades rather than months, and

ensures that protective infrastructure can be built before severe flooding becomes unmanageable. Lowering parks or upgrading drains may help in the short term, and reactive relocation can save lives after a disaster, but neither creates the long-term resilience that South Dunedin needs. Managed retreat, combined with continued investment in stormwater improvements (such as the \$29 million drainage upgrades already planned), offers a balanced, future-proof path for the suburb.