A scenic view of a rocky coastline. The foreground is filled with large, dark, jagged rocks. The middle ground shows a calm blue sea meeting a clear blue sky with scattered white clouds. The horizon is visible in the distance.

Unifying Climate Actions in the Wellington Region

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Abstract

In order to promote effective collaboration on climate actions and foster community engagement, Greater Wellington Region Council has decided to implement a unified climate action resource. We collaborated with GWRC to produce a streamlined resource prototype that compiles and highlights area climate change actions and meets additional needs and preferences from agencies and organizations in the Wellington Region. Using a baseline assessment, interviews, a survey, and feedback groups, we collected information that informed the design of a resource prototype.

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Executive Summary

Introduction & Context for Climate Communication

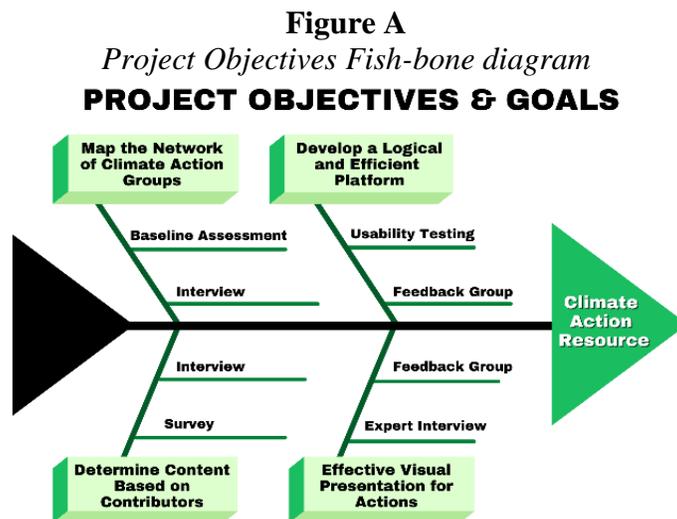
Action on climate change is a priority in New Zealand, and the capital city of Wellington serves as the center for governmental and agency coordination on climate action. Greater Wellington Regional Council ([GWRC](#)) is the main governing body for the Wellington region. Predictions are clear that the region will experience consequential effects of climate change, and that action is needed. Actions and initiatives are underway across the region among multiple organizations such as mana whenua, territorial authorities, and non-government organizations. A single updated resource on current climate actions would be useful in building regional coordination and communication.

Approach to Researching the Problem

The goal of this project was to collaborate with GWRC to produce a streamlined resource that compiles and highlights climate change actions from agencies and organizations in the Wellington Region. We established four objectives to facilitate this goal.

1. **Network:** Identify and map the network of climate action groups and agencies in the Wellington region.
2. **Content:** Determine what content the platform should communicate based on the missions of the contributors and the expected users.
3. **User Experience:** Research and develop a logical platform that officials, the public, and contributing agencies can easily and efficiently use.
4. **User Interface:** Identify how to visually present climate change mitigation and adaptation actions effectively.

Figure A represents our objectives, data collection methods, and end goal.



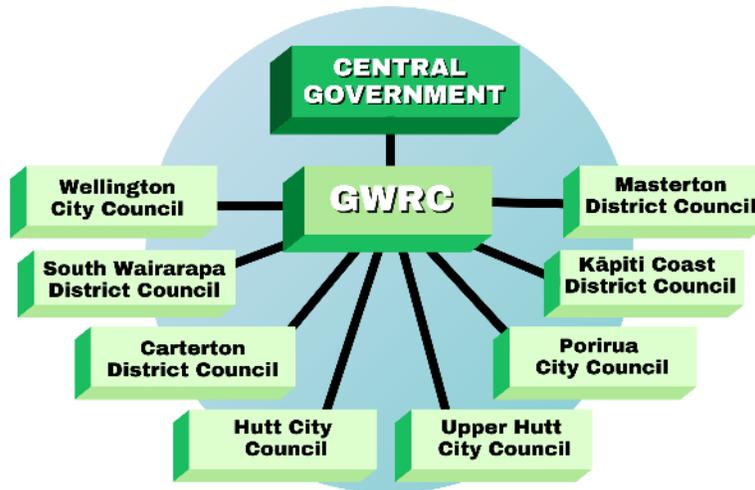
Executive Summary

Results of Data Collection

Identifying the Network of Climate Action Groups

Each council, shown in Figure B, is working towards climate change action, but they are all at varying stages of progress.

Figure B
Greater Wellington Region Governmental Structure.



As part of our assessment, we determined how Māori mana whenua groups participate in regional climate action activities. While some mana whenua groups disagreed with the approaches of councils and other organizations, many are currently collaborating with councils on various climate change and environmental actions. Non-government organizations (NGOs) focus on adaptation and restoration of ecological life affected by climate change. Their work has also been useful in improving public awareness and residents’ personal connections to climate action.

From our first interviews, there was a consensus that institutional barriers including lack of staff, expertise, updated legislation, communication, and funding make it difficult for each council to conduct climate action. A unified climate action resource would help overcome these challenges.

Determine the Content of the Resource

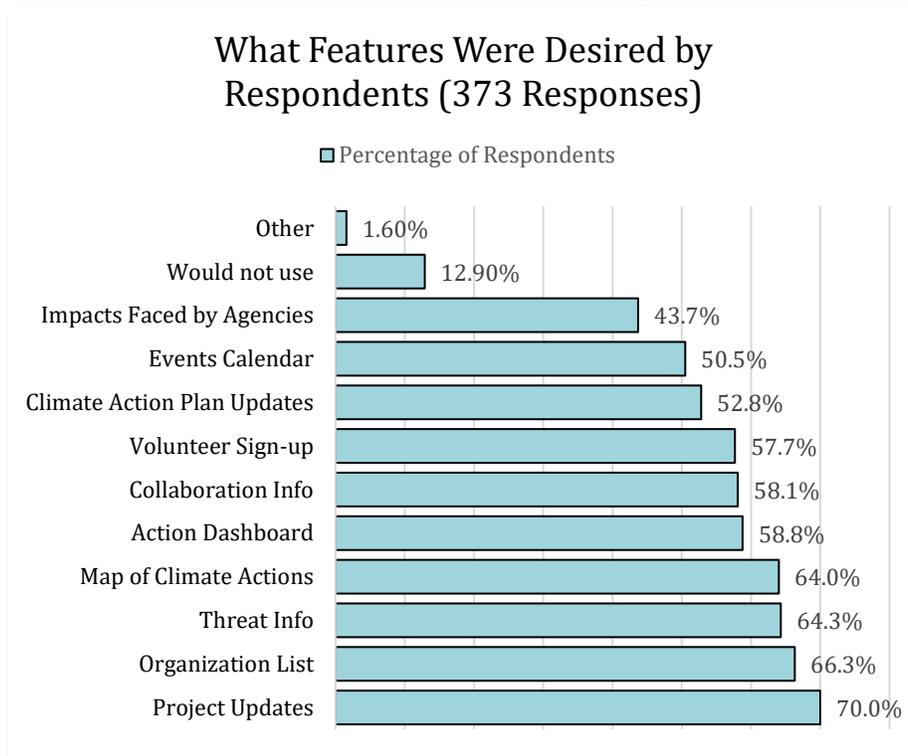
In our interviews with employees of GWRC and territorial authorities, we discerned that although communities may have basic understanding of climate change science, scientific language and online access can be barriers. All interviewees expressed the importance of relating climate actions to users’ own lives. They also expressed that they would like to extend the use of the resource beyond what was envisioned at the start of the project.

To understand what the public of the Wellington region would desire from a climate action resource, we conducted a survey through GWRC’s Citizens Panel. From the data, it is evident that the public’s knowledge of climate actions and organizations can be enhanced by a resource. To inform users of this unified resource, respondents suggested a “public awareness campaign”. They also suggested focusing on the “social, ethical and cultur[al] dimensions” of

Executive Summary

climate action in order to make the resource accessible to the “majority of residents of the area”. The survey was also used to inform the content desired for the resource. A majority of respondents wanted information about how to live a more sustainable lifestyle and desired content to stay informed about climate change and climate action. Data about desired features can be found in Figure C.

Figure C
What Features Were Desired by Respondents



Develop a Logical and Efficient Platform

From our platform efficiency feedback group, we found that having a clear website layout and menu bar can aid users. Participants also agreed that having uniform text size, font, and color scheme can make a website easier to use. From usability testing, we refined the distinction between our location-wide pages and the pages for each territorial authority. An example of a location-wide page can be seen below in Figure D. From the usability testing we also refined our events page and our climate story.

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Figure D
Porirua Location-Wide Page



Note. Porirua City Council page linked in the lower right corner.

Identify How to Present Climate Action Efforts

In our interview with a Computer Science Professor at WPI, we received helpful insights related to the testing, design, and implementation of our resource. This professor suggested using a more qualitative approach to usability testing, so that participants would verbalize their experience with the resource rather than performing specific tasks. In another interview with the [WPI Global Lab](#), an employee suggested a general color scheme, consistent art-style, cohesive text style, and minimal text so the resource would be easy to use and less overwhelming to the user. They also had multiple suggestions for improving accessibility.

In our final resource design interview with another [WPI Global Lab](#) employee, we were given more detail about how this resource could be technically implemented. They suggested contracting a development company that is familiar with the features included in the resource. The participant also gave suggestions of ways to moderate and curate the resource, such as hiring a subject matter expert in the field of climate action communication.

Discussion of Results

The results show disparities between the regional councils and related agencies. Climate action plans, strategies, accomplishments, and outreach have varying levels of progress. This has made collaboration even more challenging. The information we have gathered prioritizes story-based communication, visuals, and multimedia presentations of information. Results also indicated the value of collaborating with Māori representatives on integrating mātauranga Māori perspectives. A majority of respondents said they would use the resource for staying informed about climate change, climate action, and sustainable lifestyle changes. This data was useful in determining the content and notifications for the unified resource. Insight from our platform efficiency feedback group, resource design interviews, and usability testing informed the design of our resource prototype. We were surprised by some of the information and made changes to the existing prototype based on what we learned.

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Recommendations and Conclusion

We have four recommendations, covering the implementation, maintenance, promotion, and accessibility of the resource.

#1: Invest in the Continued Development of an Online Unified Climate Action Resource

For this recommendation we suggest:

- Contracting a website development company for handling implementation.
- Enlisting an existing member from each organization as media liaison to provide information to the resource.
- Follow the general design and structure defined in the resource prototype.

#2: Maintain and Update Online Unified Climate Action Resource

For maintaining and updating the resource, we suggest:

- Keeping information present on the resource current by using the designated media liaison.
- Training the media liaisons of each organization to update the online resource.

#3: Promote the Resource

To promote widespread community engagement we suggest:

- Social media
- Posters
- Awareness campaigns
- Church and school communities
- Radio ads
- Newspaper ads

#4: Consider Diversity, Equity, and Inclusion of the Resource

To ensure equal access, we suggest:

- Add content that relates climate actions to users' lived experiences.
- Coordinate with local iwi to incorporate mātauranga Māori into the resource prototype.
- Include accessibility measures into the final resource.

Conclusion

A commitment to developing and maintaining a resource supports the third objective of the GWRC, which is to raise community awareness of mitigation and adaptation for climate change (Greater Wellington Regional Council, 2015). There is interest among the majority of stakeholders to use this resource, and most contributors believe that it will save energy, time, and money long-term. It will also grow the collaborative abilities of the region exponentially. A unified climate action resource will elevate climate actions in the region, helping GWRC lead the way in New Zealand's climate actions.

Acknowledgements

Our team would like to extend our gratitude to every organization and individual who has helped over the course of this project. Without you, this project would have not been possible.

Thank you to:

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- Every interviewee for providing valuable insight and informing the scope of our project.
- All participants in our feedback groups and usability testing sessions for guiding our climate action resource.
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Meet the Team

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I'm a junior Biomedical Engineering student on the pre-medical track from East Greenwich, RI. Outside of school, I'm a member of the WPI Varsity Women's Rowing team, Alpha Epsilon Delta (National Health Preprofessional Honor Society), and a Peer Learning Mentor. I've really enjoyed my time on IQP working alongside GWRC to research and develop options for a unified climate action resource. Although I would have loved to travel to New Zealand, I'm grateful that we were able to complete a project with the NZ project site!



Isabelle Mellor

I am a junior Civil Engineering major from Andover, Massachusetts, north of Boston. Outside of school, I am an active member of the American Society of Civil Engineers, Theta Nu Xi Multicultural Sorority Inc., and Ketones A Cappella. I have appreciated working with GWRC and others in Wellington to research and build the resource prototype. Even though there was an 18-hour time difference, I am grateful to have collaborated with such knowledgeable professionals in the field of public governance and climate action!



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I am a junior Computer Science major from Westborough, Massachusetts. I am a member of the WPI VEXU robotics team, ACM, and I am also a student assistant for the Computer Science department for multiple courses. I have greatly enjoyed and appreciated working with my teammates, advisors, GWRC, and the many other contributors involved with our research. While the experience was quite different from what we originally expected, it was an incredibly worthwhile learning experience. I am truly grateful to have been able to work on this project!



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Unless otherwise noted, all figures were created by the team.

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Chapter 1. Introduction

Action on climate change is a priority in New Zealand, and the capital city of Wellington serves as the center for governmental and agency coordination on climate action. Although the documents generated by governments and agencies can be challenging to collect, update, and maintain on a unified platform, creating partnerships in this moment is critical. Greater Wellington Regional Council ([GWRC](#)) is the main governing body encompassing the Wellington region and works to coordinate environmental protection, land management, flood protection, and transportation. The Council's goal is to “[promote] Quality for Life by ensuring our environment is protected while meeting the economic, cultural and social needs of the community” (Greater Wellington Regional Council, 2020e).

Predictions are clear that the region will experience consequential effects of climate change, and that action is needed. GWRC reports that temperatures and droughts in the Wellington region will increase. They also predict that there will be less rainfall in the region, more extreme weather, and higher sea levels (Greater Wellington Regional Council, 2017). GWRC has focused government policy on climate action with response planning in mind. Actions and initiatives are underway across the region, and a single updated resource on current climate actions would be useful in building regional coordination and communication.

As part of coordination, and in acknowledgement of the sociopolitical history of the nation, GWRC incorporates Māori perspectives, including the notion of [kaitiakitanga](#), which means guardianship and protection. Under this notion, Māori take responsibility to safeguard the environment, a responsibility that has not always been followed by European settlers (Te Ahukaramū Charles Royal, 2007). Recent strategies to align government actions with Māori voices and promote sustainable environmental perspectives have brought greater collaboration with Māori.

GWRC governs alongside 6 Māori mana whenua partners and 8 territorial authorities consisting of city and district councils. These groups have taken actions to adapt to current climate predictions and mitigate the emissions that cause climate change. However, as of now the groups mostly act independently from one another and information about their actions and approaches is scattered among separate platforms. Existing sites have a confusing user experience ([UX](#)), meaning they are cluttered with information, difficult to navigate, and prevent

agencies from effectively collaborating. Existing sites also generally lack a tailored user interface (UI), meaning they may display information in a counterintuitive way. A single, easily navigable climate action platform can present an opportunity to enable effective communication between all parties and display information in a user-friendly manner. This would promote regional activities and facilitate better partnerships. It would also enable policy makers and activists to efficiently learn about existing climate actions from other agencies.

The goal of this project was to collaborate with GWRC to produce a streamlined resource that compiles and highlights climate change actions from agencies and organizations in the Wellington Region. To meet this goal, we identified four objectives: First, we identified and mapped the network of climate action groups and agencies in the Wellington region. Second, we determined what content the platform should communicate based on the missions of the contributors and the expected users. Third, we researched and developed a logical platform that officials, the public, and contributing agencies could easily and efficiently use. Finally, we identified how to visually present climate change mitigation and adaptation actions effectively. With these objectives, we constructed a resource that effectively communicates and promotes the climate actions throughout the Wellington region.

Chapter 2. Context for Climate Communication

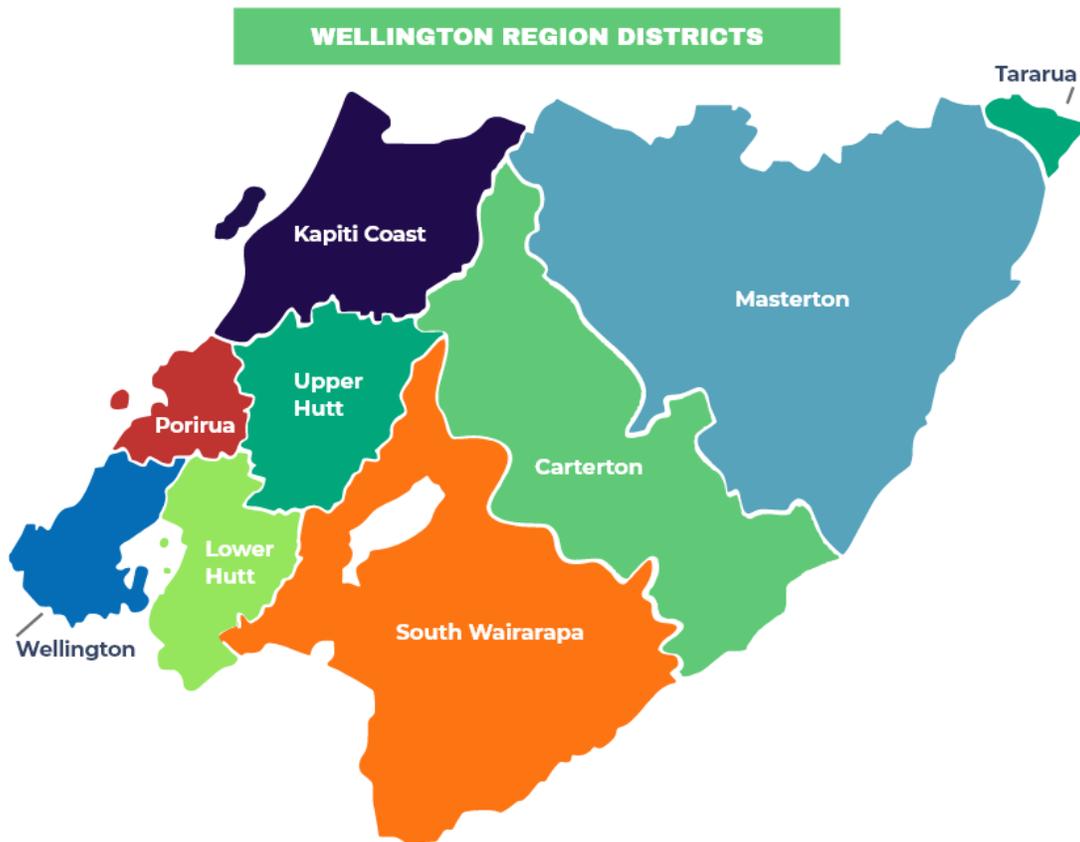
This chapter reviews contextual and previous research on the environment and science communication as it relates to climate change action in the Wellington region of New Zealand. We also evaluate challenges of communication with regard to climate change action and visualization.

2.1 - Why Communication is Important for Climate Change

The Wellington region is on the southern part of the northern island of New Zealand. As shown in Figure 1, the region consists of the cities Wellington, Porirua, Hutt, and Upper Hutt, as well as the Kapiti Coast District, the South Wairarapa District, the Carterton District, and the Masterton District. The region will experience numerous impacts of climate change in the short and long-term.

Figure 1

Greater Wellington Region Map

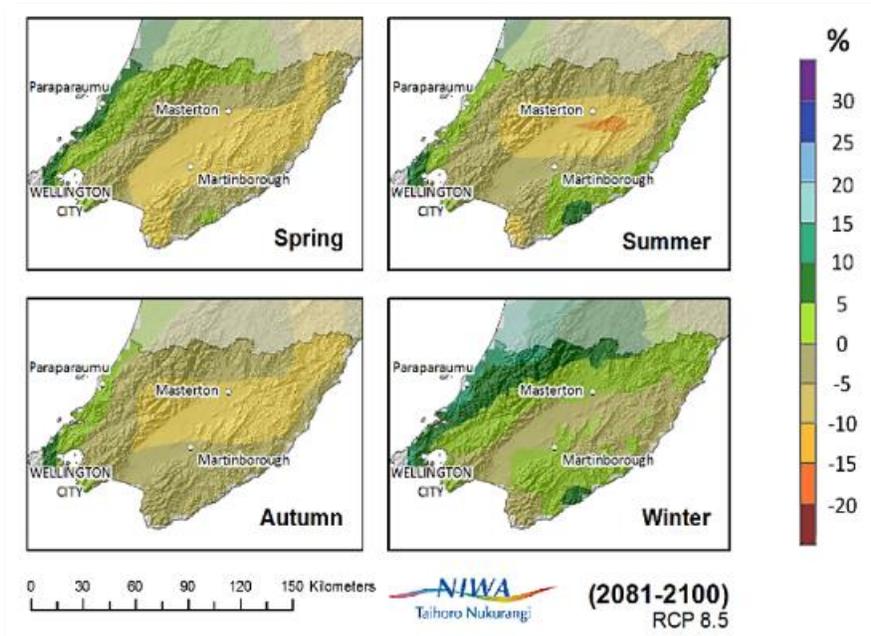


As seen below in Figure 2, the eastern side of the north region will become drier, and the western coast will see more rain. In the figure, the average rainfall in the year range of 2081-2100 will change from the average rainfall of 1968-2005. The amount of change throughout the region is shown by percentage, where positive percentages indicate an increase in average rainfall, while negative percentages indicate a decrease in average rainfall (Greater Wellington Regional Council, 2017).

By 2081-2100, the Wairarapa area in the center of the region expects to see up to 10% less rain in the summer than in 1968-2005. In contrast, the west coast will see up to 15% more rain in the winter than in 1968-2005. In the same time frame, the region is projected to experience around 2.86 more weeks per year with peak temperatures above 25°C (77°F), and the Wairarapa area will experience up to 7 weeks more per year. One of the higher risk areas is around the inland town of Masterton where, by 2090, the average temperature in autumn will rise by 3.5°C.

Figure 2

Rainfall Percentage Map for the Wellington Region



Note. Map displaying percent increase in rainfall in the Wellington Region, 2081-2100. "[Rainfall Projection Map](#)" by Greater Wellington Regional Council ('GWRC') is licensed under [CC BY 4.0](#)

(Greater Wellington Regional Council, 2017).

Climate change in the Wellington region has many implications, including a shift in ecosystem geography. For example, as temperatures change, crop growth may be reduced and plants may mature faster. This will affect the rural areas of the Wellington region that consist partly of dairy and sheep farms (Buerger & Omar, 2006). Implications also include a seasonal shift in breeding and migration. Pests may become more prevalent, and wildlife may face increased heat stress. The overall average river flow will increase, especially in the west where higher rainfall is projected. Sea level rise will have a significant impact on the coasts and forest fire risk will increase (Greater Wellington Regional Council, 2017). Overall, climate change will cause more weather extremes in the Wellington Region.

In New Zealand, communication about climate change has had a measurable impact on the behaviors of residents. A 2014 study surveyed residents of the Wellington city district and the Kāpiti Coast district to examine if considering local adaptation strategies would influence the survey-takers' responses to later questions about willingness to change personal behavior. The study found that those who first received questions about the local impacts of climate change and current adaptation strategies were significantly more willing to change their behaviors and support climate actions. Researchers concluded that when New Zealand residents consider climate change impacts and adaptation strategies, it positively influences them to take actions to reduce their own personal impacts (Evans et al., 2014). This suggests that efforts to educate the public on climate action could directly influence personal behaviors as well.

2.2 - Role of GWRC in Regional Collaboration

GWRC's mission is to ensure that the environment in the region is well protected, while also accommodating the needs of the community economically, culturally, and socially (Greater Wellington Regional Council, 2020e). To accomplish this, GWRC manages biosecurity, the environment, floods, the land, regional parks, public transport, as well as the communal water supply. These functions are carried out by developing policy and legislation to direct and support the presiding councils.

GWRC governs according to the Resource Management Act ([RMA](#)) 1991, the legislation describing environmental management. The RMA delegates resource management to local governments, since they are more likely to see their own environmental impact (*About the Resource Management Act 1991*, 2018). Due to growing demands from local councils and

organizations for a central response, GWRC has made efforts to create policy that outlines the region's plan for climate change. Under the RMA, GWRC is responsible for this response in their region. GWRC have thus established the [Climate Change Strategy plan](#), which outlines the main objectives for GWRC as listed below:

1. **Mitigation:** reduce emissions across Greater Wellington and GWRC to create a sustainable innovative local economy (Greater Wellington Regional Council, 2015).
2. **Adaptation:** manage climate risks and increase resilience through planning for adaptation with scientific information (Greater Wellington Regional Council, 2015).
3. **Engagement and Awareness:** Raise community awareness of mitigation and adaptation for climate change (Greater Wellington Regional Council, 2015).

GWRC plans to implement their objectives while balancing immediate and long-term needs, following through on coordinated actions across all organizations, and acting even when uncertainties exist (Greater Wellington Regional Council, 2015). This project's plan for a climate change action tool will support GWRC's third objective.

2.3 - Residents and GWRC Partner Organizations

Various organizations partner with GWRC, including the territorial authorities, who are local government councils that preside over portions of the region. These authorities include Porirua City, Wellington City, Kāpiti Coast District, South Wairarapa District, Carterton District, Masterton District, Upper Hutt City, and (Lower) Hutt City Councils. The councils are focused on communal services, maintaining roads, land usage, and the overall health of the community (Greater Wellington Regional Council, n.d.).

The territorial authorities have also turned available attention and resources to addressing the threat of climate change and amplifying current mitigation and adaptation actions. For instance, the Wellington City Council has made a significant push towards promoting climate change actions through their ["First to Zero"](#) plan of becoming a zero carbon city (Wellington City Council, 2020). The Porirua City Council also has established a [climate change strategy](#) to fight the rising CO₂ levels, focusing on how the city can prepare and respond to the devastating effects it will bring (Porirua City Council, 2020). Similarly, the Upper Hutt City Council has also developed an [extensive sustainability strategy](#) explaining the consequences of climate change,

and how to mitigate damages (Upper Hutt City Council, 2020). Other councils, while not as extensive, have also issued general plans of action for the public to follow, and have worked hard to lower climate emissions ([Carterton District Council](#), n.d.; [Carterton District Council, & South Wairarapa District Council](#), n.d.; [Hutt City Council](#), 2020; [Kāpiti Coast District Council](#), n.d.). The availability of resources and funds depend on the size of the council, so some are less equipped to deal with the current climate crisis.

The 6 mana whenua, Māori groups heavily involved in protection of the land, and GWRC make up the Ara Tahi leadership forum. The forum analyzes key issues in the region, including climate change actions (Greater Wellington Regional Council, 2020c). Mana whenua also contribute significantly to local conservation and climate initiatives. For example, in 2019 Te Atiawa ki Whakarongotai campaigned to conserve catchments on the Waikanae River. This evolved into a collaborative project supported by the Minister of Conservation and GWRC, among others (Davy, 2020). Mana whenua are closely involved in current climate actions but have less internal resources than GWRC. This prevents them from communicating effectively outside of their own local groups.

Entities using this centralized resource may include elected government officials, Territorial Authority officials, and mana whenua. These agencies and organizations may benefit from a unified resource that could collate and emphasize regional climate change actions. A resource can promote the activities that Wellington Region communities currently support, and may also encourage the residents of Wellington to become more frequent participants in conversations about climate action. If residents are able to use this resource, it may inform them about the current climate change actions in their communities, and they may be motivated to positively impact current initiatives. Therefore, the resource should be accessible to all parties, in order to promote widespread use. It is clear that the potential users are divergent interest groups. Even secondary organizations like Wellington Water Limited, which manages drinking water, wastewater disposal, and storm services for GWRC could better share common efforts for how climate action can protect the local water supply and minimize future crises.

2.4 - Learning from Resource-building Tools

New methods for sharing climate change data have been developed to catalyze action. A study from 2014 focusing on Interactive Sea Level Viewers ([ISLRV](#)), map-based visualization

tools for displaying rising sea levels, attempts to address issues with presenting climate change effects by analyzing effective communication (Stephens et al., 2014). ISLRVs construct a personal narrative for the user to interact with, enabling them to more deeply understand and relate to the effects of climate change. Research focused on features such as: conceptual support, risk and uncertainty of climate change, realism, intractability, local or global impacts, and promoting mitigation actions. Researchers found that in order to optimize a tools' effectiveness, development should focus on aspects such as: reliability without internet, influences on the user (motivations, interests, knowledge, and background), and how the users should respond.

Due to the difficulties in conveying climate information and actions, innovations are needed to accurately represent ideas to unscientific perspectives. A study from 2017 by Dr. Erik Glaas and other researchers focused on the importance of climate change perception and visualization by analyzing a web-based tool named [VisAdapt™](#) (Glaas et al., 2017). This tool is used to explain the importance of climate change adaptation to Nordic homeowners by displaying climate change scenarios, local risk maps, and means for adapting homes to the effects of climate change on a small scale. This study collected data through various focus groups and through usability testing. Researchers examined how participants perceived climate risks, how they personally related to the effects of climate change, as well as how they adapted to climate consequences and discussed climate issues. They recommended that climate visualization tools allow users to piece together their own "story" in order to understand and relate to the effects of climate change. These researchers also found that some homeowners thought of climate change consequences abstractly and felt no need to act against these issues. Because of this, they recommended that visualization tools offer perceivable realistic actions, with a range of required investment.

2.5 - Using Design to Enhance Science Communication

Stephen Shepard, Professor in Forest Resources Management at the University of British Columbia, focuses on new formats for accurately representing climate change progression in his book (Sheppard, 2012). Shepard first approaches this problem by analyzing why individuals misperceive climate change, concluding that it is due to denial, confusion, lack of engagement, disconnection from personal lives, failure to recognize global causes, fear, powerlessness, and lack of responsibility. Miscommunication is due to the information being complicated,

unrelatable, untrusted, uninteresting, or briefly viewed. These issues could partially be mitigated by developing *personal carbon footprint* charts, as well as *snapshot visuals* of a community. These snapshots are especially critical in providing personable evidence for individuals to relate to the effects of climate change. These snapshots can also be used to explain how to conduct climate action through images of new transportation, retrofitting infrastructure, historical communal precedence, as well as community wide actions.

Climate graphics are intended to communicate complicated science to people with a limited scientific background. Images can be interpreted in many ways, and researchers have to be careful with the messages they convey. Historically, for example, the color red has been used to show the “rising end of a temperature curve” or a way of “picturing disaster”. Unfortunately, red is often interpreted as the “apocalypse of an inevitable climate catastroph[e]” (Schneider, 2012). What a researcher perceives as the only way to picture heat, a layperson may misinterpret for alarm. Graphics also help people visualize phenomena that are otherwise unseen, such as temperature changes. For climate change they are intended to spark action so that “future worlds depicted do not become reality” (Schneider, 2012). The fear that accompanies these graphics can lead to helplessness and inaction and should be avoided.

Several factors impact the readability of scientific graphics. Many climate change graphics are interactive and allow users to design their own experience with the information. Tailoring the graphic to the viewer may improve understanding, but also requires that the creator anticipate helpful features that the viewer can make use of (Harold et al., 2016). This custom experience requires insight into the viewer’s perspective through testing and surveys. Designers can also draw on the research already completed, such as eye tracking data. Researchers can use colors, arrows, and different fonts to emphasize parts of the graphic by how the eye will track through the images. Avoiding “excess visual information” and disorganized data presentation will also help ensure that viewers understand and process graphics accurately (Harold et al., 2016). Limiting the data to relevant points is not necessarily diluting the science, but instead improves viewer comprehension. This article suggests that involving the viewer in the design process leads to more accessible graphics.

2.6 - Case Studies in Science Communication

Case 1: Using Facebook in Local Governance

The first case study we will examine is related to effective interactions between governments and citizens using social media. A team of researchers analyzed San Antonio's Solid Waste Management (SWMD) Facebook posts using text analysis and grouped them into three categories. The first category featured government posts, the second featured public replies and comments, and the third evaluated rating comments (Reddick et al., 2017). After their analysis, they determined that the Facebook page uses both single and double loop learning. Single loop learning is a method of passive communication, where the government presents information to the public. Double loop learning consists of information delivery as well, but also includes unprompted suggestions and comments from the public.

There are three modes of communication between governments and the public. Listed by increasing levels of e-participation, they include: managerial, consultation, and participatory. Managerial communication is exclusively single loop and participatory is exclusively double, while consultative is a hybrid. In this study, researchers found that "e-participation applications with user-friendly designs are likely to create a positive perception of government and increase transparency and trust in government" (Reddick et al., 2017). Although the page uses both single and double loop learning, they found that single loop, managerial posts were the main method of communication for SWMD.

Our project aimed to include participatory and managerial conversation so that e-participation would be higher. This had the potential to enable residents of the Wellington region to actively participate in the climate actions being taken in the region. The GWRC also indicated they would like unprompted feedback and comments from citizens, which is a component of double loop learning.

Case 2: Framework for Increasing Community Engagement

The second case study featured measures to increase community engagement with climate change through visualizations and projected scenarios. This study examined the use of a framework designed to increase public awareness and action in the Local Climate Change Visioning Project (LCCVP) in British Columbia.

This framework was designed with the intention of breaking away from traditional climate change resources. Most frameworks are focused on the global and national levels, while this focused on the local level and community engagement. In order to boost “participatory governance,” this framework aimed to increase community engagement related to climate change planning and policy decision-making. The past barriers to success with similar resources included concerns about the overwhelming scale of data, complex science communication, and public uncertainty. To overcome these challenges and create a better framework, there was a set of criteria to meet. These standards insisted that the resource be engaging and accessible to the public, present scientific information in an understandable manner, include data that directly impacts the local population, and impart a sense of urgency towards climate actions without overwhelming the viewer (Sheppard et al., 2011).

The framework included issues from the local level, along with different outcome scenarios based on simple choices. These choices covered different climate strategies that could be adopted. Depending on the choice, this would result in different projection data to be displayed. Local landscape visuals were also included in the resource in order to provide scenarios and imagery that resonated with the local community (Sheppard et al., 2011).

The case study on the framework implementation showed it to be effective. It increased the public’s understanding of urgency related to climate change, local climate change impacts, and prevention options available. Participants also indicated that the tool presented climate change in a way that personalized the data. Some participants also indicated that they planned to make lifestyle changes related to climate change due to their use of the resource. (Sheppard et al., 2011). This case study provided valuable insights into effective ways to increase community engagement related to climate change using criteria that are still relevant today.

2.7 - Summary

In conclusion, various points that were highlighted in this chapter should be implemented in our project. These points include communicating climate change data in a non-threatening manner, personalizing climate change information, and including snapshots of climate change scenarios to more directly illustrate impacts on the community. Past research on climate change platforms have found that realism, relatability, and dependability are essential for communicating the need for climate action in a tangible way. Case studies on climate change

communication have found that conversations are more effective than one-way information delivery alone, and that personalized data presentation is more impactful.

Chapter 3. Approach to Researching the Problem

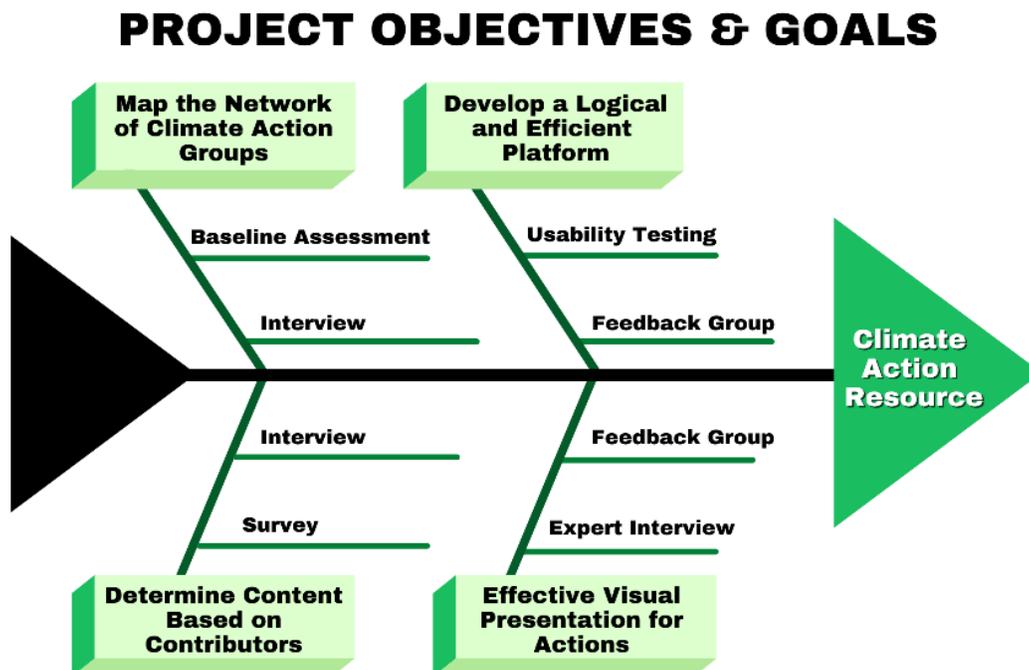
The goal of this project was to collaborate with GWRC to produce a streamlined resource that compiles and highlights climate change actions from agencies and organizations in the Wellington Region. We established four objectives to facilitate this goal.

1. **Network:** Identify and map the network of climate action groups and agencies in the Wellington region.
2. **Content:** Determine what content the platform should communicate based on the missions of the contributors and the expected users.
3. **User Experience:** Research and develop a logical platform that officials, the public, and contributing agencies can easily and efficiently use.
4. **User Interface:** Identify how to visually present climate change mitigation and adaptation actions effectively.

Below in Figure 3 is a fishbone diagram that represents our objectives, our supporting data collection methods, and the end goal of the streamlined resource.

Figure 3

Project Objectives Fish-bone Diagram



3.1 - Objective 1: Identify the Network of Climate Action Groups

Our first objective was to identify and map the network of climate action groups and agencies in the Wellington region. The resource was dependent on contributing agencies, so we determined the status of these organizations. This included understanding the missions of each group, their connections to each other, their climate change actions, the resources they use, and how they engage the public. This information was used to better produce material that benefits the users of the resource. Our research was conducted through a baseline assessment, using content analysis, social media mining, and semi-structured interviews.

A baseline assessment was used to “provide[d] a critical reference point” for us to document the activities of the groups and to understand their individual approaches to climate action (UN Women, 2012). In order to establish critical reference points, the assessment obtained data regarding current climate policy, goals of the groups, and how they planned to meet these goals. This was accomplished by compiling information from past reports, webpages, articles, and assessing their outreach strategies. Our assessment enabled us to further analyze how these climate action groups and agencies depend on one another, what difficulties they had faced, as well as what they had currently accomplished.

Our next step for continuing this research was to interview leaders and officials of GWRC, territorial authorities, and mana whenua. This was done through a semi-structured interview process involving carefully employed prompts. This style is “dominant in qualitative research in human geography and city-focused research in particular” (Ward, 2020, p. 46). During the first part of this interview, we asked questions about how the participants interacted with the public and other agencies. We prompted officials about how their constituents appear to be responding to communications about these actions, difficulties they have had with these actions, and their effectiveness in the adaptation and mitigation community engagement processes. This enabled us to understand the specific goals of these agencies, how they interact, and how they currently obtain climate change information. We used the second half of these interviews to ask about the content of the resource. A guide for the first part of the contributor interviews can be found in Appendix A, and the second part of the interview, concerning resource content, will be described below in 3.2.

3.2 - Objective 2: Determine the Content of the Resource

Our second objective was to determine the type of content the platform should communicate based on our understanding of the missions of the contributors and the kinds of actions they promote. We asked all participants to detail which information should be compiled into the resource using semi-structured interviews and surveys.

In our semi-structured interviews with representatives of the contributing agencies and organizations, we focused on objective 2 for the second half of the questions. We asked participants their opinions and perspectives on the intended content, such as essential climate change information and local community actions. As interviewers, we directed the conversation, but also allowed for open communication enabling participants to “reflect widely on the question” (Ward, 2020). Our guiding questions for the second part of the contributor interviews are included in Appendix B.

In order to understand the type of content that the public may need from this resource, we surveyed a sample of the general public. To pre-test our survey for accuracy, we distributed it among our class and assigned different viewpoints to each group. For example, some classmates took the role of climate change deniers, climate change activists, or average citizens, while others took the survey as themselves. This ensured that the survey was broad enough to capture a variety of perspectives on the questions. We requested the help of the GWRC as a community gatekeeper who referred us to the Citizen’s Panel of GWRC (Hennink & Leavy, 2014). This enabled us to host our survey on the HorizonPoll research survey platform. This survey was structured using questions regarding the content conveyed by the platform. Our targeted survey participants spanned backgrounds, ethnicities, gender, and age, to accurately reflect a sample of users for this resource. Our survey is located in Appendix C.

3.3 - Objective 3: Develop a Logical and Efficient Platform

Our third objective was to research and develop a logical platform for the resource that officials, the public, and contributing agencies could easily and efficiently use. To collect our virtual feedback group participants, we reached out to students, faculty, and staff members of the WPI community. These groups were made up of a self-selecting sample of 3 potential users from the community. The topic of our feedback group was user experience. Participants were asked to reflect on information platforms they use in their daily life, such as websites, posters, books, or

social media. They were asked to share what features they find helpful and what features detract from the efficiency of platforms. Our discussion guide with questions can be found in Appendix D. By facilitating discussions about how participants interacted with platforms in daily life, we hoped to gain insight on features that function well. The feedback groups also captured qualitative data on human thoughts and feelings related to various platforms that otherwise would have been unaccounted for.

We also implemented usability testing during the development of our platform. Usability testing is a cornerstone of user experience design. In this method, a moderator observes how participants complete tasks using a product while receiving participant feedback on the experience. Usability testing is performed to recognize issues in the product, improve the product, and gain data on user behavior (Moran, 2019). We implemented remote, moderated usability testing with volunteers and contributing parties of the platform. To collect participants, we reached out to students, faculty, and staff members of the WPI community, and tests were recorded and moderated on Zoom. Participants were asked to “think out loud” and share their screen when completing tasks (Barnum, 2020). Our usability testing guide can be found in Appendix E. This data enabled us to refine the layout of the finished platform to include the most intuitive pathways to information.

3.4 - Objective 4: Identify How to Present Climate Action Efforts

The final objective was to identify how to visually present climate change mitigation and adaptation actions effectively. This objective was related to user interface design, data visualization, and specific details of the resource design. To complete this objective, we utilized focus groups and expert interviews.

Through the use of another feedback group, we gauged initial reactions to potential resource designs. The groups were asked to provide feedback related to layouts, colors, graphics, and interactive elements. The collaboration between participants enabled discussion of effective and ineffective graphics options for the resource and allowed us to record more personalized responses than a survey would allow. Also, the real-time observations provided by the feedback groups enabled us to ask follow-up questions live. The participants were volunteers from the WPI community with varying climate change backgrounds. Our feedback group guide is included in Appendix F.

Design expert interviews allowed us to receive feedback from climate change and data visualization professionals. These interviews provided in-depth information related to science communication and effective presentations of climate actions. To identify interviewees, we contacted faculty experts from WPI. We then used snowball sampling to build a network of experts to interview. Our guide for the expert interviews is included in Appendix G.

Chapter 4. Results of Data Collection

This chapter highlights the results of our data collection. The methods we used included a baseline assessment, sets of semi-structured interviews, a survey, usability testing, and feedback groups. Our data is summarized and discussed in detail in this chapter.

4.1 - Identifying the Network of Climate Action Groups

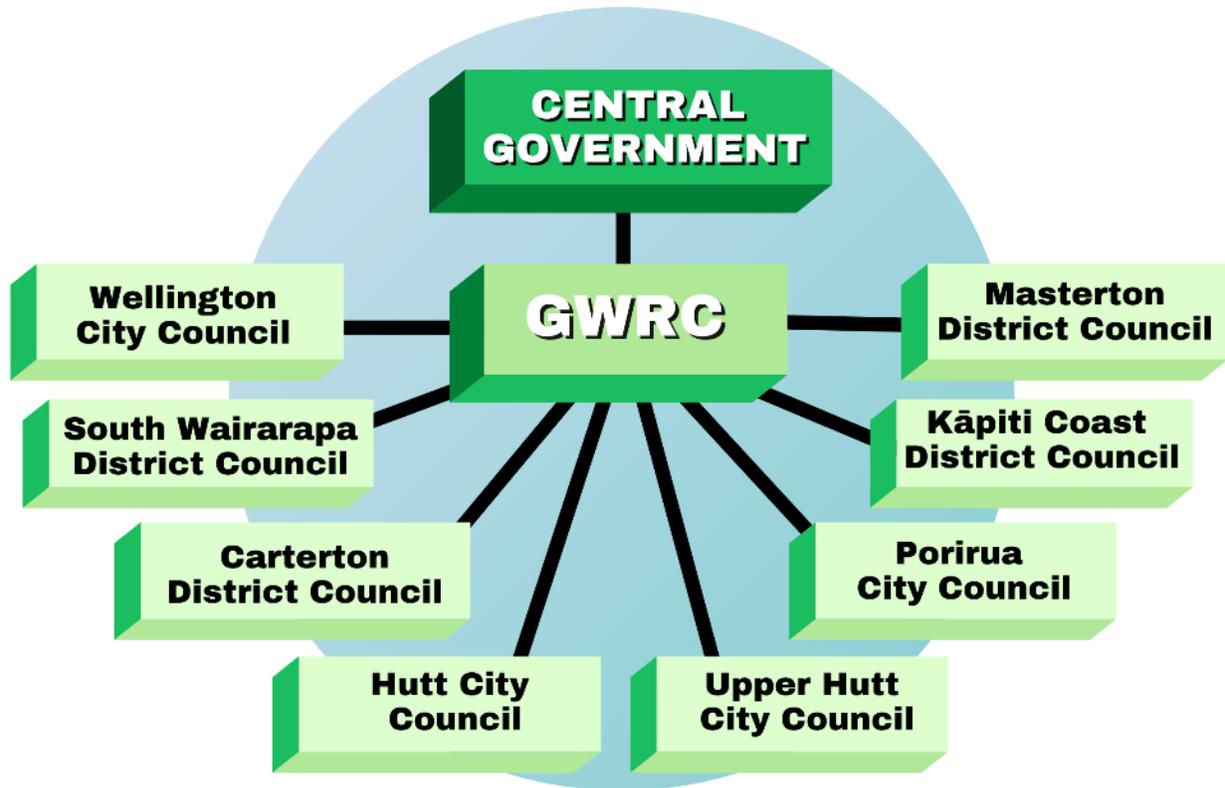
Baseline Assessment of the Network

Our baseline assessment revealed the structure of the national, regional, and local government that engages with climate action in New Zealand. As shown in Figure 4, the local government includes 8 territorial authorities. Each council is working on climate change action, but they are all at varying stages of progress. Five of the eight councils, [Kāpiti Coast](#), [Porirua City](#), [Upper Hutt City](#), [Hutt City](#), and [Wellington City](#) have dedicated climate action plans and initiatives. The action plans for those councils are also referenced in section 2.3.

Our assessment revealed that GWRC is currently managing climate change initiatives both independently and collaboratively. Some of the initiatives that GWRC runs independently include [committees on freshwater protection](#), [programs for growing plants that prevent erosion](#), and [environmental monitoring programs](#), and (Greater Wellington Regional Council, 2020a, 2020b, 2021). GWRC also leads the way on an [electric vehicle initiative](#) (Greater Wellington Regional Council, 2020d). One collaborative project is the [partnership between GWRC, Porirua City Council, and Wellington City Council for Porirua Harbor](#) (Porirua City Council, n.d.) which seeks to protect and restore the harbor. Three other projects that GWRC participates in are [Enviroschools](#), [Let's Get Wellington Moving](#), and the [Pukaha to Palliser Alliance](#) (Greater Wellington Regional Council, 2019; Toimata Foundation, 2019; Wellington City Council et al., n.d.). Other collaborative actions are also being undertaken by GWRC and other local councils and organizations.

Figure 4

Greater Wellington Region Government Structure



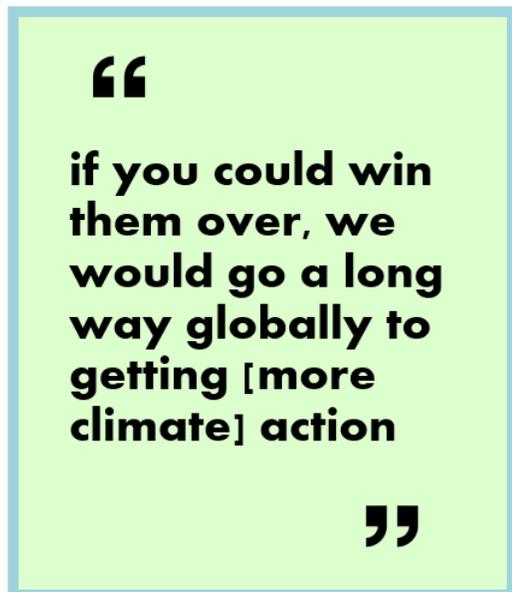
As part of our assessment, we also determined how Māori mana whenua groups participate in regional climate action activities. Te Ātiawa ki Whakarongotai, Ngāti Raukawa ki te Tonga, Ngāti Toa Rangatira, Taranaki Whānui ki Te Upoko o Te Ika, Rangitāne o Wairarapa, and Ngāti Kahungunu ki Wairarapa have initiatives and actions related to the environment. For example, many mana whenua focus on improving communication with organizations, joining climate action strategies, protecting waterways, protecting cultural locations, educating about environmental protection and climate change, restoring native lands, as well as implementing mitigation related projects such as solar farms ([Energise Ōtaki](#), 2020; [Ngāti Kahungunu Iwi Incorporated](#), n.d.; [NZ Herald](#), 2020; [Port Nicholson Block Settlement Trust](#), 2011; [Te Ātiawa ki Whakarongotai](#), 2019; [Te Awarua-o-Porirua Whaitua Committee](#), n.d.). While some mana whenua groups disagreed with a few approaches of councils and other organizations, many are currently collaborating with councils on various climate change and environmental actions.

Non-government organizations (NGOs) are also important voices in the climate action sphere. One such organization is [Wellington Water Limited](#), who have worked to develop various climate mitigation or adaptation ideas (Wellington Water Limited, n.d.-b, 2019a, 2019b, 2020). We also examined the work of NGOs and other collaborative projects such as [Local Nature Space](#) (Nature Space, n.d.), [Guardians of Pāuatahanui Inlet](#) (Guardians of Pāuatahanui Inlet, 2020), [Maara Roa](#) (Maara Roa, n.d.), and [Kapiti Island Conservation](#) (Kapiti Island Conservation, 2015). These NGOs and projects focus on adaptation and restoration of ecological life affected by climate change. Their work has been useful in improving the environment and public awareness of climate change.

Network Interview Results

Our first set of interviews focused on understanding the network between the GWRC, territorial authorities, mana whenua, NGOs, the public, and other climate action agencies. Three interviews were conducted, including one from Masterton District Council (Interview 1, February 11, 2021), one from Porirua City Council (Interview 2, February 12, 2021), and one from GWRC (Interview 3, February 18, 2021).

It was important to discover that all interviewees cited a need to foster better communication between their councils and the general public. Interviewees explained that while the majority of residents are aware of climate change, only a portion of residents frequently engage in climate action efforts. There is a large group of residents that is aware of climate action but does not get involved. According to one interviewee, “if you could win [this group] over, we would go a long way globally to getting [more climate] action” (Interview 3, February 18, 2021). All interviewees suggested promotion of a climate action resource in order to reach the greatest number of people, and all suggested using visuals in the resource that would effectively present climate change impacts in understandable ways.



“
if you could win them over, we would go a long way globally to getting [more climate] action
”

Our interviews revealed institutional barriers that prevent successful climate actions. Across interviews there was a consensus that institutional barriers, including lack of staff, expertise, updated legislation, and funding, make it more difficult for each council to conduct climate action equally and effectively. At least one interviewee noted that scientific expertise is “split up” (Interview 2, February 18, 2021) across New Zealand, leaving few councils with dedicated climate scientists. It was also evident from our data that the Territorial Authorities are at varying levels of progress in climate actions. One interviewee estimated that their council is approximately “2 or 3 years behind” the other councils (Interview 2, February 12, 2021). According to another interviewee from the Porirua City Council in regards to climate action, “[they] haven’t really started” (Interview 2, February 18, 2021). Participants also expressed that various territorial authorities are successfully focusing on one category of climate action at a time. For example, the Porirua City Council is still developing mitigation actions, while Masterton District Council is mitigating by “replac[ing] street lighting [with] LEDs” (Interview 1, February 11, 2021). However, Porirua city council is advancing on adaptation actions, like “identifying flood-prone areas” (Interview 2, February 18, 2021). A unified climate action resource can help overcome institutional barriers that currently stand in the way.

Interviewees indicated that such a resource could help with information sharing between different agencies. One interviewee suggested that sharing information would help agencies spend funds effectively by not “inefficient[ly] doubling up” (Interview 1, February 11, 2021) on the actions of another council. Another interviewee identified a need to share information in order to standardize regulations across the region. All interviewees indicated that a common resource can help improve the existing communication between agencies.

4.2 - Determine the Content of the Resource

Resource Content Interview Results

We also interviewed a sample of employees of GWRC and territorial authorities to develop a deeper understanding of what content would be useful to include in a shared climate action resource. For districts that are rural, we discerned that although communities may have an understanding of climate change science, scientific language and online access can be barriers to further community engagement. All interviewees also expressed the importance of relating climate actions to users’ own lives. As one individual stated, “people like to link it back to their

daily life” (Interview 1, February 11, 2021). All of the interviewees expressed that simple facts about climate change could reach the public more than complicated data, and one respondent also stressed the use of visuals and unified branding on the resource.

Residents, including the Māori and Polynesian population, utilize community networks and “promot[e] [information] through churches” and schools because students can bring information “home and show their [family]” (Interview 2, February 17, 2021). Because of this, one interviewee identified methods of offline advertising as essential to promote any online resource. Some of the interviewees suggested promotion through radio ads, Facebook posts, and the previously mentioned community networks.

“
**A phrase
[that]...captures
both traditional
knowledge and
traditional ways of
doing things and a
way of
understanding the
world around you**
”

The framework and tone of the resource matters as well. In our interview conversations, two individuals specifically mentioned the concept of mātauranga Māori. This was defined by one as a “phrase [that]...captures both traditional knowledge and traditional ways of doing things and a way of understanding the world around you” (Interview 2, February 18, 2021). According to interviewees, this way of understanding the world may be more accessible than scientific phrasing, and they suggested working with local Māori representatives to discuss mātauranga Māori.

In speaking with a Māori representative from the Ngāti Toa Rangatira iwi, we learned more about the concept of mātauranga Māori. Our interviewee described it in a holistic way and explained the concept of sustainability, survival, and ensuring that the same resources exist for future generations. In terms of the environment, this means only taking what resources are needed, replenishing what is used, and leaving the land in the same state as it was for future generations.

Finally, all interviewees expressed that they would like to use the resource in a variety of ways beyond how the resource was envisioned at the start of the project. While some focused on public and external engagement, others expressed need for internal use. For example, potential

users indicated that they would likely use the resource to inform elected officials, share documents and videos freely, access information from different districts, and educate the public.

Content Survey Results

To develop an understanding of what the public of Wellington region would desire from a climate action resource, we conducted a survey through GWRC’s Citizens Panel. In total, we received 396 responses. Overall, 373 respondents completed the full survey. Out of 395 respondents, 45.9% resided in Wellington City, 20% resided in Hutt City, and others resided throughout the nearby areas. For a distribution of the age groups of the respondents, see Figure 5 below.

Figure 5
Age distribution of survey respondents

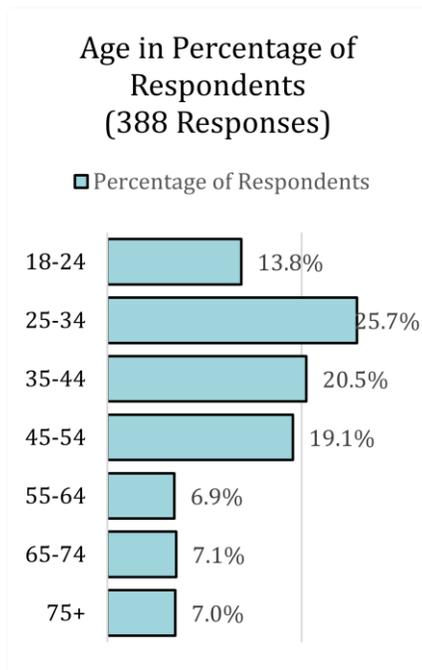
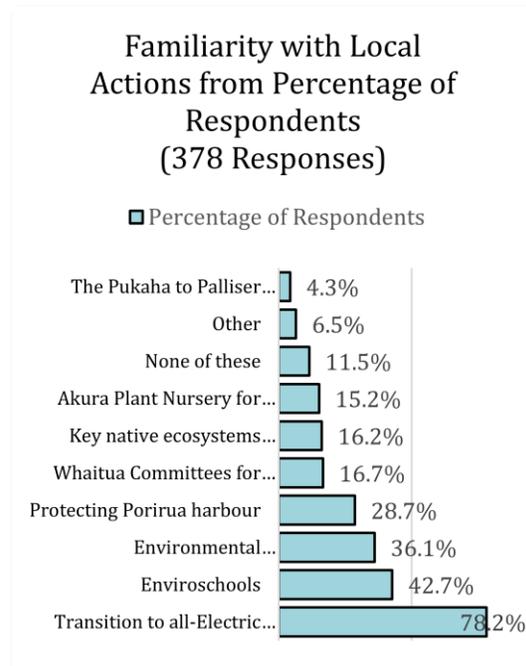


Figure 6
Percentage of respondents familiar with each local climate action



When examining the results of the survey, it was evident that most respondents were familiar with the impacts and effects of climate change on the Wellington region but were not aware of all local climate actions taking place. This is evident in the data shown above in Figure 6. While 78.2% of the respondents were aware of the initiative in Wellington City to transition to

all-electric buses, this percentage may be amplified because 45.9% of overall respondents live in this city. From this data, it is evident that the public’s knowledge of climate actions and organizations around them can be enhanced by a resource.

To inform users of a unified resource, respondents suggested a “public awareness campaign”. They also suggested focusing on the “social, ethical and cultur[al] dimensions” of climate action in order to make the resource accessible to the “majority of residents of the area”. Respondents also indicated that they would also be interested in receiving notifications to increase their own involvement in climate action. While some respondents suggested using traditional “newspaper” to accomplish this, 55.2% of 373 respondents preferred an electronic newsletter. In addition, 37.5% preferred emails, while 20.9% preferred accessing the resource on their own. This data is expressed in more detail in Figure 7. It is evident from this data that potential users are eager to be notified about the resource and want to see it advertised through a public awareness campaign focusing on various dimensions of climate action.

Figure 7
How Respondents Like to Receive Updates

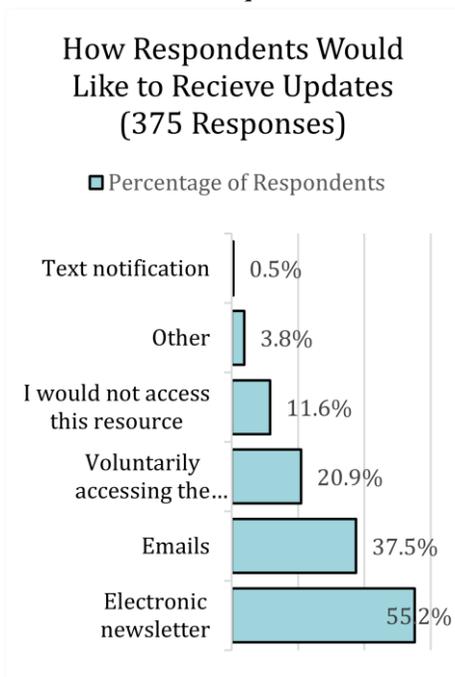
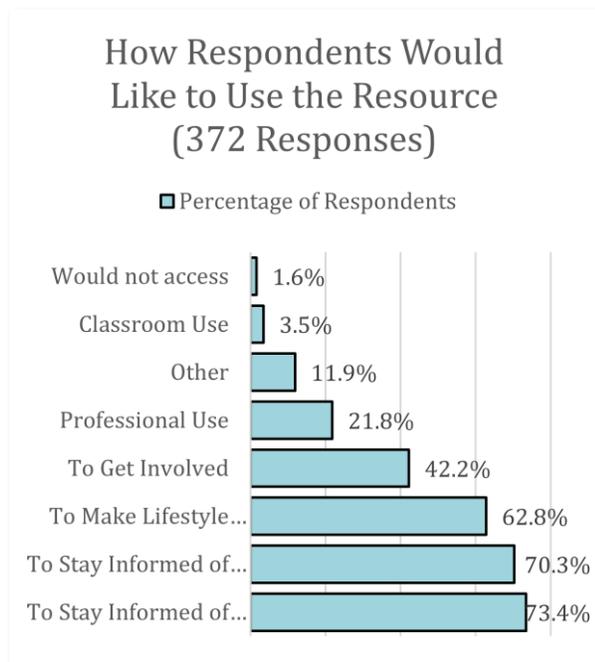


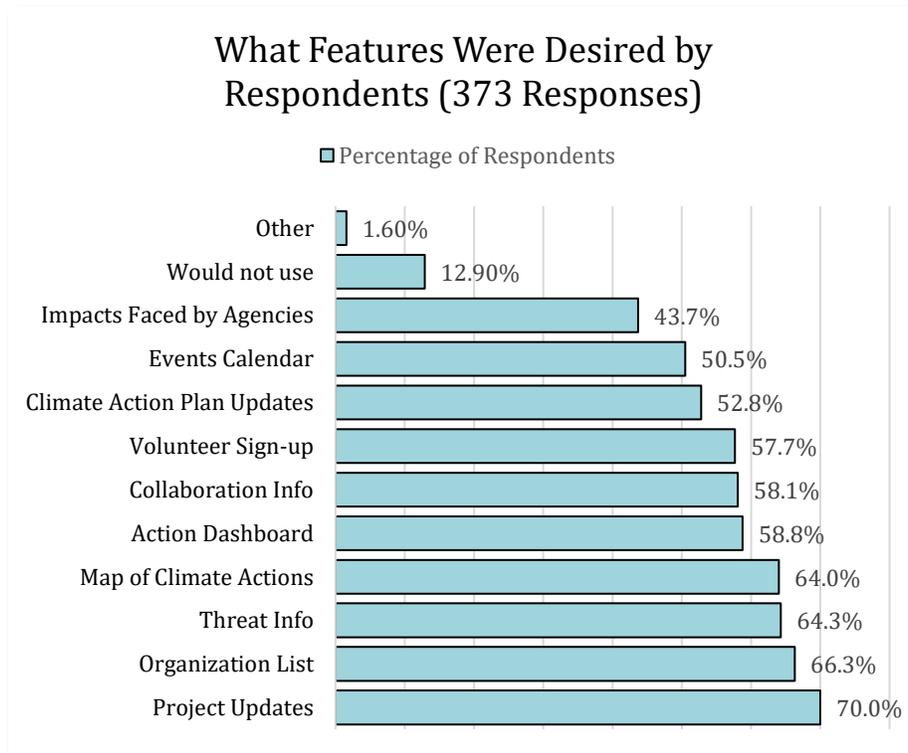
Figure 8
How Respondents Would Like to Use the Resource



The survey was also used to inform the content desired for the resource. For instance, 62.8% of the 372 respondents would like information about how to live a more sustainable lifestyle. Therefore, the resource should have dedicated content for promoting sustainability and improving living habits. The respondents also desired content to stay informed with the resource. For example, 70.3% of respondents want to learn more about climate change and 73.4% of respondents want to stay informed about climate action. To learn more about how respondents would like to use a climate action resource, see Figure 8 above. A majority of respondents also desired various features such as climate action project updates, lists of climate action organizations, information about the threat of climate action, and a climate action map. A complete list of desired features can be found in Figure 9. The data received reflected a broad population and therefore we used the survey to inform the content of the resource prototype and notification style.

Figure 9

What Features Were Desired by Respondents



4.3 - Develop a Logical and Efficient Platform

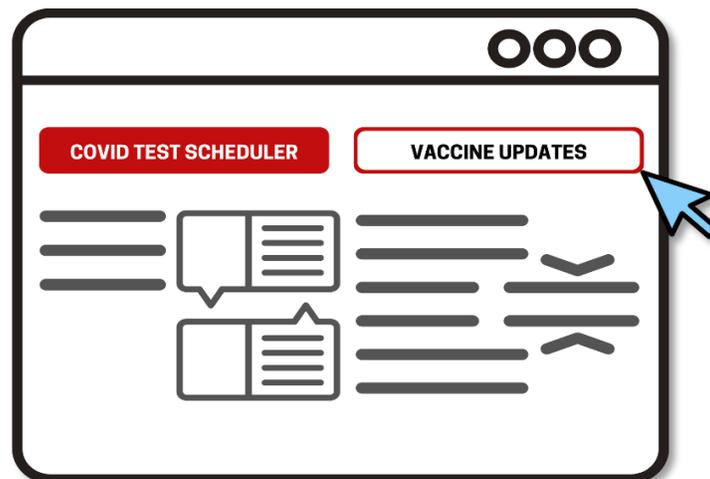
Platform Efficiency Feedback

For the platform efficiency feedback group, three members of the WPI community were asked to reflect on their personal and professional experience with different online platforms. The feedback gathered was then used to inform the design of our resource prototype. There were three major themes from this feedback group regarding ease of finding information, ease of use, and unified layout.

All participants agreed that having to “hunt for information” is unappealing and will often cause them to leave a website. The use of buttons and headers can help direct to relevant information, and buttons should not be the same color as the website background. One of the participants cited a local drug store website, where the button to schedule a COVID vaccine is the same color as the background, preventing users from accessing the relevant information. A recreation of this website layout can be seen in Figure 10. In the participants’ opinion, the vaccine button should have been red in order to draw more attention to it.

Figure 10

Recreation of a Local Drug Store Website



Note. The arrow pictured above points to the poorly designed vaccine availability button, due to contrasting colors.

Having a clear website layout can aid users in their search for information, while conflicting layouts can be confusing and overwhelming to the viewer. Participants agreed that

having uniform text size, font, color scheme, and image sizes can make the website easier to use. Collapsible headers and drop-down menus can both be helpful features in terms of condensing the information displayed, but they should not be distracting when scrolling through the website. All participants shared their frustration with drop-down menus that disappear when the cursor is not hovering over them.

On the subject of updates and notifications, all participants indicated that they only sign up for updates if the information is personally relevant to them. One participant said that they block pop-ups that ask viewers to subscribe to updates, and all other participants agreed. One participant suggested that in order for people to subscribe to updates from a site, the website first has to earn the viewer's trust and the information provided in the update has to be relevant to the viewer.

Resource Usability Testing Results

Usability testing was conducted with three members of the WPI community, who were asked to provide reactions and feedback while completing tasks on the prototype. Each participants' feedback was then implemented into the prototype.

Figure 11

Porirua Location-wide Page



Originally, all participants indicated that they did not understand the difference between location-wide pages and territorial authority pages. At the time, clicking to the location-wide page brought the user to a page where they could then navigate to the council page. Participants suggested making the distinction clearer, as shown above in Figure 11.

The events calendar, as shown in Figure 12, was liked by all participants, but they also suggested including a description of each event as all indicated that they would like to learn more about an event before attending. Participants also had difficulty navigating to the events calendar if they were not on the home page. One participant suggested linking the events calendar in the menu bar, under the “Take Action” heading.

Figure 12

Prototype Events Calendar



Another common theme was comments related to the climate story. Participants disliked some of the chosen illustrative icons, and were confused by the next section button location, but they enjoyed the interactive format. Overall, feedback towards the prototype was positive. Participants described the user interface as clean and intuitive, and also liked the color scheme of the website.

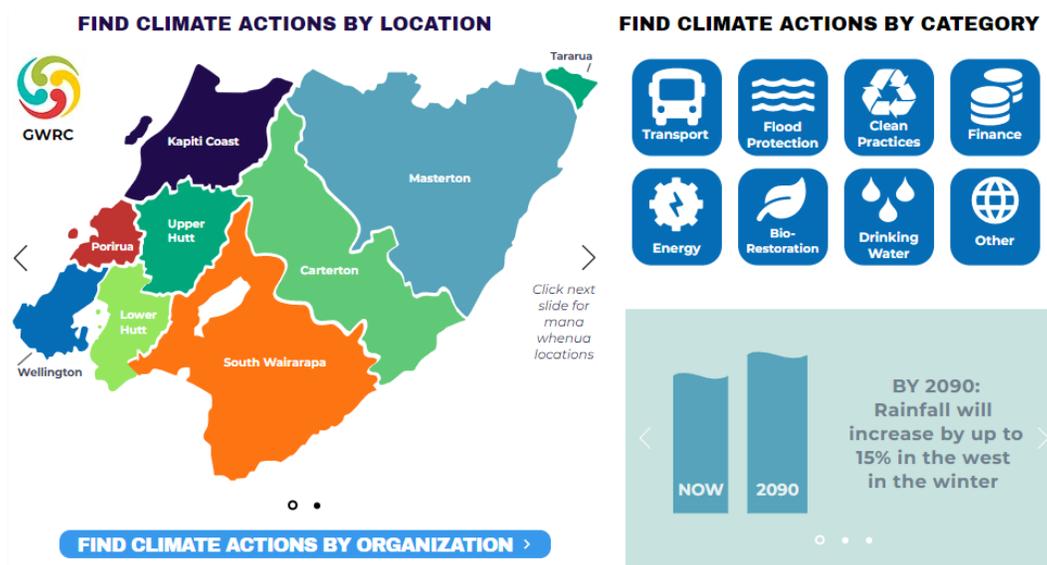
4.4 - Identify How to Present Climate Action Efforts

Resource Design Feedback

Our resource design feedback group consisted of three members of the WPI community, who were asked to provide reactions to our online resource prototype. Regarding readability, all participants agreed that the website headers and district names should be in a larger font size so that they are clear and legible. For the interactive regional map (shown in Figure 13), the participants also suggested changing the font color to maximize contrast to the region background.

Figure 13

Interactive Regional Map on the Homepage



Clickable links were cited as a necessity for all aspects of the resource. For council pages, one participant suggested that email addresses should be clickable so that a viewer would not have to leave the page to contact the council. Participants agreed that the initial light background for the category buttons (shown in Figure 13) should be changed to appear clickable. Similarly, participants said that the council goals listed on each territorial authority page should be clickable links that direct the viewer to current climate initiatives or action plans. Comments related to the color scheme of the website were mostly positive. Complaints were that some of the darker colors included in the article bar and GWRC goals section drew attention away from other information. However, overall participants enjoyed the chosen color scheme.

Participants agreed that the website layout was good, but that there were a few adjustments that could increase clarity. The scrolling facts box (shown in the bottom right corner of Figure 13) overwhelmed participants, as the slides switched too fast. Another participant indicated that the purpose of the website needed to be clearly stated and suggested moving the story of the website to the top of the page. Participants thought that the Basic Climate Story, which presents general climate information in an illustrated style, had too much space above and below the text. Our adjustments based on this can be seen in Figure 14 and Figure 15.

Figure 14

A Before Image of the Climate Story Page

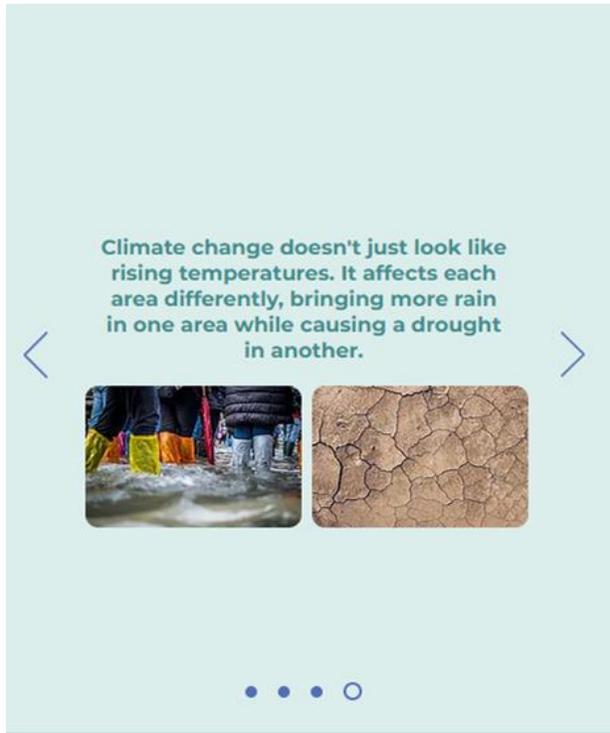


Figure 15

An After Image of the Climate Story Page



Resource Design Interview Results

In our interview with a Computer Science Professor at WPI, we received helpful insights related to the testing, design, and implementation of our resource. This professor suggested using a qualitative approach to usability testing so that participants would verbalize their experience with the resource while performing specific tasks. This interviewee suggested that it would not be possible to implement a fully designed climate change resource during a 7-week project. They cited an example where a professional contractor was hired to implement a website for [IEEE VIS](#)

(shown below in Figure 16), a visualization and visual analytics computer science conference. The project ran for about 6 months and several other consultants were brought onto the project. The use of an interactive regional map (detailed in Appendix H) in our design is difficult to implement without professional experience.

Figure 16

IEEE Visualization forum homepage



(IEEE Computer Society & Visualization and Graphics Technical Committee, 2021)

In another interview with an employee of the [WPI Global Lab](#), we were given further insights regarding the design of the resource. They suggested a general color scheme, consistent art-style, cohesive text style, and minimal amount of text so the resource will be easy to use and less overwhelming to the user. They also had multiple suggestions for improving accessibility. This includes using readable and dyslexic-friendly fonts, enabling color blindness support, resizing text when magnifying the webpage, and supporting screen readers. Their final suggestion was to determine a target demographic for the users of the web resource, which we accomplished through our research in the first objective. This would be used in emphasizing the overall goal, as well as determining how to more effectively approach the website's design.

In our final resource design interview with another [WPI Global Lab](#) employee, we were given more detail about how this resource could be technically implemented. In order for this resource to be implemented as effectively as possible, they suggested consulting and contracting a development company that is familiar with the types of features included in the resource. There could be potential ownership issues and New Zealand legal constraints if the website continued to be developed on the existing Wix platform. Therefore, the chosen development company would need to be comfortable working with a New Zealand government agency, and aware of any national privacy or accessibility laws that accompany working with GWRC. The interviewee suggested using a company such as [Technology Solutions](#), who developed [Masterton District Council's website](#). They also gave suggestions of ways to moderate and curate the resource once it is developed. This would involve hiring subject matter experts in the field of local governance and climate change communication to handle the moderation and curation of the resource content for each council. Having a subject matter expert handle updates would minimize the amount of people who require training to modify the resource.

4.5 - Discussion of Results

The results taken together show disparities between the regional councils and related agencies, which vary significantly in terms of climate action plans, strategies, accomplishments, outreach, and progress. Many mana whenua and territorial authorities face barriers in resource and funding which slows their climate action implementation. GWRC has the greatest scope, not only with climate adaptation and mitigation, but also with strategies and collaboration opportunities. The climate action resource will help agencies facing institutional barriers unify their approaches to climate action so that cross-agency collaboration is more achievable.

The information we have gathered shows a general theme of prioritizing story-based communication, visuals, and multimedia presentations of information. We were surprised that interviewees placed importance on showing climate change through stories and connecting information to users' daily lives as our group had not previously considered storytelling as a feature of an action resource. It was also beneficial to learn that many territorial authorities consider an easily updatable resource a priority because they may only have a few dedicated climate scientists in their council. Finally, we shifted to further pursue the framework of

mātauranga Māori, because interviewees indicated the value of collaborating with Māori representatives in this aspect of a resource.

With the information collected from the Wellington region public, it was evident that respondents had many thoughts on the resource including: how to receive notifications, the intended use, and what features are desired. Many of the participants expressed interest in an electronic newsletter for updates from the resource, so we prioritized this over other methods. A majority of respondents said they would use the resource for staying informed about climate change, climate action, and sustainable lifestyle changes, so we focused on promoting this content on the climate action resource. We also placed high priority on including these aspects of the resource that respondents indicated would be useful, such as climate action project updates and a unified list of local climate action organizations. This data was useful in determining the needed content for the unified resource.

Insight from our platform efficiency feedback group informed the design of our resource prototype. We were surprised by some of the information and made changes to the existing prototype based on what we learned. For example, after hearing the participants agree that drop down menus were sometimes hard to click on other websites, we made the ones from our prototype wider. In addition, we changed the colors of some buttons in order to ensure they were clearly clickable.

Both usability testing and the resource design feedback group helped us revise our prototype for the final stages of design. We changed the color of the buttons for finding climate actions by category, so that they appeared clickable. Unexpectedly, participants had difficulty locating the events calendar on the home page, and as a result we linked to it in the menu bar.

From our data collected across 7 weeks and our many discussions with stakeholders, we found compelling evidence to support a clear path forward for the climate action resource. Overwhelmingly, we found that climate action groups in the region are at different points of progress due to factors such as funding, staffing, and council size. Our results indicate that Aa unified resource is seen as a positive way to improve communication both between agencies and the general public. Participants in this study would like to see the use of this resource extended to the public, which means a few additional steps for promotion and exposure.

Chapter 5. Recommendations for the Climate Action Resource

Implementing a single unified climate action resource is a large undertaking that requires planned development and maintenance. Therefore, we have four recommendations which include: steps for launching the resource, its maintenance, promotion, and accessibility.

#1: Invest in an Online Unified Climate Action Resource

Invest in the continued development and launching of an online unified climate action resource that collates all regional climate action and information into one convenient location. To meet this recommendation, we suggest:

- Contracting a website development company for handling implementation.
- Enlisting an existing member from each organization as media liaison to provide information to the resource.
- Follow the general design and structure defined in the resource prototype.

We suggest hiring a website development company to implement the resource prototype we designed, rather than continuing to build off of the existing Wix platform. Wix is a useful and cost-effective tool for initially developing the website, but a professionally designed website is necessary to elevate this resource. With a professional website there is unlimited customization, the ability to have complete site ownership, and less potential regulatory constraints. Next, we recommend enlisting a member from each organization to act as a media liaison. This person will provide initial information about their organization's current climate actions to the web developers. The media liaison will also update the resource after it is implemented. Finally, we recommend following a similar structure as the website prototype. This prototype was refined with feedback groups and usability testing to be logical and efficient, and any improvements should be tested. Figures 17 and 18 provide some example images of the prototype website. For more details on the prototype, please see Appendix H for the prototype documentation.

Figure 17

Homepage of the Prototype

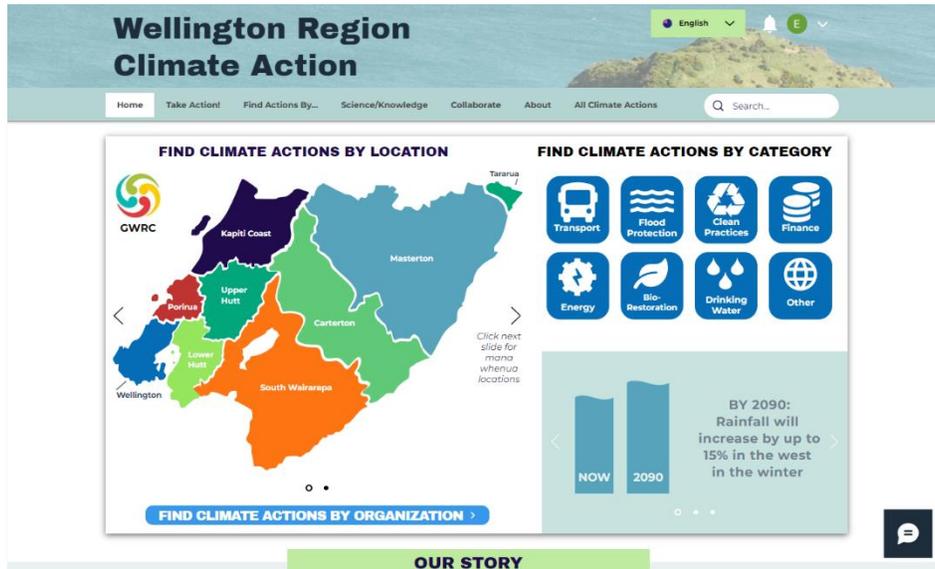
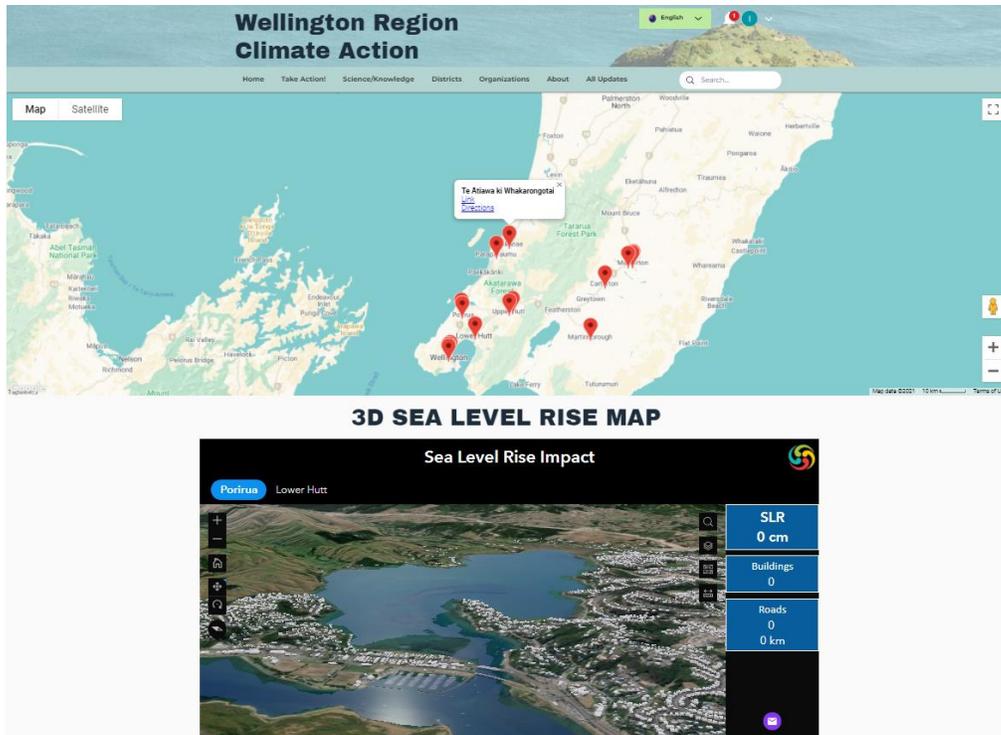


Figure 18

Maps Page of the Prototype



#2: Maintain and Update Online Unified Climate Action Resource

Keeping information on the resource relevant is important for maintaining community engagement, trust in the resource, and awareness of climate action. To that end, we suggest:

- Keeping information present on the resource current and relevant by using the designated media liaison.
- Training the media liaisons of each organization to update the online resource.

In order to keep the information on the resource relevant and up to date, the media liaison should provide regular updates to the events calendar, climate action progress, educational and event posters, and monitor the forum discussion. Regular updates of the information will enhance the relevancy and value of the resource. Individual territorial authorities should receive brief training to post updates, events, media, and documents. Articles and forum posts should be moderated by GWRC.

The media liaison will need to be informed with the resource developers on how to correctly update the resource. While the implementation of the submission process may be changed with a professional design, the basic layout and structure will remain relatively the same. For a basic understanding, media liaisons can refer to the web developers and the prototype documentation (Appendix H) for a general overview of how to submit information to the resource using the article maker.

#3: Promote the Resource

After the website is implemented, it should be promoted through a variety of means that were identified through our survey and interviews:

- Social media (Council Facebook, Instagram, Twitter, etc.)
- Posters
- Radio ads
- Newspaper ads
- Awareness campaigns
- Church and school communities

To reach the potential of such a unified resource, it is imperative that promotion occurs through all of these channels. While a unified resource in itself provides great opportunity for collaboration and engagement, it must be paired with other actions in order to bring people to the site.

#4: Add Content That is Easy to Relate to, Inclusive, and Accessible

To ensure that all users have the ability to use this resource, we have four suggestions:

- Add content that does not use overly scientific language and relates climate actions to users' lived experiences.
- Coordinate with local iwi to incorporate the ideas of mātauranga Māori into the resource prototype.
- Include accessibility measures into the final resource.

To ensure that community engagement and understanding is high, provide simplified scientific information and relate that information back to the viewer's lives. Provide examples of climate actions that all members of the public can accomplish. This will relate the information back to the users' life and foster engagement. Scientific information should be available in easy-to-understand terms and graphics.

Throughout the development and lifetime of the resource, it is critical that the resource accurately incorporates the idea of mātauranga Māori by involving Māori people in the continued development. This includes coordinating with local iwi to provide content updates to the final resource and review the site for any cultural misrepresentations. This will ensure that all perspectives are accurately represented and respected.

Ensure that the website is accessible to everyone. First, translating the resource into other languages will help reach populations, such as Māori and Polynesian communities, where English may not be the primary spoken language. A translator can ensure accuracy and messaging of the website. Second, the website should be checked for accuracy in a text-to-speech program. This would ensure that the website information is accurately conveyed by vision impaired individuals. Finally, review the color choice for graphics. Care should be taken to ensure that the use of color does not limit usability in people with colorblindness. After implementation, testing, like using a color-blindness simulation software, should be done to ensure that the resource is accessible.

Additional Observations

Many of the territorial authorities and mana whenua are facing barriers that prevent them from being able to regularly update a resource, such as this website. A recurring theme in interviews with members of the territorial authorities is that the councils lack staff. This causes

members of the councils to take on multiple roles, leaving them with little availability to dedicate to the resource. This is a challenge when considering regular newsletters and events updates as options for the resource. While this is out of the control of our team and we cannot make recommendations to solve this aspect of local coordination, it was an important observation we identified when conducting interviews.

Chapter 6. Conclusion

A platform that assembles current missions and climate actions of different regional organizations will enable organizations to locate information about initiatives undertaken by the network of local agencies. A unified platform can also act as a hub for collaboration between organizations, reduce overlap in climate actions, aid in unified communication of initiatives, and serve as a central resource to build public awareness for climate action. This directly aligns with the [third objective](#) of GWRC’s mission, which is to raise community awareness of mitigation and adaptation for climate change (Greater Wellington Regional Council, 2015).

This resource aligns with the [13th United Nation Sustainable Development goal](#), which is to “Take urgent action to combat climate change and its impacts” (United Nations Division for Sustainable Development Goals, n.d.). The logo for this development goal can be found in Figure 19. A unified resource would foster an overarching vision for climate action strategy as the Wellington region, and the world at large, confronts climate change. There is considerable interest among the majority of stakeholders to use this resource, and most contributors believe that it will save energy, time, and money long-term. This resource will assist GWRC to host a unified platform that can lead the way for climate actions. When conducting our resource content interviews, all participants indicated that a unified climate action resource would improve communication between agencies and with the public, and potentially encourage people to get involved in local climate actions. Having all contributing organizations provide information for their organizations will make this a truly unified resource. We believe that this resource will be an important step in coordinating efforts against climate change, in support of the 13th UN Sustainable Development Goal.

Figure 19

*Logo for the 13th UN
Sustainable Development*



(United Nations Division for
Sustainable Development Goals,
n.d.)

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Appendix

Appendix A: Contributor Interview Guide Part 1 - Mapping the Network

1. What do you do in your work as _____?
2. How is your agency able to support climate actions? Do you support climate actions through enforced policy, law making, or general recommendations?
3. How have you been promoting climate action?
 - a. In your opinion, how well are the current local climate actions being promoted?
4. How do you communicate with the general public in your district/city?
5. How has the public responded to any climate action that this group has conducted?
6. In your opinion, how effective has the climate change adaptation and mitigation process been within this group's region?
7. What challenges, if any, has this group faced in implementing climate actions?
8. Do you commonly partner or collaborate with other agencies on climate change action?
 - a. If so, who do you partner with?
 - b. Could these partnerships be improved? If so, how?
 - c. What is effective in your collaboration?
 - d. What is not effective in your collaboration?

Appendix B: Contributor Interview Guide Part 2 - Resource Content

1. Right now, where would you search to find information on different local climate change actions?
2. In what situations would you have to search for different local climate change actions?
3. In your opinion, would you or your agency use this climate action resource?
 - a. If yes/no, why?
 - b. If not, is there a similar replacement for what we might be looking for?
 - c. If yes, how often would you use it?

If the interviewee would use this resource...

1. How would you or your agency use this resource?
 - a. To coordinate actions between agencies? To communicate with the general public?
2. In an ideal collaborative climate action resource, what would you like to see? What would you not like to see?
 - a. Some examples:
 - i. Updates about ongoing climate action projects in the Wellington region
 - ii. Map/location of current climate actions
 - iii. A climate actions events calendar
 - iv. Updates to Climate Action Plan
3. Have you come across similar climate action sites that could be used as a reference?
4. Aside from an online website/platform, is there any other format for a resource that you think would be more effective?
5. How would you want to contribute your climate action content to the resource?
 - a. Some examples:
 - i. a title/body paragraph (similar to a social media post)
 - ii. Connections to your website and other resources
 - iii. Something of greater complexity
6. Would your agency have the time or capability to update a resource like this?

If the interviewee would not use the resource...

1. What, if anything, would make you interested? Are there specific features or content that would inspire you to use the resource?
2. Should there be a suggestions/improvements section within the resource about the resource itself?
3. Aside from an online website/platform, is there any other format for a resource that you would use?
 - a. Central climate change office with pamphlets
 - b. Paper Newsletter
 - c. Online Newsletter
 - d. Monthly climate change meeting/town hall

Appendix C: Survey Guide

Q1

Consent Agreement for This Survey:

Who we are: We are a team of students from Worcester Polytechnic Institute (WPI) located in Massachusetts, USA. We are collaborating with Greater Wellington Regional Council (GWRC) for an academic project, culminating in a written report.

Purpose: Your answers will help inform the creation of an online climate action resource. Your answers are non-identifying.

Procedures to be Followed: This survey will ask you to reflect on your opinions regarding climate change impacts and related resources. Your responses will help determine if there is a need for a climate action resource. Your participation in this survey is voluntary.

Confidentiality: Any publication or presentation of the data will not be used to identify you.

We may collect statistical information about your visit to help us improve the site. This information is aggregated and does not identify you personally. It includes:

- Date and time that you started and completed the survey
- Language that you completed the survey in

If you have any questions, comments, concerns, or wish to remove your responses at any point, please contact gr-gwrc-c21@wpi.edu.

Q2 What is your age?

- 0-17 (1)
- 18-24 (2)
- 25-34 (3)
- 35-44 (4)
- 45-54 (5)
- 55-64 (6)

65-74 (7)

75-84 (8)

85+ (9)

Q3 What is your gender identity?

Male (1)

Female (2)

Other (3) _____

Prefer not to say (4)

Q4 What is your occupation?

Student (1)

Unemployed (2)

Employed (3)

Retired (4)

Other (5)

Prefer not to say (6)

Q5 What is your position on climate change?

- Important, imminent threat (1)
- Important, will be resolved in near future (2)
- Not important, plenty of time to resolve (3)
- Not important, not well understood (4)

Q6 How would you rate your scientific understanding of climate change?

- Poor (1)
- Fair (2)
- Good (3)
- Very Good (4)
- Excellent (5)

Q7 How would you rate your understanding of climate change impacts in the Wellington Region?

Some examples are:

- Sea level rise Beach erosion
- Loss of biodiversity
- More temperature extremes
- Changes in rainfall
- Changes in growing season, etc.

- Poor (1)
- Fair (2)

Good (3)

Very Good (4)

Excellent (5)

Q8 Which of the following current climate change mitigation and adaptation actions being taken in the Wellington Region are you familiar with?

Transition to all Electric Buses (1)

Whaitua Committees for Water Protection (2)

Akura Plant Nursery for Erosion Control (3)

Environmental Monitoring Research (4)

Key native ecosystems project (5)

Protecting Porirua harbor (6)

The Pukaha to Palliser Alliance (7)

Enviroschools (8)

Other (9) _____

Q9 If an online resource compiled information about local climate actions, how would you like to get updates from a climate action resource?

Electronic newsletter (1)

- Emails (2)
- Text notification (3)
- Voluntarily accessing the resource only (4)
- Would not access this resource (5)
- Other (6) _____

Q10 How will you use this resource?

- To distribute information in classrooms (1)
- To keep informed about climate change (2)
- To keep informed about climate action efforts (3)
- To get involved in local climate actions (4)
- To make sustainable lifestyle changes (5)
- To use in a professional environment (6)
- Would not access this resource (7)
- Other (8) _____

Q11 If an online resource for local Wellington Region climate actions was created, what information would you like to see on it? (Select all that apply)

- Sign-up information for climate action volunteering opportunities (1)
- Map of current climate actions (2)
- List of organizations working on climate action (3)
- Updates about ongoing climate action projects in the Wellington region (4)
- General info about the threat of climate change to the Wellington region (5)
- Information about climate action collaboration between different agencies in the Wellington region (6)
- Information about specific climate change impacts that different agencies face in the Wellington region (7)
- A climate actions events calendar (8)
- A summarized climate action dashboard/display (9)
- Would not access this resource (10)
- Other (11) _____

Q12 Would you be willing to participate in a feedback group related to your experience using platforms in your daily life, such as websites, infographics, books, dashboards, etc.? Please email gr-gwrc-c21@wpi.edu if you are interested.

Yes (1)

No (2)

Q13 Would you be willing to participate in a feedback group related to the layout, colors, graphics, and interactive elements of this climate action resource? Please email gr-gwrc-c21@wpi.edu if you are interested.

Yes (1)

No (2)

Q14 Do you have any other comments?

Q15 Do you think this survey could be improved? If so, how can it be improved?

Appendix D: Platform Efficiency Feedback Group

Introduction:

We are developing a resource for Greater Wellington Regional Council (GWRC). This resource will be used by officials & the public to quickly access information on current climate mitigation and adaptation actions led by groups in the Wellington Region.

To create the most effective, and useful resource, we will ask questions about how you navigate websites and other media. We will also ask your opinion on how features such as drop-down menus & search bars help you find what you need from a platform.

Before we start, we will say:

1. For this project, we will be recording our interviews. By appearing on camera/audio, you consent to the use of your image/voice for the purpose of our educational project which may be published on the WPI website.

Start:

2. What types of informational platforms do you interact with daily in your personal life and in your professional life? (Websites, infographics, books, dashboards, posters etc.)
 - a. If they can't think of any useful websites, here are some examples:
 - i. <https://www.nzherald.co.nz/>
 - ii. <https://www.stuff.co.nz/>
 - iii. Facebook or other social media sites

Needs of Platforms:

3. For what purpose do you use this platform?
4. What made you choose this platform?
5. Is that purpose fulfilled when you use the platform? Does the platform serve its purpose? Or are there things the platform could do better in terms of features?
6. How do you get updates and notifications from this platform?

Things done well/improvements:

7. What do you like about the layout/experience of using this platform?
8. What do you dislike about the layout/experience of using this platform?

9. When you navigate the platform, which features do you use because they are efficient? (Search bar, table of contents, section headings, menu, etc.)
10. When you navigate the platform, which features do you avoid because they are confusing? (Search bar, table of contents, section headings, menu, etc.)

Closing:

11. When recommending a platform to a friend, what specific features would you mention?
12. What are the 3 most important features, besides content, that you would like informational platforms to have?
 - a. Example:
 - i. <https://www.boston.gov/departments/environment/boston-climate-action>
13. Do you have any questions for us?

Appendix E: Usability Testing Guide

Introduction:

We are developing a resource for Greater Wellington Regional Council (GWRC). This resource will be used by officials & the public to quickly access information on current climate mitigation and adaptation actions led by groups in the Wellington Region.

To create the most effective, and useful resource, we will ask you to describe your experience while using a prototype of our climate action resource. Please let us know of any comments, suggestions, first reactions, etc. to this website.

Before we start, we will say:

1. Is it okay if we record this session? If it's alright, we will only be using the audio recording to take anonymous quotes for our report.
2. Any questions before starting?

Website for Testing

Questions:

1. In this test today, you will use the prototype to complete the following tasks (we will ask for feedback after each task):
 - a. Find the Upper Hutt City Council page
 - b. Find the events calendar
 - c. Find the climate story and read through it, providing any reactions you have to it
 - d. Please find the Ngāti Toa Rangatira mana whenua page
 - e. Find the climate action strategy document for the Porirua district
2. Did you find the user interface to be intuitive?
3. Did you enjoy how you maneuvered through the site, and went from page to page? How would you improve this?
4. Any glaring issues that you spotted with the prototype? Any improvements you would recommend in terms of features?

Appendix F: Prototype Feedback Group

1. Begin feedback group on Zoom, moderator will state the below consent script:
 - a. This project is recording a feedback group as part of an educational project. By appearing on camera/audio, you are consenting to the use of your image/voice for the purpose of our project which will be published on the WPI website.”
 - b. “Please say and spell your name, and your title (if applicable).”
 - c. [person states name, etc. Then YOU say] “We are here on [say the date] to talk about our prototype climate action information platform. The goal of this platform is to compile and highlight climate change actions from agencies and organizations in the Wellington Region.”
 - d. “Please state your current background regarding climate change, and any issues due to climate change you have dealt with (if applicable).”
2. Walk through and share the platform prototypes to the participants, and use the interactive elements.
3. Initial design reaction questions for the group:
 - a. What are your opinions on the layout of the user interface or other elements?
 - b. What are your opinions on the use of the specific colors and graphic choices for the prototype?
 - c. [When observing specific graphical elements] What do you think the intent of this graphical element is? There are no right or wrong answers.
4. Open up the discussion to allow for collaboration between participants, and ask follow up questions if required.
5. Ask if participants have any further questions regarding the platform.

Appendix G: Expert Interview Guide

Sample Questions after introducing the goals of our project:

1. What piece of advice do you have for this project and what we have so far?
2. After our explanation of our project, what types of design elements do you think would work well in our prototype?
3. What are some best practices for basic website design?
4. What are some best practices that should be followed for accessible design?
5. What features would make it easier for information to be uploaded to the resource?
6. Some interviewees suggested using story maps to provide information, how do we go about creating them?
7. We plan on having usability testing sessions soon. How should we go about getting our prototype in a pseudo-functional state?
8. Is there any other information you can provide that you think we should know?
9. Do you have any contacts that we could also reach out to for advice?

Appendix H: Prototype Documentation

Prototype Documentation

[Link to prototype](#)

Intended Use of Prototype:

- Condense all local climate actions into one space
- Facilitate collaborative efforts between agencies
- Engage the general public
- Serve as a one-stop resource for elected officials, educators, or others to quickly gauge the extent of climate actions in an area

Home Page:



- Use the interactive regional map to look for climate actions, council and organization information, and social media pages by location
- Use the interactive regional map to find climate actions by the different mana whenua throughout the Wellington Region
- Find climate actions by organization
- Find climate action by category, such as transportation, energy, finance, etc.
- View upcoming events from around the Wellington region

Upcoming Events



23 Tue
Mar

The Great Plant Swap - Neighbour's Day Aotearoa / Masterton

[RSVP](#)



26 Fri
Mar

Climate Workshop Masterton / Masterton

[RSVP](#)



29 Mon
Mar

Planting Trees with Porirua City Council / Porirua

[RSVP](#)

Climate Actions by Category:

- Find climate actions related to: transport, flood protection, clean practices, finance, energy, bio-restoration, drinking water, and more

Wellington Region Climate Action

Home Take Action! Find Actions By... Science/Knowledge Collaborate About All Climate Actions

Transport





CWRC Electric Vehicle First Policy

[Read The Strategy](#)

Hello!

Electric vehicles (EVs) including plug-in hybrid electric vehicles, are one of New Zealand's biggest opportunities for reducing CO2 emissions. 85% of New Zealand's electricity is generated from renewable sources, and this percentage can be increased even as demand for EV charging increases. The pricing and capability of electric cars has advanced quickly in a short period of time and they are now practical for many Wellingtonians. Greater Wellington's support for EVs is part of its wider Climate Change Emergency response.



Location Page:

- Read about the council goals
- Find the climate action strategy for the district
- Contact the city council
- View the social media pages for the council
- Access the full council page
- Learn about the different mana whenua and organizations within the district
- See recent climate actions in the location

The screenshot displays the Wellington Region Climate Action website. At the top, the header reads "Wellington Region Climate Action" with a language dropdown set to "English". Below the header is a navigation menu with links: Home, Take Action!, Find Actions By..., Science/Knowledge, Collaborate, About, and All Climate Actions. A search bar is also present.

The main content area features a "PORIRUA CITY" banner with a "CITY COUNCIL DASHBOARD". The dashboard includes:

- Climate Strategy: Rautaki o Te Ao Hurihuri** with a "Read The Strategy" button.
- CONTACT US** section with phone number +64 4 237 5089, email enquiries@porirua.govt.nz, and social media icons for Twitter, YouTube, Facebook, and Instagram.
- GOALS** section listing: Monitor Emissions, Reduce & Offset Emissions, Divert Organic Waste from Spicer Landfill, Purchase Electric Vehicles, Plan for Sea level Rise, and Prepare Flood Communities.
- A photo of a Spicer Landfill truck with a "Read more on Council Page" button.

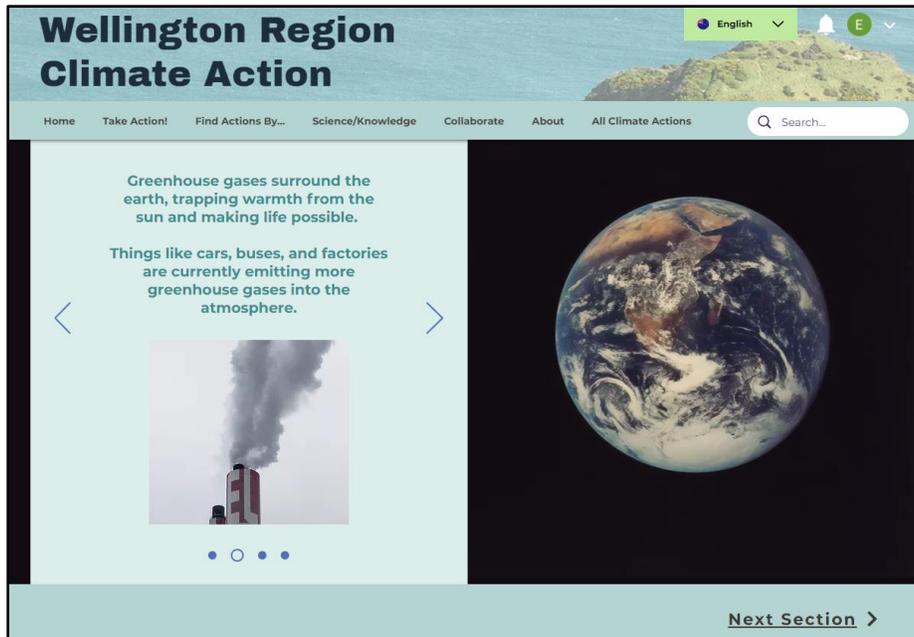
Below the dashboard is the "CLIMATE ACTIONS" section, which includes:

- GWRC and Mana Whenua Celebrate 15 Years of Partnership** with a list of participating organizations including Carterton District Council, Kaipiti Coast District Council, Hutt City Council, Masterton District Council, Porirua City Council, South Wairarapa District Council, Upper Hutt City Council, Wellington City Council, Ngāi Hapu o Otaki, Te Aisawa ki Whakarongotai, Ngāti Toa Rangitira, Taranaki Whānui, Rangiāhine o Wairarapa, Ngāti Kahungunu ki Wairarapa, Greater Wellington Regional Council, Te Awarua-O-Porirua Whaitua, Ruamāhanga Whaitua, Whaitua te Whanganui-a-Tara, Guardians of Pūatāhanui Inlet, Kaipiti Island Conservation, Local Nature Space, Masara, and Wellington Water Limited.
- Porirua City Council Announces 10 Year Plan** with a "renew" button.
- Porirua City Council** and **Ngāti Toa Rangitira** buttons.
- THE GREAT PLANT SWAP** event on Tuesday March 23 at 12:30 PM, with a "23" graphic and a "The Great Plant Swap" title.

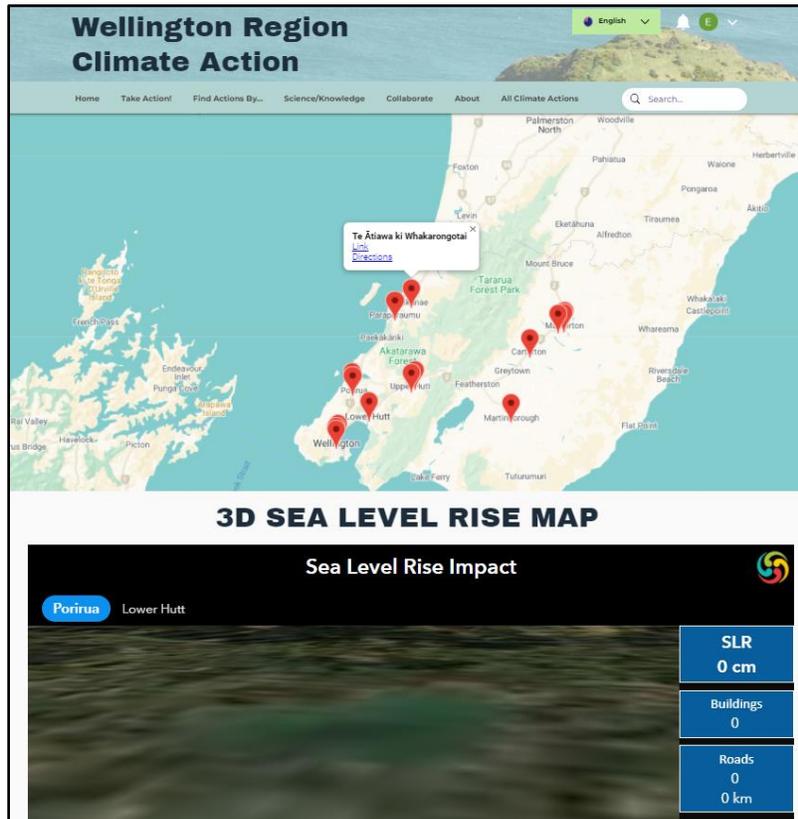
Science/Knowledge:

- Learn about mātauranga Māori and how it relates to climate change action under the mātauranga Māori tab

- View published data pertaining to climate change in the region in the Published Data tab



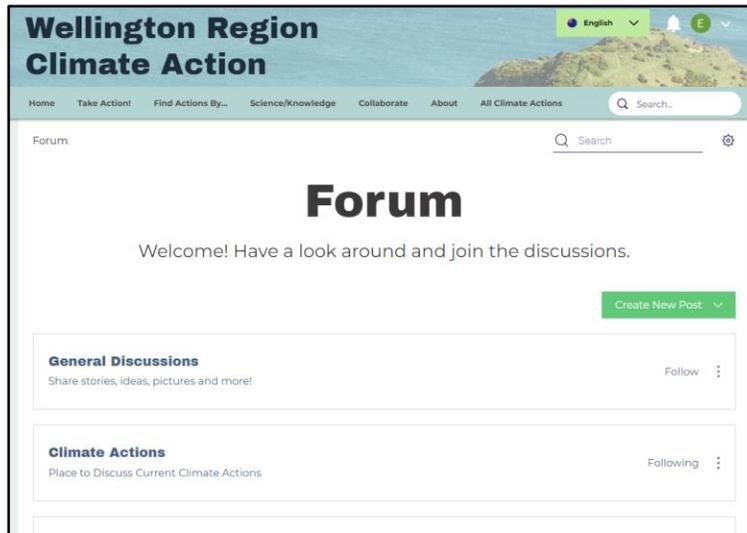
- Scroll through the story of climate change in the Basic Climate Story tab
- Read about the impacts of climate change in the Wellington Region on the next section of the Basic Climate Story tab



- View different maps from around the region pertaining to mana whenua locations, sea level rise predictions, and climate change impacts in the Maps tab

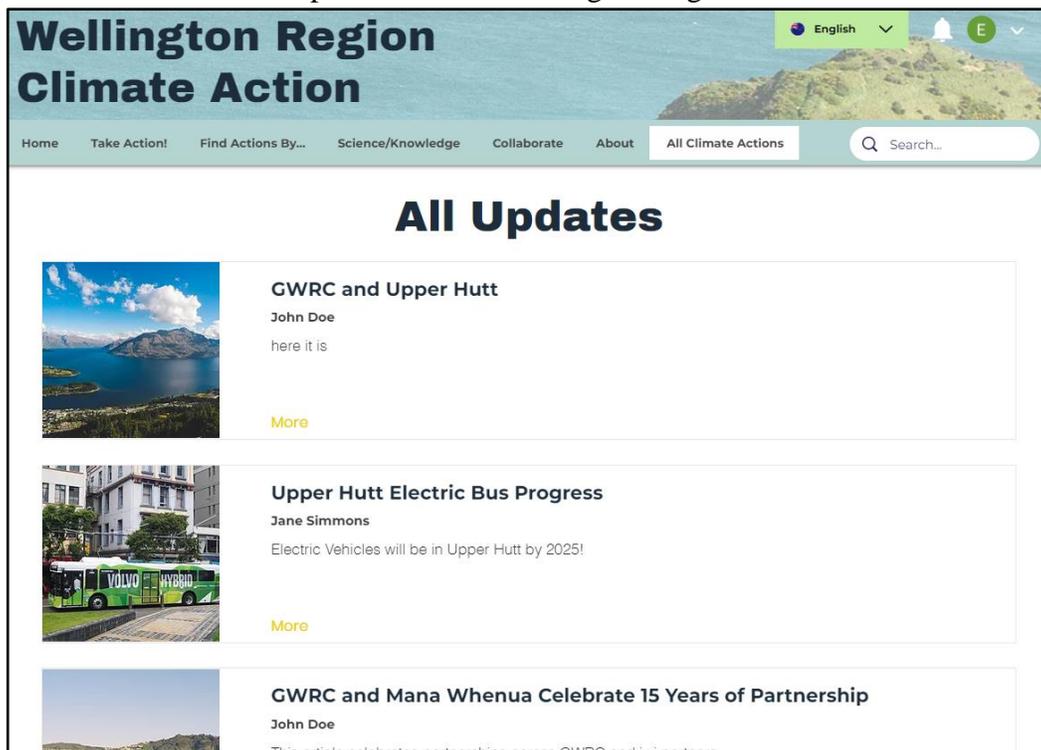
Collaborate:

- Connect with other members of the public through the forums
- Provide feedback on regional climate actions and the prototype through the give feedback page
- View GWRC's Have Your Say page



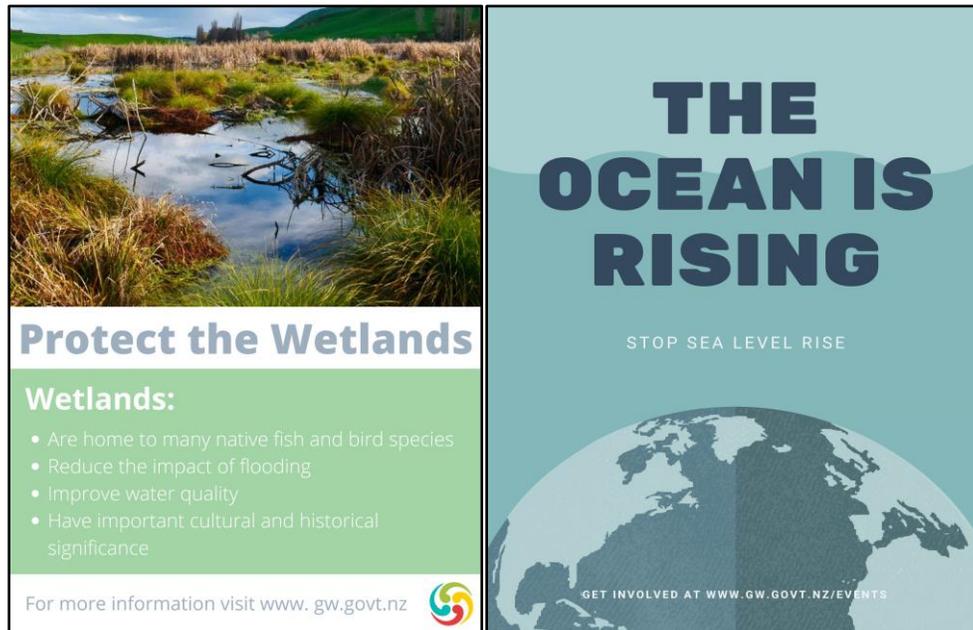
All Climate Actions:

- View all climate action posts from the Wellington Region



Take Action!:

- Learn how you can help with climate action on the “How Can I Help?” tab
- View and print educational and climate action event posters in the Wellington Region on the Awareness Materials tab
- Access the Events Calendar through the “Events Calendar” tab



How to Add Articles to the Resource:

- Use the article maker built into the Wix prototype
- Fill in all fields
- Select all Location, Topic, mana whenua, GWRC, Whaitua Committees, Territorial Authorities, and Other Organization pages that you would like the article to appear on.
- Hit “Submit”

The screenshot displays the Wix Article Maker interface, which is a dark-themed form for creating articles. At the top, a navigation bar includes links for Profile, Events, Article Maker (highlighted), Public Document Uploader, Forum Comments, Forum Posts, Files, My Account, and More.

The main form is divided into several sections:

- Title of Article:** A text input field with the placeholder "Title of Article".
- Name of Author:** A text input field with the placeholder "Name of Author" and a date field set to "03/14/2021".
- Select District Pages:** A list of checkboxes for various districts: Carterton, Kāpiti Coast, Lower Hutt, Masterton, Porirua, South Wairarapa, Upper Hutt, and Wellington.
- Select Topic:** A list of checkboxes for various topics: Transport, Flood Protection, Clean Practices, Finance, Energy, Biorestation, Drinking Water, and Other.
- Select Mana Whenua Pages:** A list of checkboxes for various mana whenua: Ngā Hapu o Ōtaki, Te Ātiawa ki Whakarangotai, Ngāti Toa Rangatira, Taranaki Whānui, Rangitāne o Wairarapa, and Ngāti Kahungunu ki Wairarapa.
- Select GWRC and Whaitua Committees:** A list of checkboxes for various regional and local bodies: Greater Wellington Regional Council, Te Awarua-O-Porirua Whaitua, Ruamahanga Whaitua, and Whaitua te Whanganui-a-Tara.
- Select Territorial Authority Pages:** A list of checkboxes for various territorial authorities: Carterton District Council, Kāpiti Coast District Council, Hutt City Council, Masterton District Council, Porirua City Council, South Wairarapa District Council, Upper Hutt City Council, and Wellington City Council.
- Select Other Organizations:** A list of checkboxes for various organizations: Guardians Of Pūatahanui Inlet, Kāpiti Island Conservation, Local Nature Space, Maara Roa, and Wellington Water Limited.

Below the selection sections, there are three upload options:

- Upload Photo:** A button labeled "Change File +" with a subtext "Max File Size 15MB".
- Upload Video:** A button labeled "Change File +" with a subtext "Max File Size 15MB".
- Upload Document:** A button labeled "Change File +" with a subtext "Max File Size 15MB".

At the bottom of the form, there is a text editor with a rich text toolbar (bold, italic, underline, text color, background color, bulleted list, numbered list, link) and a text area containing the placeholder text "How can we do it better next time?". Below the text editor is a button labeled "Publish".

How to Add Documents to the Resource:

- Use the article maker built into the Wix prototype
- Fill in all fields
- Toggle the switch on if you are uploading an awareness material, so it is included in that webpage
- Select all Location, Topic, mana whenua, GWRC, Whaitua Committees, Territorial Authorities, and Other Organization pages that you would like the document to appear on.
- Hit “Submit”

The screenshot shows a user profile for 'Izzy H' (Admin) with 0 Followers and 0 Following. Below the profile is a navigation menu with 'Public Document Uploader' selected. The main content area is a dark blue form titled 'Title of Document' with a text input field. Below the title are two 'Upload Document' and 'Upload Thumbnail' sections, each with a 'Change File +' button and a 'Max File Size 15MB' note. The form is divided into several selection sections:

- Select District Pages:** Carterton, Kāpiti Coast, Lower Hutt, Masterton, Porirua, South Wairarapa, Upper Hutt, Wellington.
- Select Topic:** Transport, Flood Protection, Clean Practices, Finance, Energy, Biore restoration, Drinking Water, Other.
- Toggle on if this is an Awareness Material:** A switch currently in the 'off' position.
- Select Mana Whenua Pages:** Ngā Hapu o Ōtaki, Te Ātiawa ki Whakarongotai, Ngāti Toa Rangatira, Taranaki Whānui, Rangitāne o Wairarapa, Ngāti Kahungunu ki Wairarapa.
- Select GWRC and Whaitua Committees:** Greater Wellington Regional Council, Te Awarua-O-Porirua Whaitua, Ruamāhanga Whaitua, Whaitua te Whanganui-ā-Tara.
- Select Territorial Authority Pages:** Carterton District Council, Kāpiti Coast District Council, Hutt City Council, Masterton District Council, Porirua City Council, South Wairarapa District Council, Upper Hutt City Council, Wellington City Council.
- Select Other Organizations:** Guardians Of Pāuatahanui Inlet, Kāpiti Island Conservation, Local Nature Space, Maara Roa, Wellington Water Limited, Enviro schools, Porirua Harbour, Pukaha to Palliser Alliance, Let's Get Wellington Moving.

A 'Publish' button is located at the bottom right of the form.

How to Sign up with the Resource:

- Navigate to the top right hand corner which says “Log In”
- Click it and enter your info to sign up

Sign Up

First Name

Last Name

Email

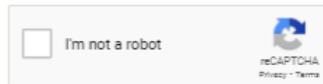
Password

Organization *

Organization

Join the community

I'm not a robot



Submit

Already a member? [Log In](#)

Appendix I: Prototype and Site Map

[Link to prototype](#)

Site Map:

- Home
 - Find Climate Actions by Location Slide 1
 - GWRC
 - Upper Hutt
 - Upper Hutt City Council
 - GWRC
 - Lower Hutt
 - Hutt City Council
 - GWRC
 - Carterton
 - Carterton District Council
 - GWRC
 - Wellington
 - Wellington City Council
 - Taranaki Whānui
 - GWRC
 - South Wairarapa
 - South Wairarapa District Council
 - GWRC
 - Kāpiti Coast
 - Kāpiti Coast District Council
 - GWRC
 - Porirua
 - Porirua City Council
 - Ngāti Toa Rangatira
 - GWRC
 - Masterton
 - Masterton District Council
 - Rangitāne o Wairarapa
 - Ngāti Kahungunu ki Wairarapa
 - GWRC
 - Find Climate Actions by Location Slide 2
 - Rangitāne o Wairarapa
 - Ngāti Kahungunu ki Wairarapa
 - Ngāti Toa Rangatira
 - Taranaki Whānui
 - Te Ātiawa ki Whakarongotai

- Ngāti Raukawa ki te Tonga
 - Find Climate Actions by Organization
 - Rangitāne o Wairarapa
 - Ngāti Kahungunu ki Wairarapa
 - Ngāti Toa Rangatira
 - Taranaki Whānui
 - Te Ātiawa ki Whakarongotai
 - Ngāti Raukawa ki te Tonga
 - GWRC
 - Upper Hutt City Council
 - Hutt City Council
 - Carterton District Council
 - Wellington City Council
 - South Wairarapa District Council
 - Kāpiti Coast District Council
 - Porirua City Council
 - Masterton District Council
 - EnviroSchools
 - Wellington Water Limited
 - Porirua Harbour
 - Maara Roa
 - Pukaha to Palliser Alliance
 - Local Nature Space
 - Let's Get Wellington Moving
 - Guardians of Pāuatahanui Inlet
 - Kāpiti Island Conservation
 - Find Climate Actions by Category
 - Events Calendar
- Take Action!
 - How Can I Help?
 - Awareness Materials
 - Events Calendar
- Science/Knowledge
 - Basic Climate Story
 - How Can I Help?
 - Mātauranga Māori
 - Maps
 - Published Data
- Collaborate
 - Forum

- Give Feedback
- Have Your Say
- About
 - Members
 - Profile
 - Events
 - Article Maker
 - Public Document Uploader
 - Forum Comments
 - Forum Posts
 - Files
 - My Account
 - More
 - Notifications
 - Settings