Terrace Community Report:

Climate Change Adaptation Planning for Northwest Skeena Communities

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COMMUNITY ACKNOWLEDGEMENT

This report authored as much by the community of Terrace as by the researchers listed above. In particular we thank the people who gave generously of their time to participate in interviews and other meetings and engagement related to the project.

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1.0   INTRODUCTION

The Skeena Community Adaptation Project (SCAP) is a joint venture between the University of British Columbia, Coast Tsimshian Resources, Ecole Polytechnique Fédérale de Lausanne, University of Victoria, BC Ministry of Environment, Environment Canada, World Wildlife Fund, ESSA Technologies Ltd., Cortex Consultants Ltd., Brinkman Forest Ltd., and BC Ministry of Forests, Lands and Natural Resource Operations. The goal of this project is to combine biophysical modelling, sociology and community engagement in a shared learning approach to build regional adaptive response capacity.

Social science researchers from the University of British Columbia were charged with the task of examining current community issues related to natural resources and the environment, collective understandings of environmental change, relationships with the resources important for community well-being, and the ability of communities and local institutions to respond and adapt to future challenges. The purpose of the sociological study was to provide a basis of social context for scientific modellers and external researchers. The information contained in this report is provided to support the rest of SCAP research team by placing scientific studies within the context of observations of the localized changes, relationships between residents and the environment, and relationships between various key groups and institutions. This serves the overall purpose of strengthening the relationship between the community and agencies that produce scientific knowledge about the environment and the local resource base.

The study region included the municipalities of Terrace and Prince Rupert, and the First Nations community of Lax Kw 'alaams (Port Simpson). Fifty people were interviewed in each community, with a focus on persons involved in resource management, community leadership and development, and forestry and other natural resource industries. The responses contained in this report are derived from a purposive sample that is intended to explore and present the opinions, perspectives, and understandings of community members that occupy key positions in the community in order to better understand how scientific knowledge and specialized tools may be used for planning around resource use and potential future scenarios.

This report summarizes data collected by the sociology team in Terrace. Respondents included town councillors, business owners, educators, workers, and members of local non-governmental

organizations. Each respondent participated in a semi-structured interview lasting between one and two hours, answering questions regarding various topics that included:

- Identification of key community and natural resource issues.
- Assessment of the impact of climate change on natural resources and the community.
- The adequacy of information on climate change and the environment.
- Their job and its relationship to environmental and natural resource issues.
- The relationships between their organization and other groups, institutions, and communities.
- The ability of the community to cope with climate change.
- Their vision of the community's future.

Respondents also filled out a set of charts (matrices) that assessed their opinions on the condition of natural resources and community resources, changes in the condition of the resources, the importance of the resources to community well-being, and the importance and influence of key factors of change in shaping community futures.

Section Two of this report outlines the general characteristics of the respondents contributing to this study. Respondents were asked about their natural resource usage, and their history of living and working in the area in order to provide a background to the perspectives they brought to the interviews.

Section Three examines what is valued within the community and the main issues facing the community today. This information is reviewed to determine which resources are most important to the community and how these resources may have changed over the past 20 years. The findings provide a general sense of change in the community and the environment, the direction of such changes, and direct assessments of specific natural and community resources.

Section Four explores understandings of potential linkages between climate change and the key issues that define life in the community. Perceptions of change are explored in more detail, and the role of climate change is highlighted and placed into context with other forces that may influence the current and future shape of the community and region.

Section Five of the report focuses specifically on climate change, and the sources of information that shape localized understandings of this issue. Attention is paid to the perceived trustworthiness of scientific information and other sources, and the adequacy and applicability of climate change information to the local area. These findings assist in understanding the context of potential working relationships between members of the scientific team and the community, and help identify specific issues and resources about which more information and research is desired.

Section Six explores competing visions for the future of the community, and examines the various pathways that local leaders and resource leaders see for the community in future years. This section explores both critical and optimistic assessments of community futures, as well as ideas about the courses of action that should be taken by community leaders.

Section Seven looks at local institutions and organizations, and their individual and collective abilities to deal with the potential impacts of climate change and other environmental challenges. This section examines institutional arrangements and perceptions of organizational efficacy. Information is presented regarding the ability of local agencies to deal with key natural resource and environmental issues, and the relationships and arrangements that either enable them to act or present obstacles to their progress in dealing with current challenges and their ability to move towards their visions of their community in the future.

2.0   RESPONDENT CHARACTERISTICS

Respondents were sought out based primarily on their occupation, and according to input from other respondents regarding which people in the community should be consulted during the research project. Letters describing the research project, its members, and its purpose were sent to respondents in advance of the interviews, along with permission forms that outlined the use of their information and steps taken to ensure the confidentiality of their responses.

Table 1

Age of Respondents	
Less than 25 years	1
25-40 years	7
40-55 years	23
55-70 years	14
More than 70 years	5

A total of 39 men and 11 women were included in the final pool of respondents. Respondents ranged from 24 to 75 years of age. The majority of respondents (68%) were identified as very long term residents who had lived in Terrace for 20 or more years. Smaller percentages of the respondents had lived in the area for ten to twenty (14%) years, and for one to ten years (18%). This sample provided a collection of well-established perspectives on the community in its present and past forms, without excluding important viewpoints of people that were born elsewhere and moved to Terrace later in life.

The sample covered a wide range of people in various positions within the community (see Table 2). An effort was made to seek out individuals at different levels of responsibility within the many different occupational sectors involved in natural resource usage and management of environmental issues (see Table 3). The sampling process utilized a snowball methodology, in which respondents were asked to help identify other community members directly involved in dealing with or managing resource and environmental issues, and people who are directly affected by such issues. Multiple starting points were selected for the snowball process to ensure that a wide range of the community was included. As the interviews progressed and the same names continued to be mentioned as potential interview candidates, the researchers were able to confirm the breadth of the sample and the depth of coverage.

Table 2

Occupational Sector of Respondents			
Primary job sector		**Secondary job sector**	
Government	19	Government	3
Forestry	11	Forestry	7
Retired	5	Education	2
Environmental NGO	3	Community NGO	2
Environmental Research or consulting	2	Retail	2
Tourism	2	Real estate	2
Community NGO	2	Environmental NGO	1
Media	2	Health	1
Retail	1	Recreation	1
Service	1	Fisheries	1
Real estate	1	Transportation	1
Education	1	Mining	1
		Environmental Research or consulting	1
		No secondary role	25

Table 3

Level of responsibility	
Community leader	2
Councillor	6
High level manager	2
Mid level manager	11
Small operation manager	7
Administrator	3
Sole proprietor	6
Resource worker	5
Other worker	2
Retired	6

Table 4

Job Sector	
Public sector	23
Private sector	19
Retired	5
Non-government organization	3

Respondents included 23 members of the public sector, 19 members of the private sector, three members of non-governmental organizations, and five retirees (based on primary occupational sector) (see Table 4). The majority of respondents engaged in a moderate to high level of community participation and volunteerism, with 22% of respondents being heavily involved in numerous leadership roles and devoting more than 10 hours per week to these activities (see Table 5). A larger portion (44%) spent between two and ten hours per week participating in various community and volunteer activities with some leadership roles. Only 18% of respondents played a minor role of less than two hours per week, and 16% of respondents held no involvement in community or volunteer roles. This range of respondents provided input from people with varying levels of involvement in community and social development.

Table 5

Volunteerism and Community Participation	
High level of involvement	11
Moderate level of involvement	22
Low level of involvement	9
No involvement	8

Respondents also provided information regarding their level of resource usage based upon their personal and occupational reliance upon forest resources, fish, berries, and other non-timber forest products (see Table 6). Only two respondents were identified as high resource-users with their reliance upon the mentioned natural resources exceeding 25% of their personal income and/or food sources. Thirteen respondents were identified as medium-level resource-users who make heavy personal use of the resources but derive less than 25% of income from the resources. The majority of respondents (32) were identified as low-level resource-users that derive only a small amount of food or income from fish or forest resources, and three respondents reported no resource usage at all. These characteristics show a wide spectrum of community resource-users among the respondents included in the sample, without deference to any specific user group.

Table 6

Natural Resource usage	
High resource users	2
Medium level resources users	13
Low level resource users	32
No resource usage	3

In summary, the people included in this study were able to provide a wide range of input on natural resource usage and associated issues in the community and the region, along with varying perspectives on the future of Terrace and the ability of the community to manage potential future challenges. It is important to acknowledge that this research does not represent the perspectives and experiences of the Kitsumkalum First Nation community, which plays an important role in the region immediately surrounding Terrace. Due to seasonal constraints, it was not possible to arrange for participation of Kitsumkalum residents at the time of this research.

3.0   VALUED RESOURCES AND COMMUNITY ISSUES

Key Messages

- Small business development and the forest industry are the most highly valued community resources.

- Sharp declines are believed to have occurred in small business and the forest industry over the past 20 years

- Many community resources are believed to have improved, including environmental protection, access to skills training and education, outdoor recreation, tourism, and local government and city administration.

- Respondents tend to see many improvements in community resources, but perceive a generalized decline in the conditions of natural and environmental resources.

- Rivers and waterways and drinking water are the two most highly valued natural resources. Although a slight decline is perceived in the condition of rivers and waterways, the condition of water resources are seen as having remained relatively stable in comparison with other parts of the environment.

- There is a distinct perception of declining conditions in oolichan, salmon, timber supply, forest health and diversity, and mushrooms.

- Economic matters revolving around the decline of forestry and the search for new industrial partners was the issue seen as being most important for Terrace and its future.

- The decline of forestry and the loss of secondary manufacturing jobs is associated with important social issues, such as youth and workers leaving town for opportunities elsewhere.

- The development of new industrial opportunities in forestry and in energy and mines is considered important for the community and its future. However, respondents are sensitive to the potential environmental impacts of new activities on water and fish resources.

- Climate change is seldom identified as a key issue to the community and its future.

Community-Level Resources

Respondents were asked to provide input on the social (or community-level) resources that they feel are most important to the well-being of the community (see Figure 1). Small business development and the forestry industry were the two most highly ranked community resources. Small business development was identified among the three most-valued resources by 45% of all

Terrace respondents, and six respondents identified small business development as the most important community resource. The forest industry was the second most highly ranked community resource, with 49% of all respondents placing it among the three most important resources for community well-being, and 11 people identifying it as the single most important resource. Although forestry was more frequently identified as the single most important resource, it was also ranked very lowly by many respondents, and its average (overall) ranking was lower than small business development.

Figure 1
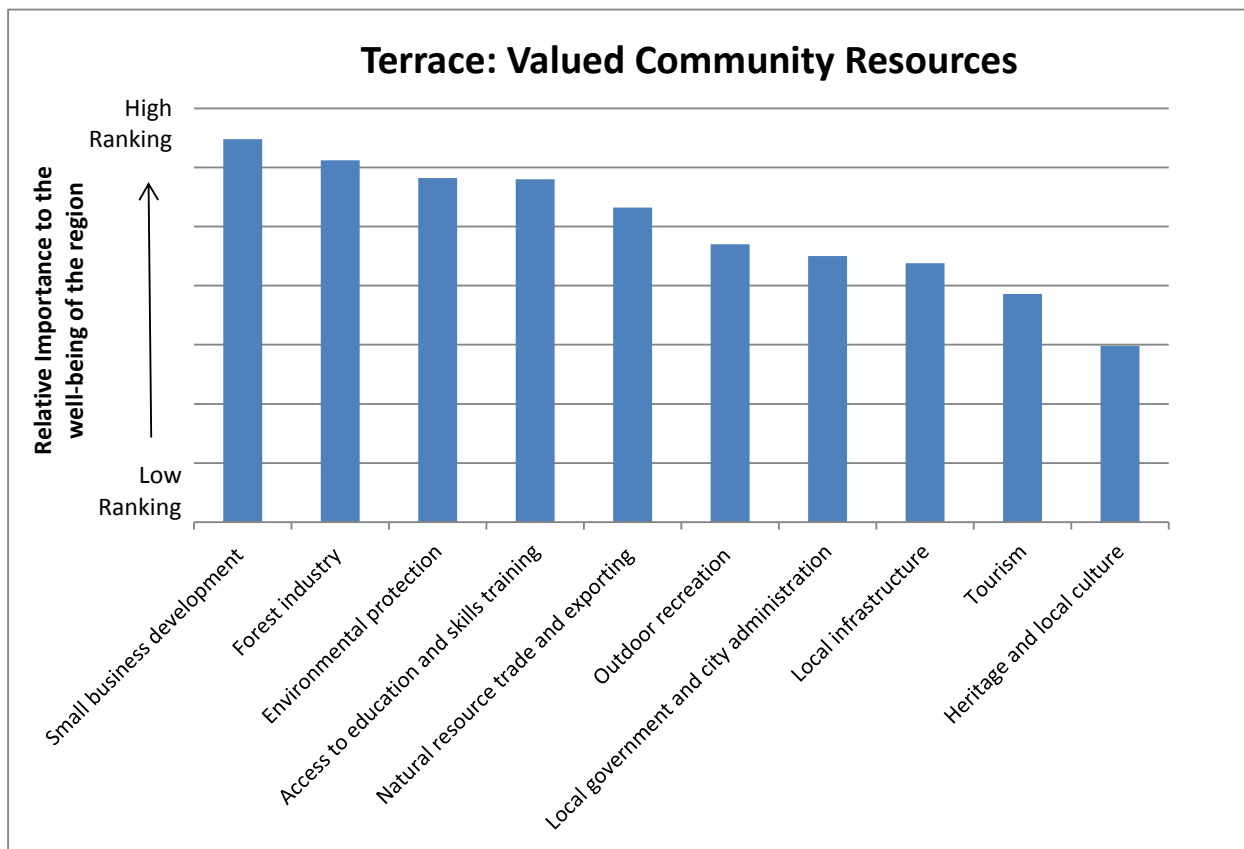
Environmental protection and access to education and skills training were ranked closely behind the leading resources, with 35% and 24% of respondents placing them among the three most important resources (respectively). Heritage and local culture, and tourism received the lowest rankings, and were rated among the top three most important resources by only 4% and 14% of respondents respectively. It is important to note that lower rankings do not correspond with a lack of importance to community well-being. All of the listed resources were presented to respondents as items that hold importance to the community, and the rankings are meant to be relative to each

other rather than absolute levels of importance. If an item was believed to lack importance to community well-being, respondents had the option of removing it from the list. The most important aspect of this data is the identification of the items deemed most important to the well-being of the community.

Respondents also identified additional community level resources that were not explicitly included in the survey, and 59% or respondents added other resources. Access to health care and social services was the resources that was most frequently added to the list of important community resources, and was included by 22% of respondents. Other additional community resources various industrial development issues (such as mining and industrial manufacturing) were included by 10% of respondents.[1]

Respondents were asked to rate community resources on a scale of 'one to ten', with 'one' representing poor conditions in which the resource is under threat and 'ten' representing very good conditions in which the resource is flourishing (see Figure 2). Respondents were asked to rate the resources on their current state, as well as the state they were in 20 years ago or around the early 1990s. This provided the opportunity to assess perceived changes in the condition of community resources over the past 20 years. Small business development (identified as the most important community resource) showed a decline in respondents' assessments of its condition, falling from an average rating of 6.6 in the past, to only 5.2 today. The foresty industry (identified as the second most important community resource), fell even more dramatically from 7.4 to only 3 .2.[2] These differences were found to be statistically significant, which means that the findings are highy unlikely to have occurred as a result of mere chance, and it is safe to assume that there is a very real perception of declining conditions in the forest industry and local infrastructure. These perceptions reflected the belief that the business centre and industrial core of the town had been severely damaged by several decades of economic and industrial recession. However, changes in the perceived condition of community resources showed more improvements than declines.

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[1] Community resources added to the list by smaller numbers of respondents included civil society; community recreation and sports opportunities; institutional presence; small town independence; First Nations history and culture; housing affordability and choice; indoor community facilities; security, fire and police; agriculture; retention of local professionals; first nations relationships, salmon fisheries; non-government leadership and civil action; social cohesion; community inclusiveness; inter-regional relationships; food security;; transportation; employment; energy; self-sustainability; research; rail system and port; rail system; political and economic services and accessibility.
[2] Difference (decline) in assessments of past and current state of forest industry was statistically significant (p<.001, paired samples t-test).

Significant improvements were reported in the perceived conditions of environmental protection, outdoor recreation, and education and skills training.[3]

Figure 2
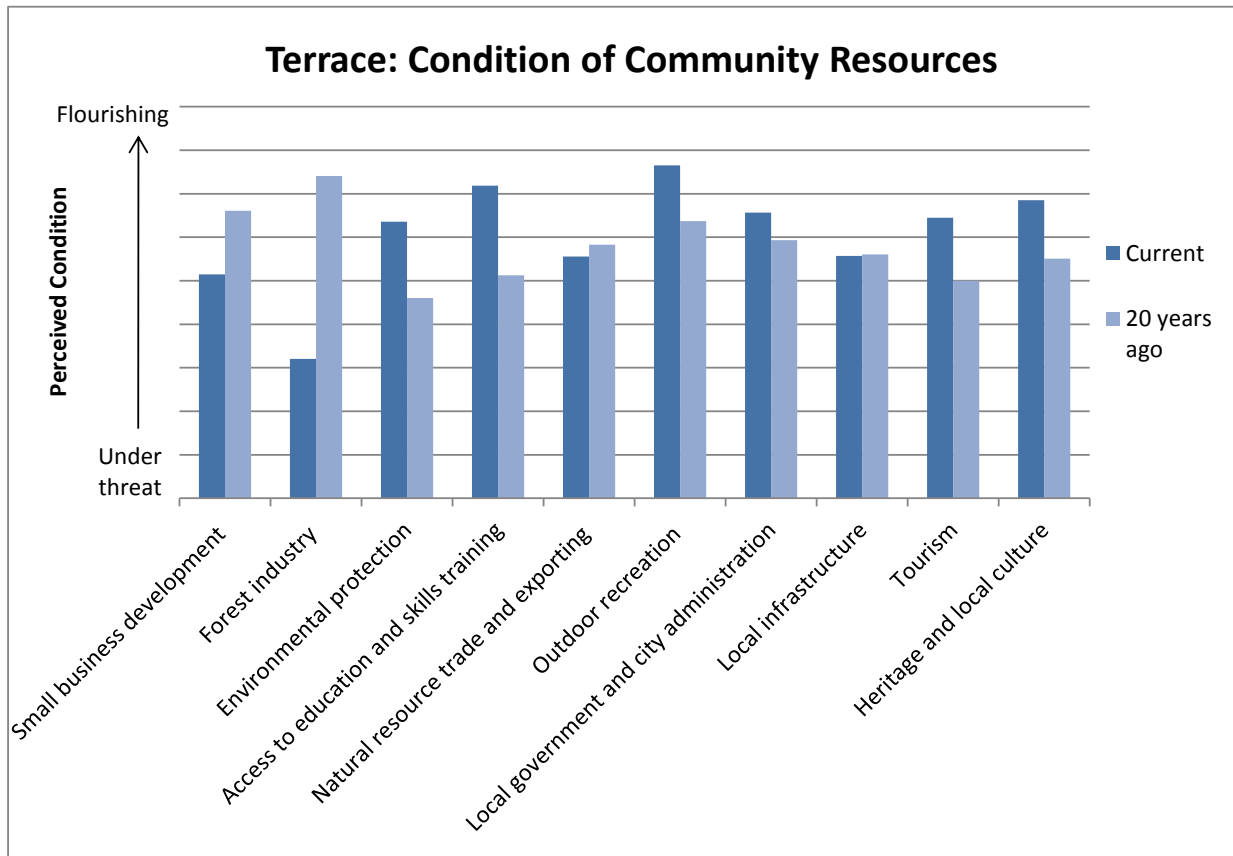
The improvement in outdoor education reflects a growing outdoor culture that figured prominently in many interviews. The improvement in education and skills training may be tied to the opening and expansion of Northwest Community College. Further improvements were reported in heritage and local culture and in tourism.[4] These assessments reflect a perception of Terrace becoming an increasingly important destination in the northwest for both out-of-towners and for people in surrounding communities. A slight (but nonetheless noticeable and signficiant) improvement was also reported in the perceived condition of local government and city administration.[5] The

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[3] Differences (improvements) in assessments of past and current states of environmental protection and outdoor recreation, and education and skills training, were statistically significant ($p<.001$, paired samples t-test).
[4] Differences (improvements) in assessments of past and current states of heritage and local culture, and tourism were statistically significant ($p<.001$, paired samples t-test).
[5] Difference significant ($p<.05$).

changes in the conditions of community resources is overlaid with their importance ranking in Figure 3. [6] This chart demonstrates the substantial decline in forestry and small business in contrast with perceptions of improvement in most other community resources.

Figure 3

### Terrace Community Resources: Condition and Ranking
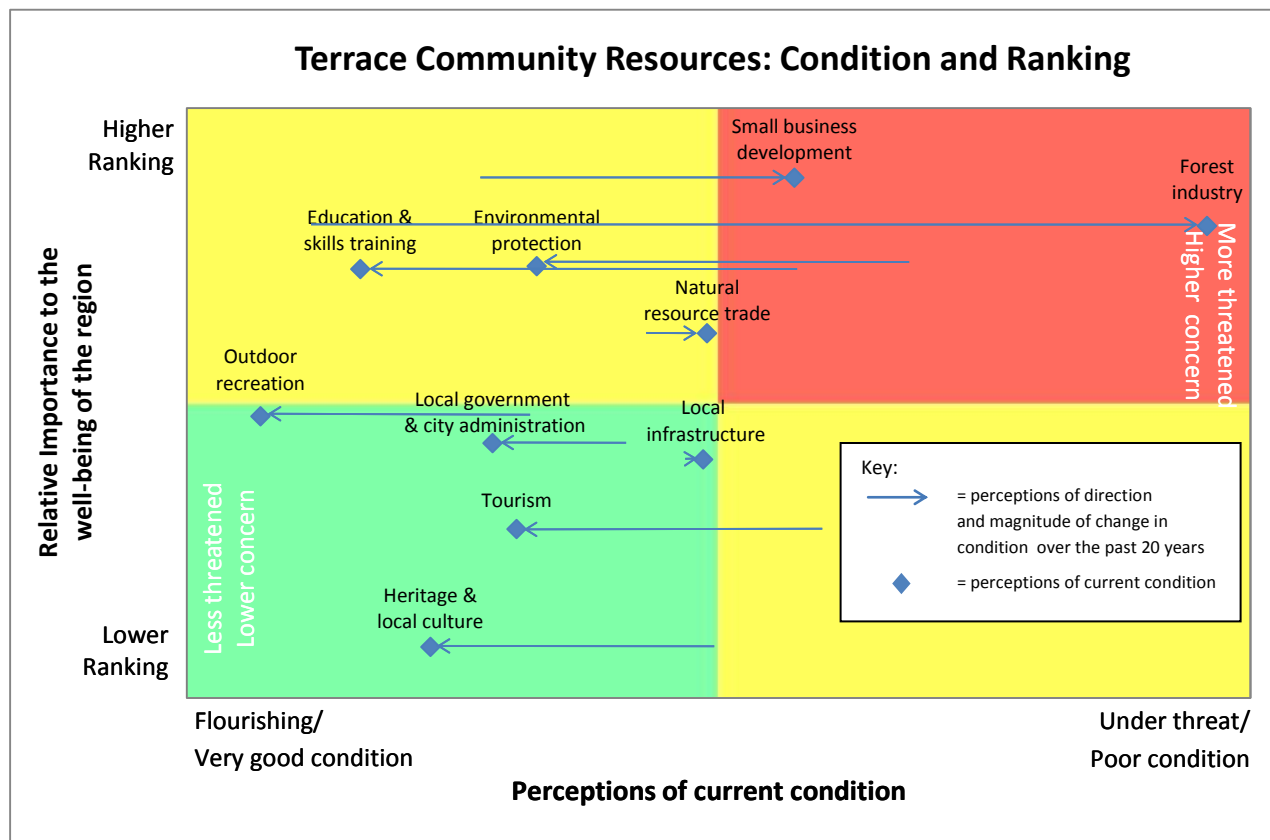
Environmental Resources

Respondents were also asked to provide input on the environmental and natural resources that they feel are most important to the well-being of the community (see Figure 4). Rivers and waterways was the most highly-ranked of the listed resources, and was identified among the three most-valued resources by 82% of all respondents and as the most important resource by 14%. Drinking water was the second most highly-ranked community resource, with 59% of all respondents placing it among the three most important resources for community well-being.

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[6] Little change was apparent among the items that respondents added to the list of resources Changes in the conditions of these resources will not produce statistically significant findings, as the resources were rated only by the small number of respondents that added them to the list.

Salmon, along with forest health and diversity, were also ranked highly, being placed among the three most valued resources by 57% and 49% of the respondents respectively.

Figure 4
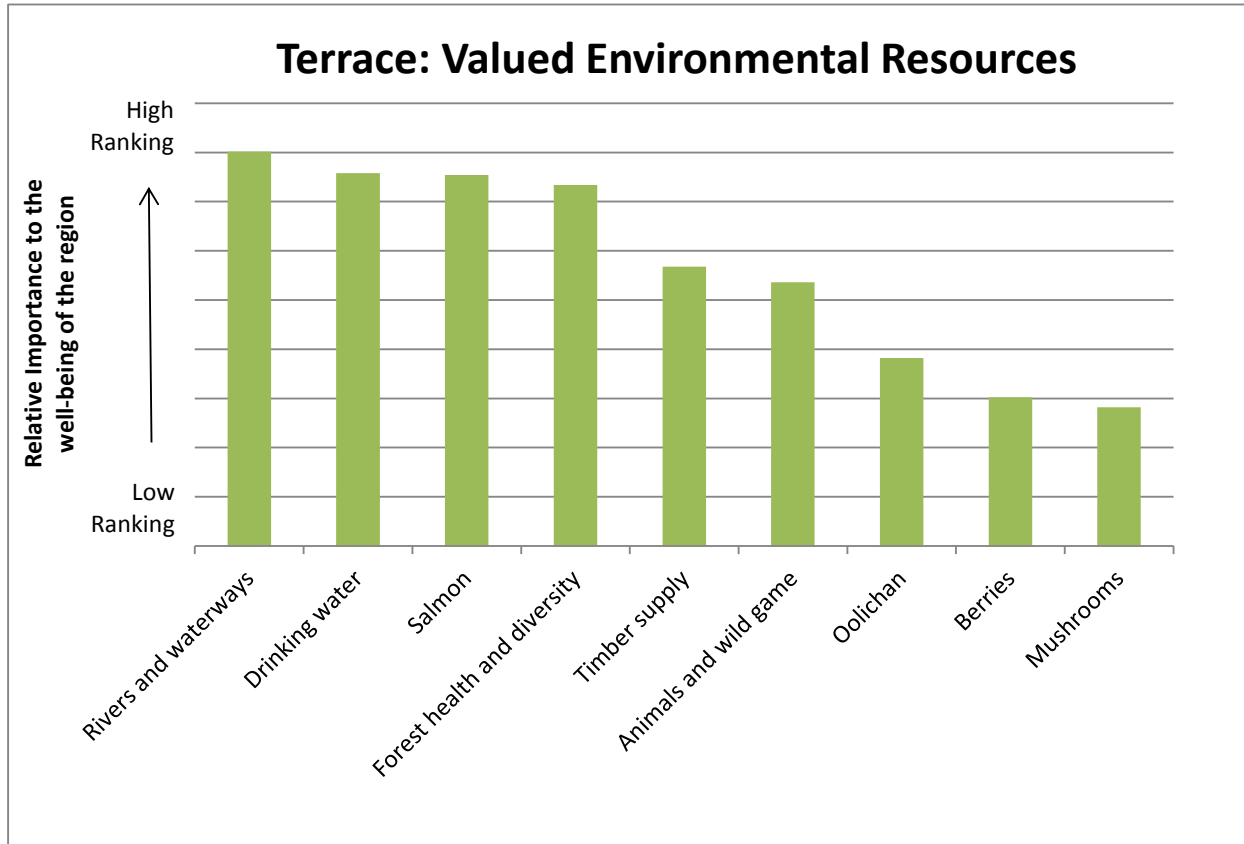
Respondents also identified additional environmental resources that were not explicitly included in the survey. A full 37% of all respondents added at least one specific resource to the list of valued resources. The additional resources included agricultural land and mineral resources (each included by 8% and 6% of respondents, respectively).[7]

Respondents were asked to rate environmental resources on a scale of 'one to ten', with 'one' representing poor conditions in which the resource is under threat and 'ten' representing very good conditions in which the resource is flourishing (see Figure 5). Respondents were asked to rate the resources on their current state, as well as the state they were in 20 years ago, or around

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[7] Additional items added to the list of environmental resources important to well-being included air quality; lakes and glaciers; access to outdoor recreation areas; snow pack; crab and other ocean products; wild grains and medicinal plants; terrain stability, habitat, and visual quality and natural aesthetics.

the early 1990s. This provided the opportunity to assess perceived changes in the condition of environmental resources over the past 20 years.

Figure 5

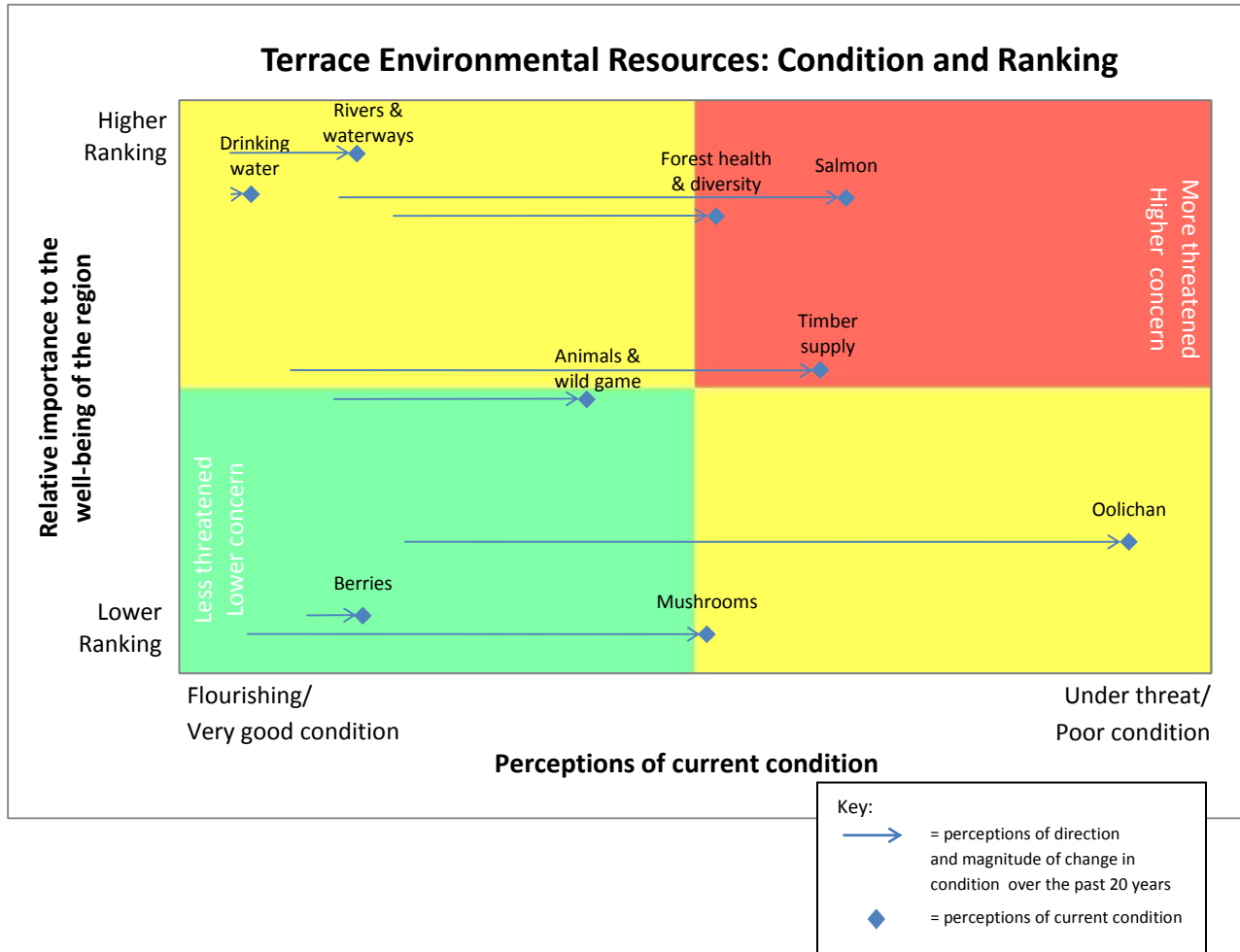Terrace: Condition of Environmental Resources
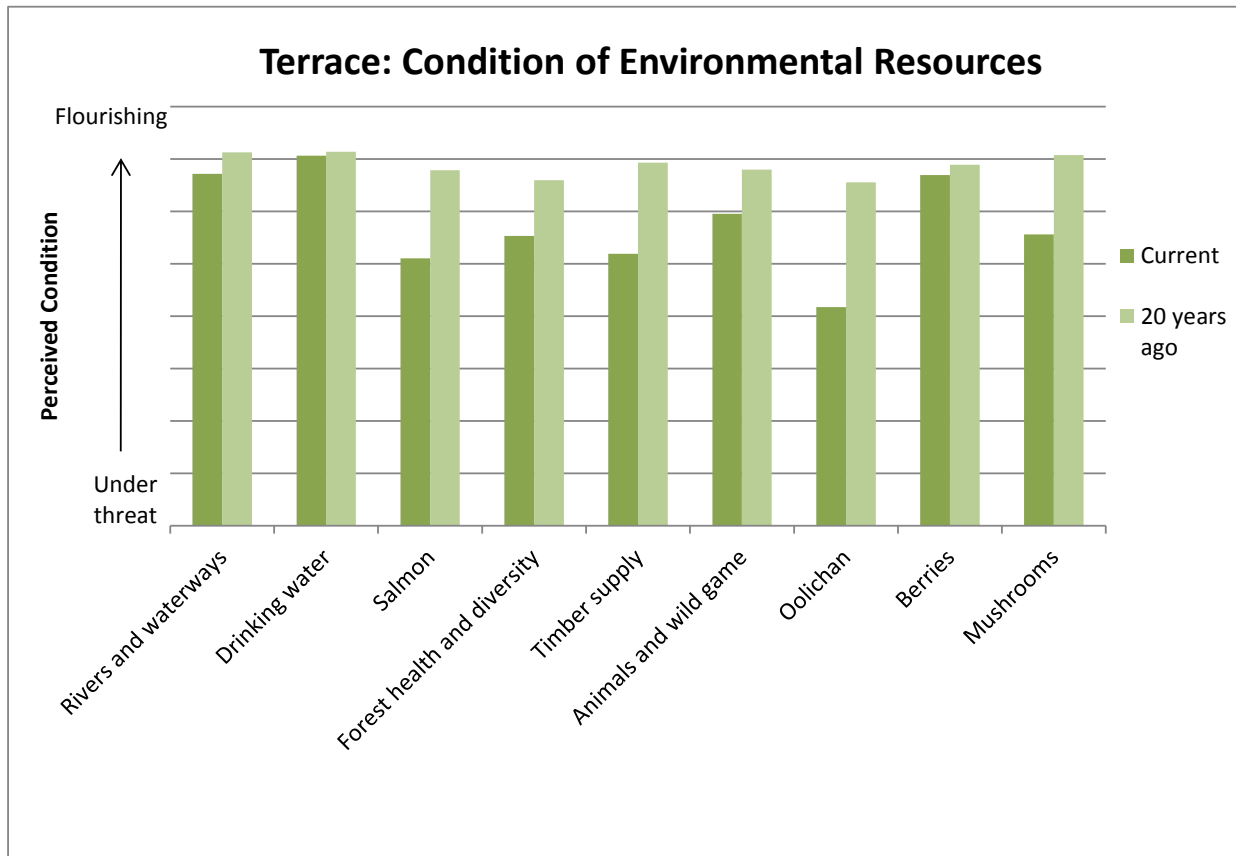
Unlike community resources which showed perceptions of improvement in some areas, environmental resources showed either declines or a lack of change for all measured items. In a positive sense, however, the two environmental resources deemed most important (rivers and waterways, and drinking water) were perceived as having remained relatively stable. There was only a slight shift in the overall perceived condition of drinking water and rivers and waterways. There was a slight decline in the perceived condition of rivers and waterways (from 7.1 to 6.7),[8] but this difference was much smaller than the declines percieved in other important environmental resources. The largest perceived declines were reported in oolichan (falling from 6.6 to 4.2), salmon (falling from 6.8 to 5.1), timber supply (falling from 6.9 to 5.1), and mushrooms (falling

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[8] Difference (decline) in assessments of past and current states of rivers and waterways was statistically significant (p<.05, paired samples t-test).

from 7.1 to 5.6).[9] Less sizeable decreases were reported in the conditions of all remaining resources, and no perceived improvements were indicated in any of the ratings.

Figure 6

Terrace Environmental Resources: Condition and Ranking

The perception of declining conditions of environmental resources were also apparent among many of the items added to the list by the respondents, with the exception of mineral resources which were seen as improving.[10] The rankings of environmental resources for well-being are overlaid with the perceived changes in their respective conditions in Figure 6. Perceptions of environmental degradation are apparent in Figure 6, with six of nine environmental resources exhibiting sizeable declines over the past two decades. While the conditions of drinking water and

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[9] Differences (declines) in assessments of past and current states of salmon, oolichan, timber supply, and mushrooms were statistically significant (p<.001, paired samples t-test)

[10] Changes in the conditions of these resources will not produce statistically significant findings, as the resources were rated only by the small number of respondents that added them to the list.

rivers and waterways are perceived to be remaining relatively stable, several resources that either rely on water resources (notably salmon and oolichan) or have the potential to affect them are seen to be deteriorating.

General Community Issues

Without reference to the resources that were ranked and rated, respondents were asked to identify the three main issues that they see as facing the community and its future. Economic issues were by far the most frequently identified issues, with 98% of all respondents placing economic or industrial-economic matters as critical community issues. Forestry was the most frequently mentioned issue, and 68% of all respondents identified lack of forestry work and the decline of the forest industry over the past two decades as one of the most important issues for the community and its future.

> *"This is a community that was built and developed on a single industry and a single resource. Its history is as a forestry town. Its existence is-- I mean, the First Nations were here for thousands of years, but I'm talking about since European contact and development here. It was created as a forestry town. What's happened, I guess over a period, certainly of 15 years, but it's been really accentuated in the last 10, is this town has gone through an economic crisis as a result of our inability to use the natural resource that we're still surrounded with."*

Many respondents identified general economic malaise and lack of employment as important issues without reference to forestry, indicating feelings that the economic challenges in the community go beyond repair of one specific industry. While the decline of forestry was generally identified as being synonymous with historical economic decline, 34% percent of respondents reported that diversification of the economic development within industries other than forestry is a critical issue for Terrace and its future.

> *"We have to diversify. This has been solely a forest industry supported town since I've been here. We have to diversify....And we have to launch ourselves into the future, right? I find that most people spend all of their time looking over their shoulders saying, "This is the way we used to do it." You have to lose that. You have to say, "This is the way we're going to do it.""*

Despite the recent history of economic struggles, many respondents expressed optimism about a variety of new industrial development on the horizon for the region, including mining, bio-coal production, and the creation of a new northwest hydro transmission line. However, those in favour

of new developments also expressed concerns about the ability of the community to take advantage of new opportunities.

> *"We're having difficulties finding qualified people to drive trucks or to fall the trees or to do the logging for us."*

> *"In the short term, it's a boom. It's a-- you know, you can expect a boom and so the concern there is do our businesses have enough strength to be able to expand to take maximum advantage."*

Nearly two thirds of respondents identified specific social issues as being important for Terrace and its future. These concerns revolved around maintaining the standard of living and level of service in the community, and developing a new community identity as Terrace moves away from its exclusively forestry-dependent past. Population loss was a common theme among social issues, and respondents were sensitive not only to the impacts of population loss on Terrace's industrial capacity, but also to its impacts on other parts of the community.

> *"Well, probably another one is population, you know, a declining population adds to those-- it's related, obviously, directly to the loss of employment. But adds to, you know, less people for community volunteers and you have less kids in your schools. As far as the city as a whole, it definitely has an impact."*

The revival of economic opportunities is seen as necessary for retaining youth and professionals in the community. Nearly all respondents spoke of new industrial and economic opportunities as heralding increased prosperity for the community. However, there was also caution expressed regarding the type of developments that may occur, and the impacts that they may have on both the community and the environment.

> *"I mean, there's a lot of bad projects, development ideas, that we're facing right now and there's also some really neat ones that have the potential to be-- to bring a lot of net benefits to our communities."*

Although very few respondents identified specific environmental impacts among the primary issues for the community and its future, generalized concern for balancing development with environmental protection was commonly mentioned as a key issue. A full list of issues deemed important to the community and its future is contained in Appendix 1.

Environmental Issues

When asked directly to identify specific environmental or natural resource issues, the most commonly identified issues were forestry, fisheries management, mining exploration, and water issues. Forestry issues were identified among the most important environmental and natural resources issues by 45% of respondents, with concerns revolving primarily around management of timber resources and organization of the industry.

Mining and oil exploration was mentioned by 41% of respondents as a key issue for Terrace and its future. Respondents tended to identify mining and oil exploration as an issue in one of three ways. Some viewed mining as a positive environmental issue associated with new opportunities for the community to capitalize on its local resource base. In contrast, respondents with concerns about fisheries tended to mention mining and oil exploration as a potential challenge to the health of the rivers and fish stocks. A third group identified mining as an exciting opportunity that is tempered by the need for balance with effective regulatory processes and environmental assessments to ensure other nature values are protected. However, mining and oil exploration did not act as a purely polarizing topic, and respondents that mentioned it as a key issue generally acknowledged both the importance of mining as an economic driver as well as the need for appropriate environmental protection.

The importance of sport fishing and the sensitivity of fishing habitat to industrial impacts were mentioned by 39% of respondents. Many respondents also made note of the unique nature of the Skeena River as an unobstructed watershed, and explained that the river provides Terrace with a special appeal to both local residents and tourists. The importance of water to the community was emphasized in many different ways, with respondents identifying important water issues that include recreation uses, fisheries habitat, flooding, pollution, hydroelectric projects, and drinking water. The wide range of values attached to water reflected the ranking of environmental resources seen in Figure 5, in which the top three resources are water-based.[11]

Climate change was identified as a key issue by only 14% of respondents, with most concerns revolving around river flows and snow packs. A full list of environmental issues deemed important to the community and its future is contained in Appendix 2.

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[11] Rivers and waterways, drinking water, and salmon were the three most highly ranked environmental or natural resources.

Forestry Issues

If respondents did not mention forestry issues among the key community or key environmental issues, they were asked to identify specific forestry issues that are important to the community and the future. The majority of respondents (75%) mentioned industrial challenges as key forest issues, with the most frequently mentioned issue being the friction between the export of raw logs and the lack of local secondary processing. While many respondents expressed opposition to the export of raw logs, there was widespread acknowledgment that new processing methods and innovations in forest products are required to enable the local forestry industry to return to a competitive position in global markets. One quarter of respondents mentioned employment in forestry as a key issue, and there was general support for the development of new forestry opportunities such as wood pellet production and small mills that cater to specialty markets.

There were varied opinions regarding the value of existing timber resources, and these opinions influenced the level of optimism that respondents directed towards forestry revival. Some respondents believe that the community is facing a tremendous opportunity as their second growth forests reach maturity, and that lack of timber supply in other areas of the province will increase the value of their local resources. However, other respondents described the local timber supply in a more negative manner and suggested that prior harvesting had removed the majority of high value timber, and that much of the prime forestry land base is covered in decadent wood with limited processing value.

Specific forest management issues were identified by 48% of respondents, covering a wide range of topics including resource ownership and control, license management, maintenance of forestry roads, and the capacity to adapt to future forest conditions. Respondents that mentioned forestry management and planning issues tended to do so in a critical manner, with concerns focusing on the decline of government involvement in forestry planning and a lack of effective coordination among the various agencies, corporations, and professionals that now work to manage the forestry land base.

Forestry health issues were mentioned by 36% of respondents. Climate change concerns and the survivability of different tree species under changing conditions were mentioned by 16% of respondents, with an additional 14% expressing concerns about the future spread of insects such as the mountain pine beetle. Overall, respondents expressed more concern about management

of forest resources and development of new strategies for secondary processing than the vulnerability of the forests to potential changes in climate. A full list of forest-related issues deemed important to the community and its future (in general order of their frequency of being mentioned) is contained in Appendix 3.

4.0   CONTEXT OF CHANGE

Key Messages

- The majority of respondents believe there are connections between climate change and the issues deemed critical to Terrace and its future.

- The perceived relationship between climate change and Terrace's future tended to revolve around the impact that climate change may have on the community's ability to use its resource base to recover from two decades of economic and industrial decline.

- Understandings of climate change tended to revolve around a distinct sense of Terrace's position between contrasting biogeoclimatic zones.

- Respondents expressed concerns about indirect climate change impacts based on the influence that new (climate-change prompted) energy policies may have on industrial development in the region.

- Concerns about direct climate change impacts focused primarily around forest health, and river flow.

- The mountain pine beetle epidemic provides a reference point for many respondents about potential climate change effects on forest pests and disease.

- The shifting of community identity that has occurred with the loss of a stable forestry-based industrial core has made it difficult for many respondents to assess the potential impact of climate change on their future economic drivers.

The majority of respondents (69%) believe there are connections between climate change and the issues deemed critical to Terrace and its future. Concerns about direct climate change impacts focus primarily around forest health, and river flow. Although salmon were ranked very highly among valued resources, respondents were more likely to focus on the state of habitat than on the actual animals. Only a small number of respondents expressed clear concerns about climate change impacts on fish stocks due to water temperature change, while many respondents expressed concerns related to climate change impacts on rivers and waterway conditions, and fluctuations in seasonal run-off and glacier melt. Concerns about climate change impacts on forests focused primarily on how different species of trees may adapt to climate shifts, and the potential for increased vulnerability to pest infestations and disease.

> *"… We never really saw mountain pine beetle as any kind of a real issue or pest to take note of. And I think that's almost maybe just a canary in a coal mine for us, looking ahead as to what other forest health vectors might affect the forests around here… perhaps there's something that would affect hemlock or balsam or cedar or spruce that is much more of a significant species for us, that we just haven't really anticipated what the effect of climate change could be on it…one example is what we call a dothistroma pathogen. It's a fungi that has really exploded in incidence around here in the last decade. And it has been attributed to warming of the climate in this area..."*

Concerns about the health of forests remained tied to the importance of forests to the economy and the community's ability to recover from past industrial declines, and only a small number of respondents expressed concerns about potential impacts on forest ecology or non-timber resources. Meanwhile, many respondents perceived ways in which climate change could have a positive effect on not only their forests, but also other local resources.

> *"The climate change could have a positive effect. It's been suggested that in temperate rainforests, in cool temperate rainforests, climate change or global warming or a warming trend could actually enhance forest productivity. We have-- you know most of our forests are limited by growing degree days, by growing season, and a one or two degree change in average temperature would actually expand the growing season fairly dramatically and result in a significant increase in the productivity in our forests. So there could actually be a benefit in a lot of the forests here that are currently limited by growing season."*

> *"I think that that probably, with warmer temperatures and stuff like that, we are a northern climate, it might be easier to grow food here, you know."*

Most respondents expressed uncertainty about the extent of change that they expected to occur in the region, and the connections between key community issues and climate change were generally speculative. However, understandings of climate change tended to revolve around a distinct sense of Terrace's position between contrasting geographic areas. Only a few respondents used the specific term "biogeoclimatic zone", but the contrasting conditions of the interior and the coastal regions formed common reference points in respondents' discussion of climate change impacts.

> *"And I think because we're on the cusp, if you go to Smithers they still have winters. If you go to Rupert, it still hardly ever sees snow, right. So we're in the middle between that, and I just noticed that we've come much-- we've become much more like Rupert and less like Smithers."*

The connection between Terrace and the outside world was seen as vulnerable to both direct and indirect climate change impacts. The geographic context of Terrace figured in concerns about

impacts that climate change may have on transportation routes between Terrace and the rest of the world, and the vulnerability of provincial rail and highway connections to slide or flood activity. Meanwhile, perceptions of indirect relationships were based on the influence that new (climate-change prompted) energy policies may have on industrial development in the area.

> *"…There's a lot of potential development around bio-coal and bioenergy and so because there is a large market being created in Europe and other places around the world to try to burn cleaner sources of energy that-- and the development of carbon credits and such-- makes you know things like bio-coal profitable, so we're now seeing it starting to take off in the area. So that's directly linked, I think, to people's concerns globally, especially in Europe, about climate change…"*

Climate change was seldom conceptualized as holding a wholly negative relationship with the primary economic issues facing the community, and respondents expressed a distinct openness to the possibility of either negative or positive impacts on the local economy and forest resource base. These attitudes appeared to be linked to the acknowledgement that economic and industrial changed are already necessary due to shifts in the forest industry and in the position of the community in the global market. Respondents appear resigned to the fact that further adaptations will have to occur regardless of changes in climate. However, uncertainty about climate change did not extend to all issues, and respondents were predominantly negative in their assessment of potential linkages between climate change and water or fisheries issues.

> *"I think everybody should be concerned about what climate change-- what effect climate change will have on the salmon because salmon are very temperature sensitive, especially for spawning."*

Only 24% of respondents feel there is no connection or relationship between climate change and the issues most important for Terrace and its future. Within this group, only a few respondents based their position on the belief that climate change is not occurring, citing the unusually cool summer of 2011 as evidence against a shift in climate. In general, the perceived relationship between climate change and Terrace's future tends to revolve around the impact that climate change may have on the community's ability to use its resource base to recover from two decades of economic and industrial decline. Respondents placed high value on both forests and water, and were sensitive to potential risks that climate change may pose to these resources. However, without a stable core of industrial activity and with a lack of clear community identity upon which to base concerns, many respondents' assessments of the relationship between climate change and the community's primary economic issues remains speculative.

5.0   CLIMATE CHANGE KNOWLEDGE

Key Messages

- People rely on a large variety of sources when obtaining information on climate change.

- Respondents are divided in regard to the trustworthiness of climate change information, and many people hold concerns about the way information is created and presented.

- Trust in scientific sources of climate change information is higher than trust in general sources, and trust in science corresponds with a strong level of trust in computer-based modelling as a way of understanding climate change and environmental issues.

- Only half of respondents feel that current climate change information is specific enough to be applicable to Terrace. Some respondents feel isolated from the institutions that drive climate change research.

- Respondents have mixed opinions regarding the ability of the community to plan for climate change. The ability to plan is believed to depend on more than possession of information, and the ability and willingness to use knowledge is also acknowledged as being important in order to enable planning.

- When asked what additional climate change knowledge would be helpful, respondents identified future impacts on forest health and changes in weather patterns as desirable targets for future computer-based models.

Respondents identified a wide range of sources from which they obtain information regarding climate change and environmental issues, including internet, newspapers, television, scientific journals, government agencies, and radio. There was general trust expressed towards a wide range of climate change information among 41% of respondents, with 35% reporting more discretion regarding which specific sources they chose to trust. Approximately 24% of respondents express a generalized distrust of climate change information. The local newspaper was generally identified as a poor source of information on climate change. Trust in climate change information would be best described as varying degrees of caution. Although some respondents feel confident in most of the information they rely upon, the majority expressed some degree of caution about either the accuracy of information or biases in the selection and presentation of evidence related to the nature of climate change or its actual existence.

> *"There's just-- a lot of the academic literature is driven by industry or if it's industry--- some of it is industry funded, some of it's funded by environmental groups, some of it is government funded. So I think it's important to understand that because I think bias is prevalent in the academic community as in any other-- any of the other information sources. And although there are, I think, stricter rules on what they can put out it's still no-- there are no sources of information which are unbiased or provide the whole story on any topic, I think."*

These assessments shifted when respondents were asked about their feeling towards scientific sources of information asserting climate change is occurring, as opposed to the broader range of sources identified previously.

> *"Well, climate change I think it's-- the overwhelming majority of scientists who have expertise in climate change are saying the same thing, so I think it's very trustworthy."*

When asked about their opinion towards scientific information supporting the existence of climate change, 71% of respondents expressed high levels of trust in scientific sources. Trust in scientific information related to climate change was based in observations of prevailing opinions, and consistency between scientific information and respondents' own observations of climate and weather. Only 12% expressed marked reservations or uncertainty regarding scientific sources while 16% of respondents were highly critical of scientific claims supporting climate change and expressed scepticism towards the generation and presentation of scientific research. Respondents with low levels of trust towards scientific data supporting climate change tended to focus on the same issues as respondents with high levels of trust. Critics of scientific claims cited lack of consistency between climate change claims and local weather, and disagreement with the premise of recognizing climate change as an issue on the basis of a majority opinion.

> *"I recognize that science is simply-- science isn't sacred and science isn't absolute, it's simply an estimate, and there's errors associated with science. And what concerns me with climate science, and you've heard this before, is that we have a whole bunch of people repeating the same thing and often referring to the same experiment. And the fact that they refer to it multiple times doesn't make it any more right."*

Respondents place high levels of trust in computer-based models as useful ways of making sense of climate change and environmental issues, and 71% of respondents viewed computer models as useful tools for producing knowledge. Even respondents that are highly critical of scientific claims about climate change are at least partially supportive of scientific models being used to learn more about climate change impacts. Although respondents expressed concerns about

existing climate change information and the trustworthiness of the global scientific community, they expressed positive attitudes towards further scientific inquiry on the subject, specifically in the form of computer models.

Approximately half of respondents (53%) believe that the current climate change information is not specific enough for the local area. Many respondents simply feel that the scale of climate change information is too large to apply to a small community like Terrace. However, others expressed a distinct feeling of geopolitical isolation, and suggested that the northwest region is not considered important enough to attract the type of research that is required for understanding climate change in a local context.

> *"Our population isn't very large and most of the information then focuses on where we have larger populations."*

> *"And I don't think there's really anybody like UBC or UNBC or any specific groups that I'm aware of that is up here studying on a regular basis."*

> *"If you look at it in some detail you wonder is that really geared towards the Lower Mainland and how well does it apply to the North. Then how are we--you're really punishing the people that live in the northern part of the province with some of these policies that are coming out of the Climate Action Plan."*

While a small number of respondents are unsure about the applicability of climate change information to their community, 28% believe that the available information is specific enough to be relevant to Terrace. Among these respondents, specific reference was made to glacial measurements and anticipated impacts of temperature and precipitation on specific tree species. These responses indicate that many people are aware of locally based research, and understand its relevance to issues in the region. However, there are also many people that do not have access to the same information or do no yet perceive its applicability to their community. Expressions of geopolitical isolation suggest that trust in key institutions may play a role in determining the way that climate change information is perceived.

Respondents that believe climate change information is specific enough for the local area are more likely to believe that the community can plan for the future. However, only 40% of respondents indicated that the community could plan for climate change based on the information that is currently available. Respondents that feel Terrace can plan for climate change often pointed to localized affects, and identified examples of actions that could be taken to adapt to

future challenges. Water and precipitation formed an important reference point for many respondents when it came to assessing the community's ability to plan for future changes.

> *"So I think there's, you know, planning for water conservation, infrastructure planning as far as raising dykes, preventing flooding, taking examples from some of the larger centres on how to minimize fossil fuel use or decrease it, minimize it."*

The ability to plan for climate change did not depend solely on having access to information specific to the area. There is also a clear acknowledgement that information must also be mobilized, and climate change needs to be perceived as an important issue in order for planning to occur.

> *"The ability for the people, for the average guy who's made his living off of lumber for so long or lived/worked in a sawmill for so long, to hear the information that's there is our biggest challenge. It's not that the information isn't there. It's whether or not we can get the population, the general, ordinary, ordinary, citizen to listen to what's out there."*

Respondents were asked about what types of climate change and environmental information they are missing and would like to see included in computer models. Forest changes were the most frequently mentioned items, with 26% of respondents indicating that they would like to see further modeling performed on forestry issues such as potential changes in tree growth and forest productivity. Although there is only a small section of pine forest in the immediate vicinity of Terrace, several respondents stated that additional modelling on expansion of pine beetle infestation would be welcome. Models of future weather pattern shifts were desired by 20% of respondents, with specific attention to snowfalls and the timing and amount of precipitation. Respondents also suggested that models should not be limited to weather or natural resources, and models should also focus on socio-economic impacts and the influence of community actions on environmental outcomes. Other topics identified as desirable for future modelling included salmon stocks, ice fields, and rivers and waterways. Appendix 4 contains a full list of topics or resources that respondents felt modellers should examine.
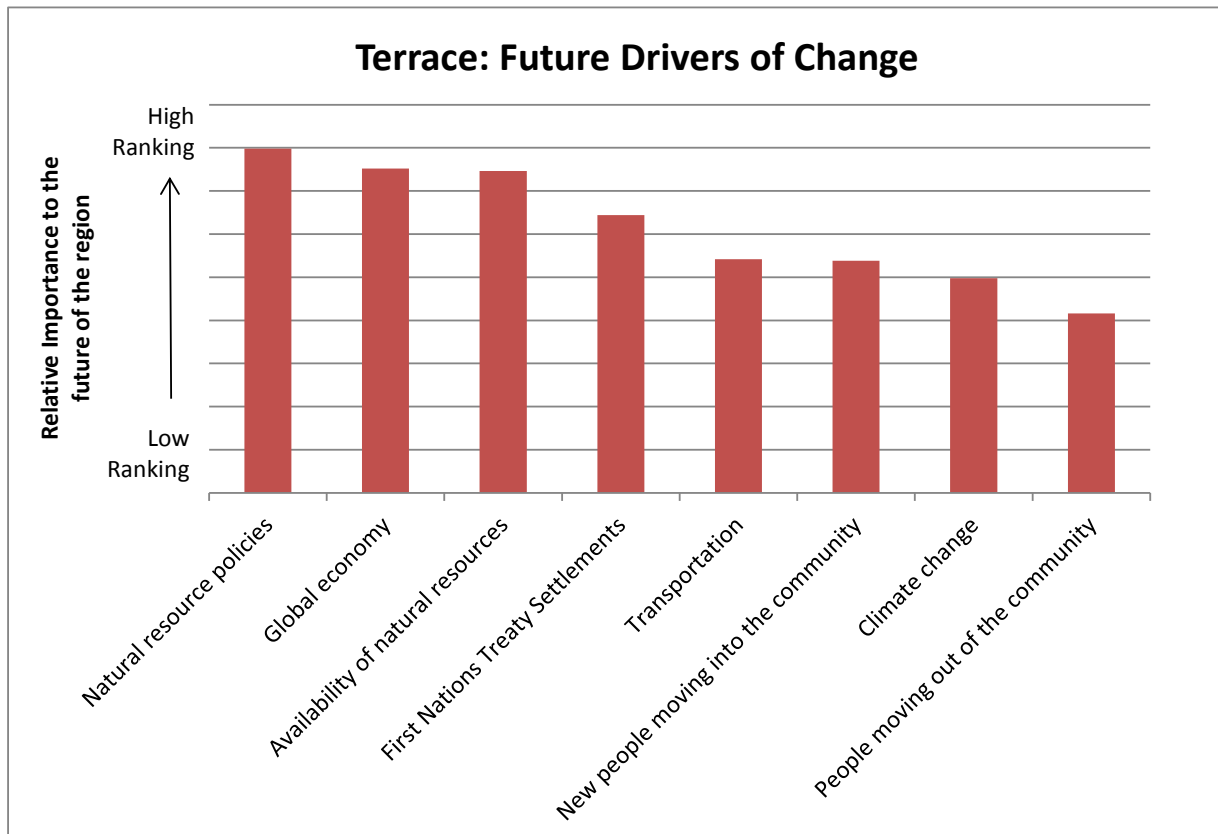
6.0 VISIONS OF THE FUTURE

Key Messages

- Natural resource policies, global economy, and availability of natural resources are perceived as being the most important and influential drivers of change in the region.

- Visions of Terrace's future are strongly linked to developing and diversifying the use of natural resources. However, these visions are accompanied by a strong interest in ensuring protection of the environment and selecting industrial partners that match community values.

- Climate change is not viewed as an influential or important driver of change. However, due to concerns regarding potential impacts on valued natural resources, climate change is perceived more negatively than other influences on the region.

- Most respondents believe that economic and industrial development will have a positive impact on the future of the community. However, respondents hold significantly different opinions regarding the best ways to enable this development.

- Development of the service sector appears to share common ground with enabling industry and with protecting desirable lifestyles. However, enabling industrial development and protecting desirable lifestyles are not always viewed as compatible strategies.

- Most respondents believe that external factors will determine the shape of change in the region, and they envision development and diversification of natural resource usage as the key to the future. However, some respondents feel isolated from resource-use decisions and are concerned about which types of industry will ultimately rise to prominence in the region.

Respondents were asked to identify the factors (or drivers of change) that they believed would be most important in determining the future of the community (see Figure 7). Natural resource policies was identified as the most important factor in determining the future of the region, with 73% of respondents placing it among the three most important drivers of changes, and 22% identifying it as the single most important driver of change in the future of the region. Global economy and the availability of natural resources followed closely as the second and third most important drivers of change. Approximately 59% of respondents placed the global economy among the three most important drivers of change, and 28% viewed it as the single most important factor. The availability of natural resources placed among the top three most important drivers of change for 59% of the respondents, and was the most important factor for 18% (see Figure 9).

Figure 7

Terrace: Future Drivers of Change

Relative Importance to the future of the region

High Ranking

Low Ranking

- Natural resource policies
- Global economy
- Availability of natural resources
- First Nations Treaty Settlements
- Transportation
- New people moving into the community
- Climate change
- People moving out of the community

The overall rankings of the top three drivers of change were quite close, and their positioning points to a set of interrelated concerns about the position of local natural resource industries in the global market. Although climate change was not perceived to be as important as most of the other factors, concerns about the environment and the desire for a greener economy remained central to the visions that respondents expressed about Terrace's future as a resource provider in the global economy.

Figure 8
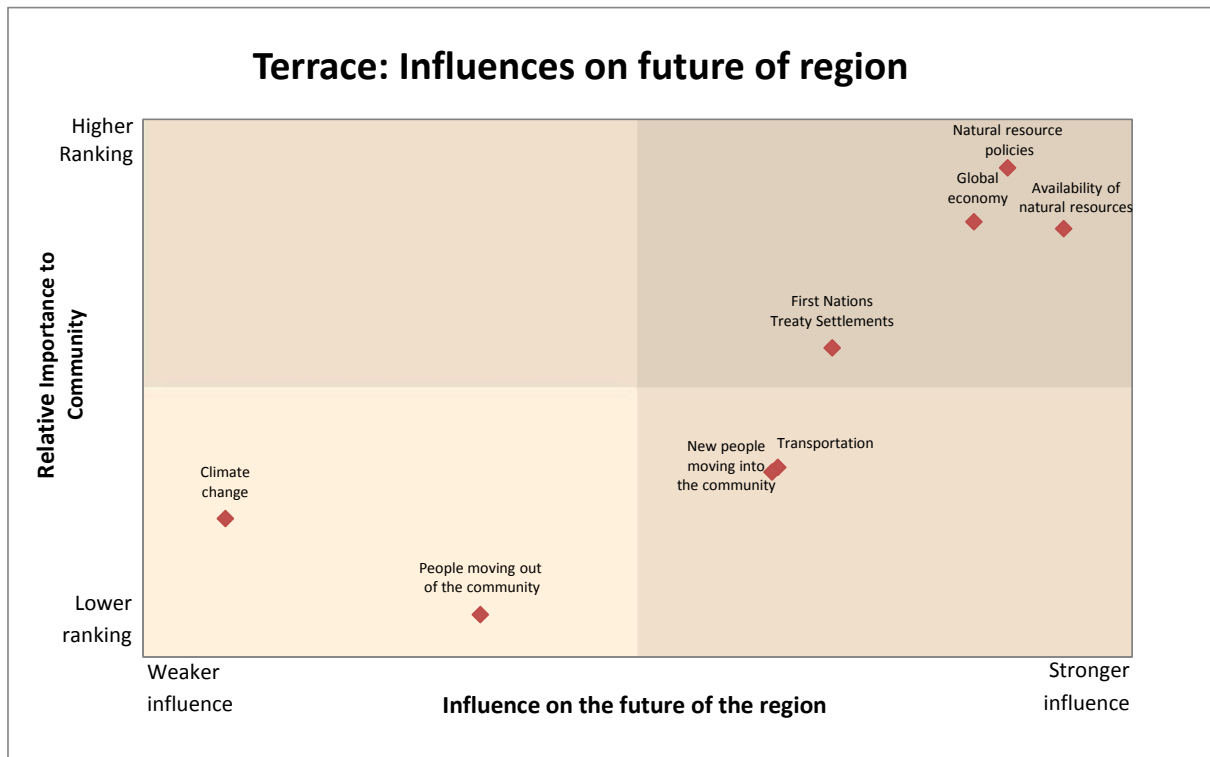
When asked to provide their thoughts about the future of the community, respondents frequently paired their interest in expanded industrial and resource trade with the requirements for environmentally sound development.

> *"If only all the ideas that have been coming forth, people are presenting bioenergy, biocoal, there's talk of water power, swift power. If all-- these all came together, I think we would be very successful community."*

> *"If only all these big planet-killing companies would stop proposing bad projects in our region, all these environmentalists could be paid to come up with sustainable energy solutions for the future….if only we had policies in place that stopped these projects before it got to that point we could really be putting our energy into some of these solutions and building a green economy."*

> *"I think if only we could get a reliable, dependable and secure natural resource industry, I guess I would say, that allows for Terrace to not only grow but to attract the right people to come here. And invest dollars and become a, you know-- the whole Northwest actually, not just Terrace."*

Respondents believe that the most important drivers of change will also have the greatest impact on the future of the region (see Figure 8). First Nations treaty settlements also figured prominently

among future drivers of change, and respondents often linked the success of future industrial and economic development with First Nations treaty processes, and the incorporation of First Nations leadership into regional development.

> *"There's a lot of First Nations traditional territory and I think without that being settled, it makes it difficult for those industries to, for major investment, to come in. I don't know, like, people can work with First Nations; they always have. But I think when you're talking about huge industrial players, there might be a bit of trepidation, right. That-- they'd be-- partner up with them but there's a lot of extra work they have to do. So if things were settled then they know exactly what they're dealing with."*

> *"What if out of every First Nation community, we could get a group, a leadership group, of well educated professionals, to guide-- to provide vision and strategic direction for the future."*

Along with changes in transportation and new people moving into the community, First Nations treaty settlements are viewed as holding a positive influence as drivers of future change (see Figure 9). Arrival of new residents was rated very positively, with 94% of respondents viewing it as a positive source of change in the future. First Nations treaty settlements and changes in transportation were each viewed as positive drivers of change by 74% of respondents.

Figure 9
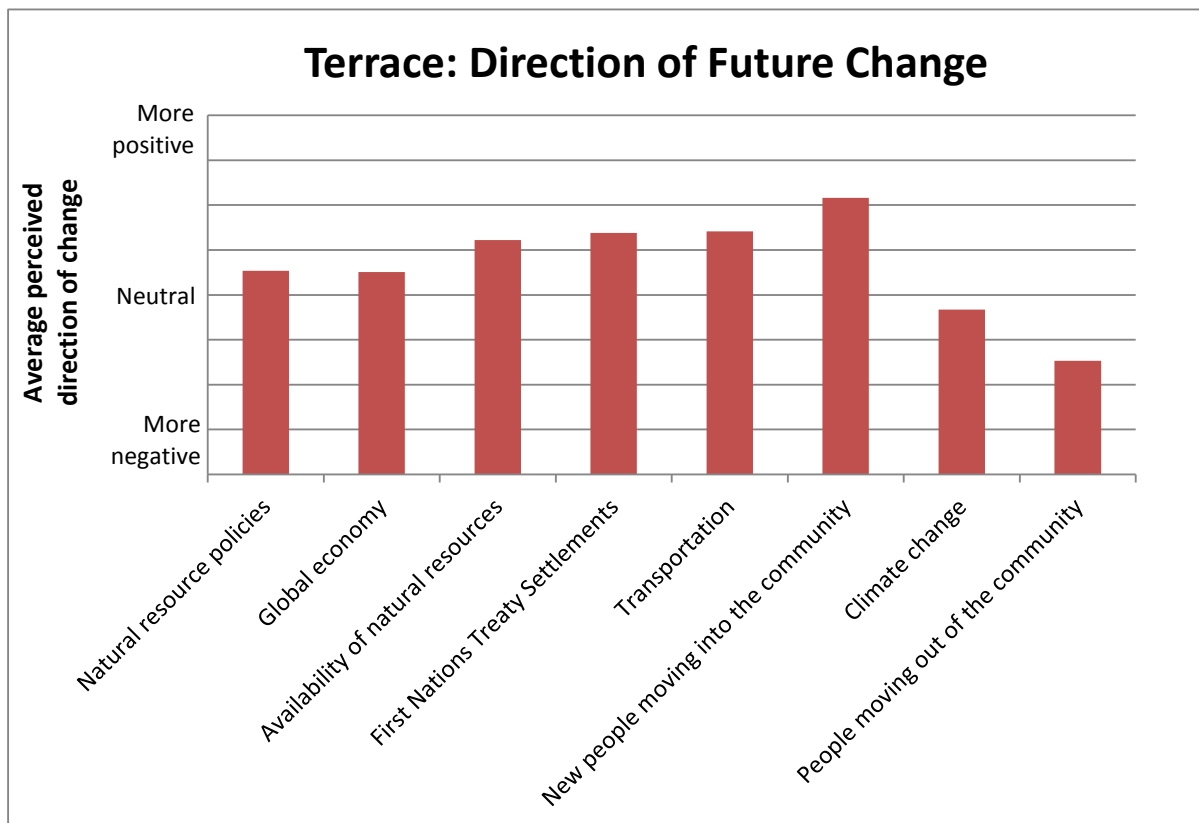
Meanwhile, uncertainty about the direction of future change and concerns about the specific forms of future industrial and resource trade expansion tempered the levels of optimism that respondents expressed towards the highest ranked factors of change. When asked if to rate the influence of future drivers of change as either positive or negative, respondents expressed mixed views about natural resource policies and the global economy. Only half of respondents expected the resource policies and the global economy to have positive effects on the future, while the rest expected them to have either a neutral or negative impact. The combined ratings placed these factors near the middle of the scale in regard to their anticipated effects on the region (see Figure 9).

Many respondents commented about loss of youth and decline of the local workforce. These concerns were echoed in the finding that 75% of respondents believe that people moving out of Terrace will have a negative effect on the future. Along with population loss, climate change was generally viewed as a negative source of future change. Although most respondents are unsure about the exact impact climate change will have, 66% expect negative or neutral effects, and only

34% believe that climate change will have a positive impact on the future of the community. Concerns about the potential for negative climate change impacts demonstrate that expectations for the future of Terrace are closely linked to the way that future events and development choices will affect the natural resource base that surrounds the community. Respondents' expectations towards climate change are based not only on direct resource impacts, but also on the indirect effects of climate change oriented policies, which includes the potential for positive outcomes.

> *"…If the world goes towards carbon credits and climate change kind of modeling, then Terrace is in good shape to respond to that. So if there is economic demand for the products that we have, we'll be in good stead."*

When asked what they believe local leaders should do to provide the best possible future for the community, respondents were generally pro-development in their answers. However, there were differing opinions offered about the best way to enable growth of the community and exactly what type of growth should occur. Many respondents believe that the best way to ensure a positive future for Terrace is to enable economic growth by creating a business-friendly atmosphere and by seeking industrial partners for future resource development. Diversification was a common theme among those that put industrial development at the forefront of community prosperity.

> *"Continue to promote the opportunities that we have here, to highlight our strengths and be welcoming to new industry to come in here to help provide the resources for the future."*

> *"You know, we're a long ways away from the Lower Mainland and a lot of people don't know where Terrace is. So it's ensuring that the right people get the message of where we are, you know, with our natural resources, with the Northwest Transmission Line, the mining-- it would be nice to have the forestry diversified instead of only being able to export logs. It would be nice to have some better manufacturing, diversified manufacturing. Diversity is so key."*

Respondents were choosy in regards to the industry they identified as desirable, and they expressed an underlying concern for ensuring protection of the environment and the sustainability of the resource base. While industrial development and new resource use opportunities are common themes for many respondents, others envision Terrace as playing a more central role as a service centre for the region. There is a distinct perception of improvement in the condition of many community level resources (discussed in *Chapter Three*). This perception is accompanied by the belief that Terrace can play a new role in servicing the northwest, and that this role could bolster the weakened municipal tax base.

> *"I think they need to focus on the fortunate location of Terrace, vis-à-vis the Northwest region, and foster commercial and social services, more so than industrial. If we can get some industrial activity, that's icing on the cake. Realism today, watching people walk by, it's a commercial centre and it's a service centre."*

> *"They should be, I guess, providing opportunities around the service sector, I guess, more than anything else. So-- and I think part of that is around the commercial tax base. Part of it is around accessibility, rail, air. Part of it is around providing a, I guess, a positive environment for, I guess, for interaction with those companies."*

Building Terrace's future as a service sector shares common ground with another approach to shaping the community, which revolves around protecting the social and environmental resources that are believed to be essential for making Terrace a desirable place to live. As opposed to enabling industrial development, some respondents believe that the main task for community leaders should be safeguarding the resources that offer desirable lifestyles.

> *"I would say, look at these young people coming in here. We have something to offer. They're adrenaline junkies, outdoors people who need a house. Set up the community so you provide what they want. So have good education, have good healthcare, have good services, have amenities in the community that attract not only them, but say early retirees."*

> *"I think that having a good level of services, whether it's recreational opportunities, ensuring that we have good medical services, ensuring that we have a good transportation infrastructure in place, I think that those are keys."*

Building the service sector as a development strategy appears to share compatibility with both industrial growth and with the enrichment of lifestyles. Enriching services can support industrial growth by providing amenities to new developers, and forming a transportation and service centre for northwest expansion. Meanwhile, focusing on the service sector shares common ground with those that emphasize lifestyles by enriching community-level resources. However, there are indications that focusing on industrial growth and creating attractive lifestyles may not always share developmental paths, and some respondents believe that one strategy should be given clear priority over the other.

> *"I think that they should try to promote industry and I think that they should stay away from spending a lot of money trying to attract people by having it be a pretty town, because I don't believe that having it pretty, is going to keep people here. They might say it's nice as they drive by, but if they can't make a living here, it's not going to matter how much money we spend on making the town pretty."*

Meanwhile, the opposing perspective suggests that the desirability of the community is more important than industrial potential, and economic opportunities will naturally unfold if people perceive Terrace as a good place to live.

> *"It might be an issue of liveability, right. If the president of the company likes your area and he likes fishing and-- you know, that might be a deciding factor in terms of where he puts his plant. Whether it's in Terrace or whether it's in Kelowna."*

Many respondents feel that increasing consultation within the community (including improving relationships with First Nations), coordinating with government agencies, and ensuring inclusiveness of voices and values should be the primary focus of building the future of the community. While there are varying degrees of compatibility and friction between the different perspectives on community development, many respondents acknowledge that the first step for Terrace is to clearly articulate its identity, so that a strategy can be chosen and the community can support a clear path towards the future.

> *"Well, I think the first thing that needs to happen is to define a clear path forward, a clear vision, articulate the clear vision forward. Something that encompasses values that we all share. I think once we have a clear vision of what we want our future to look like then we can start making decisions about how to get there."*

The majority of respondents (71%) reported that the future of Terrace and the ability to achieve their visions of progress is dependent upon external factors that are largely outside local control. Rationale for believing in the prominence of external factors revolved around the visions of the community's future as a growing contributor to the global economy. The endorsement of external factors closely reflects respondents' ranking of future drivers of change and the prominent role of resource policies and the global economy.

"Yeah, in my opinion I think the driver for the community of Terrace will be the expansion of our local economy, local and regional economy, to meet some new global demands."

External factors are largely viewed as making a positive impact on the future of the community when the outcomes include increased demands for resources and renewed economic and industrial activity. However, some respondents expressed concerns about being isolated from key decision-making processes, particularly when the use of natural resources or determining access to resources is at stake. There is an acknowledgment that influential political decisions related to forestry policy, First Nations treaties, and energy policies are likely to occur outside the community, and local leaders will have to remain ready to respond to these decisions in the best way possible.

7.0   INSTITUTIONS AND ADAPTATION

Key Messages

- Respondents expressed mixed opinions regarding the ability of the community to adapt to climate change, with 52% providing optimistic assessments of adaptive capacity compared to 35% providing pessimistic assessments.

- Numerous factors are seen as determining the ability to cope with climate change, including willingness to recognize and understand it as a problem, and availability of funding to engage in active responses.

- Terrace's unique geography influences beliefs about climate change adaptation. Some believe that the community will not experience significant changes due to the moderating influence of its position between biogeoclimatic zones and adaptation will not present challenges. However, others express concerns about the ability of Terrace to cope with isolation from outside resources and potential impacts on the natural resources that immediately surround the community.

- Financial resources and the perceived scale of climate change adaptations are seen as important factors in the ability of organizations to deal with environmental and natural resource issues.

- Success in past adaptations promotes confidence in future challenges. Respondents seem resigned to making additional future adaptations due to economic and industrial factors, and are prepared for future changes regardless of shifts in climate.

- Flexibility in organizational structure and effective local networks were identified as key factors in allowing organizations to play effective roles in local resource decision-making. Overly rigid mandates and reliance upon external decision-makers were seen as inhibiting factors.

- Many respondents report challenges in maintaining effective contact with provincial and federal bodies, but relationships with government agencies are generally viewed in a positive manner when institutional access is ensured. However, respondents feel caught between maintaining positive relationships that exist within the community and a desire for more direct linkages with external decision-making bodies.

The preceding chapters provide insight to the value placed upon various resources, understandings of changes affecting these resources, and the visions of the way that various changes may influence the shape of future community development. This final chapter explores some of the perceptions regarding the ability of the community to successfully adapt to changing

conditions, and highlights some of the prominent relationships and institutional features that may enable or inhibit the ability to respond and adapt.

When asked about the ability of the community to successfully deal with potential climate change impacts, respondents expressed a mixed response with 52% reporting optimistic assessments of community coping and adaptive capacity and 35% reporting pessimistic assessments. A further 11% of respondents indicated that they do not feel climate change will pose major challenges to the community. The ability to cope was often perceived to be contingent on various factors, such as the availability of funding, the willingness to understand climate change as a problem relevant to the local region, and the availability of knowledge and education.[12] For many respondents, their opinion about the ability of Terrace to adapt to climate change was shaped by the geographic context of the community, which holds both positive and negative implications in respect to their beliefs about the ability to adapt. Some respondents believe that adaptation to climate change will be made easier by the favourable location of the community. In contrast, the isolation of Terrace and its proximity to specific geographic features creates issues that other respondents see as being serious challenges in the future.

> *"I think they're in a better position than most communities, because …we're not in an extreme climate. Now we're in a kind of moderate climate. So it can warm and dry and we're still going to be-- we're not going to become a desert for a long time."*

> *"Pretty-- we're pretty good because of, again, the diversity that's in this area. Other than the transportation problem, if we have-- if there's a major impact on transportation. But-- because we rely on transportation for everything. But other than that, like, the environmental impacts in this-- of climate change in here, in this area, is not going to be catastrophic."*

> *"If there's major impacts on those severe weather issues, flooding, I think in particular, I don't think the City-- the City already can't handle those kinds of major things without outside assistance."*

Concerns about difficulties in adaptation often revolved around the perceived scale of climate change impacts and the financial challenges faced by the community as they continue to struggle with a limited municipal tax base.

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[12] Other factors that affect the ability to adapt to climate change included behavioural or technological change, the ability of the community to work together, and other unspecified social factors.

> *"If you're in complete survival mode and every dollar you spend is trying to fill a pothole, how do you expect that they would have any ability to respond to an unknown shift in climate?…The answer is no, we have no money to do that."*

> *"The fallacy of puny interventions, again. We can do as much as we can do. We can refuse to pursue policies which are clearly environmental unfriendly, right. We promote sustainability. We promote green practices in terms of our landfill and things of that nature. We do what we can do within our own municipal borders. It feels small when looking at the challenges faced by issues of global warming and climate change. We do what we can."*

Respondents were more optimistic in regard to the community's ability to adapt to less drastic shifts in the environment and to indirect climate change impacts such as new energy policies. Recognition of successful adaptation to past challenges promoted optimism about Terrace's ability to deal with climate change. Long-term residents feel that the town has already adapted to drastic changes in economic and industrial conditions, and has always been able to cope with a dynamic environment where dramatic swings in the weather are the norm.

Respondents expressed mixed opinions about the ability of their own organization to deal with environmental issues, with 38% of respondents seeing their organization as strong and 26% seeing it as weak.[13] Flexibility and small adaptive structures were viewed as positive influences on the ability of organizations to take action in relation to environmental and natural resource issues. Respondents with favourable views of their organization also made reference to the importance of strong communication networks in supporting their ability to play an active role in the community.

> *"I think it's very strong. What makes it-- part of what makes it strong is our relationships with other people working on the issues, whether they're ENGO's or people working in government or community groups, they're-- we have strong ties to people in those communities."*

> *"It's strong because-- if we get into that-- when we get to that stage, we have some strong characteristics, which is a small, flexible-- we're able to react, grow if we need to. We have the resources. We don't have a lot of resources, but we've got-- but potentially-- we're not limited by the politics of more formal organizations."*

Limits on financial resources were commonly cited as a factor that inhibits the ability to deal with environmental or natural resources issues. Respondents were also critical of their organization when they perceived it as being overly inflexible or subject to restrictive rules and mandates.

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[13] The remaining 36% of respondents had mixed opinions about the efficacy of their organization in dealing with environmental issues.

"Our weakest point, though, is that we have no money. We can barely afford to keep the existing stuff we have running. So I sat down the other day and said, you know, how can we do this cheaper? And they said we can't."

"Well, basically we're governed by procedural manuals that are geared to the whole province in a cookie cutter approach, and in a lot of respects it just doesn't work the same everywhere."

Difficulties in coordinating action with other agencies were often perceived as obstacles to taking effective action. One respondent pointed out that the presence of seven different economic development agencies within the region, and explained the challenge posed to provincial politicians in deciding which group to deal with. Difficulties were also reported in maintaining effective lines of communication and sharing of information with realigned provincial ministries.

"Well, that changes. It's so-- it changes all the time, you know. You get to know what minister's in what department and what-- and you know the bureaucrat's in his office and you make your case and you might be making some headway. And next thing you know, everything shifts and everything changes and so, I don't know."

Most respondents indicated that relationships remained effective and cooperative with other offices and departments that were within the same building, and the various offices of the municipal government and city works reported positive working relationships. However, organizations with offices and departments that extend outside of Terrace reported more difficulties in maintaining functional linkages with their organizational counterparts. Freedom to exercise discretion in action and open access to other offices and departments were cited as positive influences on relationships within organizations. The ability of respondents to maintain good working relationships with other internal offices or departments sometimes hinged upon the way the organization had adapted to restructuring and the way changes had affected relationships between offices.

"The role I had here years ago is completely different than what I do now. I do one thing and one thing only and that's it: I put the bun between the burgers and there's nothing else. At least that's the way I feel and it's like you're boxed into a corner. And I can see that down here in our office because that's what we do. Everybody does one specific thing. It's like an assembly line. I've worked in General Motors; I know what that's like. Put on this tailgate. That's all you do for eight hours. And I don't think that's healthy…"

The majority of respondents reported having interactions with other agencies and organization as part of their work. Environmental NGOs, ministerial offices, and economic development agencies were frequently mentioned as groups involved in resource decision-making. Respondents reported good working relationships with other agencies and groups when dealing with compatible mandates and projects with shared objectives. The density of communication and relationship networks in the community were also cited as factors that support cooperation between groups.

> *"And so I'm not anonymous in this town so-- at all. I think it works in the favour of everyone working well together, actually, just the size of the community because everyone knows everybody else. You know, you go to church with the Mayor, the MLA, or whatever."*

However, competition over access to or control over natural resources was identified as a factor that complicated the ability of different groups to work together effectively, and some respondents noted difficulties working with environmental NGOs under such conditions. Although some challenges were mentioned, environmental NGO's were nonetheless acknowledged as a legitimate and active force in resource decision-making, and were referred to as valuable allies when common objectives were involved.

Relationships with government were described in polarized terms, with respondents reporting either difficulty or success in maintaining good working relationships with provincial and federal offices. Federal offices in particular (including the Department of Fisheries and Oceans) were identified as being difficult to access, and respondents expressed sympathy toward federal employees operating under limited budgets with reduced human resources. Local groups such as economic development agencies and the Chamber of Commerce were identified as being instrumental in maintaining good relationships with the provincial government, and Terrace's status as a regional service-centre was identified as a strength in gaining access to provincial ministries and services. The local Member of Parliament and Member of Legislative assembly were spoken of in favourable manners. However, due to their membership in non-ruling parties, some respondents indicated they were hesitant to work too closely with the members out of concern that such relationships could jeopardize their ability to work with the governments in power. Thus, many respondents feel torn between the positive relationships that exist within the community and the desire for more effective and direct channels with external decision-making bodies.

Appendix 1: Issues important to the community and its future

Economic Issues	
	Infrastructure
	Employment
	Impact of population decline on local economy
	General economic decline and instability
	Forest industry
	Economic administration
	Fishing industry
	Economic developing in an isolated area
	General industrial decline and need for new industry
	Opportunities for future development
	Economic impact of policy uncertainty
	Managing growth
	Skilled workforce
	Economic impact of First Nations rights and title
	Mining industry
	Challenges for service economy
	Diversification of economy
	Involvement of First Nations in local economy
	Cost of living
Social Issues	
	Population decline
	Collaboration and communication within the community
	Lack of youth opportunities
	Preservation of culture
	Community participation
	Outside perception of the community
	Maintaining quality of life
	Community vision and identity
	In-migration from surrounding communities
	Education
	Racism
	Adaptive capacity
	Necessary social resources not located in community
	Social fragmentation
	Brain drain
Environmental Issues	
	Sustainable growth and development

	Mining and exploration
	Rivers and waterways
	Maintenance of local food resources
	Forestry
	Climate change
	General environmental conditions
	Potable water
	Community dependence on natural resources

Appendix 2: Environmental Issues important to the community and its future

Fisheries and Oceans	
	Fisheries management
	Fish farms and aquaculture
	Salmon
Mining and Exploration and Oil	
	Enbridge pipeline
Climate Change	
	Snowfall and snowmelt
	Mitigation
	Decreased river flow
Waste Management	
	Littering and garbage
	Recycling
	Littering
Forestry	
	Forest management
	Timber supply and wood quality
	Local processing of raw logs
Balancing environment and economy	
Pine beetle	
Environmental education and awareness	
Agriculture and local food	
Eco tourism	
Sustainable growth and development	
Weather changes	

Appendix 3: Forestry Issues important to the community and its future
Forest industry and organization
Secondary processing of materials
Employment
General economic issues
Low quality wood
Waste management
Environmental stewardship
Questioning economic benefit to community
Movement away from forestry
Decadent wood
Potential new forest industries
Capacity building and education
Saw and pulp mills
Decadent wood
Cost of logging versus value of wood
Isolation from key markets
Ecosystem service and carbon value
Forestry management
Resource ownership and control and license management
Government consultation and regulation
Adaptive capacity
Roads
Stream protection
Forestry administration
Oversight of practices
Adaptive capacity and future forests
Landscape level planning
Lack of reforestation
Deforestation and clearcutting
Forest health
Pine beetle
Aesthetics
Hydrology
Wildlife
Non-timber forest resources: berries, bark, greens
General forest health
Climate change
Old growth forests
Wind storm effects

	Erosion

Appendix 4: Topics for future modelling.

Note: The contents of these tables are likely to be recategorized to provide more accurate categorization of the issues. However, respective frequencies remain accurate in this data.

Impact on salmon	
Fish stocks	
Global issues dynamics and interconnection	
Weather patterns	
	Rainfall changes
	Changes in seasons
	Wind
	Snowfall and snowmelt
	Slides
	Flooding
Forests Changes	
	Fire
	Changes in tree species distribution
	Pine beetle infestation
	Growing season data
Impact on wildlife	
Rivers and waterways	
Earthquakes and tsunamis	
Ice fields	
Model formats and applications	
	Socio-economic impacts
	Specific models of local area
	Mitigation related modelling
	Models easy to understand
	Identification of opportunities
	Consultation on what should be modelled
	Impact of community actions