

Chapter 3 Appendices

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Building A Sustainability Matrix For the Skeena: Lessons from Amazonas

In 2002, Virgilio Viana was a professor of sustainability in Sao Paulo, Brazil when Governor Barcas of the state of Amazonas asked if he would like to walk his talk. So in 2003 he was appointed the Amazonas State Secretary of Environment, responsible for reducing deforestation. Amazonas is the largest, wildest and most remote state of Brazil, at 157 782 000 hectares one and half times the size of British Columbia with about the same population and five fairly independent and separately evolved population groups (Viana, 2008).

In 2006, Dirk Brinkman met Minister Virgilio Viana at the Conference of the Parties for the United Nations Framework Convention on Climate Change in Nairobi, Kenya at his report on how he had reduced deforestation by 53% in the state of Amazonas over three years.

Most impressive about his rigorous process was his recognition that the issues and solutions of one community do not apply to another community. To capture the unique elements he designed a chart on which each community could identify their issue (such as health care, education) which was color coded so every person, whether they could read or not, could participate in ranking its condition from desirable to critical and these rankings could be collated. Each community had their own chart, which was described to Brinkman as a 'Sustainability Matrix'. These matrices helped each community recognize the condition of their community, and helped them prioritize holistically, so that all issues could be included. To learn more about the work of Virgilio Viana, see his account of his experience in his on-line book [Sustainable Development in Practice: Lessons Learned](#).

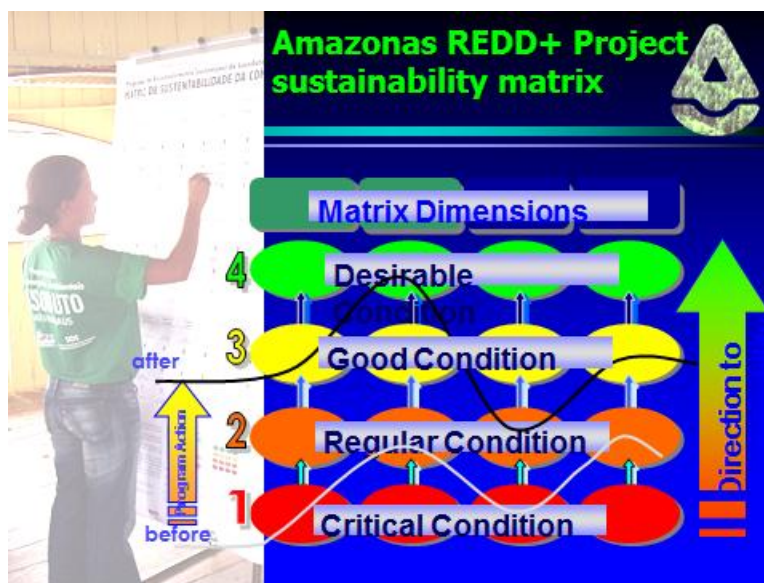


Figure A3.1: The colour coded matrix was a simple way to illustrate the condition of community resources and track improvement over time.

The matrices developed for the Climate Change Adaption Planning for NW Skeena Communities Project are intended to serve in a similar way. Although the outputs are presented through a series of graphs, there is opportunity for ongoing work to periodically test the direction of perceived change with respect to community and environmental values and resources.

Resources important for well-being of the region

In my opinion, the condition of these resources was/is...

Ranking

☐**Small business development**

Current state

Under threat/
Poor conditionFlourishing/
Very good condition

Don't know

☐

20 years ago

☐☐**Outdoor recreation**

Current state

☐

20 years ago

☐☐**Environmental protection**

Current state

☐

20 years ago

☐☐**Local infrastructure
(bridges, roads, river
dikes, and utilities)**

Current state

☐

20 years ago

☐☐**Natural resource trade
and exporting**

Current state

☐

20 years ago

☐☐**Access to education
and skills training**

Current state

☐

20 years ago

☐☐**Heritage and local
culture**

Current state

☐

20 years ago

☐☐**Forest industry**

Current state

☐

20 years ago

☐☐**Tourism**

Current state

☐

20 years ago

☐☐**Local government and
city administration**

Current state

☐

20 years ago

☐☐

Current state

☐

20 years ago

☐☐

Current state

☐

20 years ago

☐

ENVIRONMENTAL RESOURCES

Resources important for well-being of the region

In my opinion, the condition of these resources was/is...

Ranking

Mushrooms

Current state

Under threat/
Poor condition



Flourishing/
Very good condition

Don't know

20 years ago



Salmon

Current state



20 years ago



**Forest health and
diversity**

Current state



20 years ago



Rivers and waterways

Current state



20 years ago



Oolichan

Current state



20 years ago



Berries

Current state

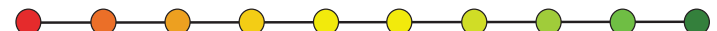


20 years ago

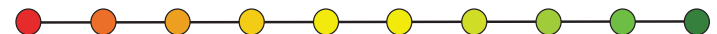


Timber Supply

Current state



20 years ago



Drinking water

Current state



20 years ago



**Animals and wild
game**

Current state



20 years ago



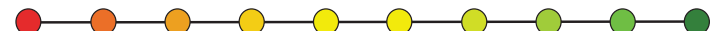
Current state



20 years ago



Current state



20 years ago



Current state



20 years ago



WHAT WILL INFLUENCE THE FUTURE OF THE REGION?

Drivers of change

Influence on the region

Don't know

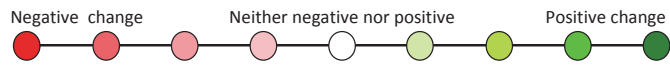
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Natural resource policies

How much will this influence the region in the future?



Will this be a negative or positive change?

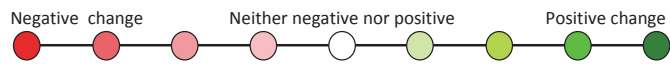

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Global economy

How much will this influence the region in the future?



Will this be a negative or positive change?

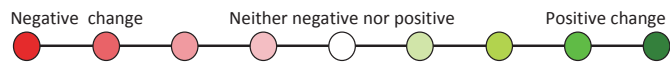

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Climate change

How much will this influence the region in the future?



Will this be a negative or positive change?

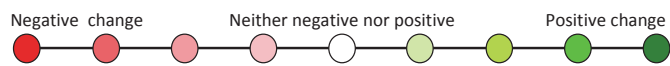

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Transportation

How much will this influence the region in the future?



Will this be a negative or positive change?

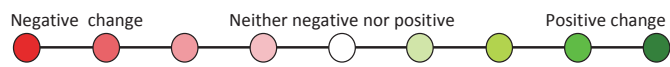

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People moving out of the community

How much will this influence the region in the future?



Will this be a negative or positive change?

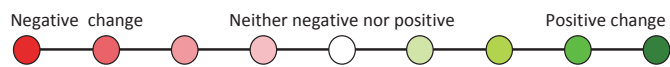

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New people moving into the community

How much will this influence the region in the future?



Will this be a negative or positive change?

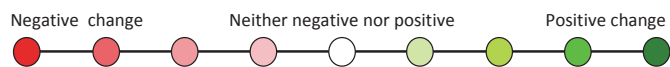

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First Nations Treaty Settlements

How much will this influence the region in the future?



Will this be a negative or positive change?

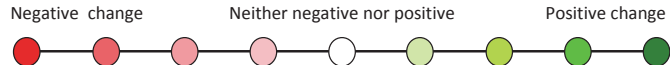

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Availability of natural resources

How much will this influence the region in the future?



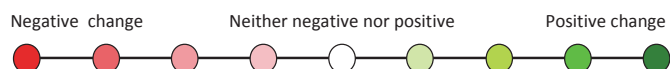
Will this be a negative or positive change?


☐
☐

How much will this influence the region in the future?



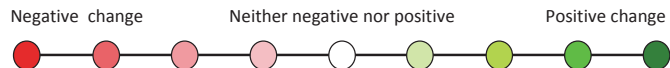
Will this be a negative or positive change?


☐
☐

How much will this influence the region in the future?



Will this be a negative or positive change?


☐

Appendix 3.2 Social Science Methodology

The social science component of the “*Climate Change Adaptation Planning for Northwest Skeena Communities*” (CCAPNSC) project sought to place climate change within the context of community values and resources, and to gain insight into the institutional and organizational factors affecting the processes of community leadership and resource management. The social science study examined these topics by interviewing local leaders and resource management stakeholders working within the study region, and obtaining a wide range of qualitative and quantitative data regarding their opinions and experiences.

Community Selection

The study included the communities of Terrace, Prince Rupert, and Lax Kw’Alaams. These communities comprise three of the most prominent population centres in the area included in the CCAPNSC project. They also represent the central hubs of resource management, administrative, economic, and governmental activity in the region. Terrace serves as host to a large number of municipal, regional, provincial, and federal government offices, corporations, and NGOs that are relevant to the field of resource management. The community also serves as a service and retail hub for surrounding communities, and has historically played a central role in the regional forestry industry and other resource-based activities. Prince Rupert has also played a large role in resource harvesting, processing, and exporting (for both fishing and forestry industries), and plays a key role as a service and retail hub for numerous communities on the central and north coast. Lax Kw’Alaams was considered crucial to this study in order to provide input from First Nations, and due to the controlling interest held by the community in the primary timber forest license in the study region. Lax Kw’Alaams also offered a very different perspective on resource industries and the environment due to the positioning of the community on the ocean, and detached from major land transportation routes. While Terrace occupies a pivotal inland location between major routes west and north from the centre of the province, Prince Rupert sits in a key position at the end of western highway and rail routes. These geographic features form an important role in shaping the relationships between these communities and resource industries and the rest of the province. Lax Kw’Alaams, meanwhile, is more isolated from major routes of shipping, commerce, and tourism, but remains directly involved key resource management activities in the region. In addition to geography, the communities differed in terms of the natural resources immediately surrounding the communities, and the

types of environmental issues posed by the geography (such as proximity to rivers, slopes, and ocean) and local climatic characteristics (such as temperature variations and average rainfall).

Efforts were made to include other First Nations communities in the research. However, the challenges of coordinating research schedules with seasonal harvest activities that occupy key resource managers created barriers to arranging completion of the study in additional communities. The three communities included in the study provided a wide range of economic, social, geographic, and cultural viewpoints on the research topics, and provided access to numerous diverse organizations and institutions involved in community development and resource use and management.

Sample

Interview participants were purposively chosen using a snowball sampling technique (Goodman 1961), whereby initial interviewees were identified by the study team based on their prominent role within their community, and then subsequent participants were chosen based on suggestions by interview participants. A total of 150 interviews were conducted, with 50 key informants chosen in each of three communities (Terrace, Prince Rupert, and Lax Kw'Alaams).

In order to ensure that the initial interviewee did not determine the shape of the rest of the sample, multiple starting points were selected by identifying key community positions at the beginning of the research and ensuring that respondents were contacted in numerous areas of activity and different levels of community and organizational responsibility. The study did not aim to stratify the sample according to these characteristics (or other variables known or unknown), but instead focused on identifying key individuals with knowledge of or involvement in resource management, community leadership and development, and forestry and other natural resource industries. In Lax Kw'Alaams, elders with important knowledge of the traditional resource practices and the local environment were also selected. Close attention was paid to the prospective respondents identified during interviews. Repetition of the same names through multiple interviews provided verification that appropriate respondents were being selected, so that, as the research progressed, the lack of new potential respondents indicated satisfactory coverage of the desired sample population. The demographic characteristics of interview participants can be found in Appendix E1.

The sampling process was focused primarily on obtaining information from a key subset of the population that is believed to be most knowledgeable and most directly involved in resource use and management, and in the process of community leadership and development that guides adaptation to changes in environmental conditions. The

goal was not to obtain data based on the views of the average community resident. However, numerous workers and other citizens outside of formal resource management organizations and processes were included in the study due to them being identified as individuals with lengthy histories in the region and important perspectives on natural resource topics.

As part of the respondent selection process, 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. Interviews were conducted in a variety of settings, including places of work, private residences, coffee shops, and other public meeting spaces. Interviews were typically conducted on a one-on-one basis, with measures taken to ensure privacy of the conversation.

Multiple interviewers were involved in the interview process. In order to maximize inter-rater reliability, the initial interviewer kept notes of key interview features including methods of defining words and issues, methods of introduction and moving between sections of the interview, and practices related to establishing the role of the interviewer and the interviewee. These notes formed the basis of the training and orientation that was provided to the other interviewers in order to ensure that the interviews were conducted in as consistent of a manner as possible. The interviewers reviewed each other's notes and transcripts as the interviews progressed to support the goals of reliability throughout the research process.

Interviews

Each respondent participated in a semi-structured interview lasting between one and three hours. Interviewees answered a range of questions (see Appendix E2) that covered key subject areas, each with distinct learning objectives. The choice of questions included in the interview schedule was informed by previous work by Matthews and Sydneysmith (2010a; 2010b) on climate change and community adaptive capacity. Further revision and development of additional questions was completed by the collective social science team. The questions were generally open-ended questions designed to collect information within specific bounds of the learning objectives. The interview sections were ordered in a manner that placed easier and more straightforward questions at the beginning, while moving towards more complex issues, and using input from the initial sections of the interview to establish the basis and context for the later sections.

The first section of the interview examined the personal histories and characteristics of the respondent, and gathered information regarding their involvement

with the community and resource management or usage activities. This information provided insight to the professional and personal experiences and circumstances that may influence perspectives on resources issues, and the community positions that inform respondent answers. Information on personal or household reliance upon natural resources and time spent living in the region provided important context to information provided later regarding the conditions of natural resources and perceptions of changes in the community and region.

The second section of the interview focused on the identification of key issues associated with the community, the environment or natural resources, and forestry issues (in that specific order). Respondents were asked to first identify the three most important issues for the community and its future. Any environmental or forestry related issues identified at this point were carried forward and included as responses in the subsequent topic areas of the environment and forestry. If no environmental or natural resources issues were identified among primary community issues, respondents were asked to explicitly identify three such issues. Any forestry issues identified among environmental issues were carried forward and included as responses in the subsequent topic area. Finally, if respondents had not yet identified specific forestry issues deemed to be important to the community and its future, they were asked to do so. This approach provided a cascading flow of responses that allowed examination of forestry and other natural resource topics within a hierarchy of issues seen as most important to the community, while providing valuable insights into other economic and social circumstances in the communities. Following the identification of key issues, respondents were asked if they perceived any relationships or linkages between climate change and the issues that they had identified. This query allowed respondents to express their own assessment of climate change in the community without reference to specific items or limitations imposed by the researchers, and provided insight to the causal logic with which climate change is connected to various resources and issues.

The third section of the interview moved from the semi-structured approach to a more structured and quantified tool, which is discussed in the next section. The fourth section of the interview examined the sources respondents rely upon for information about climate change and the environment, and their assessment of the information that is currently available on these topics. Questions about these topics were deemed important as they helped to identify where information is lacking in the community, and they created the opportunity to examine relationships between information sources and the understandings that are held in regard to climate change and environmental issues.

The fifth section of the interview dealt with the role of the respondent and their organization in dealing with or responding to environmental and natural resource

issues. A central objective in the research was to develop an understanding of what assists or inhibits the ability of individuals and organizations to deal with environmental and natural resource issues. Also, through collective analysis of individuals and organizations, we sought to obtain understandings of the communities' respective capacities (i.e. adaptive capacity) to deal with the challenges posed by environmental change.

The sixth section of the interview examined relationships between the individual (or their organization) and other organizations, groups, institutions, and communities. This included attention to relationships with both governmental agencies and NGOs involved with natural resource management. Due to the regional nature of the research, it was desirable to obtain input on relationships between the communities included in the study and with other communities either within or outside the study area. These questions provide a more far-reaching pool of information regarding the capacity of the study communities to adapt to environmental change based on the web of relationships within and between their communities.

The final section of the interview asked respondents for feedback on their assessment of the community's ability to cope with climate change challenges, and their visions of the future of the community. Assessments of community coping and adaptation ability provided a secondary view of community capacity to accompany the organizational and institutional information collected earlier in the interview. Questions concerning the way that respondents view the future of the community were deemed important for understanding the context in which adaptation is expected to have to occur. Envisioning the future of the community also provided respondents with an opportunity to share more open-ended input about their perspectives on the community while being less confined by the structure of the questionnaire.

The Matrices

As indicated previously, the interview included a separate section of more tightly structured questions. In the third section of the interview, the recording device was deactivated, and respondents were also asked to fill out a set of matrices composed of various scales dealing with environmental and community resources, and factors that are expected to influence the future of the region (see Appendix E2). The resources and future drivers in the matrix charts came from previous qualitative research in the study area on community and environmental values (Matthews and Sydneysmith 2010c), and from suggestions from the broader project team. The data collected in these matrices

provided a means for quantitatively comparing perceptions of the relative importance and condition of key resources and future drivers of change. There were three pages to this instrument, which were filled out in ink by the respondent or by the researcher under the direction of the respondent.

The first page of the matrix examined environmental resources (natural resources). A list of nine resources was provided, with three additional spaces in which interviewees were asked to add other items if they felt these were important. Conversely, interviewees could also remove an item already listed if they believed the item was not a resource that is significantly important in the community. The list of environmental resources focused primarily on terrestrial resources (in particular forest-related resources), as that was the focus of the broader study (see Appendix E2). Timber supply was included due to the prominence of timber in the history of the area and the current economy. Forest health and diversity was also included, recognizing that there are other resources besides timber inherent in the forests and to provide the opportunity to gather input on the many different types of values that may be attached to the same general resource (i.e. forest landscapes). In a similar manner, both drinking water (as a specific use of the water) and rivers and waterways (as both habitat and transportation routes) were included to accompany the breadth of values attached to water-based resources.

Each resource was accompanied by a blank space and the interviewees were asked to rank the items in terms of their importance to the well-being of the community, with '1' representing the most important resource, moving down to '9' (or a higher number if additional resources were added to the matrix). Community well-being was articulated to interviewees as reflecting multiple dimensions, including economic, social, and cultural well-being. Interviewees were also informed that while '1' represented the most important resource, the highest number did not reflect an absence of value. Instead, they were reminded that all the resources are viewed as holding significant importance, and the ranking was intended to represent relative rankings.

Interviewees were also asked to rate each resource on a scale of '1' to '10', in regard to the condition of the resource as they see it today, and the condition that the resource as in approximately 20 years ago. It was noted that some interviewees had lived in the area for less than 20 years. In such instances, interviewees were informed that they could reply 'don't know' or could indicate what state they believe the resource was in at that point in time. It was acknowledged that the ratings were subjective in nature, and represent interviewee perceptions of resource conditions, and did not necessarily reflect objective scientific evaluations. However, it was also acknowledged that the interviewees represented a select pool of individuals within the community that

were selected in part because of their relationships with the management or utilization of natural resources. Therefore, it was believed that the perspectives of the selected interviewees are more well-informed than members of the general public, and potentially more important in terms of the impact of their perceptions on their decision-making when it pertains to resource-management decisions.

Instead of a scale of numbers from one to ten, interviewees were provided with a colour-coded continuum that moved from red (representing under threat or poor condition) on the left to green (representing flourishing or very good condition) on the right. The decision to use the colour-coded continuum instead of a numerical scale was partially based on ensuring the instrument was well-suited to respondents of varying comprehension levels and cultural backgrounds, and partially upon the desire to incorporate aesthetic qualities in the instrument that were appropriate to the goals of gathering input on environmental and community well-being and health. Completion of the matrices was facilitated by the interviewers (social science researchers), who help explain and interpret what was required to help ensure that reading comprehension did not constitute a barrier to respondents. The interviewer guided the interviewees through the structure of the matrices, ensured that the interviewees understood each item listed, and provided general definitions to items or resources as required or requested by the interviewee. The position on the continuum selected by the interviewee was later translated into numerical values by the research team as part of the data entry process.

The resource ratings and rankings thus provided input on each respondent's general prioritization of resources in terms of what they believe to be most important to the well-being of their community. Second, they provided an assessment of the condition of environmental resources and a sense of how the said resources are believed to have changed in the past 20 years. The responses provided in the matrices provided data that could be combined with interview responses to investigate relationships between perceptions of resources and the responses to questions asked in the interview. The data from the matrices were also averaged for each community to give comparative measurements of the most valued resources, changes in resource condition, and the most important influences on the future in each community.

The second page of the matrices followed the same process and incorporated the same methodology as the first page. However, instead of focusing on environmental or natural resources, the second page focused on community, or social-level, resources. Ten community resources were listed, with spaces to add additional resources identified as important by the interviewee. Again, interviewees were invited to omit items (i.e. resources) that they did not see as important. The list of resources (see Appendix E2) included both economic and industrial based resources (such as the forest industry and

natural resource trade and exporting), political resources (such as local government and city administration), and more generalized social resources (such as heritage and local culture). While environmental and natural resources were assessed in order to capture perceptions of the relative importance of environmental resources, community-level resources were assessed to capture the perceptions that interviewees held regarding the social fabric of their community as well as their perceptions of changes in the various areas of social activity that define and support life in the region.

The third page of the matrix was different from the first two pages in several important ways. First, instead of focusing on resources, it focused on drivers of factors of change. A list of eight potential factors was provided, along with space to identify up to two additional factors if the interviewee desired. Second, the interviewees were asked to rank the factors in order of their respective importance in shaping the future of the region, rather than their respective importance to the well-being of the community. Third, instead of rating the factors based on their condition today and 20 years ago, interviewees were asked to rate the resources in two ways. They were asked to rate the factors based on the level or strength of influence on a scale of one to nine, with 'one' representing 'no influence' and 'nine' representing a 'very powerful influence'. They were also asked to rank the factors on a scale of 1 to 9, with '1' representing a very negative influence, '9' representing a very positive influence, and '5' representing a neutral influence that is neither distinctly negative nor positive in nature. While the same green to red continuum was incorporated for the rating of negative to positive, a different white to yellow graduation was utilized to represent the scale that measured strength of influence. A scale of '1' to '9' (instead of '1' to '10') was utilized in order to provide a clear mid-point in the scale of positive-to-negative influence.

While the first two pages of matrices asked interviewees to compare the past with the present and describe changes that they had perceived over the past two decades, the third page focused on the future of the region and the kinds of changes that are anticipated. Collectively, the matrices provided a set of quantitative indices that will enable the placing of the rest of the social science data within the context of a changing natural and social environment as perceived by the interviewees. When individual scores are combined, it will allow the placement of each community within the context of developmental paths with defined histories, existing circumstances, and anticipated future conditions that may influence the choices of community members.

Data

Interviews were recorded both on paper and on digital recording devices (with permission of the respondents) and later transcribed into text files. Interview questions were coded by one researcher (assisted by the qualitative research software NVivo9) using an open coding technique, whereby segments of the text were given descriptive labels, and then codes were grouped thematically. This process allowed groups of responses to complex questions to be organized into categories that expressed the way in which specific issues are understood by different groups of individuals within each community. This design allowed the researchers to ask the interviewees relatively complex, and often somewhat broad, questions, yet extract specific answers. For example, Question 14 (see Appendix E2) asked interviewees to identify the most important issues within their community. Responses that identified economic issues were grouped together into a category, which was then available in a summary form for examination by the researchers. This process allowed the researchers, in this example, to review not only how many (what percentage) of the interviewees mentioned economic issues, but also the prominent themes that defined economic issues amongst the respondents who mentioned them. Where categorical responses were collected (for example, yes/no questions), descriptive statistics summarizing the responses were also calculated.

This process of coding and categorizing responses provided the means to translate semi-structured interview data into statistical data, while retaining the ability to derive qualitative insights from the actual responses of the interviewees. Reports were created for each community that presented the statistical data from both the matrices and categorical responses. These reports combined both types of data into summaries of the key themes from the interviews, using representative quotes to illustrate the ways that specific questions were answered and how different issues were understood in each location. The community reports were predominantly descriptive summaries that focused on key trends and themes. These reports were summarized in presentations at all day meetings in December 2011 in each of the communities. These presentations by the social science team (in concert with presentation of data by other members of the CCAPNSC project), were presented in full-length reports that were made available in each community.

The social science research team is midway through the process of entering the matrix data and the coded and categorized interview data into a single quantitative database using SPSS statistical software. Once the database is completed, we will be afforded the opportunity to investigate relationships among key variables about the more complex patterns of behaviour, perception, and understanding among the

interviewees. This method of analysis provides the means to make observations regarding basic correlations as well as observations of the existence of and strength of relationships between pairs of variables, such as the association between personal consumption of natural resources and perceptions of the condition of specific natural resources. The data base will also allow us to conduct more sophisticated inquiries into relationships among multiple variables, such as participation in specific activities combined with perceptions of specific changes in the community, and the way that these two variables interact to influence expectations regarding the future of the community.

In sum, the data collected from the interviews and matrices remains in the care of the social science researchers, and are being analyzed for less descriptive and more analytical study. The data provide the opportunity to conduct analysis on numerous important topics in several key areas of inquiry, including (but not limited to) those described in the following section.

Future Analysis

The primary focus of the CCAPNSC project was on forests and forestry management. A wide range of information was gathered regarding perceptions of forest-based and terrestrial resources and their importance to and role in the communities studied. Future analysis of the data produced from this research will provide the means to examine the economic, social, and cultural relationships that exist between the communities and the forest resources that have played, and continue to play, such a key role in the region. The inclusion of both First Nation and settler communities provides the opportunity to examine the distinct cultural and social specificity of these relationships, and to obtain more detailed understandings of the way that forestry activity is appreciated and perceived in these communities, the different types of values placed on forestry resources, and the various local priorities that may affect future forestry management decisions.

The inclusion of diverse communities within the project provides the opportunity to examine additional sources of contrast, such as the role of geography (including proximity to specific resources and hazards) in shaping understandings of the environment and assessments of respective abilities to cope with distinct environmental issues and climate change impacts. The communities also differ in terms of their economic circumstances and trajectories and this creates questions about the different levels of capacity to engage in new resource development opportunities as well as regional disparities based on these. There are also community differences in the values

placed on various resources and this will have an effect on the difference strategies taken by these communities with regard to future development. This area of inquiry is supported directly by the availability of data regarding the way that the communities envision their futures, and the various models and strategies of development that are favoured by various community leaders and resource managers in each community. Insights based on these areas of inquiry can provide guidance on the way that specific issues need to be articulated in different communities. This may assist resource managers in understanding the needs and desires of the local population.

Although the project was focused primarily on forests and terrestrial resources, interviewees (particularly in Prince Rupert and Lax Kw'Alaams) provided extensive input regarding ocean and freshwater resources, including salmon and other fish species. The project data provide a rich source of information regarding the relationship between marine and land-based resources in the study communities (and their respective levels of importance and conditions). In particular we have obtained significant levels of information regarding perceptions of relationships between marine resources, forestry, and other industrial activities. These data offer entry points to social impact analyses of different resource management strategies based on the types of values attached to various resources, and the role that they play in the communities. This area of inquiry can support efforts to understand the way that new development initiatives can affect different segments of the community. In doing so it will reflect the manner in which the interests of different resource user groups may contrast or align in relation to specific initiatives.

An important part of this study was its heavy focus on perceptions of specific natural resources and environmental changes according to local community leaders, resources managers, and resources users. These data can be combined with the data that we collected about the sources of information relied upon for environmental and natural resource knowledge. This grants us a valuable opportunity to examine the process of knowledge mobilization. In particular, it allow us to consider the processes whereby direct experience and observation interacts with expert knowledge and external information sources in forming more complex understandings of local conditions, global environmental issues, and the interaction between them. Analyses in this area include consideration of the role of traditional ecological knowledge (TEK) as well as the relationships of trust between local populations and the institutions and agencies that serve to deliver environmental and natural resource knowledge to the community and its organizations. Analysis in this area of inquiry can help support efforts to provide education to specific communities, industries, and organizations by identifying specific knowledge gaps and the identifying key points in the process of transforming knowledge into action.

Along with forests, the social research project was heavily focused on the ability of communities to respond to changes in the environment and to take steps to successfully adapt to changing conditions. The data include information regarding the ability of communities, organizations and individuals to successfully adapt both to socio-economic change and to environmental change. These data includes subjective assessments of adaptive capacity from key community members, as well as information regarding organizational features, inter-organizational and intra-organizational relationships, and adaptive and responsive capabilities from which third party assessments of capacity can be derived. This range of data provides the means by which to examine the institutional features and processes within each community that affect the ability of that community to adapt to change. Insights from this type of analysis can support efforts to increase coordination between organizations, institutions, and individuals, and help them identify behaviours and processes that either enhance or inhibit their ability to serve as effective actors in community development and adaptation processes.

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Climate Change Adaptation Planning for Northwest Skeena Communities

(aka the **Skeena Climate Adaptation Planning (SCAP)** project)

Funded by
Future Forest Ecosystem Science Council (FFESC)
BC Ministry of Forest and Range

INTERVIEW SCHEDULE Version 2.0

Prepared by:

Ralph Matthews, PhD, Principal Investigator (email: ralph.matthews@ubc.ca)

Robin Sydneysmith, PhD, Co-Investigator (robin.sydneysmith@ubc.ca)

Department of Sociology
University of British Columbia

INTERVIEWEE NAME: _____

INTERVIEWEE'S HOME COMMUNITY: _____

Interview Code: _____

SCAP Institutional Capacity Interview Schedule

Interviewer's introduction:

The City Council of Prince Rupert is participating in a research project funded by the Future Forest Eco-system Science Council of British Columbia. The project focuses on:

- the impacts that climate change may be having on the resources around your community,
- the ways that any change in resources due to climate conditions may affect your community; and
- the extent to which local community residents are able to respond to any changes.

The study involves the skills of scientists, social scientists, consultant firms, industries, and environmental groups. **The general idea that underlies these questions is that we want to get a sense of how this community and the people who live and work in it deal with possible new situations – and particularly those that may be occurring due to changing climate conditions.**

As part of this study, we are interviewing people in Prince Rupert who have some knowledge of the capacity of this community to respond to changes, and those with particular knowledge about the environment, and local organizations. In particular, we are interested in the role that you play both in your work activities and in your other activities in Prince Rupert. You have been identified as someone who has some of that knowledge and expertise and I thank you for giving us a little of your time today. Our questions will focus particularly on:

- First your background, work experience and role in this community.
- Second, your awareness of changes occurring in this area, particularly environmental changes, and their potential impact on this community.
- Third your involvement with these issues both in your work and in other aspects of life in the community.

Section 1: Respondent's Background

So to get us started, I would like to ask a few questions about you.

- 1) In what year were you born? _____
- 2) Where were you born? _____
- 3) **If not born here, ask:** How long have you lived here? _____
- 4) Have you ever lived elsewhere for an extended period of time (e.g. > 1 year)?

Yes: _____ No: _____

- a) **If yes:** Where? _____

SCAP Institutional Capacity Interview Schedule

5) What is your current job or position?

6) Do you have any training or experience that you rely upon or that you would use in dealing with environmental issues?

Yes_____No_____

Explain:_____

7) Other than your formal employment, are you involved in any clubs, organizations, churches, sports groups, etc? Yes_____ No_____ Please specify:

8) Do you have, or have you in the past, any sort of administrative or leadership role in those organizations? Yes_____ No _____

Specify:_____

9) What is the AVERAGE number of hours in a WEEK that you NOW spend on these (non-work / informal) activities: _____

10) Do you participate in any outdoor activities in the local area? Yes_____ No _____

List them

11) Do you fish or hunt? Fish_____ Hunt_____ Both_____ Neither_____

12) Do you or your family harvest any non-timber forest resources such as berries, mushrooms, or wild greens?

(Ask which ones) Berries_____ Mushrooms_____ Greens/Other ntfr's_____

Specify greens or other non-timber forest resources (such as ferns, salal, , roots etc)

SCAP Institutional Capacity Interview Schedule

- 13) Do you or your household derive any income or provide food for your household through any of these harvesting activities? (harvesting, fishing, hunting)
Yes _____ No _____

(a) **(If income or household usage is indicated)** What percentage of your annual income (or household food) comes from local harvesting, fishing, or hunting?
*Be clear if it is a percentage of **household** income.*

Section 2: Questions about the environmental issues and community

Okay, now I would like to ask you a few questions about environmental issues and the community of Prince Rupert.

- 14) What would you say are the 3 main issues or challenges facing Prince Rupert and its future? **(Note down in the order they are said)**

- a) _____

b) _____

c) _____

- 15) Are there any key environmental and natural resource issues facing Prince Rupert?

- a) _____

b) _____

c) _____

- 16) Are there any key **forestry** issues facing this Prince Rupert?

- a) _____

b) _____

c) _____

SCAP Institutional Capacity Interview Schedule

17) Do you think that any of these issues are connected in any way to global warming or climate change? *(Be sure to ask about forestry and non-forestry issues)* \

Yes: _____ No: _____ Don't Know: _____

a) Please explain your thinking on this.

Section 3: Matrices

MATRIX PAGE ONE

TURN OFF RECORDER

In the next part of this interview, I would like to ask you to assist us in identifying the resources that are most important to this region. Based on past interviews with the people in this region, we have composed a partial list of the social resource that are important to the well-being of the community. We have arranged them in random order on this chart. They include (list them.....)

18) The first thing I would like to ask, is if you think there is anything missing from this list in terms of key sources of well-being in the Prince Rupert region. Is there anything you think should be added or subtracted from this list? *(allow up to 2 more – allow them to eliminate items from the list if they request)*

19) Now could you rate the current state of each resource, using the line of points on the chart, with the far left (red) side meaning the resource is in poor condition and under threat, and the far left green side meaning the value is flourishing and in very good condition. *(direct their attention to the appropriate lines- walk them through each item)*

20) Now using the lines below, could you indicate what you think the state of these resources was 20 years ago.

21) Now that we have a full list, could you rank these community resources from 1 to 12 (or 10) in terms of their importance to the well-being of the Prince Rupert region, with 1 being the most important and 12 (or 10) being the least important.

MATRIX PAGE TWO

On this chart, instead of community values as sources of well-being, I'd like to ask you about natural resources as sources of well-being for the Prince Rupert Region. We have listed nine resources that have previously been identified as important to people in this region.

22) I would like to ask, is if you think there is anything missing from this list in terms of key resources that support well-being in Prince Rupert. Is there anything you think should be added or subtracted from this list? *(allow up to 2 more – allow them to eliminate resources from the list if they request)*

23) Now could you rate the current state of each natural resource as you see it today, using the line of points on the chart, with the far left (red) side meaning the value is in poor condition and under threat, and the far left green side meaning the value is flourishing and in very good condition.

24) Now using the lines below, could you indicate what you think the state of these resources was 20 years ago?

SCAP Institutional Capacity Interview Schedule

25) Now that we have a full list, could you rank these natural resources from 1 to 12 (or 1 to 10) in terms of their importance to the well-being of the region, with 1 being the most important and 12 (or 10) being the least important.

MATRIX PAGE THREE

26) In the last page of this interview, I would like you to tell me what you think will be the most important sources of change for the future of Prince Rupert over the next 20 years. We have a list of eight sources of change, including..... Is there anything that you think should be added or subtracted from this list.

27) Now could you please rate the power or the strength of each source of change on the line of coloured circles. The clear circle at the left means no influence at all and the yellow circle at the far right means a very powerful influence on the region.

28) There is one final set of lines on this chart, and they deal with changes as being negative or positive. I would like to ask you if you see each these factors being a source of negative change or positive change on the region. Red, on the left, represents a very strong negative influence, Green on the right means a very strong source of positive change, and White, in the middle, means neither negative nor positive.

29) Now that we have a full list, could you rank these sources of change on a scale of 1 to 8 (or 1 to 10) in terms of their importance to the future of Prince Rupert, with 1 being the most important and 8 (or 10) being the least important.

Section 4: Sources of knowledge and understanding

TURN ON RECORDER- INFORM RESPONDENT

When it comes to issues of environment and climate change as they may affect Prince Rupert, I would like to ask you a few questions about the information you have, how you get it, and what you think of it.

30) Where do you get most of your information on the environment and climate change from right now?

(a) (**If not mentioned**) Is the local newspaper a good source for information on the environment and climate change? Yes _____ No _____

(b) How trustworthy do you think each of these sources is when talking about climate change and global warming?

SCAP Institutional Capacity Interview Schedule

31) There is a lot of scientific information out there that claims fundamental climate change is now taking place. How much do you think you can trust the scientific information about the environment and climate change that is currently available?

32) Would you say that overall, the information about environmental change that you now have from the sources that you mentioned is specific enough to be applicable to Prince Rupert? Yes: _____ No: _____ Part: _____

Explain: _____

33) Do you think Prince Rupert can plan for climate change based on the information it has?

Yes: _____ No: _____ In Part: _____

Explain: _____

34) What sorts of information on the environment or climate change would you like to have that you don't have now?

35) Many scientists work with computer models that combine different types of data to help them predict what will happen as the climate changes, and how specific parts of the environment might be affected. These models involve collecting information, and using computer programs to create a picture of what might happen under different conditions. For example, some scientists are looking at the way that changes in the climate (such as temperature and rainfall) affect the growth of certain types of trees, vegetation, or wildlife. .

Do you think that computer models are useful tools for understanding climate change and environmental issues? Yes: _____ No: _____ Part: _____

Explain: _____

a) What would do you think should be included in such models?

SCAP Institutional Capacity Interview Schedule

36) Are there any divisions in the community regarding the way that these issues should be managed? (

a) Do these divisions ever make it difficult for you or your organization to respond to, or take action on the issues we are talking about?

b) (If not already explained) How do these divisions affect your own decision making?

Section 5: Your activities/involvement with Resource and Environmental Issues:

As we mentioned at the beginning, we asked to meet and talk with you because we understand that you have a role in the community that is particularly related to **some of the key issues that you just outlined**.

I would now like to ask you about **any role that you have in connection with these issues** – either in your work or in your other activities in the community or outside.

I am particularly interested in any activities that may be related to the **resource and environmental issues we talked about earlier**. Let's begin with work activities:

(INTERVIEWER: Identify the environmental issues that were previously mentioned if there have been any).

37) Does your place of work deal directly or indirectly with any of the issues facing the community that you mentioned earlier? Yes: _____ No _____

A) *If not actively dealing with the issues, ask,*

Is your job or your place of work in any way affected by these issues? Yes: ____ No ____

B) [IF YES to either of the above]: Can you give me some examples? Seek to determine exactly what their organization is doing in relation to the issues or how they are affected.

If in no way working on or affected by environmental issues at work – skip to Question 46 and ask about non-work activities related to environmental issues:

38) [If not already explained]: In your own work activities, is it part of your responsibility to work on some of the environment issues that you identified earlier as important to Prince Rupert? Yes: _____ No _____

a) If yes, What are you personally doing with regard to these environmental issues you have identified?

SCAP Institutional Capacity Interview Schedule

"What sorts of activities do you typically do when you are deal with these environmental issue?"

b) If not working directly on the issues, ask respondent "How do these issues affect your work?"

39) In these activities (or dealing with these issues), do you tend to work on these issues by yourself or do you work with other people?

By self: _____ With Others: _____

a) (if with Others) What other people or departments are involved?

Please specify who, e.g. within this dept. or other parts of the organization

40) Are there people, departments, or outside organizations that you consult for knowledge regarding these environmental issues? If so, who are they?

Section 6: How the department organization works (especially with respect to Resource and Environmental Issues):

These next few questions focus more on the organization or dept. you work in as a whole. In particular I'm interested in how well you think it operates or responds to the specific resource and environment issues we've been discussing.

41) Do you see your organization or department as strong or weak in its ability to deal with issues involved with environmental change?

(INTERVIEWER) *You may need to refer to 28B, and what the respondent or their organization is doing specifically to establish the context for this question.*

Explain: _____

42) Are there any rules or procedures that get in the way of what you're doing, or make it harder for you to carry out your job or respond to these issues as they come along? Can you give me an example? *(probe for both formal and informal rules and procedures, as well as regulations)*

43) *(Ask only if the respondent works within a large organization with different departments or levels)* What can you tell me about the working relations between your dept. or organization and other dept. or organizations? [*PROMPT for lines of communication, committees, formal/informal interactions*].

44) Are there people in other organizations in Prince Rupert working on these same problems or issues? Yes: _____ No: _____

a) IF YES: Do you work with them directly or indirectly as part of your job? Please explain, e.g. *What sorts of things do you work on together?*

SCAP Institutional Capacity Interview Schedule

45) Is it generally easy or hard for people in your organization to team up with, or work with people from other organizations on any of the resource and environmental issues you mentioned at the beginning?

Other groups: _____

Other communities: _____

Other levels of government: (Fed and prov and regional) _____

Section 7: Outside Work: Let's now turn to your activities outside of your work

46) Do you deal with any of these issues facing Prince Rupert outside of where you work – either in one of the organizations **in Prince Rupert** or on your own?

(INTERVIEWER; It may be necessary to remind the respondent about both the issues s/he identified and the organizations s/he is involved in – E.G. "... and what about _____ organization?")

Also, probe to determine if the organization they are involved with is AFFECTED by the issues in the discussion. Be specific about which issue(s) they deal with or are affected by.

a) Yes, in an organization: _____ . No: _____

b) Yes, on own _____

c) What sorts of things do you do? (or how exactly do the issues affect you or your organization?)

47) Does the organization(s) you are involved with work on things together with other organizations? (Or, if working alone, DO YOU work with other organizations?)

a) Yes: _____ No: _____ Sometimes: _____

b) If Yes: What activities / things?

SCAP Institutional Capacity Interview Schedule

c) If No: Why not? If sometimes – explain:

48) Are there groups working on these environmental issues in Prince Rupert that you would rather NOT be involved with? Yes: _____ No: _____

a) Which are they?

b) Why / Why Not?

49) Do you work on resource or environmental issues, with people or organizations (businesses, agencies etc.) from **outside of Prince Rupert**?

Yes: _____ No: _____

a) Which ones? Please explain?

50) Are there any other organizations or people that are involved with these issues as they relate to Prince Rupert that you haven't mentioned that we should talk to about in regard to what is being done?

51) What exactly is being done about these issues? (*ask specifically what the above mentioned parties are doing about the issues mentioned earlier*)

Section 8: Conclusion

In concluding this interview, I have a few final questions regarding the resources and sources of change we have just discussed.

52) Do you think that the future of Prince Rupert is most likely to be determined by what goes on within the community and by the actions of local leaders, OR do you think the future of Prince Rupert will be determined more by external factors that may be largely outside local control?

53) Looking at all of the things we have talked about today, and the values and resources you have considered, what do you think the community leaders in Prince Rupert should do to provide the best future for this community?

(

54) What do you think of the ability of Prince Rupert to successfully deal with the effects of global warming and climate change, if these are occurring?

55) In closing, I would like to ask you one final question. Considering all of the things we have talked about, could you give me your thoughts about the future of Prince Rupert by completing the phrase "If only...." Or "What if....".

Many many thanks

Terrace Community Report:

Climate Change Adaptation Planning for Northwest Skeena Communities

Robin Sydneysmith, Jordan Tesluk, Georgia Piggot and Ralph Matthews
Department of Sociology
University of British Columbia

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

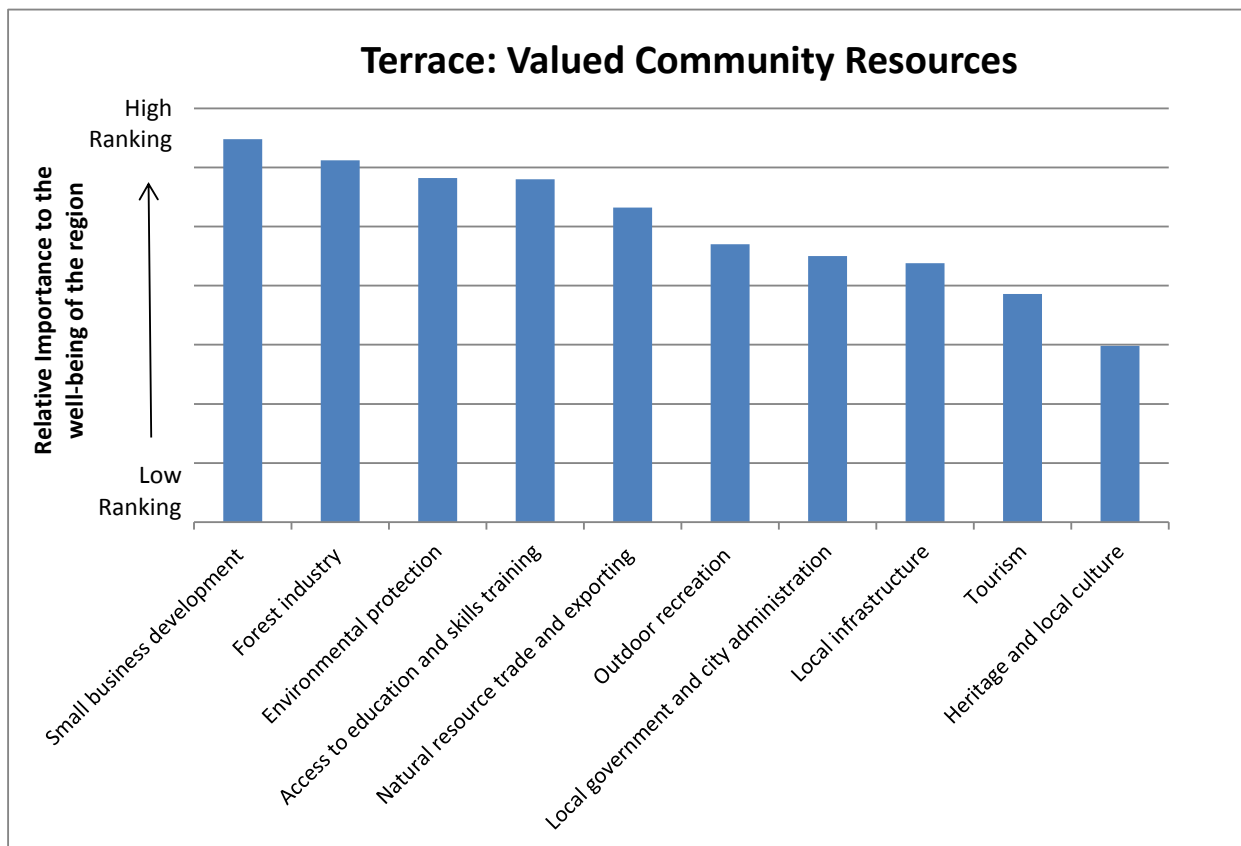
- Small business development and the forest industry are the most highly valued community resources.
- Sharp declines are believed to have occurred in small business and the forest industry over the past 20 years
- Many community resources are believed to have improved, including environmental protection, 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% of 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

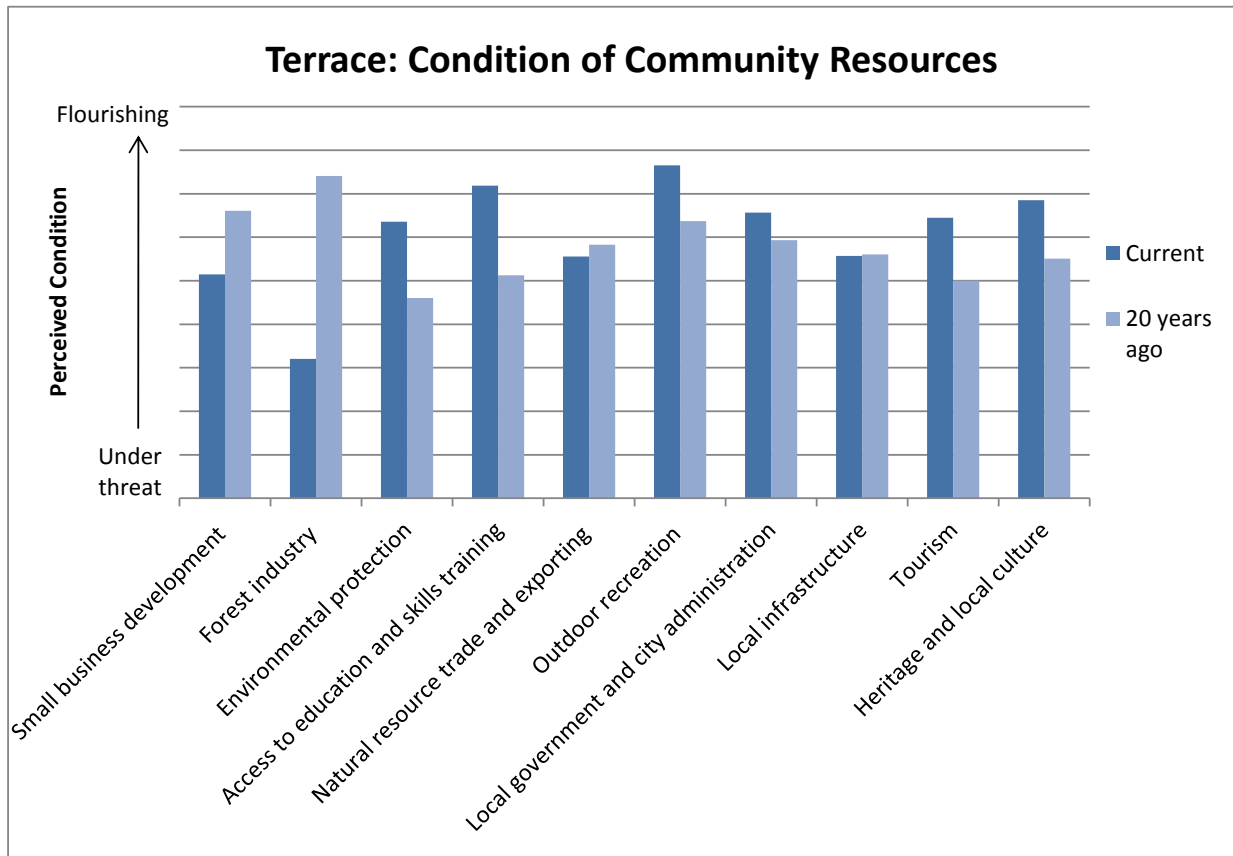
Respondents were asked to rate community resources on a scale of 'one to ten', with 'one' representing poor conditions in which the resource is under threat and 'ten' representing very good conditions in which the resource is flourishing (see Figure 2). Respondents were asked to rate the resources on 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 forestry 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 highly 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.

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 significant) improvement was also reported in the perceived condition of local government and city administration.⁵ The

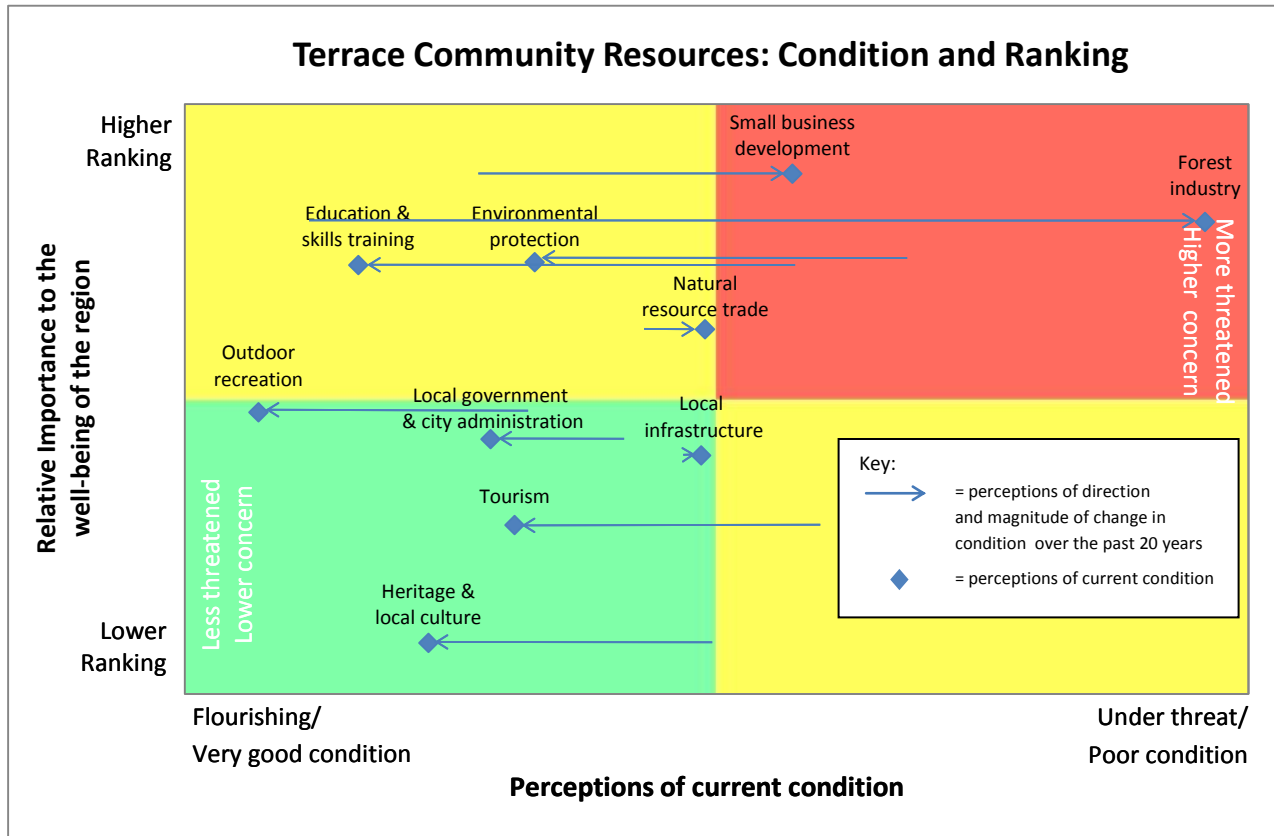
³ Differences (improvements) in assessments of past and current states of environmental protection and outdoor recreation, and education and skills training, were statistically significant ($p < .001$, paired samples t-test).

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



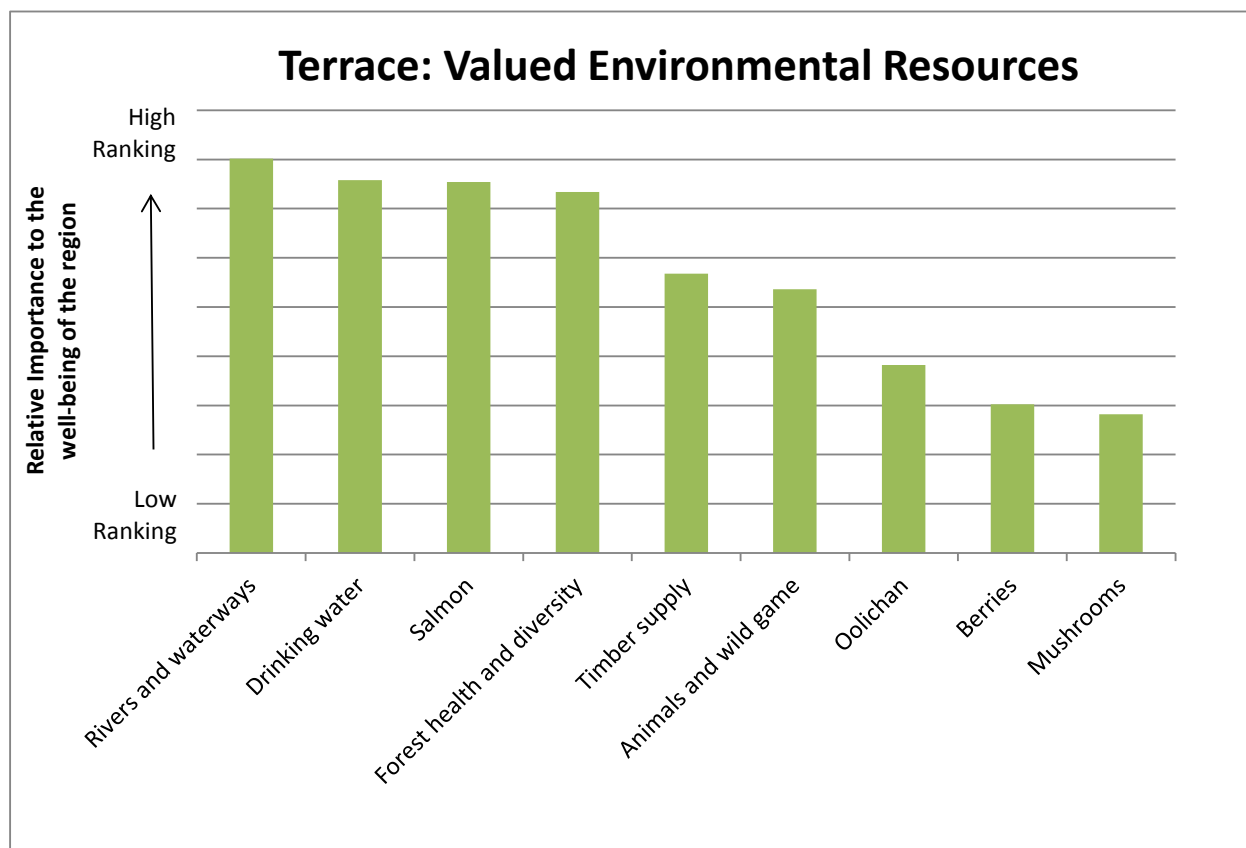
Environmental Resources

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.

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



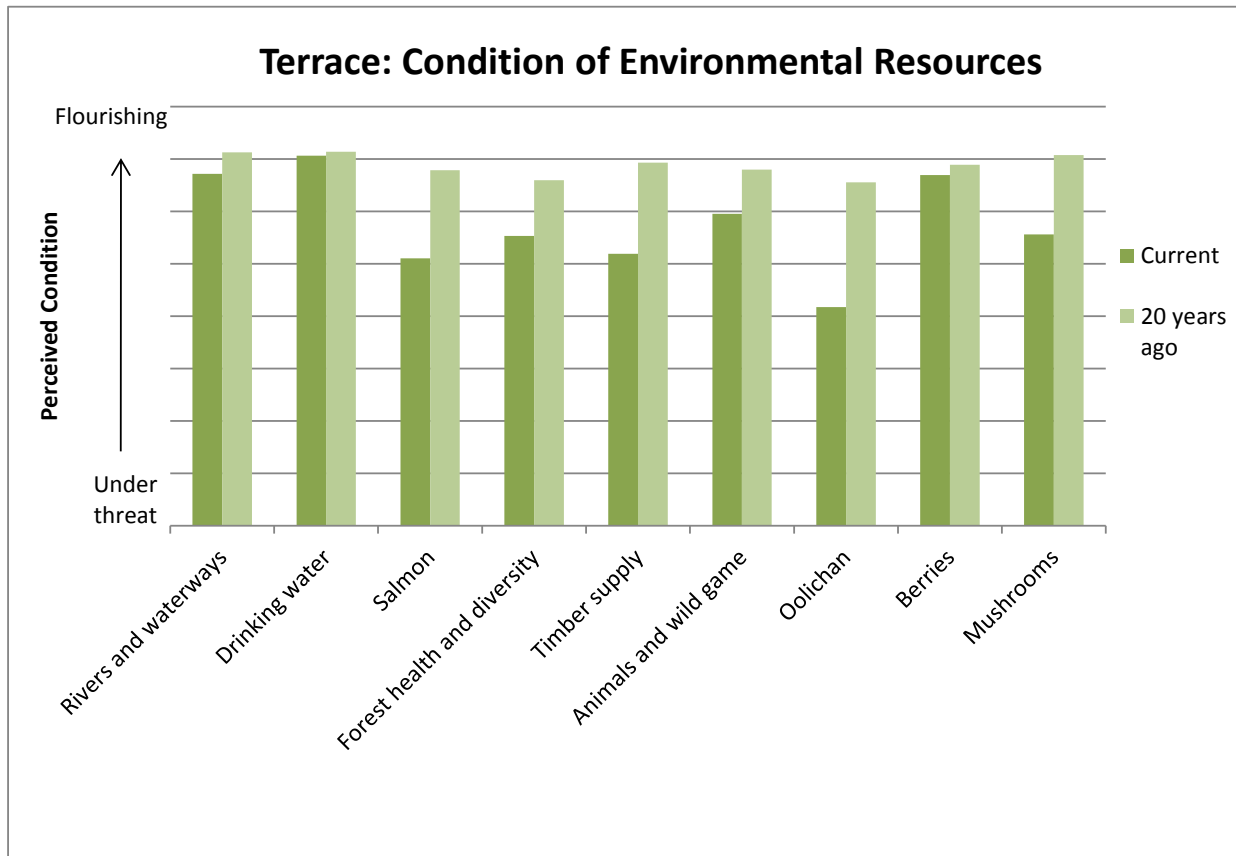
Respondents also identified additional environmental resources that were not explicitly included in the survey. A full 37% of all respondents added at least one specific resource to the list of valued resources. The additional resources included agricultural land and mineral resources (each included 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

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

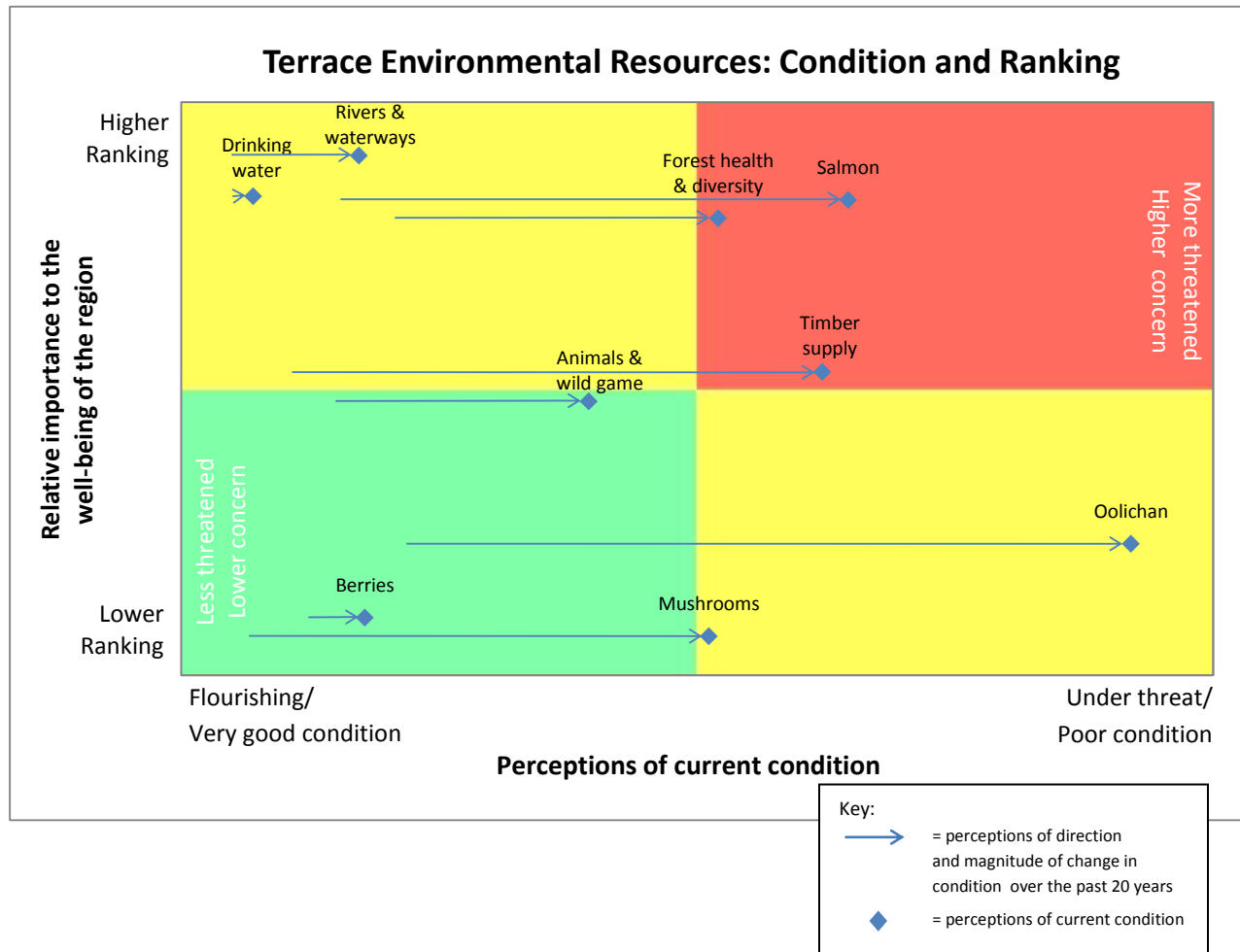


Unlike community resources which showed perceptions of improvement in some areas, environmental resources showed either declines or a lack of change for all measured items. In a positive sense, however, the two environmental resources deemed most important (rivers and waterways, and drinking water) were 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 perceived 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

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



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

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.

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 changes 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 not 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.

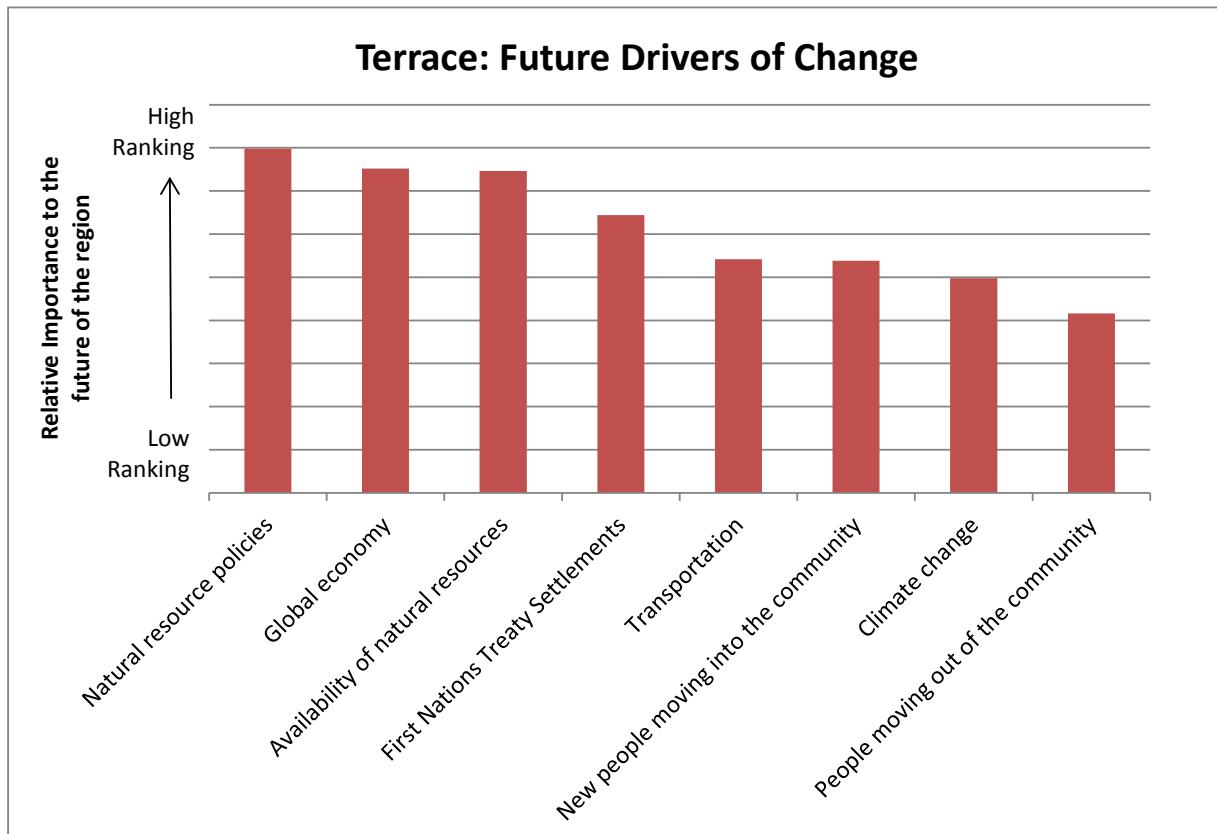
6.0 VISIONS OF THE FUTURE

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.

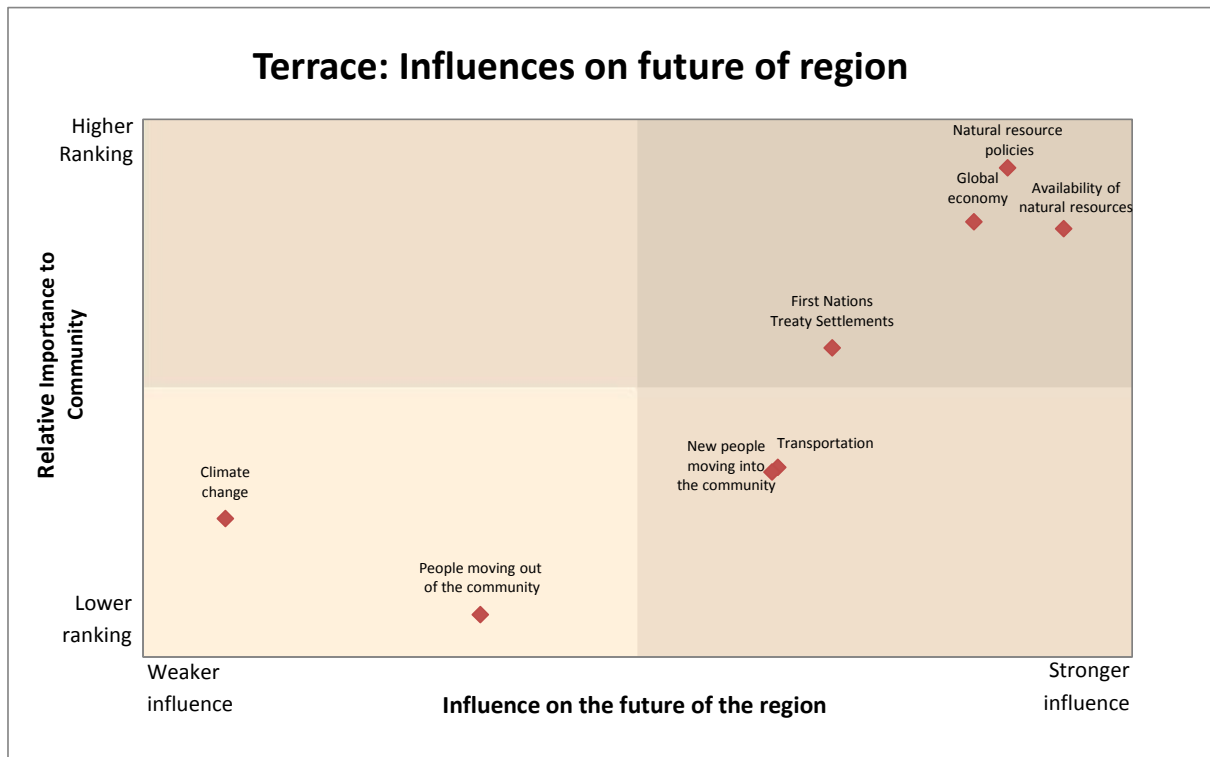
Respondents were asked to identify the factors (or drivers of change) that they believed would be most important in determining the future of the community (see Figure 7). Natural resource policies was identified as the most important factor in determining the future of the region, with 73% of respondents 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



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

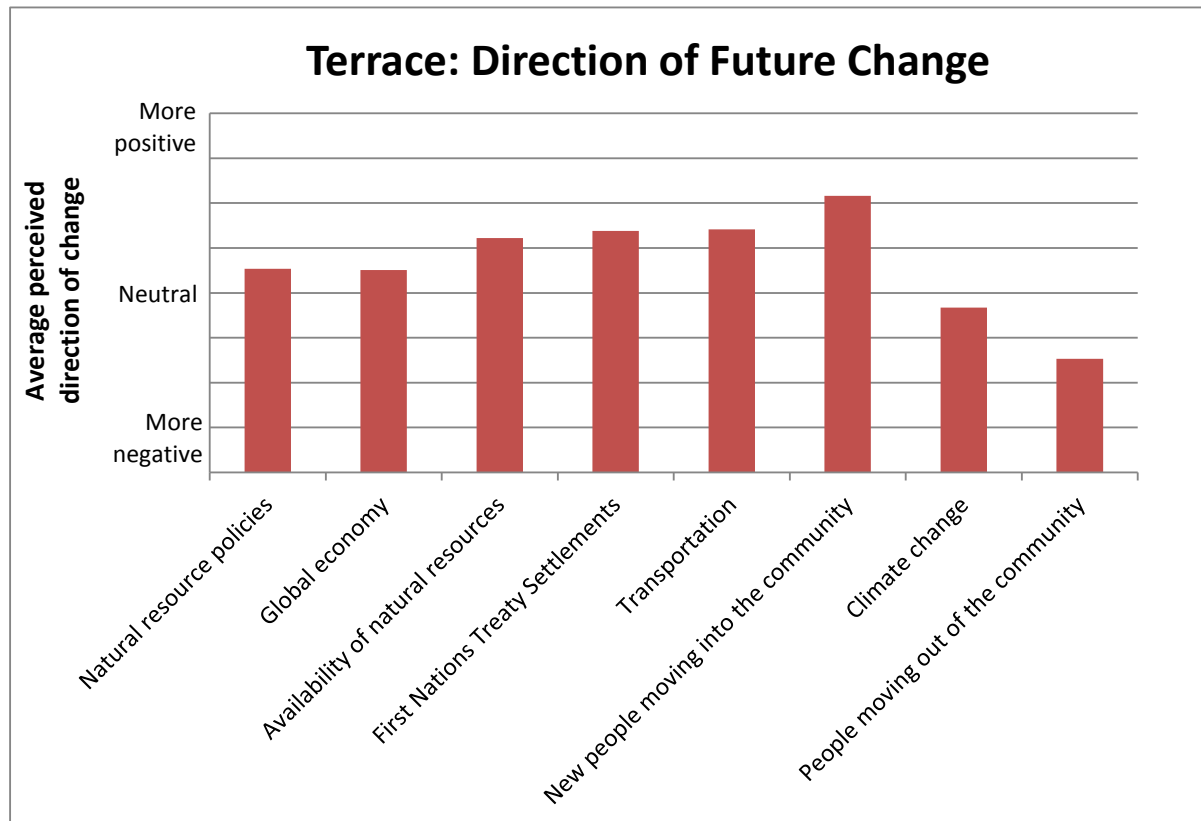
among future drivers of change, and respondents often linked the success of future industrial and economic development with First Nations treaty processes, and the incorporation of First Nations leadership into regional development.

“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.

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.

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
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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

Prince Rupert Community Report:

Climate Change Adaptation Planning for Northwest Skeena Communities

Jordan Tesluk, Georgia Piggot, Robin Sydneysmith and Ralph Matthews

Department of Sociology

University of British Columbia

COMMUNITY ACKNOWLEDGEMENT

This report authored as much by the community of Prince Rupert 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 Prince Rupert and Terrace, 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, along with community elders and long time residents. 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 Prince Rupert. 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	8
40-55 years	19
55-70 years	18
More than 70 years	4

A total of 36 men and 14 women were included in the final pool of respondents. Respondents ranged from 24 to 75 years of age. One person of First Nations ancestry was included in the Prince Rupert sample with the rest of the respondents coming from settler backgrounds. The majority of respondents (74%) were identified as very long term residents who had lived in Prince Rupert for 20 or more years. Smaller percentages of respondents had lived in the area for ten to twenty years, and for one to five years (12% in each group). Only one respondent was identified as being newly arrived to the community. 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 Prince Rupert later in life.

The sample covered a wide range of people in various positions within the community (see Table 2). A strong effort was made to seek out individuals at different levels of responsibility within the many different occupational sectors involved in natural resource usage and the 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 that are 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 in order to ensure that a wider 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	16	Government	2
Forestry	2	Forestry	3
Fisheries	1	Fisheries	4
Education	2	Education	5
Health	1	Health	1
Tourism	5	Tourism	1
Community NGO	1	Environmental NGO	2
Environmental NGO	2	Retail	2
Retail	1	Service	1
Service	1	Real estate	1
Shipping	4	No secondary role	28
Finance	1		
Media	1		
Environmental Research or consulting	2		
Transportation	1		
Retired	9		

Table 3

Level of responsibility	
Community leader	2
Councillor	4
High level manager	3
Mid level manager	12
Small operation manager	6
Administrator	3
Sole proprietor	5
Resource worker	2
Other worker	4
Retired	9

Table 4

Job Sector	
Public sector	23
Private sector	15
Retired	9
Non-government organization	3

Respondents included 23 members of the public sector, 15 members of the private sector, three members of non-governmental organizations, and nine 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 30% 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 (48%) spent between two and ten hours per week participating in various community and volunteer activities with some leadership roles. Only 16% of

respondents held no involvement in community or volunteer roles, and 6% of respondents played a minor role of less than two hours per week. This range of respondents provided input from people deeply involved in community and social development.

Table 5

Volunteerism and Community Participation	
High level of involvement	15
Moderate level of involvement	24
Low level of involvement	8
No involvement	3

Respondents also provided information regarding their level of resource usage based upon their personal and occupational reliance upon fish, forest resources, berries, and other non-timber forest products (see Table 6). Only four 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. Six 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 (34) were identified as low-level resource-users that derive only a small amount of food or income from fish or forest resources, and six respondents reported no resource usage at all. These characteristics show a wide spectrum of the community leadership being included in the sample, without deference to any specific user group.

Table 6

Natural Resource usage	
High resource users	4
Medium level resources users	6
Low level resource users	34
No resource usage	6

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 Prince Rupert and the ability of the community to manage potential future challenges.

3.0 VALUED RESOURCES AND COMMUNITY ISSUES

Key Messages

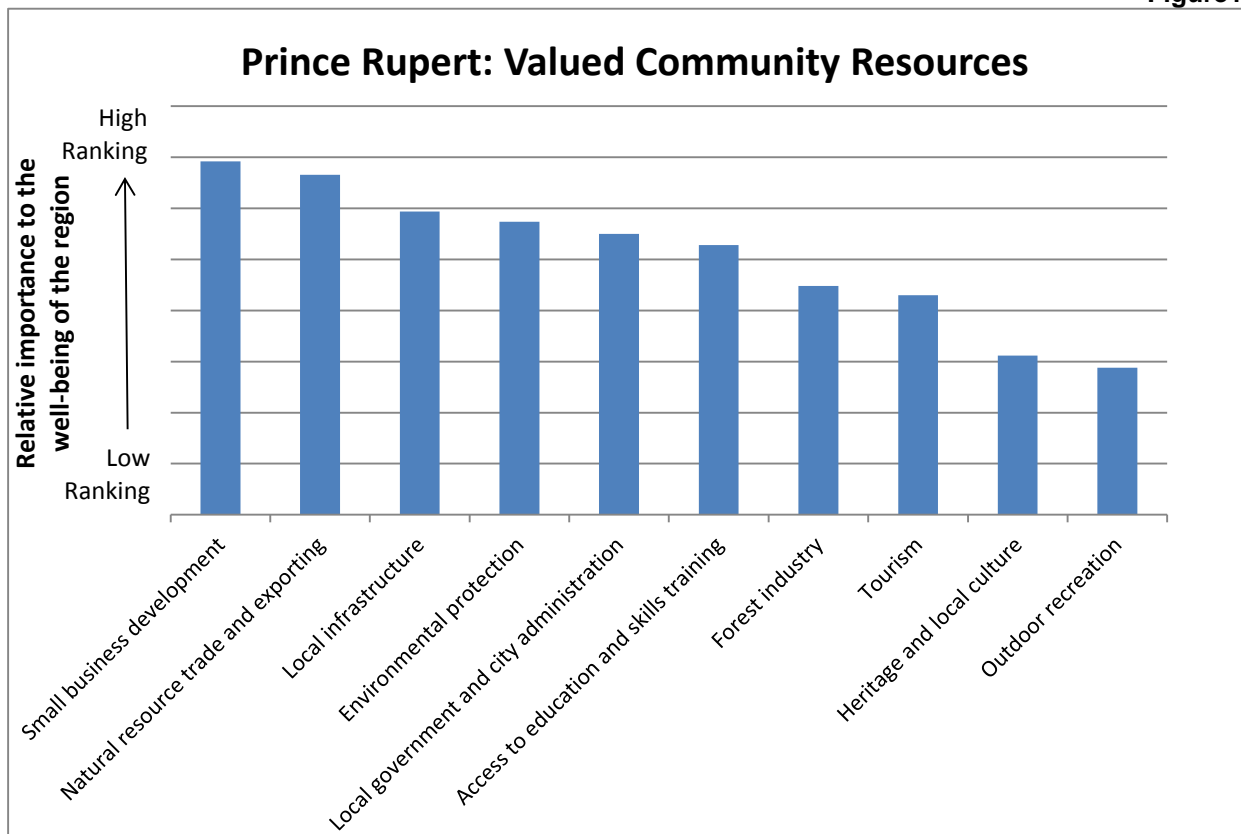
- Small business development and natural resource trade are the most highly valued community resources.
- Sharp declines are believed to have occurred in small business, forest industry, and local infrastructure over the past 20 years
- Some community resources are believed to have improved, including environmental protection, access to skills training and education, and heritage and local culture
- The community resource with the highest level of importance to regional well-being, is also the resource that is believed to have endured the greatest decline in conditions.
- Salmon is the most highly valued natural resource, followed by rivers and waterways, drinking water, and forest health and diversity.
- There is a perception of declining conditions in salmon resources and other ocean resources, as well as in timber supply and forest health.
- Economic matters (specifically employment challenges) dominate the issues that are seen as most critical to Prince Rupert and its future.
- Employment is seen as a problem both as a lack of opportunities for workers, but also in a reduced workforce capacity due to the loss of skilled labour.
- Employment losses are connected with population shrinkage, and a shrinking municipal tax-base that threatens the ability to fund repairs to failing infrastructure.
- Fisheries are the most commonly cited environmental concern.
- Among forestry concerns, organization of the industry and log market are the most commonly cited issues, with forest health being of concern to few respondents.
- 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 was the most highly ranked item in the list of presented resources, and was

identified among the three most-valued resources by 48% of all respondents. Natural resource trade and exporting is the second most highly-ranked community resource, with 44% of all respondents placing it among the three most important resources for community well-being. Moderately high levels of importance were also attached to local infrastructure, environmental protection, access to education and skills training, and local government and city administration.

Figure1



Heritage and local culture, and tourism received the lowest rankings, and were rated among the top three most important resources by only 6% 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 represent 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 the 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. The additional community resources included fisheries and the fishing industry (included by 14% of respondents), funding for social services and health care (12%), and the container port (8%).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 (the community resource identified as most important) showed a substantial decline in respondents' assessments, falling from an average rating of 8.8 in the past, to only 4.5 today. Substantial declines were also apparent in the forest industry (falling from 8.4 to 4.9) and local infrastructure (falling from 6.9 to 5.1).² These differences were found to be statistically significant, which means that the findings are highly 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. Less sizeable decreases were reported in natural resource trade and exporting, local government and city administration, and outdoor recreation.³ Changes in the condition of community resources were not universally negative, however, and small improvements were reported in the perceived conditions of environmental protection, access to education and skills training, tourism, and heritage and local culture.⁴

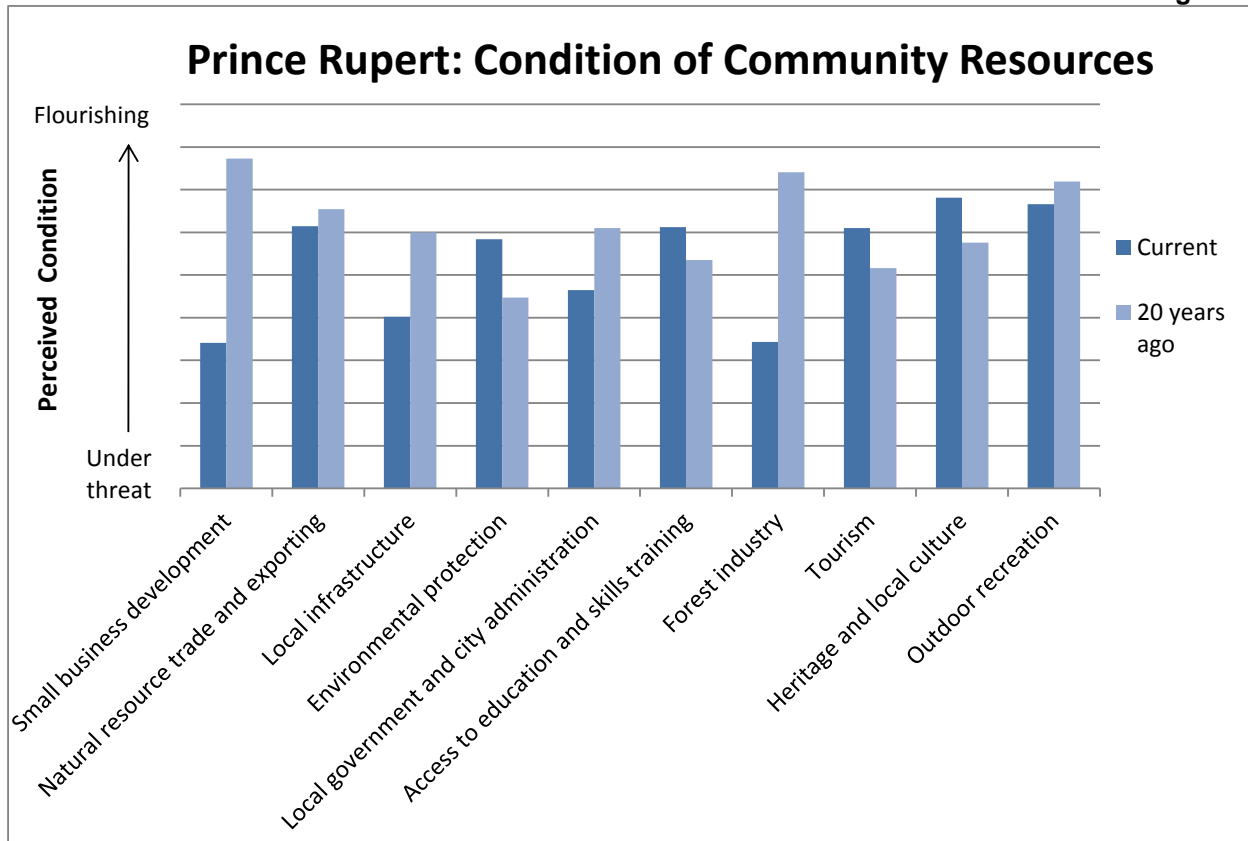
¹ Community resources added to the list by smaller numbers of respondents included Employment Opportunities; Industry; First Nations Provincial and Fed Government; Local area accessibility; Aquaculture sustainability; Large Business Development; Sustenance fishing/hunting; Parks; Population; Municipal infrastructure; and Arts community

² Differences (declines) between assessments of past and current states of small business development, infrastructure, and forest industry were statistically significant ($p < .001$, paired samples t-test)

³ Difference (decline) between assessments of past and current state of local government and city administration was statistically significant ($p < .001$, paired samples t-test). Differences in natural resource trade and outdoor recreation were not statistically significant.

⁴ Differences (improvements) between assessments of past and current states of environmental protection and in heritage and local culture were statistically significant ($p < .01$, paired sample t-test). Improvements in tourism and in access to education and skills training were not statistically significant.

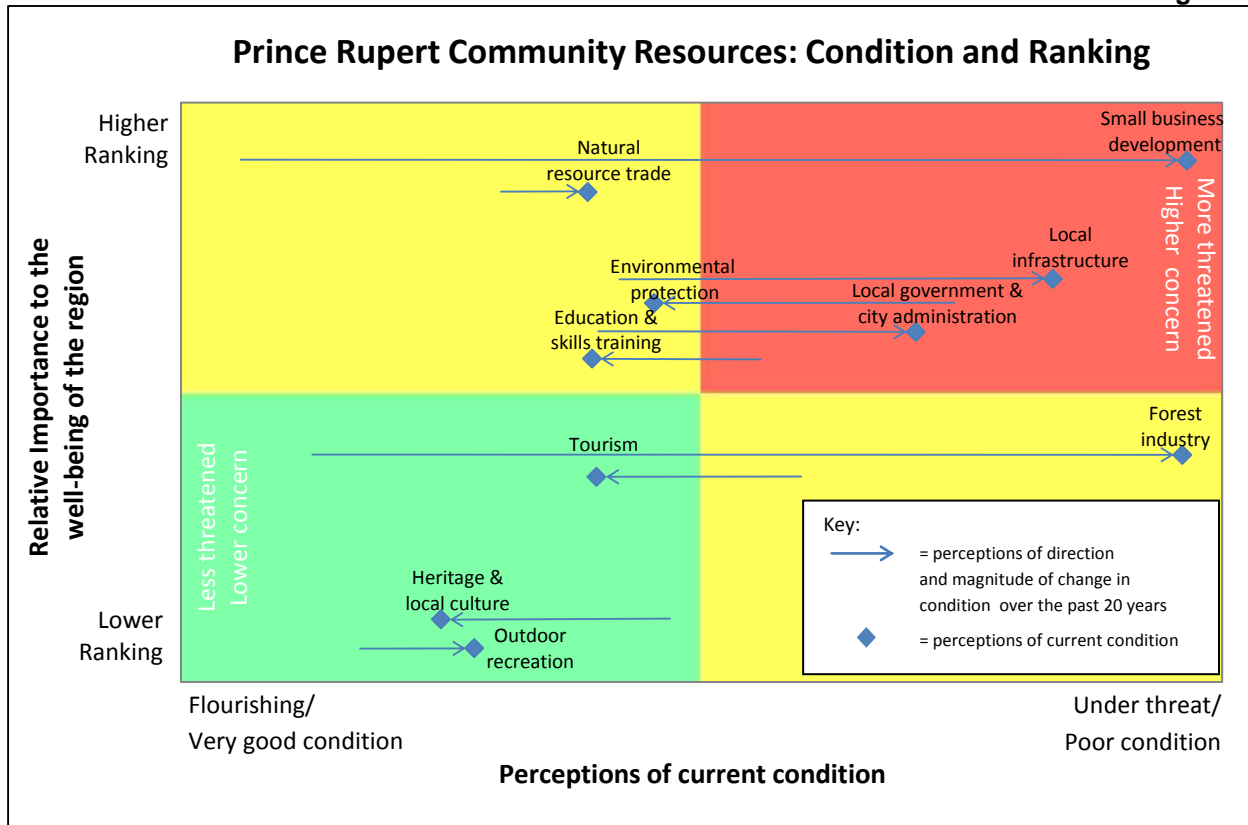
Figure 2



Among items that respondents added to the list of resources, sharp declines were reported in the state of the fishing industry and funding for health and social services, contrasted with a substantial improvement in conditions related to the container port.⁵ The changes in the conditions of community resources is overlaid with their importance ranking in Figure 3. Figure 3 demonstrates the substantial nature of the perceived decline in small business, forestry, and local infrastructure in comparison with other community shifts.

⁵ Changes in the conditions of resources added to the list cannot be expected to provide meaningful data. The resources were only rated by a small number of respondents, and the scores for these items thus possess a wider confidence interval.

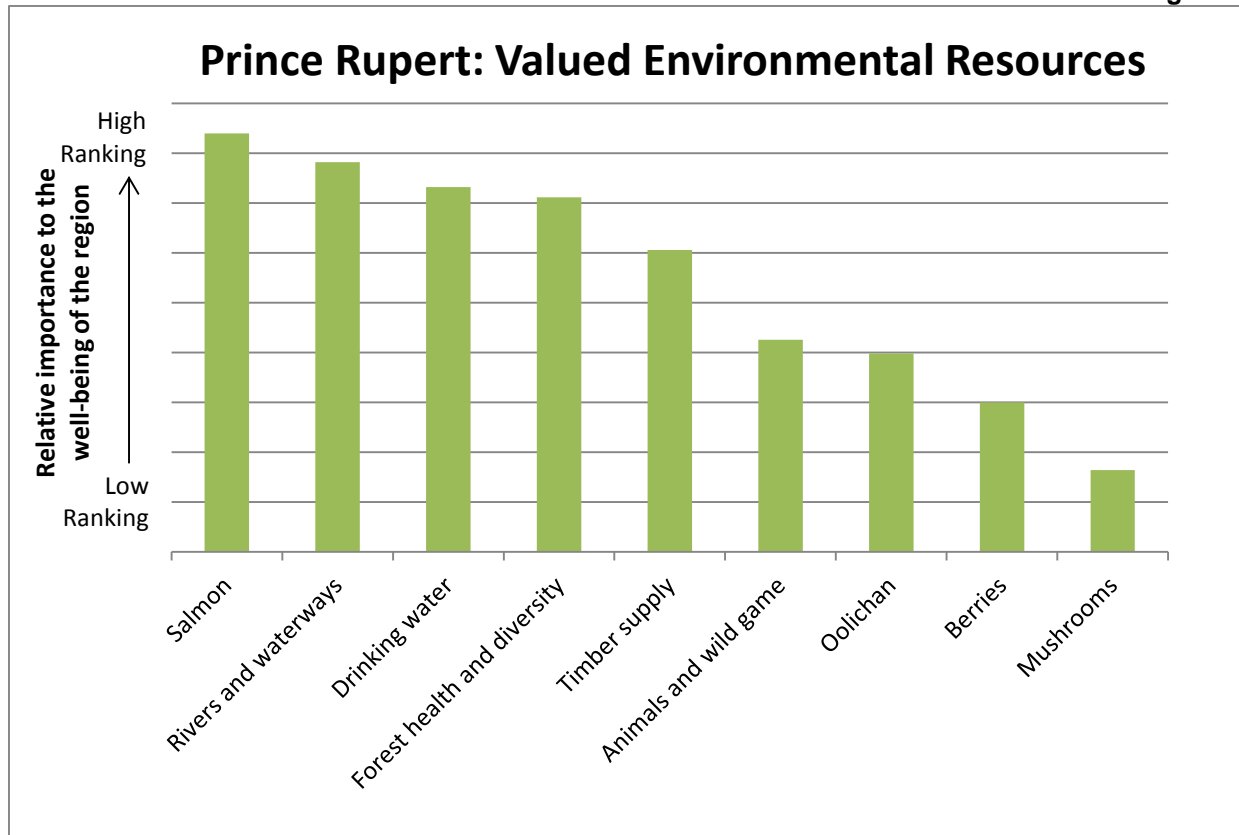
Figure 3



Environmental Resources

Respondents were asked to provide input on the environmental or natural resources that they feel are most important to the well-being of the community (see Figure 4). Salmon was the most highly ranked item in the list of presented resources, and was identified among the three most-valued resources by 74% of all respondents and as the number one important resource by 32%. Rivers and waterways was the second most highly ranked community resource, with 64% of all respondents placing it among the three most important resources for community well-being. Drinking water along with forest health and diversity were also ranked highly, being placed among the three most valued resources by 54% and 48% of the respondents respectively. Mushrooms (which are of significant value in other parts of the northwest region) were ranked lowest among the listed resources, and were left unranked or excluded from the list altogether by 32% of respondents, indicating the specificity of some resources to specific areas or communities.

Figure 4



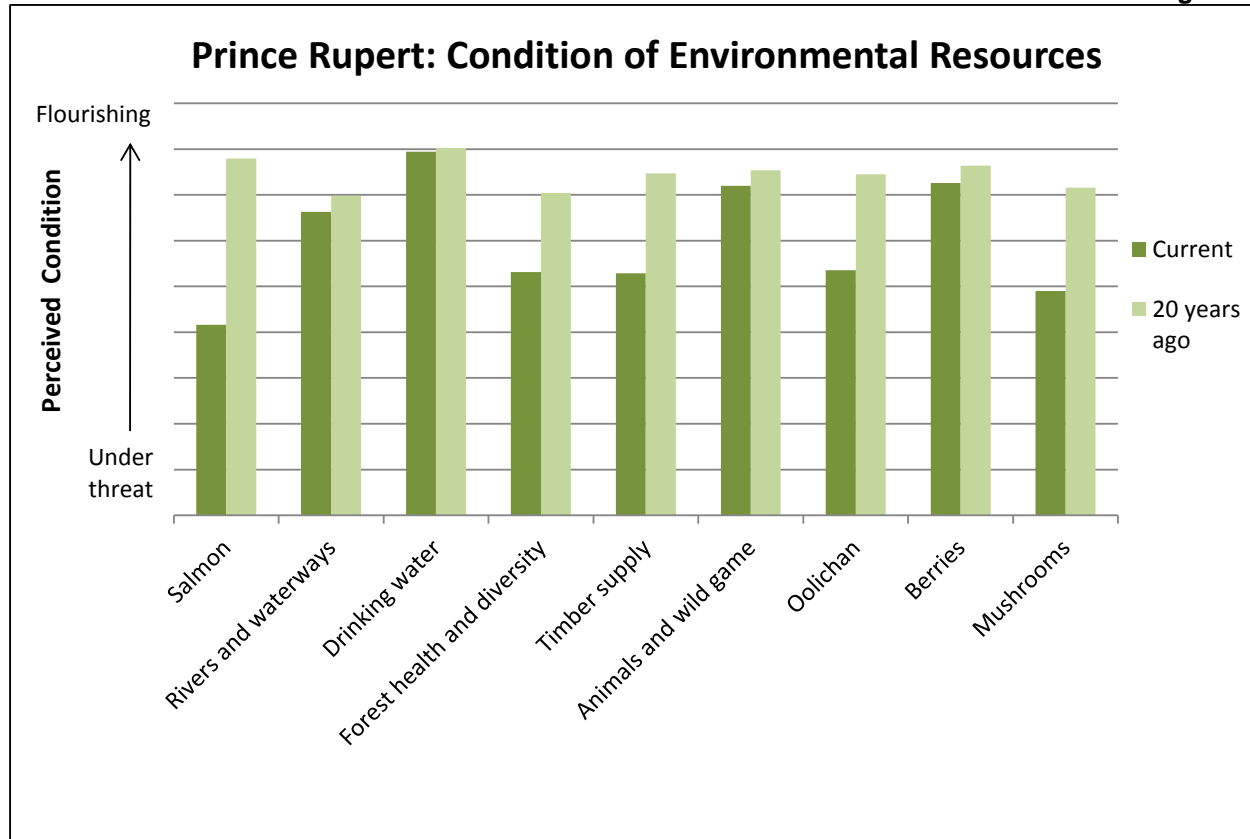
Respondents also identified additional environmental resources that were not explicitly included in the survey. A full 36% of all respondents added at least one specific marine resource to the list of valued resources. The additional resources included groundfish, shellfish, and halibut (each included by 8% of respondents), and herring and other fisheries (each included by 6% of respondents). The frequent reference to marine resources, and the wide range of items mentioned, indicates the importance and diversity of marine resources in Prince Rupert.⁶

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 the early 1990s. This provided the opportunity to assess perceived changes in the

⁶ Additional items added to the list of environmental resources important to well-being included Halibut; Ground Fish; Shellfish; Other Fisheries; Herring; Mineral Resources; Seaweed; Islands to Use; Ocean; Grain Shipping opportunities; Medical/Edible Vegetation; Wind Energy; Whales; Oil/Gas; and Youth.

condition of environmental resources over the past 20 years. As with community resources, the most important environmental resource was perceived as having deteriorated substantially over the past 20 years, with salmon falling from a rating of 8.7 to 5.⁷

Figure 5



Substantial declines were also apparent in timber supply (falling from 8.7 to 6.5), oolichan (falling from 9.3 to 6.7), and forest health and diversity (falling from 8.0 to 6.3).⁸ Less sizeable decreases were reported in the conditions of all remaining resources, and no perceived improvements were indicated in the resource ratings.⁹ The perception of declining environmental conditions was mirrored among the items added to the list by the respondents, with nearly universal perceptions of decline in the condition of environmental and natural

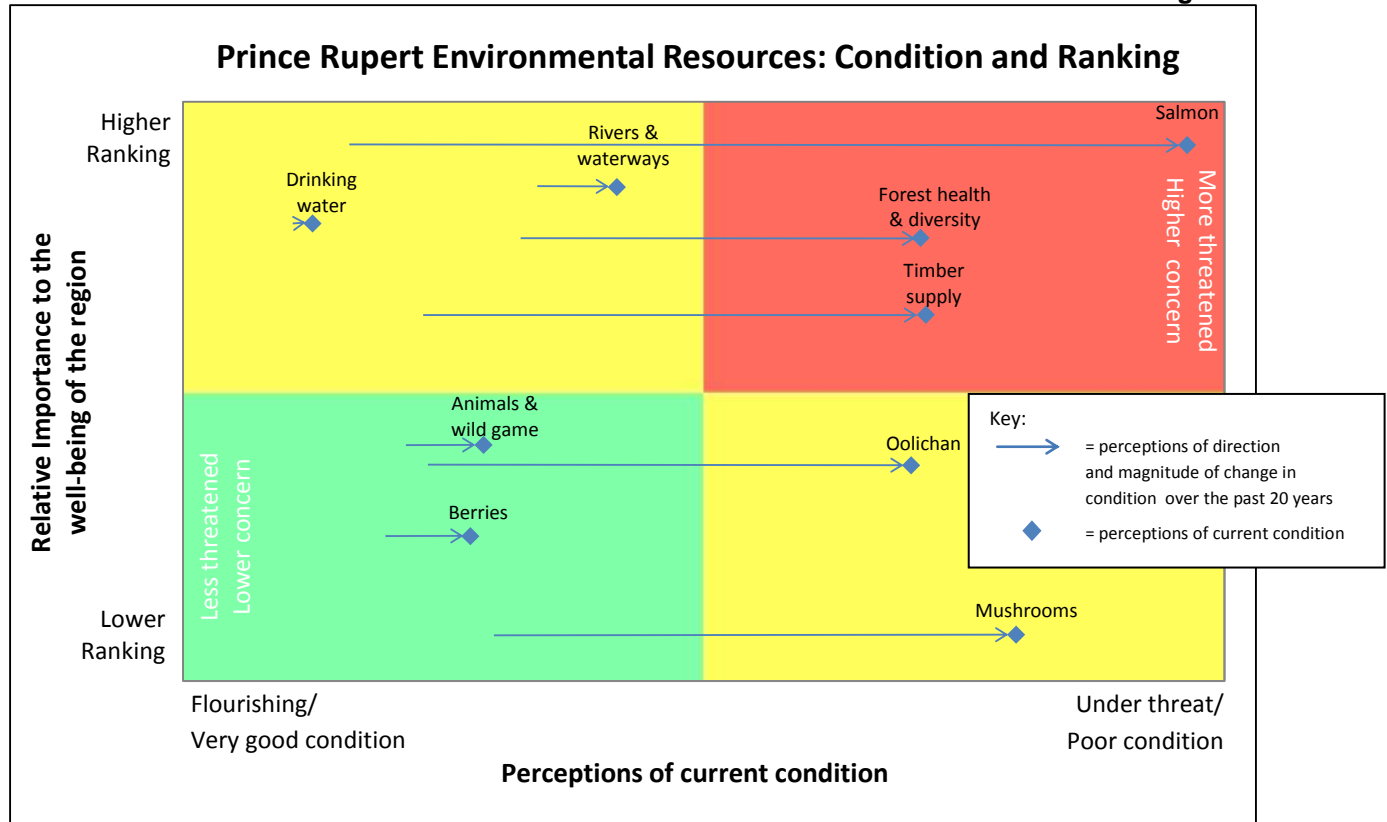
⁷ Difference (decline) between assessments of past and current state of salmon significant ($p < .001$)

⁸ Differences (declines) between assessments of past and current states of timber supply, oolichan, and forest health and diversity were significant ($p < .001$). Although mushrooms were not deemed as important as other resources, they shared a distinct deterioration within the perceptions of the respondents ($p < .001$).

⁹ All remaining differences were not significant ($p > .05$), except for animals and wild game ($p < .05$).

resources. The rankings of environmental resources are overlaid with the perceived changes in their respective conditions in Figure 6.

Figure 6



The distinct perceptions of declining environmental conditions is readily apparent in Figure 6, with three of the five most important resources exhibiting sharp declines over the past two decades. Highly valued marine resources and forest resources are both believed to be in a state of decline.

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 mentioned issues, with 98% of all respondents identifying economic matters among critical community issues. Within these reports, 60% of all respondents identified a recent decline in employment and/or an ongoing need for new job opportunities as one of the most pressing local issues. Numerous respondents pointed to job

losses in pulp milling and fishing as key factors in the depression of employment opportunities. Opportunities in expansion of the port facility were often mentioned as a potential way of bouncing back from these losses. However, the prevailing tone of the employment issues in the community was negative, and the second most frequently identified issue (population loss) was often tied directly to the lack of employment. More importantly, the perceived lack of employment opportunities and associated population loss suggests that local industrial and business capacity has been compromised by as a result of losses in key segments of the population.

"The skilled tradespeople have left town, a lot of them. My-- a lot of my friends have left to go find work elsewhere, right, usually in Alberta or similar industry or got into oil and gas, type of thing. So with them leaving, that obviously took their families and their skill and education with them."

This statement resonates with the views of business owners who reported difficulties in finding appropriate new hires, and 18% of respondents mentioned a loss of a skilled workforce as a key community issue. Respondents also tied population and employment loss to the third most frequently mentioned issue; deterioration of local infrastructure, which is mentioned explicitly by 24% of respondents. The declines of employment and population were seen as being linked to a weakened municipal tax-base that compromises the ability to repair essential infrastructure. This pattern of community issues points towards important challenges for the community to manage if and when infrastructure improvements are required to deal with future environmental issues such as climate change impacts. Challenges within the fishing and forest industry, and depressed general economic conditions were placed among critical community issues. The remainder of key community issues revolved around topics such as the need for future economic development, industrial decline, and obstacles to growing new opportunities.

Social issues figured prominently in the responses of 72% of respondents, with population loss as the defining issue. A wide range of social issues was mentioned as important for the community, including problems with health care and education. Although First Nations treaty settlements were deemed to be important drivers of future change (see Chapter 6, Figure 9), only 16% of respondents pointed to making progress in relationships with neighbouring First Nation communities as one of the keys to enabling repair of the economic and social fabric of the region.

A diverse array of environmental issues accounts for the third largest group of issues identified as critical for Prince Rupert and its future, with 34% of respondents identifying specific fishing, forestry, or other resource issues as being highly important. Some respondents identified positive resource opportunities such as expansion of mineral exploration as keys to the future. Only 6% of respondents identified climate change as one of the three most important issues for the community and its future, but specific environmental problems such as pollution and waste management were identified as important by 18% of respondents. A full list of issues deemed important to the community and its future (in general order of their frequency of being mentioned) is contained in Appendix 1.

Environmental Issues

When asked to identify specific environmental or natural resource issues, fisheries and ocean issues were identified by 62% of respondents. Oil and gas activities were the second most frequently mentioned environmental issue, with 22% of respondents reporting concerns about the potential risks that projects such as the Enbridge pipeline may pose to the environment and fisheries. Other environmental concerns covered a wide range of topics, including waste management, access to natural resources, and various forest issues. Climate change was mentioned by only 18% of respondents as one of the most critical environmental issues for the community and its future.¹⁰ A full list of environmental issues deemed important to the community and its future (in general order of their frequency of being mentioned) is contained in Appendix 2.

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 may be important to the community and the future. The majority of respondents (76%) identified issues related to the organizational and structural features of forestry, most notably the export of raw logs. Log exports were generally identified in a critical light, but some respondents expressed mixed opinions about the economic trade-offs inherent in the immediate economic use of the timber versus the value of secondary processing.

¹⁰ This figure remained low despite the mentioning of climate change as an integral aspect of the wider research project in the introductory literature provided to the respondents prior to the interview.

"It's creating some employment, but...obviously people would like to be working here in the community. But when you export the logs that's not necessarily an option."

Loss of pulp mill jobs and general forestry employment also figured prominently among key forestry issues (mentioned by 24% and 20% of respondents respectively), along with a slate of other less-frequently mentioned issues such as declining wood quality, indirect impacts of forestry on other industries, and closure of the local ministry office. A full list of forest-related issues deemed important to the community and its future is contained in Appendix 3.

Specific forest management issues were identified by 38% of respondents, with ownership and control of forest resources being the primary concern within this topic area. Concerns about control of resources sometimes focused on division of resources between First Nations and settler communities, but also included desire for access to useable timber for secondary processing regardless of which local groups benefit. The environmental impact of forestry was seldom mentioned, corresponding with beliefs that environmental protection has improved over the past 20 years (as indicated in Figure 3). However, forest health issues were still identified by 30% of respondents, with occasional references to topics such as downstream impacts of logging and changes in hydrology that may negatively affect fisheries. Only one respondent identified climate change as a forestry concern, but there was a wider sense of other environmental challenges to the health of forestry as illustrated by reference to the pine beetle infestation by eight respondents. Overall, concerns related to the overall management and allocation of forest resources were more prominent than concerns about the general health of the forests and impacts associated with human activity and/or climate change.

4.0 CONTEXT OF CHANGE

Key Messages

- Half of all respondents believe there are definite connections between climate change and key community issues. Many respondents remain uncertain if such linkages exist, while only a small number feel that there is no relationship between climate change and the most important issues in the community.
- Climate change is often perceived to pose a threat to salmon and fisheries, but there is a lack of clarity and causal logic regarding the exact nature of potential impacts, and explaining potential climate change impacts must compete with other important issues that capture the attention of the community.
- Potential climate change impacts on forestry are perceived by few respondents as forests holds less overall importance in the community than other natural resources. However, perceptions of forest impacts appear to revolve around a more clearly defined set of causes and effects.
- Respondents expressed uncertain expectations towards both climate change impacts on the environment and potential policy shifts that may occur in response to climate change.

Although climate change was seldom identified as a key issue for the community and its future, more than half of respondents (54%) believe there are connections between climate change and the issues deemed critical to Prince Rupert and its future. In keeping with the resources identified as most important to the community, potential impacts on fisheries figured prominently among perceptions of climate change impacts. In *Section Three*, it was shown that respondents perceived distinct changes in the conditions of many highly valued natural resources, with fisheries (particularly salmon) exhibiting the greatest decline. Thus, it appears that concerns related to climate change revolve primarily around impacts on the natural resource (salmon) believed to play a keystone role in regional well-being, and these concerns are accompanied by a sense of significant decline in the condition of the resource. However, most respondents were uncertain about the exact nature of potential climate change impacts on salmon. Respondents tended to express questions and general concerns regarding effects from temperature changes and other shifts on salmon and their habitat rather than specific beliefs about the causal linkages between climate change and fisheries (or distinct negative or positive aspects thereof).

Understanding relationships between climate change and salmon appears to compete with other contentious changes occurring in relation to fisheries relating to catch allocations, licensing, and concerns of over-fishing. When attempting to discuss climate change impacts on this resource, one must acknowledge that community concerns may already be dominated by other more prominent issues.

“So, you know, Mother Nature, I don’t know, I mean, it’s a big funny world. And the only things I can relate to is, like, the Fraser River, the sockeye run, like, where did all those fish come back last year?”

“You just-- you don’t know, like, how much temperature-- they say that the fish are very sensitive to any kind of temperature changes. And so you see that, you know, maybe they’re not coming back ‘cause they don’t recognize the water. I don’t know. So, I mean, that’s a possibility.”

Fisheries issues tended to dominate the issues identified as critical for the community, and in turn dictated much of the discussion of potential climate change impacts. This indicates that the topic of fisheries may be one of the most open channels of discourse for engaging Prince Rupert residents in climate change discussions. Linkages between forestry and climate change were also reported within the interviews, and form a secondary area of concern regarding environmental change. Potential challenges to the survival of specific tree species (yellow cedar) were mentioned along with implication of climate change in the mountain pine beetle infestation.

“We don’t have the cold winters that we had. We can’t kill off the pine beetles in a natural process. We can’t get two or more seasons of extreme sub-zero temperatures that would kill off the pine beetle. We need-- we have to kill-- we have to have two successive years before we can see any result in it.”

Climate change impacts on forests tend towards more concrete specific impacts than on fisheries, but are less likely to figure prominently in the overall context of perceived changes in the region.

Several respondents related an ambiguous sense of concern regarding new energy policies and fuel shortages either stemming from oil depletion or from higher prices produced from policies aimed at mitigating the climate change impacts of fossil fuels. Some respondents suggested

that these possibilities pose challenges to the ability of the local area to maintain linkages with other parts of the world, thus affecting travel of goods both to and from the community.

"I guess with global warming and peak oil...just sort of being in isolation and not being able to depend on maybe shipments of food or anything...I think it has to happen and eventually there'll be probably more carbon taxes and... how is that going to affect people in a rural community...?"

In general, specific climate change impacts were seldom identified as holding clear causal linkages with current natural resource issues. Respondents often expressed climate change related concerns about issues such as salmon stocks and the pine beetle. However, they seldom expressed confidence in their articulation of the specific linkages between specific climate shifts and distinct corresponding impacts on the resources. The political and policy implications of responding to and adapting to climate change were expressed with similar degrees of uncertainty, and direct causal linkages were seldom established.

Among the small number of respondents that believe climate change is not related to the key community issues, about half expressed explicit doubt of climate change as a veritable phenomena, or believed that climate change would not produce noticeable impacts within their lifetimes. The remainder simply did not perceive distinct connections between climate change and the issues they mentioned.

Many respondents expressed doubts regarding anthropocentric (human-caused) versus natural cyclical explanations for both climate change, and other forms of human interference (such as mismanagement or overuse and depletion) were commonly implicated in the declines of important resources. The specific nature of the perceived relationship between climate change and the condition of natural resources and key community issues appears to be tied to the understandings that people hold regarding climate change and the sources they rely upon for information on these topics. These issues are discussed in the following section, and discussion of potential ongoing future changes in the region are explored in *Section Six* of this report.

5.0 CLIMATE CHANGE KNOWLEDGE

Key Messages

- Trust in information regarding climate change varies greatly across the wide range of sources relied upon by respondents, but only a small number are explicitly distrustful of general climate change information.
- Trust in scientific sources of climate change information is higher than trust in generic sources.
- There are clear points of doubt regarding climate change information, and the objectivity of the researchers and the agencies presenting the findings figure prominently in the willingness to trust both generic and scientific information.
- Nearly half of all respondents feel that current climate change data is not specific enough to be useful for the local area. However, belief in the applicability of the data does not correspond with belief in the ability to plan for climate change. Other factors (such as political will and beliefs about the scope and scale of change) appear to influence assessments of planning potential.
- Computer-based modelling is generally held in high regard, and respondents frequently mentioned ocean-based issues as sites where more model-based information is desired.
- Forestry-based models do not figure prominently among the areas where additional information is desired. However, respondents that do identify forestry as an area of inquiry express interest in understanding changes in non-timber resources and overall socio-economic impacts of forestry changes, rather than specific timber-based changes.

Respondents identified a wide range of sources from which they obtained 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 36% of respondents, with 44% reporting more discretion regarding which specific sources they chose to trust. Only 12% of respondents express a basic distrust of generalized climate change information. The local newspaper was generally identified as a poor source of information on climate change.

These assessments shifted when respondents were asked about their feelings toward scientific sources of information that assert climate change is occurring, as opposed to the broader range of sources identified previously.

"I think [scientific information is] very trustworthy at this point, all right. I mean, we've been at this now for two decades at any rate and I think that the scientific community is fairly unanimous in its assurance that climate change is taking place. What's driving it may be debated, but it is happening and I don't think there's any argument there."

When asked to provide their opinion toward scientific information supporting the existence of climate change, 68% of respondents expressed high levels of trust in scientific sources. Trust in scientific information related to climate change is based in observations of prevailing opinions, confidence in scientific methodology, and congruence between scientific claims and personal observations of the environment.

Only 18% expressed uncertainty regarding scientific sources, and 14% of respondents were highly critical of scientific claims supporting climate change. Doubt and mistrust towards scientific data is often based in tendencies to embed scientific sources within other sources, and many respondents referred to scientific sources only through their appearance in media and other sources. Other respondents, however, express clear concerns about biases in the selection and presentation of data, and/or inability to assimilate a vast and incomprehensible range of conflicting and complex perspectives.

"But there's stuff on both sides, and-- it's good or bad, and if it's a cycle and all this and that, I don't know what to make of it half the time, to tell you the truth."

"Well, and again, it depends where it's coming from and who's funding those sources. So if it's an environmental bent, again, or if it's corporation driven there is-- that's just a natural bias that happens, right."

Respondents that place high levels of trust in scientific information are more likely to identify computer-based models as useful ways of making sense of climate change and environmental issues. Nearly 80% of respondents that expressed trust in scientific information also expressed trust in computer-based models, indicating a strong relationship between scientific methodology and trust in information.

One of the strongest critiques of scientific information is the perception that existing and available data are not specific enough for the local area. While 38% of respondents feel that available climate change information is well tailored to local scales of analysis, 46% feel there is a poor fit, and 18% believe there is only partial compatibility between current data and local

needs. Correspondence (or lack of correspondence) between personal observations of local conditions and belief in wider climate shifts appears to play an influential role in confidence towards the applicability of climate change information to the local area.

"Yeah, I think that we see, in Prince Rupert, the effects of climate change on-- it's easy to see the impacts of climate change. Foolish to say that you didn't see them. So, I mean, I think that there are huge impacts of climate change already that we're seeing in Prince Rupert."

"...they hear that the world's heating up, but here we're not. We get-- we're still cold, we're still rainy. We don't see a change in our climate."

Respondents were divided in regard to the ability of the community to plan for climate change. Only 36% believe that the community can plan for climate change based on the currently available information and a similar percentage believe that planning cannot occur. However, the belief that climate change information is specific enough for the local area does not clearly correspond with the belief that Prince Rupert can effectively plan for climate change based on the information that it possesses. Among respondents that felt that existing information is specific to the local area, only 42% also feel that the community can in turn plan for climate change. Interviews indicate that information alone is seen as insufficient for planning. Some see climate change as too vast or overpowering of a force to plan for, while others see other factors (such as political will) as more important to the planning process.

When asked what types of information on climate change and the environment they are missing (and would like to have access to), ocean changes were the most frequently mentioned with 44% of respondents expressing a desire for increased data in this area, and 24% of respondents requesting models that examine sea level change. Only four respondents mentioned salmon or fish stocks as sites where increased modelling is desired. This limited interest is surprising given the importance of fisheries to well-being and the perceived declines in the state of marine resources. It is unclear if there is already sufficient modelling currently available around fishing, or if respondents are unsure of how such tools may apply to fisheries investigations. However, other answers indicate that many respondents hold at least a rudimentary understanding of what computer-based models can provide. A total of 28% expressed interest in specific outputs related to weather and climate (including rainfall, seasonal

shifts, snowmelt, and slide activity), and 20% indicated a desire for forestry-specific models focusing on topics such as berries, invasive plants, and other vegetation. Desire for specific forestry-based models rarely focused on timber impacts, and tended to touch on non-timber resources or impacts on the overall economic viability of forest industry activity on a wider regional scale. These responses suggest that specific (tree-based) forestry changes do not figure prominently among the issues that most respondents are interested in learning more about, and making such data relevant to local actors will require careful consideration of the delivery of the information and its relationship with community needs. Appendix 4 contains a full list of topics or resources (in general order of their frequency of being mentioned) that respondents felt modellers should attend to.

Respondents also provided input related to the general content and format of computer models, with 18% indicating a desire for socio-economic dimensions to be incorporated into future models, and 12% requesting models based on local conditions. A more commonly mentioned topic for adaptation modelling revolved around understanding future challenges to local infrastructure (which was earlier identified as being a valued resource that has deteriorated in the past 20 years).

6.0 VISIONS OF THE FUTURE

Key Messages

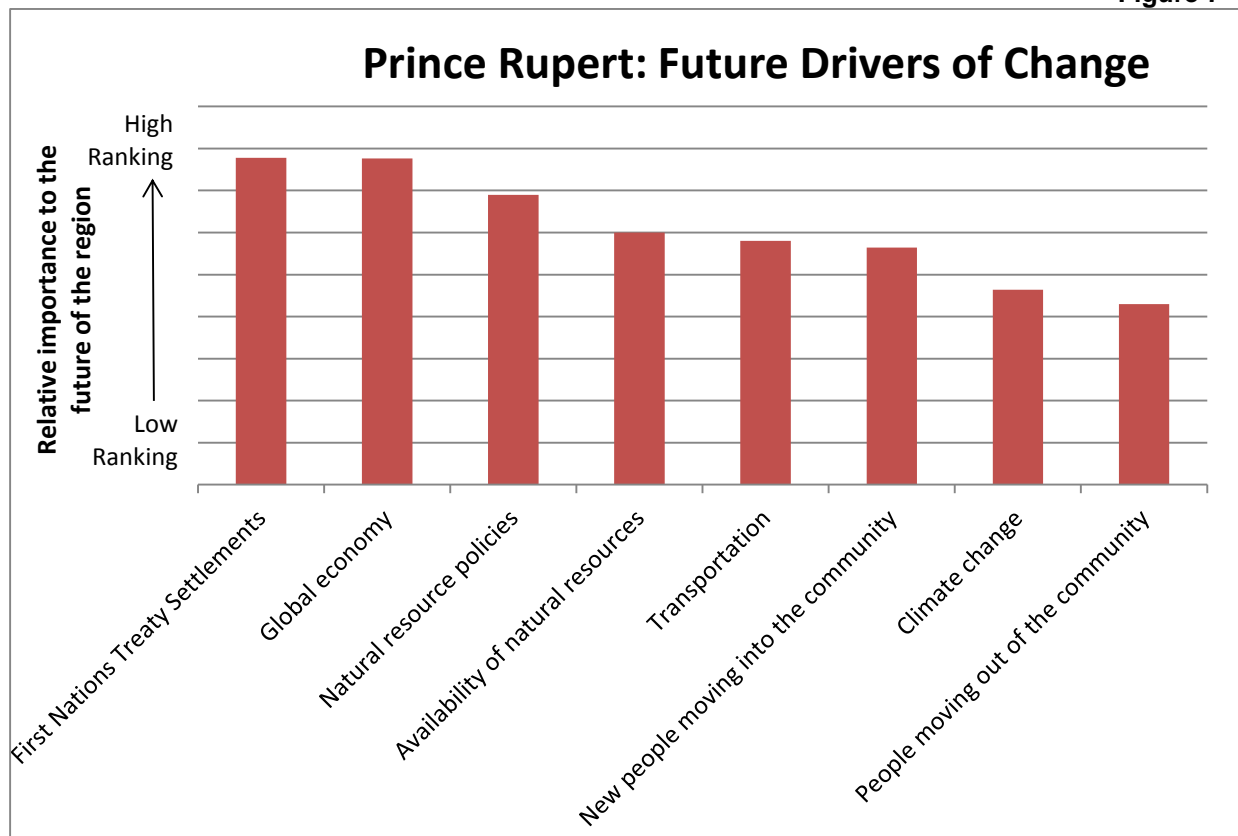
- First Nation treaty settlements are perceived as the most important and influential driver of change in the region, and are seen as critical to enabling beneficial development.
- The influence of the global economy and Prince Rupert's role as a shipping nexus for natural resources forms the core of future community visions.
- Endorsement of resource trade is strongly tempered by clear desires for increased localized access to, control over, and processing of natural resources.
- Environmental protection plays a secondary, but nonetheless noticeable and important, role in visions of the future.
- Climate change is not perceived as an influential or important driver of change. However, it is generally perceived as a negative influence on the region.
- Although some respondents expressed confidence in the ability of the global economy and increased trade to solve local problems and bring prosperity back to the community, positive outcomes were more likely to be visualized when effective and influential local leadership was seen as a key force in future development.

Respondents were asked to identify the factors (or drivers of change) that they believe will have the strongest influence on the future of the community (see Figure 7). First Nations treaty settlements were identified as the most important factor in determining the future of the region, with 67% of respondents placing it among the three most important drivers of changes and 37% identifying it as the single most important driver of change in the future of the region. First Nation treaty settlements were also perceived as portending positive change for the region, and were among the issues with the most positive ratings as drivers of future change (see Figure 9).

"Because having viable, mutually beneficial partnerships with those individuals, having a real partnership, is absolutely key to moving those initiatives forward. And until that happens in earnest, there's no way for that economic impact to be flooding back into the community.... So-- and I'm not saying that that's a bad thing, that that's there, because it needs to be there for the Aboriginal peoples of this area to become self-sustaining, which is what everyone wants to have happen. There needs to be a true partnership there, but it's difficult to get to that partnership. So the end goal is great, but it makes the process take longer."

The global economy was the second most influential factor, with 65% of respondents placing it among the three most important driver of change and 20% rating it as the single most important driver in the region. Although the global economy was generally perceived as a source of positive change, many respondents expressed reservations about the impact that increased global demand for local resources may have on other resource values such as personal resource usage for sustenance and non-consumptive resource values such as aesthetics and recreation. Natural resource policies were perceived as the third most important factor, with 44% of respondents placing it among the three most influential drivers of change and 14% identifying it as the most important driver in the region.

Figure 7



Respondents expressed a moderate balance of optimism and pessimism in relation to the nature of changes produced by natural resource policies. However, in concert with the global economy, changes to transportation (and shipping), and availability of resources, respondents generally perceived Prince Rupert as facing a future of ascension based on increased global

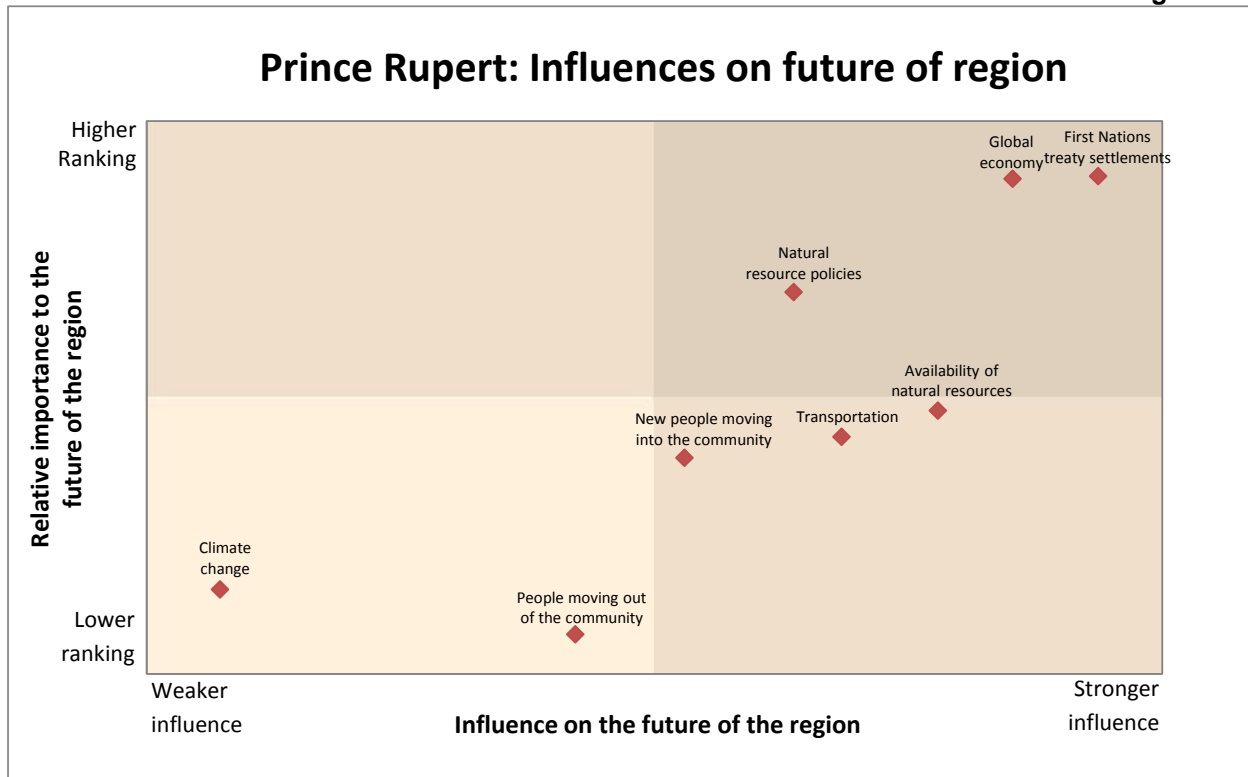
trade and passage of natural resources through the community. Optimism about Prince Rupert's future, however, is preceded by a belief that First Nations treaty settlements represent a critical step toward ensuring future prosperity for all residents of the region.

"Okay, well, I think the future of Prince Rupert is bright, even though I said all that negative stuff that we've gone through and we have gone through that. Prince Rupert has had a very, very tough time in the last ten years. If only we could market the products that we have for sale in Canada, to China and India better, that port would flourish even more. And I believe that's going to happen."

"If only we could get settlement around First Nations' concerns or First Nations' agreements, I think we could be in a much better place. Where they just-- it's not good nor bad, it's just whatever it is, it's an agreement so that we know the rules and just trying to let everyone be-- play on a level playing field, right. No one-- we need to know, we need to be able to make plans and how my plans on this is impacting somebody else, is just-- I don't know. So if we could only get that settled, I think we would be much further ahead, 'cause that has aspects around our city, to the port, to everything, right."

There was a general sense of optimism that the most important drivers of change not only tended towards positive influences (as indicated previously), but that they also will exert the most powerful influences. Climate change was rated among the least important, and least influential drivers of change in the region (see Figure 8). However, it was also perceived to be one of the most negative sources of change (see Figure 9). Perceptions about the negative impact of climate change as a future factor was comparable only to the anticipated impact of population loss, which was earlier implicated as one of the primary reasons for regional depression.

Figure 8

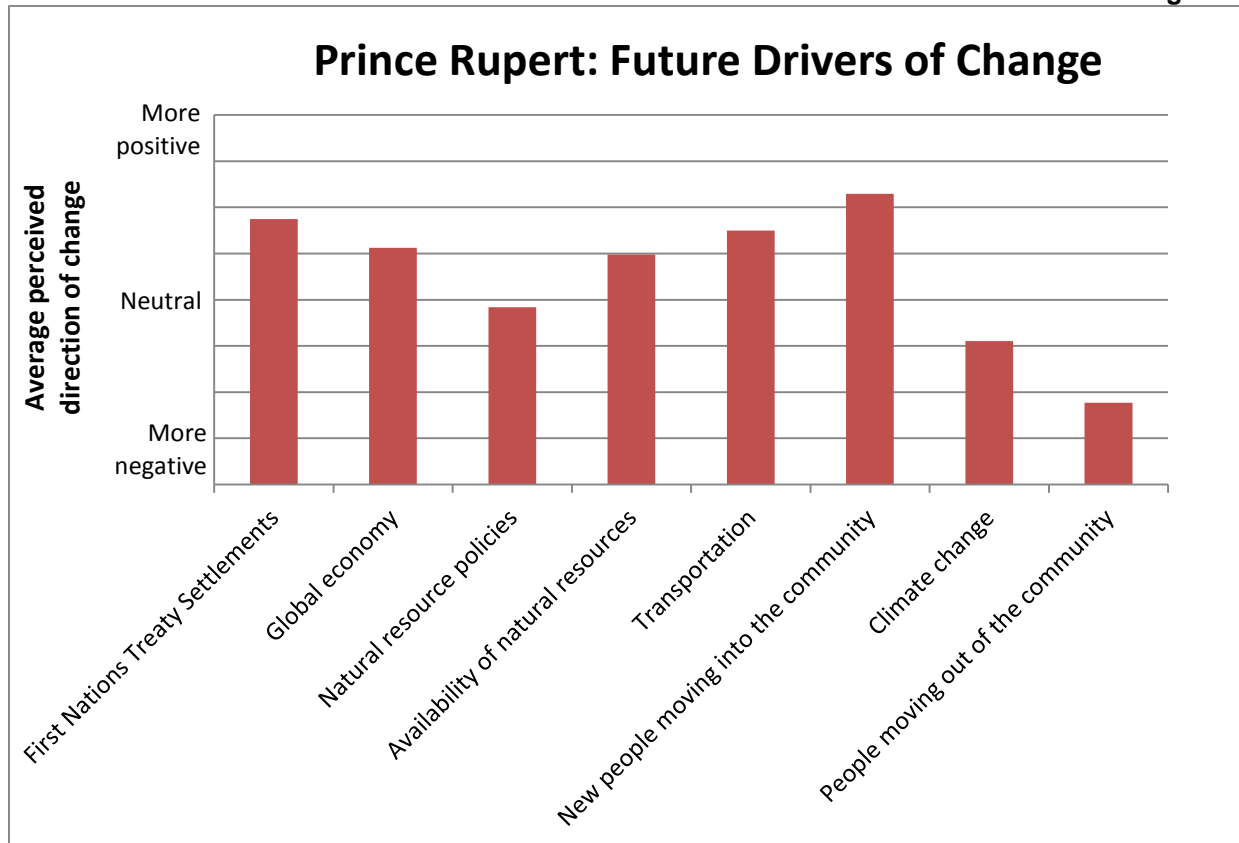


A small group of respondents (15%) reported the belief that climate change would have a positive overall impact on the region. However, the majority perceived it as a slightly to strongly negative influence (52%) or as neither negative nor positive (33%). Additional drivers of change were added to the list of sources of future change, but individual items were seldom mentioned by more than one respondent.¹¹

The low ranking (in importance) and low rating (in influence) of climate change provides helpful insight to perceptions of change when combined with the earlier observation that the majority of respondents place high trust in scientific research asserting the reality of climate change. Simply speaking, although most respondents acknowledge climate change as an actual phenomenon that is occurring, they do not see it as having immediate or significant impacts on the local region, relative to other forces of change.

¹¹ Added drivers of change included energy policies; quality and affordability of life; peak oil, container port development; Tsimshian access project; national trade policy; new business policy; tourism; environmental protection policies; social and health services; internet media; recreation; education; and general government policy.

Figure 9



"We're not living up in the Arctic where-- we're seeing-- receding icepacks, not coming in, we're not seeing that sort of stuff. All we see are declines in the fish stocks, which are probably impacts in land on the-- in the spawning beds and that sort of stuff. But here, we still get rain 300 days a year. We don't see any climate change. We don't have great summers; we have horrendous weather. We're not getting warmer; we're moderate because we're beside the ocean. So we don't have spikes in our temperatures."

There is a clear vision and shared optimism among respondents regarding the future of the community as a transit point for natural resources in the global economy, and a belief that settlement of First Nations treaties and positive resource policies will fuel the success of the region.

When asked what they believe local leaders should do to provide the best possible future for the community, the most common recommendation was to enable economic growth and business development. This general prescription for action was accompanied by more specific strategies for achieving this goal, including the assertion of local access to natural resources required for

industrial activity, development of the port, promotion of the community to attract population growth, and creation of long term jobs and opportunities. These recommendations generally correspond with the vision of Prince Rupert as a hub for future resource trade and transit. However, these recommendations are also accompanied by a clear desire for increased local control and processing of natural resources, and the belief that export of raw materials alone is insufficient as a basis for positive community development.

“I think they-- well, I think they should really try to actively pursue-- more actively pursue industry, the right kind of industry. And I think they-- the leaders of Prince Rupert should really try to encourage the small business growth in this community as well and open up the doors for that and try to get this town strong, almost from the inside out, you know.”

“Just have, you know, to have to have creative thinking, you know, we just-- they can't sit back on business as usual type approach. You have to look at Prince Rupert entirely differently, like, you know, how do we bring people here and keep people here.”

Environmental protection was a secondary theme in future courses of action. Environmental protection was ranked as the fourth most important resource for ensuring well-being in the community (see *Part Three, Figure 1*), following business development, resource trade, and infrastructure. When asked what should be done to protect the future, environmental protection occupied a similar position in the hierarchy of priorities with 16% of respondents singling it out for special attention by community leadership. The need for environmental protection was tied to maintaining the liveability of the community, rather than an explicit commitment to conservationist values.

“Promote the community the best way they can for all kinds of industry: light, small business, light industrial and heavy industrial. And at the same time be sure that we're getting industries that are compliant to the environmental regulations. You don't want big plants with big smokestacks blowing out black smoke, you know. We want to keep our environment clean and free of pollutants in the air. I mean, nobody wants to live in Vancouver up here.”

The majority of respondents (62%) reported that the future of Prince Rupert 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 vision of the community as a prospering contributor to a beneficial global economy.

"...it's all tied up with strategically where we are, here on the North Coast, and, you know, how we relate to the whole global scheme of things in the world economy."

"I would actually say it's more external factors that may be outside of local control. The reason being a lot of what Prince Rupert sees as an optimistic future is dependent on global demand for product. We've sort of gotten ourselves as the gateway to the Asia Pacific-- for instance, Ridley terminals eventually looking at doubling capacity."

Endorsement of external factors does not always follow positive visions of community development, and often reflects feeling of geopolitical isolation and inequities in the division of power between urban heartland and rural hinterland areas of the province.

"Unfortunately, the latter and, again, this pertains primarily to the whole impetus around globalization and the move to disconnect communities from resource."

"External factors. Local hasn't got a snowball's chance. The sport fishing industry is controlled by a handful of people down in Victoria, so they're going to control that. The logging industry, controlled out of Vancouver."

Some respondents (14%) insisted that external and internal influences will play equal roles in determining the future of the community, but 24% believe that local leaders will play the greatest role in determining the future of the community. Respondents that endorsed the ability of local leaders to determine the future of the community, or that spoke about more of a balance between internal and external factors, tended towards more positive assessments than respondents that focused on external factors alone.

"I think it's going to be affected by both, but I think that for it to be a positive, it's going to have to come from within the local community."

"I would say a combination. You can't have a community grow unless you have the locals who would have a vested interest or ability to be able to contribute to the needs of what needs to happen."

"Quality of life and development of the community will be determined by local leaders. Development of the port and development of port and port-related facilities, the expansion or the enhancement of those, will be determined by the Prince Rupert Port Authority, the Government of Canada and to a lesser extent, the City of Prince Rupert working with companies whose interest is to be involved in such enterprises and entities."

Although some respondents expressed confidence in the ability of the global economy and increased trade to solve local problems and bring prosperity back to the community, positive outcomes were more likely to be visualized when effective and influential local leadership was seen as a key force in future development.

7.0 INSTITUTIONS AND ADAPTATION

Key Messages

- Respondents expressed mixed opinions regarding the ability of the community to adapt to climate change, with 48% 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 climate change as a problem, and availability of funding to engage in adaptive responses.
- Financial resources are seen as important factors in the ability of organizations to deal with environmental and natural resource issues.
- Direct involvement in local issues is often offered as proof of efficacy in dealing with environmental and natural resource issues. However, adoption of smaller measures to mitigate fuel use or carbon footprints are often cited as being insignificant in relation to the larger scale of environmental challenges.
- Respondents seldom work in isolation on environmental issues, and frequently draw on support from within their own organizations and from outside agencies.
- Relationships within organizations and between organizations and other communities are generally characterized in a positive manner.
- Relationships with NGOs (specifically environmental NGOs) and government agencies show wider ranges of success in achieving collaboration.
- Geopolitical isolation is a commonly cited barrier to establishing and maintaining healthy relationships with provincial and federal government agencies. However, such linkages are deemed to be beneficial when effective steps are taken to build them.

The preceding sections 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 section explores perceptions of the community's ability 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.

As indicated in the previous section, active involvement of local leaders balanced with external forces is associated with more optimistic assessments of community futures. When asked about

the ability of the community to successfully deal with potential climate change impacts, respondents expressed a mixed response, with 48% reporting optimistic assessments of community coping and adaptive capacity and 35% reporting pessimistic assessments. The ability to cope with climate change was often perceived to be contingent on various factors, such as the willingness to understand climate change as a problem relevant to the local region, and to grant it a higher level of prioritization than it currently holds relative to other issues. This belief was most often conveyed in a pessimistic manner, with respondents expressing doubts about the likelihood of climate change receiving greater consideration within the community.

"I think it's next to zero...when you're trying to struggle to put food on the table, the last thing you're concerned about is whether the ocean comes up another foot, you know, and that's kind of our concerns, right. Our concerns are job creation, so that the less fortunate people that are staying in the community, that are on E.I. or welfare or social assistance, can actually get jobs and have meaningful work every day so that they can create economy."

Availability of funding was another commonly cited key factor in the ability of the community to cope. This consideration echoed concerns about the influence of depressed economic conditions on adaptive capacity, including the lack of a municipal tax base to support adaptive modifications to critical infrastructure. Optimistic respondents cited the need for cooperation to support adaptation, but belief in the ability to respond to climate change was often based in the expectation that actual impacts will be minimal or at least far less significant than in other areas.

"See-- but this whole thing of this climate change isn't happening immediate, or at least that's my understanding of it. So for the short term, they're doing what they need to be doing."

Respondents were also asked about the ability of their own organization to deal with environmental issues. Again, optimistic assessments outnumbered pessimistic assessments with 46% of respondents seeing their organization as strong versus only 21% seeing it as weak. As with community capacity, availability of financial resources was a key factor in determining the ability of organizations to deal with environmental issues. Respondents that perceived their organization as strong often cited direct involvement in local environmental issues as evidence of their strength. In contrast, respondents perceiving their organization as weak often pointed to smaller environmental initiatives within their own agency (such as recycling), and conceded that their efforts were insufficient given the nature of the larger scale of challenges associated with the environment.

The vast majority of respondents reported that they work with others within their organization when dealing with environmental or natural resource issues. Respondents also reported a reliance on a wide range of internal departments and external organizations for knowledge regarding natural resource and environmental issues. These findings suggest that information on environmental issues forms a common area of discourse within and between organizations, and people often seek the assistance of others when seeking to understand environmental issues. However, based on earlier critiques on the trustworthiness of sources and the limited applicability of climate change information to the local area, there is reason to doubt whether individuals are able to access high-quality information or if it provides support to them in building adaptive capacity.

Relationships with other departments within organizations were generally characterized in a positive manner, and were often cited as being key factors in supporting the efficacy of the organization. In contrast, relationships with other groups and organizations were described in both positive and negative terms, and reflected varying levels of success in working together. Environmental NGOs were sometimes cast as instigating polarization of issues, but were also cited as being valuable partners in many situations. Compatibility of agendas was a common factor in enhancing collaboration with NGOs, and narrowly confined sets of values and objectives were identified as presenting obstacles to collaborating with these groups.

“There-- sometimes the NGO's are-- that we've worked with, have been sort of more single-value focused and that creates difficulty when you're looking at a multi-value approach to things. So the balance between certain opportunities are constrained by other opportunities and what the group may not be willing to bend at all, if they have a single value 'cause, you know...”

Relationships between organizations and other communities outside Prince Rupert were generally characterized in a favourable manner, and respondents made numerous references to improving linkages with First Nations communities. There was also a strong sense of regional solidarity expressed by many respondents.

“Coastal communities work together. And in some ways there-- certainly work together on larger environmental issues with-- down the Skeena.”

However, the same geographic features that seemed to bind communities together within a regional identity also presented challenges as respondents spoke about the challenges of getting representatives to attend meetings and the difficulties of bringing a wide geographic area together when transportation routes often include combinations of boat, plane, and highway travel. Another geographic feature that affected inter-community collaboration is the impact of geo-political isolation combined with the depressed economic conditions that are seen to pervade the northwest.

“One, we can’t come together as often as we’d like. Two, we’re all scrambling and competing for the same small pot of grants that exist out there. It’s actually-- we’re more fractured now than we were ten years ago, because of the economic constraints that our communities are feeling. So we become competitive rather than cooperative and that has always bothered me.”

The challenges of geo-political isolation were also expressed in assessments of respondents’ ability to collaborate with various levels of government. The lack of regionally elected representatives belonging to the party in office was identified as an obstacle to fostering governmental relationships. Access to government agencies (such as Department of Fisheries and Oceans) and the ability to obtain cooperation from government officials was also cited as an obstacle to organizations achieving their goals in many situations. However, assessments of linkages with government agencies (provincial and federal) were not universally criticized. Respondents that reported strong governmental relations often cited the need to work to maintain such linkages and stated that maintaining such relations was very beneficial to achieving their organizational goals.

Appendix 1: Issues important to the community and its future	
Economic Issues	
	Infrastructure
	Fishing Industry
	Forest Industry
	General Economy
	Skilled workforce
	Opportunities for future development
	Mindset shift from previous industries
	Economic impact of First Nations rights and title
	Industrial decline
	Benefit of resource extraction not staying in community
	Retail sector decline
	Economic impact of policy uncertainty
	Balancing economy and the environment
	Managing growth
	Barriers to efficiency
	Lack of government investment
	Economic development in isolated area
Social Issues	
	Population decline
	Collaboration and communication with outside (First Nations) communities
	Lack of youth opportunities
	Healing the past
	Community leadership
	Education
	Collaboration and communication within the community
	Alcohol and drugs
	Welfare dependency
	Racism
	Adaptive capacity
	Necessary social resources not located in community
	Social fragmentation
	Brain drain
	Housing
	Fear of change
	Arts and music
	Recreation facilities
Environmental Issues	
	Sustainable growth and development

	Mining and exploration
	Climate change
	Pollution
	General environmental conditions
	Water quality
	Air quality
	Invasive species
	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
	Ocean resources
	General fish stocks
	Pollution
	Salmon
	oolichan
Mining and Exploration and Oil	
	Enbridge pipeline
Climate Change	
	Mitigation
	Decreased river flow
	Sea level rise
	Ocean temperature change
Waste Management	
	Liquid waste
	Recycling
	Littering
Resource access and control	
Transportation and fuel	
Forestry	
Balancing environment and economy	
Pine beetle	
Air quality	
Port development	
Water quality and availability	
Green energy	
Agriculture and local food	
Eco tourism	

Sustainable growth and development
Maintenance of local food resources
Pesticide use
Global scope of problems
Weather changes

Appendix 3: Forestry Issues important to the community and its future	
Forest industry and organization	
	Secondary processing of materials
	Prince Rupert pulp mill closure
	Employment
	General economic issues
	Low end wood
	Impact on other industries
	Prince Rupert forest office closure
	Prince Rupert port
	Information for the community
	Beachcombing
	Waste management
	Wood pellet plant
	Selective logging
	Environmental stewardship
	Accountability to community
	Questioning economic benefit to community
	Movement away from forestry
	Forestry infrastructure
	Decadent wood
	Forestry as positive for the community
Forestry management	
	Resource ownership
	Government consultation and regulation
	Adaptive capacity
	License management
	Roads
	Stream protection
	Forestry administration
	Cultural protection
	Lack of reforestation
	Deforestation and clearcutting
Forest health	
	Pine beetle

	Downstream impacts of logging
	Cedar issues
	Health of trees
	Aesthetics
	Hydrology
	Wildlife
	Non-timber forest resources: berries, bark, greens
	General forest health
	Climate change
	Urban forestry
	Erosion

Appendix 4: Topics for future modelling.

Ocean Changes	
	Sea level
	Fish stocks
Model formats and applications	
	Socio-economic impacts
	Specific models of local area
	Mitigation related modelling
	Models easy to understand
	Identification of opportunities
Weather patterns	
	Rainfall changes
	Changes in seasons
	Snowfall and snowmelt
	Slides
	Flooding
Forests	
	Impacts on plants
	Berries
	Invasive species
Impact on infrastructure	
Rivers and waterways	
Earthquakes and tsunamis	
General global models	
Groundwater	
UV health related issues	