Fraser Basin Council

2006 STATE OF THE FRASER BASIN REPORT

SUSTAINABILITY SNAPSHOT

Inspiring Action 3

// Of head and heart—today's journey of sustainability //

Each of us has a life's journey, with dreams, challenges and opportunities that are uniquely our own. Yet when it comes to the future of the Fraser Basin, our home, there is a journey we must take together. That is the journey of sustainability.

Today's most pressing social, economic and environmental issues are, in essence, sustainability issues, and they touch our lives in so many ways. Similarly, the way we live our lives influences progress—or lack of progress—towards sustainability. From the struggle that some people face to find affordable housing, to increasing rates of consumption, congestion and waste, to the impacts of climate change on our local ecosystems, communities and livelihoods—we face myriad challenges. And the challenges can either overwhelm us, or inspire us to action.

Sustainability flows from compassion towards people and stewardship of the natural world. And it calls for long-term thinking if future generations are to enjoy social well-being, a vibrant economy and a healthy environment. In an age of information overload, the question is: How can we measure, understand, and make better decisions for sustainability?

The Fraser Basin Council presents *Sustainability Snapshot 3* to contribute to the dialogue and help answer this question. A compilation of social, economic and environmental indicators across a broad range of topics, *Snapshot 3* summarizes many of the important trends and helps put current events in context. Like a map and a compass, the report is a tool to help guide us on the trail and mark our progress along the way.

The numbers, statistics and graphs help to bring focus, but the journey of sustainability is one of the heart as well as the mind. To speak to the heart, *Snapshot 3* includes some of our region's stories, simply to illustrate how inspired action on the ground is bringing about change for the better.

There have been many champions of sustainability over the years, even unexpected ones. In the 1980s, scientists from around the world did an unusual thing—they stepped out of the laboratory and onto the world stage to advocate against chlorofluorocarbons (CFCs) that were depleting the earth's ozone shield. The efforts paid off—by 1987 many nations had agreed to ban CFCs and, nearly 20 years later, the ozone layer is improving. It's just one example of how information and inspiration can be a powerful combination.

When it comes to sustainability, we can all play our part, whatever our walk of life. Today, it may be scientists—or economists—speaking about climate change, community leaders advocating for more sustainable communities, or volunteers working to restore habitat for fish and wildlife. It is also you taking action in your workplace, your community and your home. Whatever your journey for change, we hope that *Sustainability Snapshot 3* will help you along the way.

PHOTO: Aileen Penner

Two brothers visiting the 2006 Adams River sockeye run in Squilax, BC proclaim their enthusiasm to "Think Salmon."

// THINK SALMON... Think Inspiration //

We've all heard the words of wisdom: *Think Before You Act!* And when it comes to the Fraser River watershed, the word now is to *Think Salmon*.

Think Salmon is an educational outreach program focusing on the role people play in safeguarding sensitive ecosystems. It's meant as an inspiration and call to action—to ensure the survival of salmon for all future generations. Pacific salmon are both a prized resource and a cultural icon. No part of our natural heritage elicits greater admiration and respect, or better embodies the spirit of survival and regeneration. A keystone species, salmon are also nature's barometer and reflect the health of our environment and the sustainability of the Fraser Basin.

Think Salmon is an initiative of the Fraser Salmon and Watersheds (FSW) program, co-managed by the Pacific Salmon Foundation and the Fraser Basin Council, with funding from the provincial government, the federal government, the Pacific Salmon Endowment Fund Society and others.

FSW is all about inspiring change in human behaviour for the benefit of salmonids and the watersheds they depend on. The program encompasses research projects, stock assessment, and stewardship work, such as habitat restoration and enhancement. Public engagement is key to success—since people can boost salmon survival through respectful treatment of water and surrounding habitat.

For more information on the Fraser Salmon and Watersheds program, contact the Fraser Basin Council or the Pacific Salmon Foundation. For public events and information, visit the *Think Salmon* website at **www.thinksalmon.com**.

// SOCIAL WELL-BEING SUPPORTED BY A VIBRANT ECONOMY AND SUSTAINED BY A HEALTHY ENVIRONMENT //

INTRODUCTION

// Welcome to Sustainability Snapshot 3 //

I am pleased to present, on behalf of the Directors and staff of the Fraser Basin Council, our 2006 State of the Fraser Basin report: *Sustainability Snapshot 3*. The report offers insights into the important sustainability trends in the Fraser Basin today. It is intended to inform, to encourage dialogue and to inspire action.

In these pages, you will learn about some of most dramatic sustainability issues unfolding today—such as the reality of climate change in our communities, now and projected for the years to come; the persistent economic vulnerability of some people, even in a time of economic boom and high employment; the impacts of an increasing population and rate of consumption; and, on a very positive note, the wonderful opportunities that emerge when people choose collaboration over conflict to solve problems.

Caring for the Fraser Basin—its people and its natural heritage—is an important responsibility we share. We will see the Basin thrive if we make a collective commitment to sustainability in all its dimensions—social, economic and environmental. May this report help deepen your understanding of the issues and renew your enthusiasm for making changes when and where they are needed.

Dr. Charles Jago, *Chair, Fraser Basin Council*

FBC directors and staff at a meeting in Chase, BC.

// The Fraser Basin Council //

The Fraser Basin is a special place. Keeping it that way demands that people share in the responsibility for its future.

That is where the Fraser Basin Council comes in. Formed in 1997, the Fraser Basin Council (FBC) is a charitable, not-for-profit body that plays a unique role in advancing the social, economic and environmental dimensions of sustainability in the Fraser Basin.

The FBC is led by 36 Directors representing the diversity of the Basin—from the four orders of government, including First Nations—and from the private sector and civil society. All Directors commit to the vision, principles and goals of the *Charter for Sustainability*, which includes making decisions through collaboration and consensus, based on mutual understanding, respect and trust.

This governance structure is the first of its kind in Canada and has served as a model to others in this country and abroad. The structure also positions the FBC to help others in public and community life find shared solutions through collaboration and long-term thinking. This is one way the FBC brings a unique and lasting value to the Basin and its people.

// Sustainability Today //

The latest research shows that Canadians support the concept of sustainability, although defining the word itself presents a challenge. What does sustainability mean today?

In 1987 the United Nations report *Our Common Future* gave a contemporary meaning to the term "sustainable development" by saying this: "Humanity has the ability to make development sustainable by ensuring it meets the needs of the present without compromising the ability of future generations to meet their own needs."

Today, nearly 20 years later, the word "sustainability" is in common use and embraces social, economic and environmental considerations. Although different people may give it different meaning or emphasis, the word reflects the need for long-term thinking in all human endeavours.

The Fraser Basin Council defines sustainability this way:

"Living and managing activities in a way that balances social, economic, environmental and institutional considerations to meet our needs and those of future generations."

This is in keeping with the FBC vision statement for the Fraser Basin as a place where social well-being is supported by a vibrant economy and sustained by a healthy environment.

// The Fraser Basin: Our Shared Heritage and Future //

From its source at Mount Robson in the Rockies, the mighty Fraser River travels almost 1,400 km to meet the Pacific Ocean at the Strait of Georgia. It is British Columbia's longest river and, together with its many tributaries, drains a quarter of the province. This is the Fraser River Basin, a land of spectacular beauty, diversity and opportunity. It is our heritage, and our future.

For thousands of years, the Basin has been home to many Aboriginal peoples, including the Halquameelem, Hun Qui Min Um, Nlaka'pamux, Secwepemc, Stl'atl'imx, Tsilhqot'in, Carrier and Okanagan-speaking Nations. Aboriginal peoples are an integral part of the Fraser Basin's history, its cultural heritage and its future.

The faces of the Basin are ever changing. Today, almost 2.8 million people—two-thirds of BC's population—call this place home. Ours is now a community of many cultures, languages and religions. In addition to this rich cultural heritage, the Fraser Basin offers a diverse natural heritage. It boasts one of the world's most productive salmon river systems, supporting six salmon species, including steelhead, and 65 other species of fish. Here also is British Columbia's most productive waterfowl breeding area, home to hundreds of species of birds and mammals as well as reptiles, amphibians and insects.

From Prince George to Williams Lake to Kamloops, and throughout the most populated stretches of the Fraser Valley and Greater Vancouver, communities depend on the Basin to support a range of economic activity—from natural resource industries, to agriculture to businesses of all types. This is the land where we live, work and play. Our well-being is so closely tied to the Fraser Basin that its future is our own. That connection should instill in us an attitude of respect, inspiration and responsibility—to each other and the life around us.

// Sustainability in the Fraser Basin: the Story behind the Statistics //

"More People, More Consumption, More Waste"

The population in the Fraser Basin in 2003 was estimated to be 2.8 million. Through efficiency and conservation over the last 10-15 years, residents of the Fraser Basin have reduced, on a per capita basis, their use of both energy (by 6%) and municipal water (by 7%). However, the total rates of energy and municipal water use have increased by 20% and 21% respectively over the same period, suggesting that the per capita improvements have been outpaced by population growth.

In terms of solid waste generation and diversion from landfills through recycling and composting, there are mixed results that are also related to population growth and consumption rates. Between 1996 and 2002, the Basin communities achieved an 18% decrease in the disposal of solid waste in landfills. However, there were increases in three of five Fraser Basin regions over this period as well as a Basin-wide increase between 2001 and 2002.

Clearly, there is room for improvement in reducing and managing solid waste, an increasingly important challenge given the rate of population growth the Basin is experiencing and the continued growth that is forecast (4 million by 2031).

"Climate Change—The Sustainability Challenge"

Climate change has profound implications for many aspects of sustainability, and is a recurring theme throughout *Snapshot 3*. Total greenhouse gas (GHG) emissions from human activity have grown by 30% in BC since 1990, and in 2004 reached a 15-year high of 16.8 megatonnes. Although GHG emissions per capita during this period were relatively constant, there were increases of almost one tonne per person between 2002 and 2004 (also a 15-year high).

While the causes and impacts of climate change are still not fully understood, current trends signal a range of significant potential implications. For example, sea level rise and extreme storm events threaten to increase flood risks. The frequency, magnitude or intensity of other natural hazards, such as forest fires and drought, may also increase. A continued warming of freshwater temperatures and low river flows could devastate the health of salmon stocks in the Fraser Basin. The health and distribution of forests, grasslands and other ecosystems may also change dramatically, impacting on native species and biodiversity.

With such dramatic environmental impacts come numerous social and economic consequences; however, the scale and scope of these are difficult to determine. Warmer temperatures in winter have already made it easier for Mountain Pine Beetle to infest forests in a number of areas across the Basin. The full extent of the social and economic costs associated with the current outbreak is not yet known.

Looking ahead to other sobering possibilities, if climate change were to contribute to the future extinction of Fraser River salmon, or result in severe water shortages in different parts of the Basin, there would be serious consequences for fisheries, agriculture and industry—not to mention, social, cultural and environmental costs. Critical questions arise, including: What is the cost for communities to take action against climate change? How can communities adapt and protect themselves from some of the harmful impacts of climate change? Finally, what are the social, economic and environmental costs of doing nothing?

"A Tale of Two Economies"

There are significant discrepancies between the growth and vitality of the economy as a whole in BC, and the economic hardship that many individuals and families experience. The average income for families and individuals in BC increased by 8% from 1995-2004 and is the 3rd highest in Canada; however, BC also has the highest percentage of its population below the Low Income Cut-Off in Canada. Similarly, while unemployment rates in BC are the lowest in 20 years, the proportion of working poor in BC is twice the national average.

The gap between the highest 20% of income earners and the lowest 20% is widening. The relative gap is an important measure of inequality. However, even more striking is that the lowest 20% of income earners actually saw their income decrease by 16% between 1995 and 2004.

Rates of low-income and working poor are exacerbated by the housing affordability crisis in the Lower Mainland and other parts of the Basin. For example, the average income for families and individuals in BC in 2004 ($47,800) was below the qualifying income necessary to purchase a condominium in BC and even more deficient in relation to the costs of an average detached bungalow.

It will be an ongoing challenge to address income and housing problems in a sustainable way. There is growing necessity to help people who are homeless and in crisis, and also a need for long-term strategies to assist people who, while working, find it difficult to pay the cost of housing and other living expenses.

"Collaboration for Sustainability"

Complex sustainability challenges in the Fraser Basin often involve more than one jurisdiction and various interests—governmental, non-profit and business—that can contribute expertise and resources.

During the research and development of *Snapshot 3*, the project team found numerous examples of collaborative approaches that were underway to advance sustainability in the Basin. Some of these are illustrated in the sustainability stories in *Snapshot 3*. While this is an observation, not an analysis or conclusion based on the indicators, it appears that these approaches are particularly advantageous in assisting communities in their efforts to pursue sustainability. A greater emphasis on collaboration is required to advance sustainability and address some of the challenges in the Basin and beyond.

// About the Report //

The 2006 *Sustainability Snapshot* profiles the social, economic and environmental health of the Fraser Basin, and is the third in a series of reports prepared by the Fraser Basin Council since January 2003. The purpose of *Sustainability Snapshot 3* is to help:

- Increase public awareness and understanding of sustainability issues and trends
- Identify critical issues and appropriate responses to improve progress towards sustainability
- Inform and influence decisions and actions to advance sustainability.

Sustainability indicators are not decisive measurements or solutions in and of themselves. They can, however, reflect certain trends and help identify areas where progress is being made and where more change is required.

// What's New in this Report? //

Sustainability Snapshot 3 builds on the scope and approach of the Council's first two *Snapshot* reports and includes some refinements and new features.

Refinements to the Scope of Topics

The scope of sustainability topics has been refined in some cases, including:

- *Fish and Fisheries*
- *Natural Hazards*
- *Population and Consumption*
- *Waste and Toxins*.

Updates and Refinements to the Indicators

Indicator trends have been updated where possible since release of the *Snapshot 2* report. Sometimes more current data (such as 2006 Census data) were not yet available, so that alternative indicators or approaches were used to update the analysis. In some cases, a broader suite of indicators is presented to provide a more complete picture of the state of sustainability.

Sustainability Stories

For most topics, a case study has been profiled to complement the quantitative indicators and data. The stories highlight the projects of diverse organizations working to advance sustainability throughout the Fraser Basin.

Sustainability Highlights

For each of the topics, a few significant indicators have been selected to profile as highlights. The status of these indicators is presented "At-a-Glance" to provide a quick sense of what is getting better or worse in the Fraser Basin. These highlights are summarized on pages 26-27 of this report to give a concise summary of the overall state of the Fraser Basin.

Regional Summaries

Snapshot 3 profiles each of the five regions of the Fraser Basin: the Upper Fraser, Cariboo-Chilcotin, Thompson, Fraser Valley, and Greater Vancouver-Sea to Sky (GVSS) regions. A map of the Basin and the five regions is presented on pages 14-15. Surrounding the map are regional profiles, including a description, key highlights of indicator trends and examples of sustainability initiatives.

Online Access and More Details

The *Snapshot 3* report will be available in a PDF version (November, 2006) and an HTML version (January, 2007) on the Council's website at **www.fraserbasin.bc.ca**. This approach allows access to the report—and more detailed content—in a way that is user-friendly and easily shared with others.

For a summary of Sustainability Highlights, see pages 26-27

For a Regional Summary, see pages 14-15

ABORIGINAL AND NON-ABORIGINAL RELATIONS

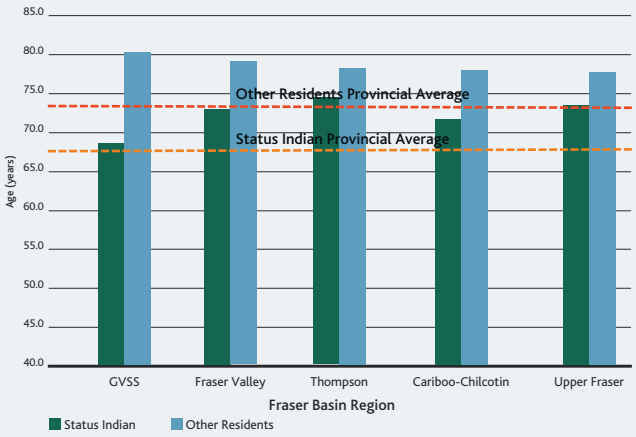
// Sustainability Highlights //

Good relations between Aboriginal and non-Aboriginal peoples in the Fraser Basin are critical to the overall sustainability of the region. Constructive relationships work to enhance culture, build and sustain a healthy community and environment, and create a foundation of trust and dialogue upon which sustainability can be advanced. It is in everyone's interest to resolve issues of Aboriginal title and rights. The Fraser Basin Council acknowledges the importance of title and rights in the 11th principle of its *Charter for Sustainability*—"We recognize that aboriginal nations within the Fraser Basin assert aboriginal rights and title. These rights and title now being defined must be acknowledged and reconciled in a just and fair manner." [1] Court decisions have defined some aspects of Aboriginal rights and have also described the duty of the Crown to undertake consultations and to accommodate Aboriginal rights. There have also been encouraging advances in treaty negotiations as well as other formal and informal methods of establishing self-determination, rights and title.

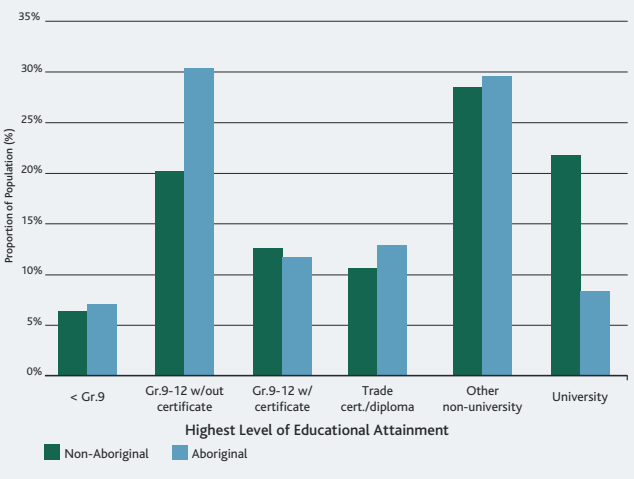
- In 2001, the population of Aboriginal origin in the Fraser Basin was 115,000 and the population of Aboriginal identity was 88,000 (18% increase since 1996).[i]
- Average life expectancy of Status Indians in the Fraser Basin was 72.1 years in 2001, compared with 78.5 years for non-Aboriginals in the Basin.

Life Expectancy	FAIR/MIXED RESULTS	On average, life expectancy is less for the Aboriginal than the non-Aboriginal population in the Fraser Basin (by 6.4 years), but the gap is narrowing.
The Next Generation (Children in Care and Highest Education Levels)	MIXED RESULTS/POOR	Since 2000 an increasing proportion of children in care are Aboriginal. Highest education levels attained are, on average, lower than in the non-Aboriginal population, but improving.
Progress in Treaty and Non-Treaty Measures, Protocols and Agreements	GETTING BETTER	Since 2002 significant progress has been made in improving relations and clarifying, respecting and accommodating title and rights.

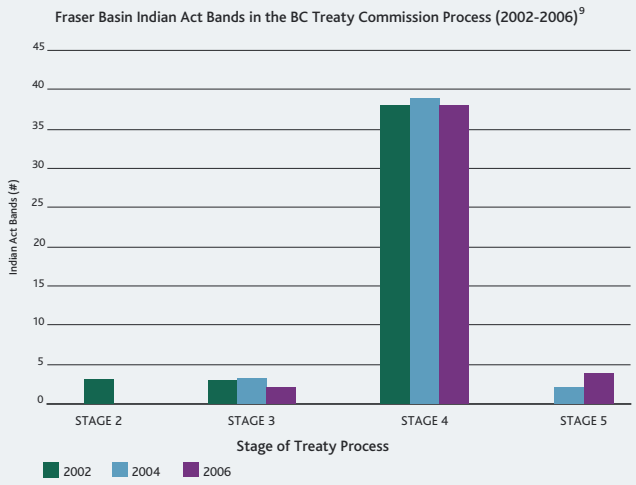
Life Expectancy for Status Indians and Other Residents in the Fraser Basin (2001) [2]



Highest Education Levels Attained by Aboriginal and Non-Aboriginal People in the Fraser Basin (2001) [5]



Fraser Basin Indian Act Bands in the BC Treaty Commission Process (2002-2006) [9]



// Issues and Trends //

Life Expectancy and Socio-Economic Conditions (2001)[2,3,4]

Life expectancy is a key indicator of socio-economic conditions of people and is strongly related to relative poverty, income inequality, and sustainability. Average life expectancy for Status Indians living in the Fraser Basin in 2001 was 72.1 years, compared to 78.5 years for other Basin residents. The largest difference (more than 11 years) was in the Greater Vancouver-Sea to Sky region. The BC Provincial Health Officer's 2001 Annual Report[2], the Indian and Northern Affairs Canada's *Community Well-Being Index*[3], and a recent study by the Centre for Native Policy and Research[4] show that Aboriginal people in the Fraser Basin face poorer overall socio-economic conditions than non-Aboriginal people, such as higher unemployment rates and lower income rates and educational attainment. However, the gap is narrowing with time.

Children and Youth—The Next Generation (2000-2006)[5,6]

In 2001 over half of all Aboriginal people in Canada were under the age of 25. While children and youth inspire hope, there is significant concern for young Aboriginal people in BC. Educational attainment data for 2001 show that there is a lower proportion of Aboriginal people (8.4%) with a university education, compared with non-Aboriginal people (21.7%). However, there are similar proportions of both populations at the levels of high school graduation, college and trades.

Aboriginal children make up approximately 9% of all the children up to age 18 in BC, but 40% of all children under the care or guardianship of the BC Ministry of Children and Family Development. Although the total number of children in care in BC has been decreasing over time, the proportion of Aboriginal children in care has risen from 36% to 49% between 2000/01-2005/06.

Participation in Protocols, Agreements and Informal Arrangements in BC (2006)[7,8]

There are many approaches underway to advance sustainability in Aboriginal communities and to improve Aboriginal and non-Aboriginal relations. In the spring of 2006, the provincial government enacted the *New Relationship Trust Act*, which provides funds for First Nations in BC to acquire tools, training, and skills to better participate in land and resource management planning, and develop social, economic and cultural programs for their communities. The independent Board of Directors is appointed by the First Nations Summit, Union of BC Indian Chiefs, BC Assembly of First Nations, First Nations Leadership Council and Government of BC. The government's commitment to The New Relationship is a fresh approach to building and strengthening relationships and working towards self-governance.

The Union of BC Municipalities documented 24 different agreements between First Nations and local governments in BC, ranging from cooperation and communication agreements to resource management and capacity development partnership agreements. The First Nations Summit and the Union of BC Municipalities held four provincial-wide Community-to-Community Forums, and more than 135 regional forums in the past five years with an aim to increase dialogue, improve understanding and support opportunities for partnership and collaboration.

Participation in the BC Treaty Commission Process (2002-2006)[9]

The BC Treaty Commission facilitates treaty negotiations among the federal and provincial governments and BC First Nations through a six-stage process, leading to the signing of a final agreement. Of the 98 First Nation Bands in the Fraser Basin, 44 are participating in the Treaty Commission process. 38 Bands are represented at the 11 treaty tables that have reached Stage 4 in the BCTC process. Of the seven Bands now at Stage 5 (Negotiation to Finalize a Treaty), four are within the Fraser Basin—Yekooche Nation, Yale First Nation, Tsawwassen First Nation and Lheidli T'enneh Band, which has now initialed a final agreement. The next stage is consultation and ratification. Negotiations have been completed with the Tsawwassen First Nation.

Aboriginal Language Characteristics (2001)[10]

Language is often inseparable from culture. It is integral to traditional Aboriginal perspectives and value systems, and ultimately, to Aboriginal identity. In 2001, Aboriginal language retention was highest in the Cariboo-Chilcotin and Upper Fraser regions of the Fraser Basin. In both regions, the proportion of the Aboriginal population who spoke traditional languages at home and who had knowledge of Aboriginal languages was higher than the provincial average.

Aboriginal Salmon Harvest (2001-2005)[11]

The Fraser River is home to one of the world's largest runs of sockeye salmon, a key element of the region's sustainability. Salmon are a principal mechanism for transporting nutrients from marine to freshwater and terrestrial ecosystems. Salmon are also extremely important to the economy, culture and history of First Nations who have depended on this resource for thousands of years.

As established through the courts and government policy, the Aboriginal harvest of salmon for food, social and ceremonial purposes is accorded highest priority after conservation concerns, while recreational and commercial fisheries follow in priority. In 2005 Aboriginal fishers in the Fraser River harvested nearly 700,000 sockeye, consistent with the numbers harvested over the past several years. Fraser Aboriginal catch data include fish for food, social and ceremonial purposes, as well as Pilot Sales, which provide an economic opportunity for some First Nations. The commercial harvest occurs mainly in the marine regions and usually accounts for the majority of sockeye salmon taken. Lower salmon runs in recent years, however, have led to conservation concerns and lower commercial allocations.

The On- and Off-Reserve Population of Aboriginal Identity (1996-2001)[12, i]

The geographic distribution of Aboriginal people is changing rapidly. Today, more than half of all Aboriginal people in Canada and more than three-quarters in the Fraser Basin live off-reserve. This rapid transition to urban areas impacts on such things as the delivery of services to Aboriginal people no longer living on reserve and a sense of cultural separation.

From 1996-2001, the Fraser Basin's off-reserve population of Aboriginal identity increased nearly 20%, from 55,000 to 68,000, while the on-reserve population increased approximately 15% from 16,000 to 19,000.[2] Three-quarters of the Basin's Aboriginal population lived off-reserve in 1996 and 2001; nearly half of all those off-reserve lived in the Vancouver region. The Thompson Region had the largest on-reserve Aboriginal population in 2001, more than two-thirds of the population.

Photo: Lilian Chau

// Partners in park management //

"The strength of our partnership will help ensure that Say Nuth Khaw Yum is protected and conserved for the benefit of all peoples."—Chief Leah George-Wilson

Today there are a growing number of innovative partnerships between the province and First Nations governments. Since 1998, the Tsleil-Waututh Nation (TWN) and the Government of BC have co-managed Say Nuth Khaw Yum Heritage Park / Indian Arm Provincial Park. The Park is located in the core of TWN traditional territory and on the beautiful waters of Indian Arm, a popular area for boaters, kayakers, campers and hikers.

In September 2006, the TWN completed phase one of the park management planning process by presenting BC Parks with a bioregional inventory atlas documenting all current biophysical, cultural and recreational aspects of the area. This is the first time that a bioregional inventory atlas has been developed for a provincial park.

The TWN and BC Parks are committed as partners "to protect the wilderness environment and heritage values of the park and to maintain and make use of the park in a way which recognizes and affirms the Tsleil-Waututh Nation aboriginal rights, culture, traditions and history and protects and conserves the area for the benefit, education and enjoyment of all people."

PHOTO:Tsleil-Waututh Nation and the BC government share responsibility for management of Say Nuth Khaw Yum Heritage Park / Indian Arm Provincial Park in Indian Arm.

// Inspired Action //

What is being done?

- In 2005 and 2006, the BC government supported social and economic opportunities by signing Forest and Range agreements with 25 different First Nations in BC, involving over 4,000,000 m^3 of timber: www.for.gov.bc.ca/haa/FN_Agreements.htm.
- The First Nations Mountain Pine Beetle Working Group has distributed $1.2 million since April 2006 to various First Nations communities to assess the economic and cultural impacts of the Mountain Pine Beetle: www.fnmpb.ca.
- In March 2006, the provincial government committed $1 million to preserving Aboriginal languages in BC. The funds will be distributed to 36 different Aboriginal communities through the First Peoples' Heritage, Language, and Culture Council: www.fpcf.ca.
- If or when ratified, the current agreements with the Lheidli T'enneh Band and Tsawwassen First Nation will provide an economic opportunity for these First Nations through the commercial harvest of Fraser River salmon after considerations for conservation and fish health concerns: www.bctreaty.net.
- The Greater Vancouver Regional District recently created an Aboriginal Relations Committee, responsible for providing advice to the GVRD. The GVRD endorsed a comprehensive First Nations Strategy to improve overall communication and relationships with First Nations: www.gvrd.bc.ca/board/aboriginal.htm.

What else can be done?

- Invite members of local Aboriginal and non-Aboriginal communities and governments to participate in local meetings, events, projects and organizations.
- Learn more about the Aboriginal and non-Aboriginal communities in your area, and introduce yourself to local organizations and governments. Informal meetings and discussions work directly to build and strengthen relationships and trust.
- Explore ways that you, your organization, government, or business can work with local Aboriginal and non-Aboriginal communities and organizations, such as through formal and informal agreements, protocols and Memorandums of Understanding.
- Access local government resources prepared by the Union of BC Municipalities, such as "*Building Relations with First Nations: A Handbook for Local Governments.*" See www.civicnet.bc.ca, and select Featured Policy Topics/First Nations Relations.

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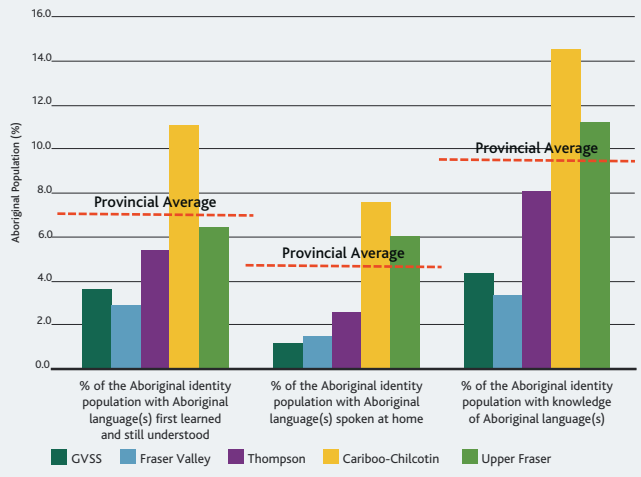
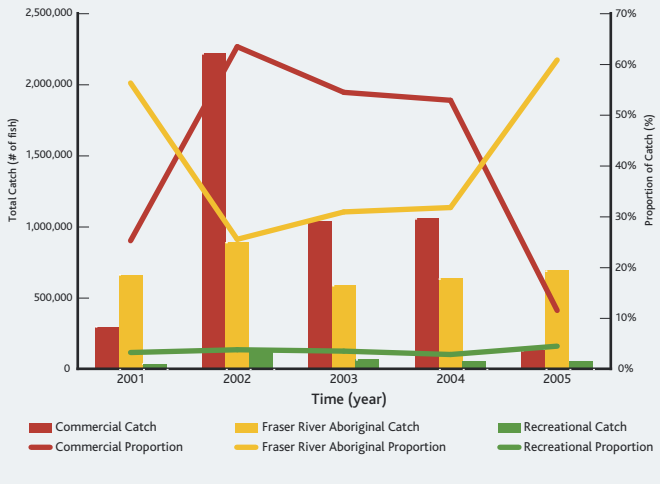
FOOTNOTE:

i. Population estimates for Aboriginal origin and identity are from the population census. The growth in population of Aboriginal identity in the Fraser Basin appears to be larger than would be expected from natural increase and migration. Upon review by Statistics Canada and BC Statistics, the largest part of the growth was in the Métis, particularly among older people, and may be due to an increased propensity to identify as Aboriginal.

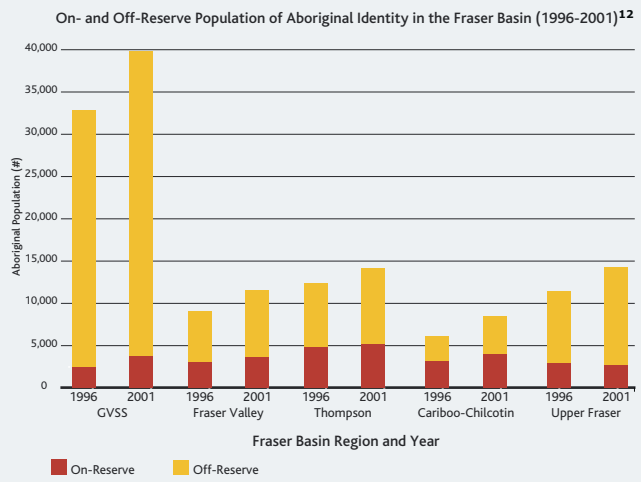
Aboriginal Language Characteristics in the Fraser Basin (2001)[10]



Total and Proportional Catch of Fraser Sockeye (2001-2005)[11]



On- and Off-Reserve Population of Aboriginal Identity in the Fraser Basin (1996-2001)[12]



// Lheidli T'enneh initials Final Agreement in treaty process //

Taking a moment to celebrate—Premier Gordon Campbell, Indian and Northern Affairs Minister Jim Prentice and Chief Dominic Frederick.

October, 2006 marked a milestone in the BC Treaty Commission process when a Final Agreement was initialled by the Lheidli T'enneh Band, the federal government and the provincial government. For the Lheidli T'enneh, the next step is to hold a ratification vote in that community.

The Final Agreement covers issues of self-government, rights to resources, such as wildlife, fish, timber and subsurface minerals, a fee simple transfer of 4,330 hectares of land (including 677 hectares of former reserve land) to the Lheidli T'enneh, and provisions for a capital transfer and payment of shared resource revenues.

Three other First Nations in the Fraser Basin are in stage five of treaty negotiation: Yekooche Nation, Yale First Nation and Tsawwassen First Nation.

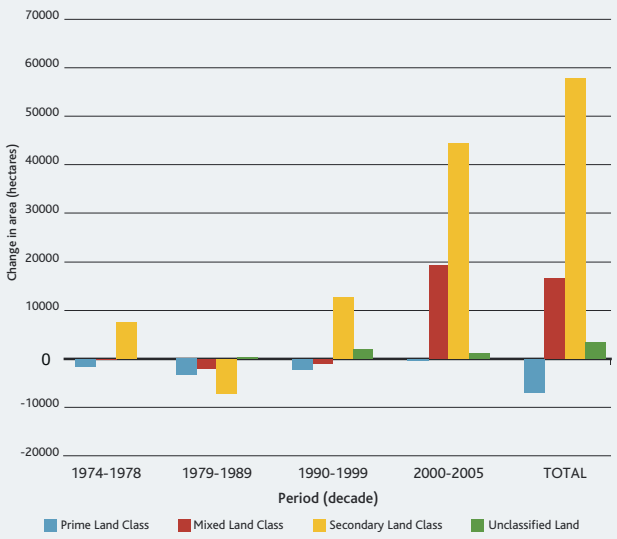
AGRICULTURE & FOOD

// Sustainability Highlights //

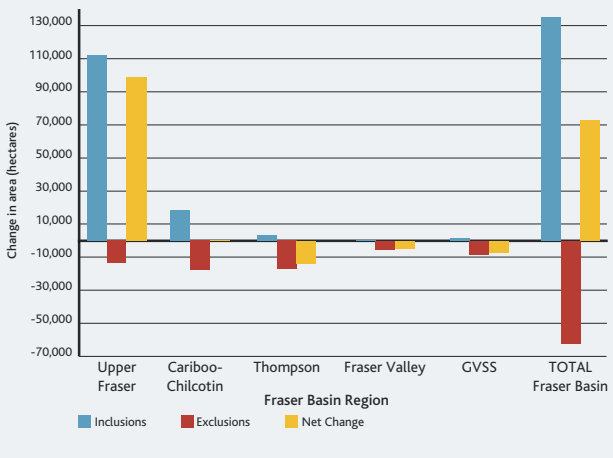
A secure, safe, reliable food supply is integral to sustainability. Food production takes place on less than 5% of BC's total land mass, and about 50% of BC farms are located within the Fraser Basin. In addition to food, agricultural lands provide income and employment, support local and regional economies, contribute to wildlife habitat and add to a region's green space. There are many pressures on, and risks to, agriculture, the family farm and a sustainable food supply, such as pressure on agricultural lands from urban development, low and shrinking farm incomes, competition from corporate agriculture around the world, invasive plants, a lack of local and regional food processing facilities to optimize food value, and diseases such as BSE (Mad Cow Disease), avian influenza, and most recently, E.coli. For example, avian influenza was initially identified in the Fraser Valley poultry industry in February, 2004. As a result, over 17 million birds were destroyed, and total economic losses are estimated at $380 million.[1]

Agricultural Land Reserve	FAIR/MIXED RESULTS	—As of 2005, there has been a net increase of land in the ALR in the Fraser Basin; however, there has been a net loss in prime agricultural land overall and a net loss of ALR land in 4 of 5 regions.
Agriculture and the Environment	GETTING BETTER	—Significant participation rates in the Environmental Farm Plan Program; growth among certified organic producers.

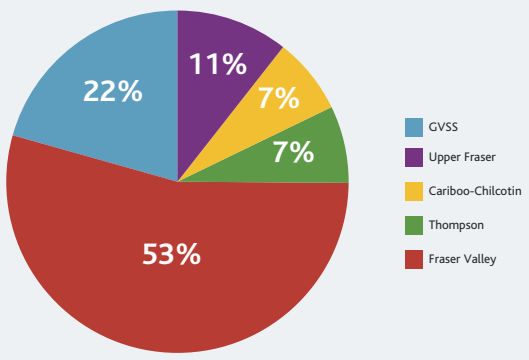
Net Change in Fraser Basin ALR by Land Classification (1974 -2005)[2]



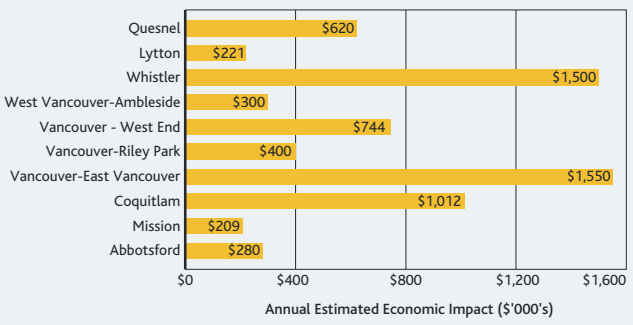
Change in ALR Area in Fraser Basin Regions (1974-2005)[2]



Proportion of Completed Environment Farm Plans in the Fraser Basin by Region (2006)[3]



Annual Local Economic Impact of Reported Fraser Basin Farmers' Markets in 2006 ($000's)[7]



// Issues and Trends //

Agricultural Land Reserve (1973-2005)[2, i]

The Agricultural Land Reserve (ALR), established in 1973, has prevented the conversion of farmland in the province into non-agricultural uses. Urban development is the most common basis for application for the exclusion of ALR lands. Since 1974, there has been a net increase in total ALR area in the Fraser Basin (3.3%), mostly due to the inclusion of mixed and secondary land classes in the Upper Fraser and Cariboo-Chilcotin regions since 1989. For example, 99% (97,808 ha) of ALR inclusions in the Upper Fraser were from mixed or secondary land classes. Other than the Upper Fraser, all Fraser Basin regions have experienced a net loss of prime, secondary and mixed quality agricultural land since 1974 (30,103 ha combined total decrease). There has been a net loss of 6,935 ha of prime land since 1974. Prior to establishment of the ALR, nearly 6,000 ha of prime agricultural land was lost each year to urban and other uses.[2]

Environmental Farm Plans (2003-2006)[3]

Launched in 2003, the Canada-BC Environmental Farm Plan (EFP) Program aims to complement and enhance the current environmental stewardship practices of BC producers. The stated vision is "a sustainable agriculture industry in BC," with objectives including encouraging stewardship of the land, implementing beneficial management practices and improving farm profitability. A total of 365 Fraser Basin farms have completed and are implementing EFPs (45% of EFPs in BC) and many others have initiated EFP processes.

Organic and Other Producers (1992-2006)[4,5,6]

The number of certified organic producers in BC has increased considerably (187%), from 154 producers in 1992 to 442 producers in 2004.[4] This trend is also evident in the Fraser Basin, where the number of organic producers has more than doubled since 2000. There were 196 farms producing certified organic products by 2006.[5] In addition to certified organic producers, there are a significant number of farmers that contribute to sustainability with environmentally responsible practices. For example, an inventory of agriculture in the District of Kent in the Fraser Valley region, found 26 nearly organic producers in addition to the three certified organic producers.[6]

Buying Local—Farmers' Markets (2006)[7, ii]

Producing and buying locally grown food supports local economies and communities, while reducing transportation costs and environmental impacts. The number of local farmers' markets in BC has grown considerably in the past few years, increasing from about 60 in 2000 to 100 known markets in 2006, 28 of which are within the Fraser Basin. Preliminary results from a recent UNBC study of 10 Fraser Basin farmers' markets found that, on average, 1,670 people attended each market, spending between $11 and $21 per person, and that each farmers' market contributed between $210,000 and $1.5 million annually to the local economy.[i] "Grown or produced locally" was regularly cited as one of the top reasons for buying at farmers' markets.

// Inspired Action //

What is being done?

- The BC Agriculture Plan Committee held public consultation meetings across BC in 2006 to develop a "Made-in-BC" agriculture plan that will increase public awareness on agriculture and food, support engagement of First Nations, encourage the growth and diversification of the industry and enhance the contribution of agriculture to the economy, environment and quality of life: www.harvesttohome.bc.ca.
- Some local approaches to address agricultural interests, urban development pressures and conflicts with non-farm uses of rural lands include Agricultural Area Plans (11 in the Basin), Agricultural Advisory Committees (11 in the Basin), and agricultural land use inventories (14 in the Basin). [8]
- In the Thompson region, the Fraser Basin Council, in partnership with the Government of Canada, Province of BC, Pacific Salmon Commission, and the BC Agriculture Council, has installed 11 climate stations and 7 soil moisture stations to assist the agricultural community with their land and water management decisions.

What else can we do?

- Individuals and businesses (such as restaurants and retailers) can purchase local, organic and environmentally responsible products to help support local farmers and reduce environmental impacts.
- Local governments and the Agricultural Land Commission can continue to protect prime agricultural lands.
- Farm owners and operators can implement EFPs, and participate in programs such as the Strengthening Farming Program[8] or the BC Agriculture Plan Committee.
- Governments and businesses can expand and enhance the capacity of local food processing facilities to strengthen the viability of the agri-food sector.

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FOOTNOTES

i. For a description of Agriculture Capability Classes, see: www.alc.gov.bc.ca/alr/Ag_Capability.htm.
ii. The UNBC study calculated the annual local economic impact of each farmers' market by multiplying the direct annual sales by 2.0. UNBC acknowledges that, although this is the most commonly used multiplier, it does vary widely (from 1.2 to 8.0) and further research is required to establish a reliable multiplier for farmers' markets.

// BC 4H Club for today's youth //

BC 4H (Head, Heart, Hands and Health) is a recognized agriculture and outdoor recreation program that engages youth by helping them become productive, self-assured adults who contribute to their communities. Most 4H youth live on farms or in rural areas. Through such programs as Rural-Urban Connections—they gain exposure to careers in agriculture, new technologies and the issues agriculture faces in rural-urban interface areas. The club offers agricultural and other skills training, plus opportunities for fun and friendship: see www.bc4h.bc.ca..

PHOTO: The BC 4H weed squad at work

AIR QUALITY

// Sustainability Highlights //

We all need clean air to be healthy—without it, we're at greater risk of respiratory diseases such as asthma, bronchitis, emphysema and lung cancer, as well as heart attack and stroke. Air pollution is the most significant contributing factor in respiratory disease. Fine particulate matter[i]—very small particles that we inhale deep into our lungs—is considered the most serious form of air pollution in BC. In particular, children, the elderly, asthmatics and those with cardio-respiratory diseases are most at risk. Particulate Matter (PM) and Ground Level Ozone (GLO) both have significant health impacts, including asthma, which is the number one reason for hospital admissions among Canadian children.[1,2]

- The main sources of PM_{10} and $PM_{2.5}$ within the Fraser Basin are from forestry and industrial sources, vehicle emissions (especially from diesel-powered vehicles), road dust, as well as wood smoke from domestic burning, and forest fires.
- Annual $PM_{2.5}$ concentrations have increased every year between 1999 and 2004 in Prince George and exceeded the Canada-Wide Standard (CWS) every year since 2002.
- Annual GLO concentrations exceeded the CWS in Langley, Chilliwack and Hope at least once between 1994 and 2004.

Particulate Matter$_{2.5}$	**GETTING WORSE**—Since 2000 in 4 of 6 communities, with particular concerns in Prince George.
Ground Level Ozone	**GETTING WORSE**—Since 2000 in 6 of 8 communities, with particular concerns in the Fraser Valley and GVSS regions.

// Issues and Trends //

Air quality data are presented for $PM_{2.5}$ and GLO from monitoring stations in select communities throughout the Fraser Basin. For additional data, see the National Air Pollutant Surveillance website: www.etcentre.org/NAPS/index_e.html. Although the CWS for $PM_{2.5}$ has been set at 30 ug/m^3, and set at 65 ppb (parts per billion) for GLO, research has not been able to determine an effects-free—or safe-level. Health risks are known to increase with exposure to $PM_{2.5}$ and negative health effects occur at very low concentration levels of GLO.[1,2,3]

Particulate Matter $_{2.5}$ (1997-2004)[4]

$PM_{2.5}$ refers to all airborne particles that are less than 2.5 microns in diameter. These very small particles have the most significant impact on health as they are inhaled deep into our lungs. $PM_{2.5}$ concentrations[ii] have increased in four of six Fraser Basin monitoring locations since 2000, with Kamloops experiencing the largest increase across all locations between 2002 and 2003. Prince George exceeded the $PM_{2.5}$ Canada-Wide Standard of 30 ug/m^3 each year since 2002, while the Williams Lake, Quesnel and Kamloops monitoring sites have recorded annual $PM_{2.5}$ concentrations greater than 20 ug/m^3 since 2002.

Ground Level Ozone (1990-2004)[2,3,4]

Ground Level Ozone (GLO) is a significant air pollutant in BC and is the main component of smog. GLO is formed when compounds such as nitrogen oxide and volatile organic compounds react with the atmosphere in the presence of sunlight. Meteorological factors, such as sunlight intensity and high temperatures increase the formation of GLO, which partly explains why smog is often worse during summer months. Exposure to GLO irritates the respiratory tract and can lead to impaired lung function and increased risk of developing asthma.[2] GLO concentrations[iii] have increased at six of eight monitoring locations since 2000, with considerable increases recorded at five of the eight locations. In 2003 and 2004, the Hope monitoring location exceeded 65 ppb, while in 2004, Squamish and Chilliwack monitoring locations exceeded 63 ppb. On the other hand, GLO concentrations have continued to decrease at Williams Lake and Prince George monitoring locations in recent years.

// Inspired Action //

What is being done?

- The BC Clean Air Committee released *A Teacher's Guide to Clean Air* in the fall of 2005. Designed for Grade 5 students, the guide explains how children can become involved in enhancing air quality and keeping the air clean. The BC Clean Air Committee consists of BC Transit, BC Ministry of Environment and Environment Canada, and the main purpose of the Committee is to encourage and support Clean Air Day activities across BC.[5]
- The BC School Bus Emission Reduction Project recently retrofitted about 550 school buses with diesel oxidation catalysts and closed crankcase ventilation to reduce emissions of particulate matter, carbon monoxide, and air toxics such as aldehydes.[2]
- In 2005, 70 municipal trucks were retrofitted with diesel oxidation catalysts through a partnership between Environment Canada, GVRD and nine municipalities, including North Vancouver, Delta, New Westminster and Richmond.
- The BC Clean Air Research Fund has been established to promote research into air quality issues. The project is jointly managed by the Canadian Petroleum Products Institute, GVRD and BC Ministry of Environment: www.env.gov.bc.ca/air/airquality/carf/index.html.
- The Fraser Basin Council sponsored a series of Clean Air Forums in 2005 and 2006 to bring together various stakeholders in BC and focus on community-based airshed planning, tools used to protect air quality and the protection of air quality in the future.
- Clean Air Day is held on the first Wednesday in June. It originally started as a BC event in 1992, but has since become a national day. The aim of Clean Air Day is to encourage people to adopt clean air choices as lifelong habits: www.env.gov.bc.ca/air/cad/index.html.

What else can we do?

- Individuals can walk, cycle, carpool or take public transit instead of driving alone, especially to work or on short trips in the neighbourhood, and employers and governments can provide related incentives, facilities and infrastructure.
- Governments can maintain and expand air quality monitoring and reporting initiatives to track air pollution trends, such as the National Air Pollutant Surveillance Network, the National Pollutant Release Inventory and the Air Quality Health Index.
- Individuals can adopt alternatives to burning for home heating. These include certified wood stoves, clean energy sources and improved home energy efficiency.
- Governments can set and enforce more stringent air quality objectives or national standards as well as support the development of cleaner technology to minimize emissions.
- All communities, even those with relatively low concentrations of $PM_{2.5}$ or GLO, should act to reduce emission sources, as there is no known safe level of exposure to these pollutants.

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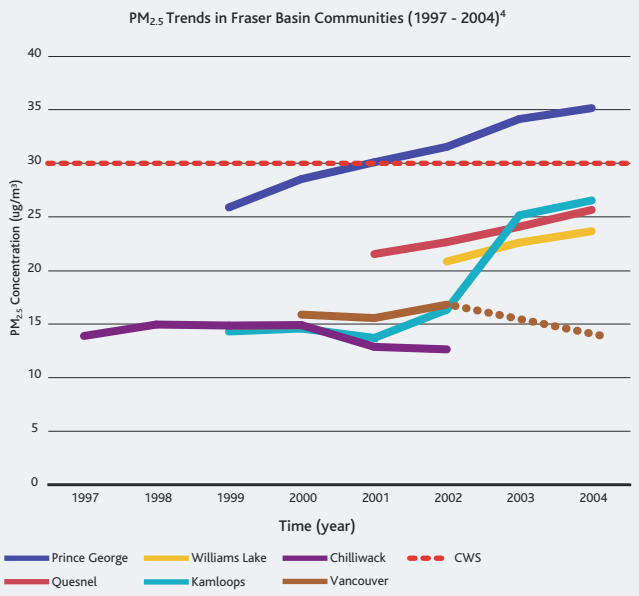
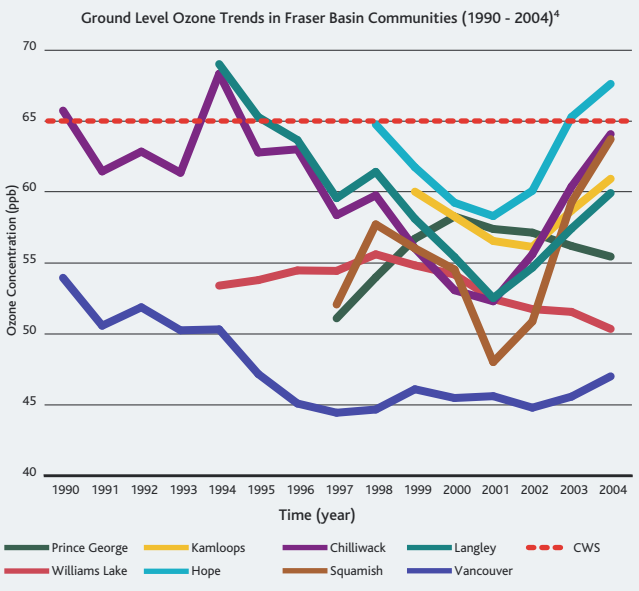




// A new Air Quality Health Index //

The Air Quality Health Index identifies the health risks posed by local air pollution conditions, a key tool for the public and media. The index was piloted in 14 BC communities in 2006 –10 in the Fraser Basin. In each location, a daily health risk rating is calculated on a scale of 0-10, based on a combination of four air pollutants: GLO, $PM_{2.5}$, Nitrogen Dioxide and Sulphur Dioxide. The tool comes with recommendations on when at-risk individuals and the general population should limit their outdoor activities: www.airplaytoday.org.

FOOTNOTES

i. Particulate Matter (PM) refers to a combination of very small solid and liquid particles that are suspended in the air we breath. The size of the particles is measured in microns, which are one millionth of a metre in size. Particles smaller that 10 microns are referred to as PM_{10}, and fine particulate matter includes particles smaller than 2.5 microns and is often referred to as $PM_{2.5}$, which is about 30 times smaller than the diameter of a human hair.

ii. The yearly $PM_{2.5}$ concentration is calculated by the average of the 98th percentile for each of the three previous years.

iii. GLO concentration is calculated by the average of the 4th highest reading for each of the three previous years.

BUSINESS AND SUSTAINABILITY

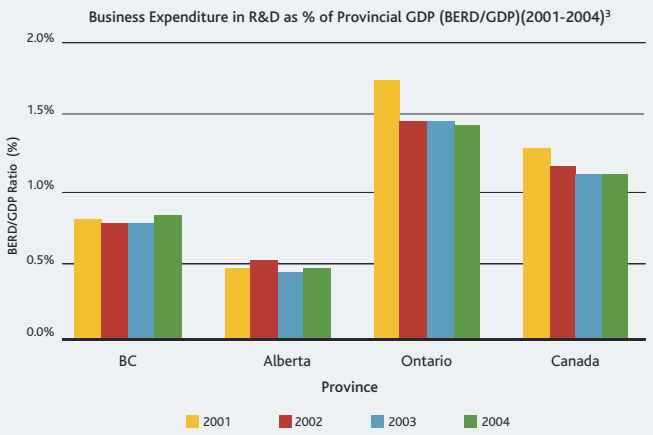
// Sustainability Highlights //

In addition to increasing shareholder value, driving economic growth and providing stable employment, businesses are being called on to help ensure the ongoing social and environmental sustainability of the Fraser Basin. Sustainable businesses create value for six stakeholder groups: customers, employees, investors, vendors, communities, and the environment. Companies frequently refer to these commitments as corporate social responsibility (CSR), and these commitments help differentiate them from competitors by building public trust, attracting and retaining the best employees, and reducing environmental impacts and liabilities. Sustainable purchasing is one approach to business that integrates social, ethical and environmental considerations in the purchasing process. The Conference Board of Canada has reported that corporations that voluntarily behave in a socially responsible manner stand to benefit from those actions.[1] Some of the benefits of CSR include improved reputation and brand management; enhanced employee recruitment, motivation and retention; greater access to capital; operational efficiency and cost savings; greater social licence to operate; and improved relations with regulators.

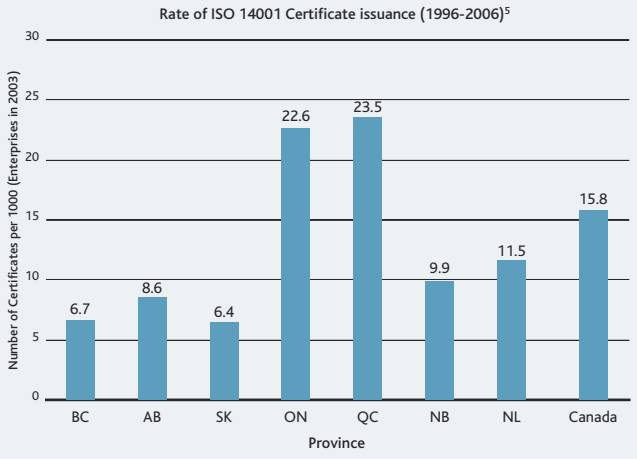
- 65% of British Columbians are likely to pay attention to CSR issues (2006).[2]

Research and Development	**GOOD**—Business expenditure on R&D was 3rd highest in Canada in 2004.
Corporate Social Responsibility	**GOOD**—Companies based in the Fraser Basin claimed 5 of the top 11 socially responsible Canadian corporations as ranked by Stratos Inc. in 2005.
Environmental Management	**FAIR/MIXED RESULTS**—BC was 4th in the country in the number of ISO 14001 certificates issued, but only 6th nationally in certificates per 1,000 enterprises (6.7).

Business Expenditure in R&D as % of Provincial GDP (BERD/GDP)(2001-2004)[3]



Rate of ISO 14001 Certificate issuance (1996-2006)[5]



Ranking of BC's MBA programs by sustainability curriculum (2005-2006)[6]

	2005 ranking (of 25 schools)	2006 ranking (of 34 schools)
University of British Columbia	15th	8th
University of Victoria	12th	15th
Royal Roads University	10th	22nd
SFU	16th	19th

// Issues and Trends //

Research and Development (1984-2004)[3]

Investing in research and development (R&D) is a good indicator of the business sector's interest in improvement and innovation. A business can invest in R&D to strengthen its competitiveness, viability, productivity and resilience to ever-changing markets and regulatory environments. R&D can support the sustainability of the business itself as well as a sustainable economy. Between 1984 and 2005, the business sector's participation in domestic Business Expenditure on R&D increased from 48% to 53%, peaking at 62% in 2001. Between 2001 and 2004, the BC business sector's contribution to R&D, as a percentage of provincial GDP, was 0.8% on average. By comparison in Alberta, the contribution was 0.4%, Ontario 1.53 % and the rest of Canada 1.18 %.

Corporate Social Responsibility (CSR)[1,4]

CSR policies reflect a company's broader commitment to sustainability and "triple bottom line" performance (social, economic and environmental). The number of Canadian companies publishing reports on their environmental, social and economic performance continues to grow—114 companies in 2004 compared to 100 in 2002. In its 2005 national benchmark CSR survey, Stratos Inc. found that Vancity, TELUS and BC Hydro took the three top spots. Fraser Basin-based companies claimed five of the top 11 spots in the rankings, with Weyerhaeuser (7th) and Vancouver International Airport (11th) also ranking very high nationally.[4]

Environmental Management—ISO 14001 Certification (1996-2006)[5]

ISO 14001 is among the most widely known of environmental certification systems. In practical terms, an organization that receives an ISO 14001 certificate has demonstrated that it has a system in place to consider and manage those aspects of its operations that could potentially affect the environment. In absolute numbers, 1,055 ISO 14001 certificates have been issued in BC—the fourth highest number in the country. 672 of these certificates were in the Fraser Basin (64% of the BC certificates). When the number of certificates is divided by the number of enterprises operating in the province in 2003, BC slips to sixth place in the country (6.7 certificates for every 1,000 enterprises), well behind Ontario (22.6) and Quebec (23.5).

The Next Generation—Sustainable Business, Engineering and Law[6]

Sustainability is being included in the curricula of business, engineering and law schools across the province. The Corporate Knights Magazine annual survey of Canadian Universities ranks business schools, law programs and engineering schools in terms of how well they infuse social and environmental impact management into their curricula, considering institutional capacity, student-led initiatives, and course work. The UBC Engineering School (third out of 36) and the Law Schools of the University of Victoria and UBC had very favourable rankings in this survey (fourth and fifth out of 21 respectively). Four BC university MBA programs ranked in the middle of the pack across Canada, with rankings between 10 and 16 out of 25 schools in 2005 and between 8 and 22 out of 34 schools in 2006. Only UBC improved its MBA ranking in this time period.

// Inspired Action //

What is being done?

- The Sustainable Purchasing Network (SPN) helps organizations develop sustainable purchasing policies through training, case studies, tools, guides and networking sessions. 75 individual organizations participated in workshops and learning circles between October 2005 and June 2006: www.buysmartbc.com.
- Westport Innovations Inc. received the 2005 *Leadership in Social Responsibility Award* at the *Technology Impact Awards* in recognition of its performance in integrating CSR principles into its corporate culture and operations, and for contributions the company and its employees have made to their communities.[7] Westport develops environmental technologies to allow vehicles to operate on clean-burning alternative fuels.
- Natural Resources Canada's Industrial Energy Audit Incentive covers up to 50% of the cost of an on-site energy audit, to a maximum of $5,000: oee.nrcan.gc.ca/industrial/financial-assistance/existing/audits/index.cfm?attr=20.

What else can we do?

- Pay employees a living wage and provide work-life balance opportunities for employees, including flex-time and job-sharing.
- Join the Sustainable Purchasing Network to learn how to advance sustainability through purchasing decisions, such as post-consumer recycled paper, sustainable forest products, Fair Trade coffee, and sourcing goods and services from businesses that hire from vulnerable populations (e.g., youth-at-risk, Aboriginal people, people with disabilities).
- Avoid use of toxic products and other "off-gassing" chemicals.
- Invest in ethical funds and companies that are advancing sustainability through consultation and collaboration with local communities, partnerships with First Nations communities, and sustainable resource management.

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// Investing in sustainability //

Vancity, through its *Shared Success Program*, has given back to its members and local communities more than $100 million of profits since 1994. Among its various sustainability successes are the EnviroFund VISA, support for the SFU/UBC transit U-Pass program, low-interest loans for hybrid cars, financing for energy-efficient home renovations, achievements in energy efficiency certified by BC Hydro's Power Smart program, "extreme green" branches that maximize energy efficiency and minimize their environmental footprint, and the highest employee participation rate in the Commuter Challenge over several years.[9]

PHOTO: Vancity CEO Dave Mowat hops on a Segway during Clean Air Day.

COMMUNITY ENGAGEMENT

// Sustainability Highlights //

Community engagement is a central part of a well-functioning, democratic society. The more involved people are in their communities, the more likely they are to value those communities. When people volunteer at a local school or community centre, participate in community events, join a business group, take the time to vote or help out at their local food bank or get to know their neighbours, they contribute towards better schools and community services, lower crime rates, racial tolerance, closer involvement in decision-making and better economic opportunities. Engagement in communities can also help citizens understand the importance of sustainability and the links between social, economic and environmental issues.

• 45% of BC residents volunteered in 2004 (the same as the Canadian average), volunteering an average of 199 hours (higher than the Canadian average).

• 77% of BC residents donated money in 2004 (lower than the Canadian average) donating an average of $467 (higher than the Canadian average).

Volunteerism		**GETTING BETTER** for volunteerism rates and hours volunteered in BC.
Charitable Donations		**GETTING BETTER** for rates of giving and average monetary donation in BC.
Voter Turnout		**GETTING WORSE** for federal, provincial and local elections in BC.

// Issues and Trends //

Volunteerism in BC (1997-2004)[1]

In BC, the rate of volunteering and the average number of hours volunteered have increased since 2000. In 2004 the British Columbian rate of volunteering was 45% of the total population aged over 15 years (1,580,000 people), which is a 19% increase since 2000. The average number of hours volunteered annually has increased 18% since 2000, from 169 hours to 199 hours. This is the highest number of volunteer hours in all of Canada, and considerably higher than the Canadian average of 169 hours.

British Columbians aged 45-54 years were the most common volunteers, with 52% of the population in this age category volunteering in 2004. This was closely followed by British Columbians aged 15-24, with 50% volunteering in 2004. On average, fewer people over 65 volunteered, but those who did spent more time per person volunteering than all other age categories.

Charitable Donations in BC (1997-2004)[1]

77% of British Columbians 15 years and older made a monetary donation in 2004, which is less than the 2004 Canadian donation rate of 85% and less than the 1997 BC donation rate of 89%. In 2004, the average annual value of donations by British Columbians was $467, considerably higher than the Canadian average of $400, and an 83% increase in the BC average since 2000 ($255).

Not surprisingly, as household income increases, so too does the rate and value of charitable giving. In general, between 2000 and 2004, households with an annual income greater than $20,000 show an increasing donation rate, except those with an income of $40,000-$59,999, which show a 3% decrease since 2000. Households with an income of less than $20,000 have the lowest rate of giving, and the rate has declined since 2000.

Voter Turnout in BC and the Fraser Basin (1983–2006)[2,3,4]

Voter turnout is declining. The rate of voter turnout in both provincial and federal elections has dropped since the mid-1980s. The Canadian average voter turnout for federal elections has also declined since the 1980s.

Data on municipal election voter turnout rates were made available from the Union of BC Municipalities for some, but not all Fraser Basin communities. The 2005 municipal election voter turnout rate for the 38 reported Fraser Basin communities was 31%, which is considerably lower than BC voter turnout rates for provincial or federal elections. For municipal elections, it appears that, as the population of the community increases, voter turnout decreases. This is particularly true for communities with a voter population of less than 1,000, which had on average an 18% higher voter participation rate than larger communities.

// Inspired Actions //

What is being done?

➜ Community stewardship groups provide an important means of engagement in many communities. The second Annual BC Interior Area Stewards Workshop was held on March 17-18, 2006 at the Cariboo Friendship Society Longhouse in Williams Lake and was attended by nearly 60 stewards from across the interior.

➜ The 2006 BC Rivers Day involved about 80,000 British Columbians at more than 125 events across the province. Some highlights from the Fraser Basin include Prince George Rivers Day Music Festival, the Allco Park celebration on the Alouette River in Maple Ridge, and the Salmon Festival and parade in Vancouver.[7]

➜ In 2006, 2,105 British Columbians participated in the Weekend to End Breast Cancer, raising $5.5 million in funds for breast cancer research. This is a 17% increase in participants from 2005.[8]

➜ The Go for Green annual Commuter Challenge is a Canada-wide community-based program that aims to increase sustainable commuting by encouraging people to walk, cycle, take transit, carpool or tele-work instead of driving alone to get to work: www.commuterchallenge.ca.[9]

What else can we do?

➜ Contact Volunteer BC, your local volunteer centre or community organizations for opportunities to participate and advance sustainability in your community.

➜ All levels of government, business and community organizations can provide ongoing opportunities and resources for people to be involved in planning and decision-making processes that affect sustainability.

➜ Individuals, organizations, businesses, governments and schools can participate, volunteer or sponsor community events.

➜ Businesses can provide employees paid time off to volunteer in the community and can match employee donations to community groups.

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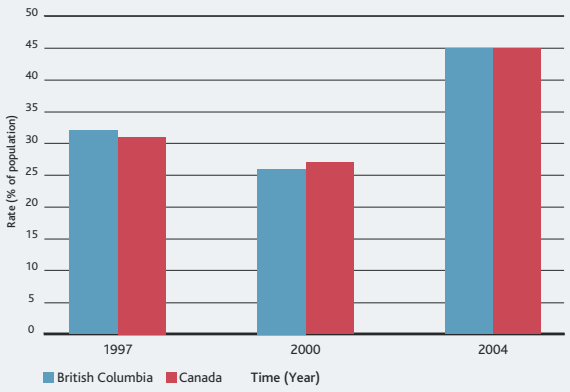
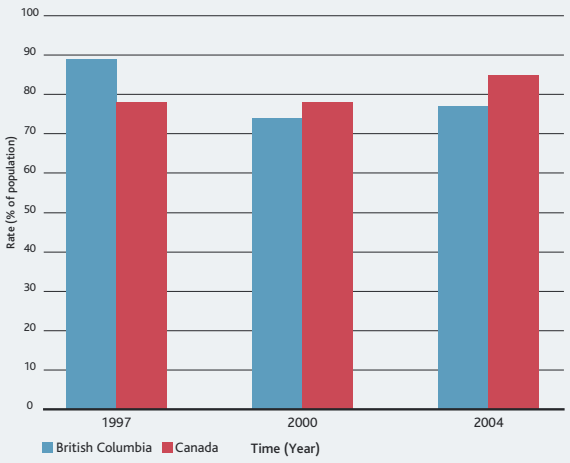
7. BC Rivers Day website and personal communication; www.riversday.bcit.ca
8. Weekend to End Breast Cancer Website and personal communication; www.endcancer.ca.
9. Commuter Challenge website: www.commuterchallenge.com.

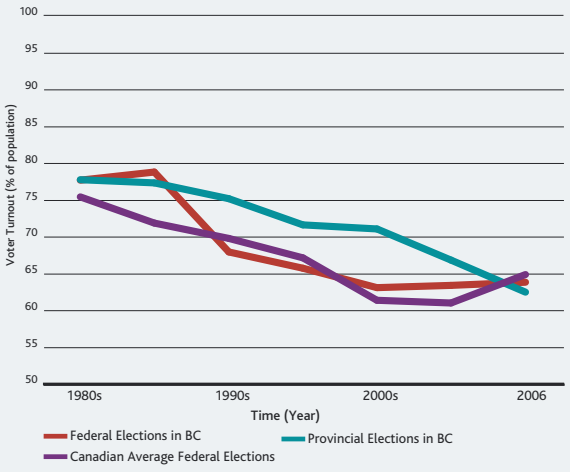
Annual Volunteer Rates in BC and Canada (1997 - 2004)[1]



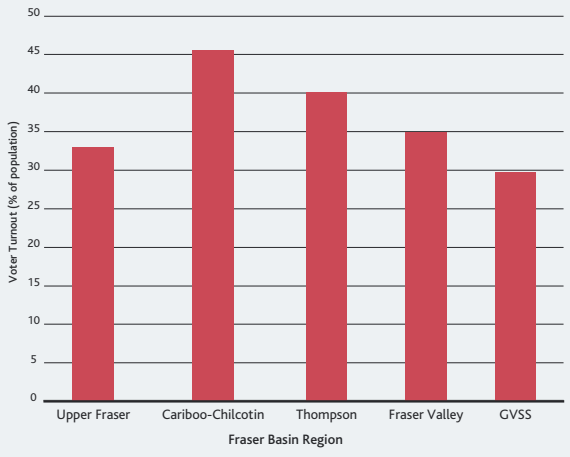
Annual Donation Rates in BC and Canada (1997 - 2004)[2,3]



British Columbia Voter Turnout Rate: Federal and Provincial Elections (1983 - 2006)[2,3]



Fraser Basin Voter Turnout 2005 Municipal Elections[4]



// Stepping up to volunteer //

Volunteerism is on the upswing. BC boasts 35 volunteer centres across the province, including 17 in the Fraser Basin, to assist local organizations with volunteer recruitment, referral and training services. Volunteer Kamloops offers adult and youth volunteer placement. A special program, Focus through Volunteering, helps people with mental health issues find volunteer positions that connect them to the community, while building their skills and confidence. The North Thompson Volunteer & Information Centre has coordinated volunteers for special events, such as an initiative to replant 10,000 trees, and supported Barriere Against Drugs to combat methamphetamine addiction through education, prevention strategies and facilitated community meetings.

ECONOMY

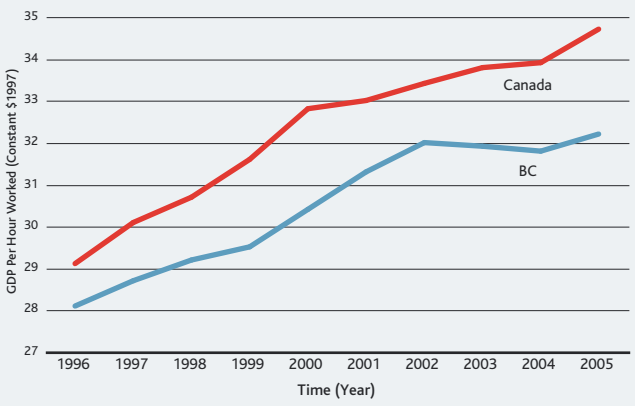
// Sustainability Highlights //

A vibrant economy is part of the vision for a sustainable Fraser Basin region. Economic well-being at a regional scale can be described as the performance of the economy within BC or the Fraser Basin, and can be measured through indicators such as economic growth, unemployment rates, economic productivity and economic diversity. A sustainable economy can contribute to an increased standard of living and increased prosperity, and is composed of good corporate citizens that are socially and environmentally responsible (see Business on page 8). A sustainable economy uses renewable resources and minimizes adverse impacts on the environment by reducing pollution and waste, and efficiently using energy, materials and labour. A low unemployment rate is important to the economic stability of a community. Likewise, high employment rates generate lower employment insurance claims and more income tax, providing public funds in support of healthcare, education, transportation and other public services. Increasing economic diversity is associated with economic stability, resilience, human well-being and sustainability.

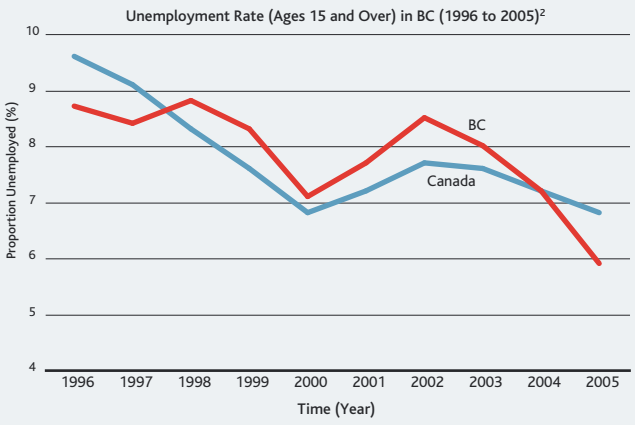
• An aging population and increased retirement are projected to lead to skill shortages in many different sectors and industries.

Productivity Growth		POOR—Below the national average over the past decade and minimal growth since 2002.
Unemployment		GETTING BETTER—Unemployment rates are at the lowest levels in over 20 years and dropped below the national average in 2004/05.
Economic Diversity		FAIR/MIXED RESULTS—Best in the Thompson, Fraser Valley and GVSS regions and worst in the Upper Fraser and Cariboo-Chilcotin regions.

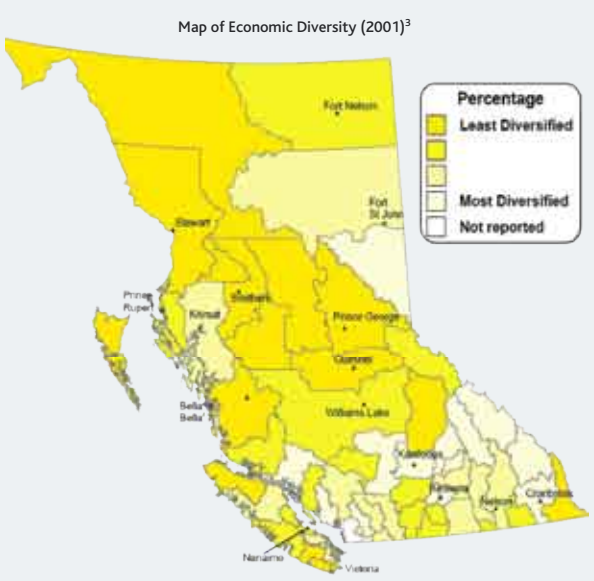
Labour Productivity-Real GDP Per Hour Worked in the Business Sector (1996 to 2005)[1]



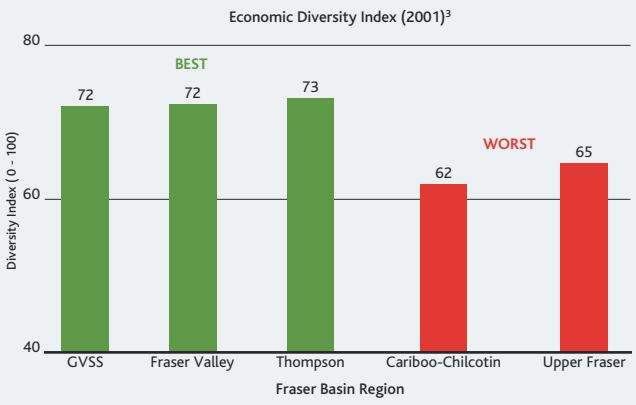
Unemployment Rate (Ages 15 and Over) in BC (1996 to 2005)[2]



Map of Economic Diversity (2001)[3]



Economic Diversity Index (2001)[3]



// Issues and Trends //

Due to limited availability of current data, many of the indicators have been analyzed at the provincial level. Provincial data is more current (2004 or 2005) than data otherwise available specifically for the Fraser Basin (2001).

Gross Domestic Product Growth Per Capita (1996-2005)[1]

Economic growth refers to the expansion of the total production of goods and services over time. The growth in real GDP is used as an indicator of the general well-being of the economy. However, many activities that contribute to GDP growth might negatively influence sustainability, such as expenditures on human tragedies, including car accidents and environmental catastrophies such as oil spills. BC has had strong economic growth over the last few years. Real GDP per capita growth in BC has outpaced the national average since 2002. In 2005, BC had the third highest growth rate among the provinces, with a GDP per capita growth of 2.2%.

Productivity Growth (1996-2005)[1]

Productivity growth is a key contributor to economic growth and income growth. Economic growth is a result of increased labor use, increased capital or an improvement in the efficiency with which labor and capital are utilized. A common measure of this efficiency or productivity is GDP per hour worked. Economic growth achieved through increased productivity puts less pressure on finite natural resources or environmental services. Although BC has recently had strong GDP growth, real GDP per hour worked in BC was $32.2, below the national average of $34.7. Productivity in BC has consistently been at levels below the national average from 1996 to 2005.

Employment and Unemployment (1996–2005)[2]

The labor force includes all individuals 15 and older who are employed in full-time and part-time positions or are actively looking for work. The unemployment rate (% of labour force without work) in BC in 2005 was 5.9%, while the employment rate (% of population employed) was 61.5%. Although province-wide Labour Force data are presented in this report, 1996 and 2001 Census data were examined to compare BC and Fraser Basin data. It was found that Fraser Basin unemployment rates were similar, and slightly lower than the BC rate in both the 1996 and 2001 Census years (0.4% and 0.5% lower respectively).

Economic Diversity (2001)[3]

Economic diversity is an important indicator of the stability and resiliency of regional economies. Dependency on a single industry makes that economy extremely vulnerable to economic downturn. BC Statistics developed an Economic Diversity Index that rated 20 smaller BC communities in 2001. The higher the number (0-100), the more diverse a community's economy is presumed to be. Communities in the Upper Fraser and Cariboo-Chilcotin regions were relatively less diverse than in the southern regions of the Basin. In particular, Vanderhoof (index rating of 56) and Quesnel (57) had the lowest levels of economic diversity. The low diversity scores in the Upper Fraser and Cariboo-Chilcotin regions are in part due to heavy reliance on the forestry sector in these regions.

// Inspired Action //

What is being done?

- ➜ Community Futures Development Corporation of British Columbia coordinates and facilitates a number of community economic development initiatives in the Fraser Basin and throughout BC. These initiatives include entrepreneurship, self-employment and community economic development programs.
- ➜ Western Economic Diversification Canada is providing $25 million in funding to create new employment opportunities, support economic infrastructure and promote entrepreneurship in BC. This funding will be matched by the BC government.
- ➜ The BC Competition Council conducts a comprehensive review of BC's competitiveness in every sector, pinpoints barriers to growth and identifies solutions to overcome them.

What else can be done?

- ➜ Buy from local businesses and from those that are based in BC.
- ➜ The BC Progress Board suggests that increasing productivity through public and private capital investments, new funding for and focus on research, training and academics need to be priorities if we want to increase our economic well-being. Further, public policy must include favourable tax, immigration and regulatory policies.[4]
- ➜ Support government programs in school districts and post-secondary institutions that contribute to a well-educated, highly qualified work force.
- ➜ Support the development of partnerships between communities, government and business to diversify local and regional economies.
- ➜ Support initiatives such as job sharing, cooperatives, peer lending groups, and entrepreneurship training.

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// Reconnecting new Canadians with their careers //

Over 35,000 immigrants—including many highly skilled people—come to BC each year. It is key to economic sustainability that they effectively integrate into the workforce and secure positions that match their qualifications. BC Skills Connect, funded by the Ministry of Economic Development and offered through local non-profit service agencies, helps tradespeople, professionals and other skilled immigrants ready themselves for the BC workforce through career assessment, skills enhancement and workplace orientation, including internships or mentorships. The initial focus is on those in the construction, transportation, energy and tourism and hospitality industries.

EDUCATION

// Sustainability Highlights //

Education and lifelong learning are vital to the social and economic well-being of Basin residents and therefore to the sustainability of our communities. Education is a bridge from the past to the present and from the present to the future that enables people to meet their basic needs, adapt to environmental, economic and social shifts in the world, and plan their lives. It is key to both individual and collective stability by supporting economic development, innovation and employment. Early education shapes a child's capacity to learn in school, during adulthood, and for a lifetime. Lifelong learning, in turn, helps people maintain competence and competitiveness in today's knowledge economy and enhances personal growth and fulfillment. The provincial government has adopted a goal to make BC "the best educated, most literate jurisdiction on the continent."

- As of 2001, levels of educational attainment were high and had continually increased between 1981 and 2001 throughout the Basin. Educational attainment rates of Aboriginal people in 2001 were comparable with those of non-Aboriginal people for graduates of high school, college and trades, but there were fewer university graduates (by 50%).[1]

Early Childhood Development	**GETTING WORSE**—Since 2001, there are more 5-year-olds considered as having developmental vulnerabilities in terms of "readiness for school" in all regions.
Index of Education Concerns	**MIXED RESULTS/POOR**—Rural areas have higher educational concerns than urban areas.
Student–Teacher Ratios	**GETTING BETTER**—Since 2004, there are fewer students per teacher in all regions.

// Issues and Trends //

Early Childhood Development (2001-2006)[2]

Research has shown that a person's capacity for lifelong learning is fundamentally shaped by development in the first five years of life. The earliest years of a child's life are also critical to his or her long-term physical health, well-being, competence and coping skills.

The Early Development Instrument is a survey tool that examines the developmental status of five-year-old children across the province and gauges their "readiness for school" as they enter kindergarten. The survey has now been conducted twice in all but three school districts in the Basin.

The most recent survey cycle showed that between 23% and 33% of kindergarten students in the Basin were "vulnerable" in one or more of the following five developmental domains: 1) physical health and well-being, 2) social competence, 3) emotional maturity, 4) language and cognitive development or 5) communication skills and general knowledge. The Fraser Valley Region had the greatest average proportion of vulnerable children, followed closely by the Cariboo-Chilcotin and Upper Fraser regions. In every region, the proportion of children deemed to be "vulnerable" increased between the two survey cycles, with the greatest increases in the Cariboo-Chilcotin and Upper Fraser regions.

Index of Education Concerns (2005)[3]

The Index of Education Concerns, developed by BC Statistics to measure the education well-being of the population, suggests that there are considerable discrepancies in learning environment and educational attainment levels in the different regions. The index incorporates data on the home and community learning environment, the educational status of 18-year-olds in the community, the quality of graduates, and the academic achievement scores of children currently in the school system. Because the index measures concerns, a higher index score indicates poor performance, while a lower number suggests fewer concerns and a higher level of educational well-being.

There are relatively low levels of concern in the Greater Vancouver-Sea to Sky region; however, the Cariboo-Chilcotin and Upper Fraser regions exhibit among the highest composite index ratings in the province.

Student-Teacher Ratios (2004-2006)[4,5]

Over the past decade, 10 of the 24 school districts in the Basin experienced increases in student-teacher ratios. However, this trend has reversed since 2004 in all but one school district, signalling a positive trend for student learning. A lower student-teacher ratio means that teachers and aides generally have fewer children in their classes and more time to spend with each. Recent legislation now requires school districts to limit average class size (19 children in kindergarten and 30 children in Grades 8-12). Individual class size is also now capped at 30 students for Grades 4-7.[5]

// Inspired Action //

What is being done?

- In an effort to increase access to post-secondary education, the provincial government has committed to adding 25,000 new student spaces in BC's colleges, university-colleges, universities and institutes between 2004 and 2010. 12,000 of these seats have already been established.[6]
- In the fall of 2005, a Learning Roundtable was created in BC as a forum for teachers, government, parents, trustees, superintendents, principals and vice-principals to discuss and address issues related to learning conditions such as class size, school funding, libraries and services for children with special needs.
- The BC Chapter of the Sierra Club of Canada offers environmental education programs for elementary and secondary school students, including topics such as climate change, rainforest and interior ecosystems, stewardship and sustainability: www.sierraclub.ca/bc/programs/education/index.html.

What else can we do?

- Basin residents, government and organizations can support early literacy outreach programs, such as story times for young children and particularly those for families in which English is a second language to help them to become comfortable and familiar with the rhythm and structure of language.
- Businesses can support their employees in the pursuit of lifelong learning by allowing them time and opportunities for professional development.
- As individuals, we can take advantage of the rich array of classes, programs and skills workshops offered by school districts, community centres and public libraries.

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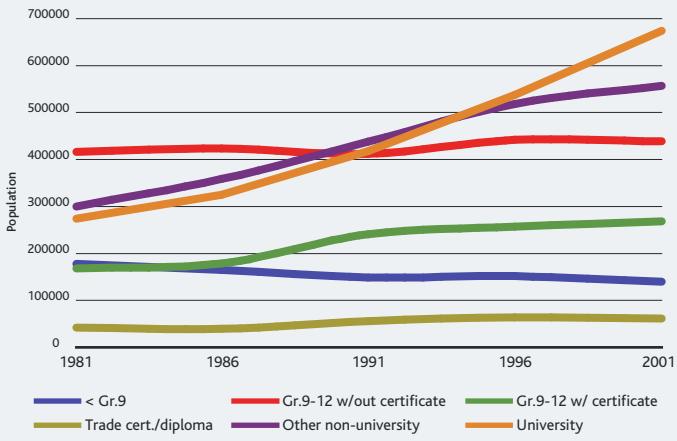
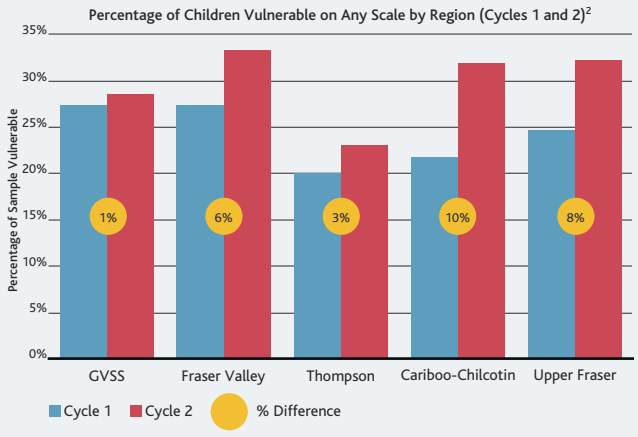
// Early learning to last a lifetime //

The early years are formative years. Children who are talked to, sung to and read to by their parents and caregivers exhibit more advanced language skills than those children who received little verbal stimulation. Books for BC Babies is an innovative program that encourages parents to read to their newborns. A partnership between the BC government and the BC Library Association, Books for Babies provides babies born in the province with a book—in 2006 *Baby Beluga* by Raffi—and an accompanying CD of songs.

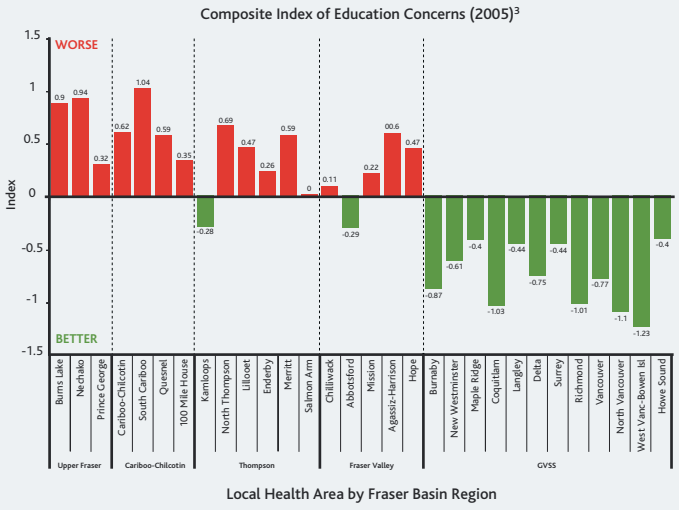
Basin Population by Highest Level of Educational Attainment (1981-2001)[1]



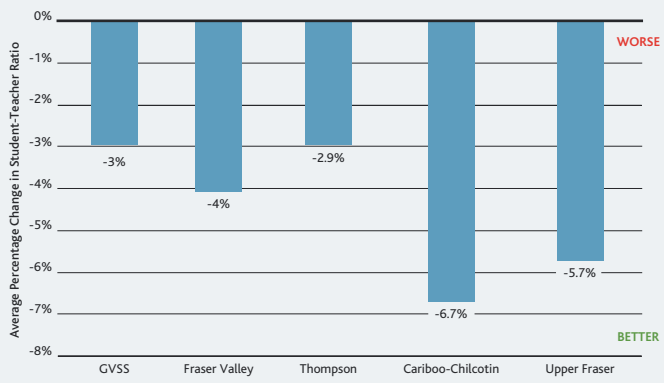
Percentage of Children Vulnerable on Any Scale by Region (Cycles 1 and 2)[2]



Composite Index of Education Concerns (2005)[3]



Percentage Change in Student-Teacher Ratios by Fraser Basin Region (2004-2006)[4]



ENERGY & CLIMATE CHANGE-CLIMATE CHANGE

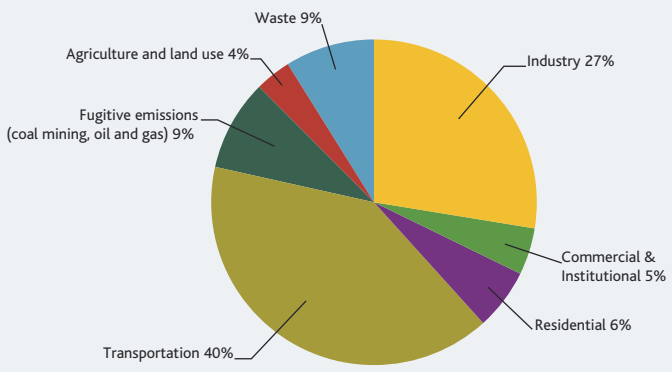
// Sustainability Highlights //

Climate change is one of the world's leading sustainability challenges, and the energy sources we rely on play a determining role. Most scientists agree that greenhouse gas (GHG) emissions from human activities are adversely changing the earth's climate. The main sources of these GHGs include the burning of fossil fuels, as well as additional contributions from land use practices, including agriculture, landfills and forestry. This buildup of GHGs is contributing to rising average temperatures, changes in wind and precipitation patterns and increases in the frequency of severe weather events. In addition to lowering our output of GHG emissions, it is imperative that we prepare our communities to be more resilient to face impending climate variation and its impacts—both negative and positive.

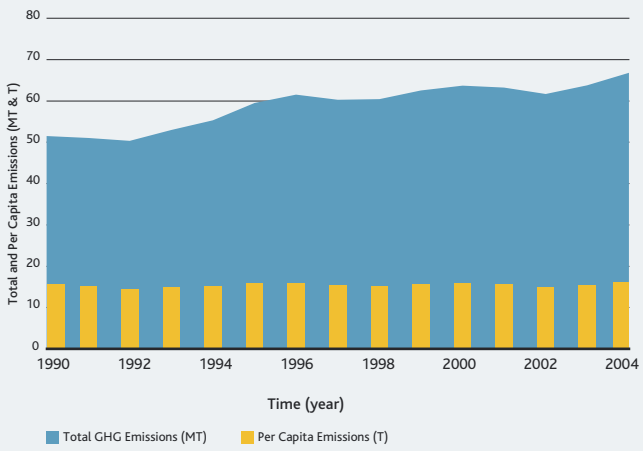
- Per capita GHG emissions in BC were 15.9 tonnes in 2004 (2% increase since 1990), compared with the Canadian average of 23.7 tonnes. Levels below the national average are largely due to BC's clean hydroelectric resources and the fact that the majority of the BC population lives in a relatively mild climate.
- Total emissions in BC increased by 30%, due mainly to changing energy consumption patterns and increases in natural gas production.

Greenhouse Gas Emissions	GETTING WORSE—In 2004 both total and per capita GHG emissions were at their highest levels reported since 1990.
Climate Change Impacts	GETTING WORSE—Average freshwater and air temperatures have already warmed over the past 50-100 years, and Fraser River peak flows are occurring earlier than in the past 85 years.
Climate Change Adaptations	GETTING BETTER—Communities are assessing climate risks, initiating plans to adapt, and preparing for climate-related vulnerabilities such as flooding, drought and interface fires.

Sources of Greenhouse Gas Emissions in BC (2004)[1]



Greenhouse Gas Emissions in BC (1990-2004)[1]



BC's GHG emissions in 2004 and change since 1990.[1,2]

	% Change (1990-2004)	Total emissions (2004)
Total BC GHG emissions	+30%	16.8 megatonnes
Per capita BC emissions	+2%	15.9 tonnes
Per $GDP BC emissions	-11%	na
SECTOR	**% Change (1990-2004)**	**% of total BC emissions (2004)**
Transportation	+42%	40%
Industry (excluding fossil fuel production)	+22%	27%
Production/mining of oil, gas & coal	+83%	9%

// Issues and Trends //

Greenhouse Gas Emissions in BC (1990-2004)[1,2]

GHGs originating from human activity include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). These gases—emitted by a wide range of human activities—enhance the warming capability of the natural greenhouse effect to such a degree that scientists from around the world agree that GHG-emitting human activities are a contributing factor to the climate changes occurring around the globe.

Despite increases in total (30%) and per capita (2%) GHG emissions between 1990 and 2004, the BC economy has become more carbon-efficient, producing 11% fewer emissions per dollar of GDP. Although the economy is becoming more efficient, population growth, rates of economic production, consumer choices (e.g., larger homes and vehicles), and increased use and production of fossil fuels continue to drive GHG emissions upward.

Climate Change and Its Impacts[1,3]

In the Fraser Basin, some observed climatic changes in the past 50-100 years include:

- Average temperatures in the Basin rose by approximately one degree Celsius in the past century, and average precipitation rose as well.
- Summer water temperatures of the Fraser River have warmed over the past 50 years at a rate equivalent to 2.2°C per century, and are increasingly in the upper threshold of what sockeye salmon can tolerate.
- Peak flows on the Fraser River and its tributaries are now occurring earlier in the year than 85 years ago. The Fraser is reaching half of its annual cumulative flow nine days earlier on average compared with a century ago.

The following are some of the predicted impacts in the Fraser Basin that may result from climate change:

- Many of the extreme events to which communities are already vulnerable are predicted to increase in frequency, magnitude and intensity, such as floods, drought, interface fires, pest outbreaks and invasive plants.
- An increased amount of precipitation will be received in the form of rain, rather than snow, which may result in low flows and droughts during the summer in some watersheds.
- Increased distribution of grasslands and transition areas are expected, compared with forests.
- Not all predictions are bad news. There will likely be an enhanced potential for growing agricultural products such as apples, tomatoes, corn, grapes, plums and peaches in the Cariboo-Chilcotin and Upper Fraser regions of the Basin.

// Inspired Action //

What is being done?

- 28 local governments in the Basin belong to the Federation of Canadian Municipalities (FCM) Partners in Climate Protection Program, and the number of communities that have developed corporate or community emissions reduction plans has increased from five to nine since 2004.[4]
- Biodiesel use in BC is estimated to have grown from near zero to approximately 4 million litres in 2005, reducing emissions by the equivalent of taking 2,500 light-duty cars off the road.
- The number of LEED® certified green buildings in the Fraser Basin has grown from five in 2004 to 17 in 2006, with 63 buildings in the registration process.[5,i]
- Adaptation planning—Several communities, including Vanderhoof and Delta, have developed initiatives to better understand their climate risks and begin to plan for changes in sea level rise, precipitation, forest species, forest pests and other factors.
- Communities are better preparing for current climate-related vulnerabilities—like floods, drought, and fires—and these efforts will strengthen resilience to future impacts related to climate change. See Natural Hazards on page 22.

What else can be done?

- Walk, bicycle, carpool, telecommute and take transit where available.
- Reduce energy use through more efficient fleet management. Participate in the E3 Fleet Rating System and be recognized and supported in efforts to green your fleet: www.e3fleet.com.
- Consider alternative fuels, such as biodiesel, that reduce GHG emissions and other air pollutants: www.bcbiofleet.ca.
- Join Idle Free BC and reduce unnecessary idling in your community or vehicle fleet. You could save up to 10% of fuel costs: www.idlefreebc.ca.
- Visit www.bcclimateexchange.ca for other ideas on energy efficiency and GHG emission reductions.
- Communities can undertake vulnerability assessments and develop adaptation strategies.
- Reduce transportation emissions by buying locally grown or manufactured products, as well as products that use less packaging.

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FOOTNOTE

i. LEED®, stands for "Leadership in Energy and Environmental Design." It is a green building rating system that recognizes leading-edge buildings that incorporate design, construction and operational practices that combine healthy, high-quality and high-performance advantages with reduced environmental impacts

// E3 Fleet Rating System sets the bar for green fleets //

E3 Fleet Rating System is a new program of the Fraser Basin Council to help on-road fleets increase their fuel efficiency, reduce emissions, manage expenses, adopt new technologies and use alternative fuels. Excellence in fleet management is publicly recognized through Bronze, Silver, Gold and Platinum ratings. For more information, see www.e3fleet.com . While on the E3 site, search Canada's first Green Fuels map for nearby stations offering biodiesel, ethanol, hydrogen, natural gas and propane.

PHOTO: John McQueen is fleet manager for Langley Township, one of the municipalities coming on board the E3 program.

// Sustainability Highlights //

Energy is crucial to the ongoing functioning of our communities and the economy. We use energy to provide power and heat to homes and businesses, for manufacturing processes and transportation, and to cook and heat water. BC has a significant supply of renewable energy through hydroelectricity, and other renewable energy sources are being pursued, such as solar, wind and tidal energy. However, the Fraser Basin and British Columbia still rely on a significant proportion of non-renewable energy, such as oil, natural gas and other fossil fuels. Most electricity in BC comes from hydroelectricity generation facilities in the Columbia and Peace River systems, along with numerous smaller generators. However, the associated reservoirs result in the flooding of river valleys and loss of natural resources and ecosystems.

- Although total energy consumption in BC rose 20% between 1990 and 2004, during this period the population grew by 28% and GDP grew by 71%, suggesting significant gains in energy efficiency.
- The transportation sector had the greatest increase in energy consumption (39%) since 1990.
- Average residential consumption of hydroelectricity in the Fraser Basin was 9,320 KWh per year in 2005.

Total Energy Consumption in BC	GETTING WORSE	—Total energy consumption in BC has increased by 20% (1990-2004).
Energy Intensity in BC	GETTING BETTER	—Energy consumption per capita and per $ of GDP have decreased since 1990 (by 6% and 18% respectively).
Hydroelectric Consumption in the Fraser Basin	GETTING WORSE	—Total industrial consumption increased in 4 of 5 Fraser Basin regions, and average residential consumption increased in 3 of 5 regions (1990-2004).

// Issues and Trends //

Energy Consumption in BC (1990-2004)[1]

Total energy consumption of all energy sources in BC rose by 20% between 1990 and 2004. However, energy intensity is improving. The amount of energy consumed per person has decreased by 6% on average, and the amount of energy required to produce one dollar of GDP has decreased by 18%. The greatest growth in energy consumption was seen in the transportation and agriculture sectors (39 % and 33% respectively).

Energy Use by Source in BC (1990-2004)[1]

The major energy sources in BC are natural gas, electricity and refined petroleum products such as gasoline and diesel. Growth between 1990 and 2004 was slowest for electricity consumption (16%), followed by natural gas (18%) and refined petroleum products (30%). Although coal consumption represents a small proportion of total energy consumption, it had the highest increase at 333%.

Hydroelectricity Consumption in the Fraser Basin[2]

BC Hydro provided electricity use data for the five regions of the Fraser Basin, broken out by residential, industrial and commercial use.

Residential (1992-2005)[2]

Over the past 13 years, the average annual consumption of electricity per residential account in the Fraser Basin has been relatively constant, ranging from 9,223 KWh (1992), to 9,320 KWh (2005). However, there are significant regional variations, which are illustrated in the table.

Residential Hydro Consumption in 2005[2]

Fraser Basin Region	Average Consumption per Residential Account (KWh)	Compared with Fraser Basin Average
GVSS	8,654	-7%
Fraser Valley	12,245	+31%
Thompson	11,228	+20%
Cariboo-Chilcotin	10,233	+10%
Upper Fraser	10,649	+14%
Fraser Basin	9,320	

Industrial (1998-2005)[2]

Industrial electricity use in the Fraser Basin is increasing. Trends since 1997 are as follows:

- Total industrial electricity use in the Fraser Basin increased by 4% from 9.4 to 9.8 million KWh.
- The GVSS region is home to the largest industrial consumption, and experienced an increase in consumption of 7%.
- The Fraser Valley region had the lowest industrial consumption, but experienced the largest increase (47%).
- The Thompson region experienced a steady increase of 2%
- The Cariboo-Chilcotin experienced a 6% increase, which included a decline in the early 2000s, followed by an increase to the mid-2000s.
- The Upper Fraser was the only region in the Basin that experienced a decrease (-8%).

Commercial (1992-2005)[2]

Commercial use of electricity increased by 9.5% in the Fraser Basin over the past five years, from 2001 to 2005. The greatest increase (18%) was in the Fraser Valley region. The Thompson region had the next largest increase (12%), followed by the Upper Fraser (10.6%) and Greater Vancouver (8.5%). The Cariboo-Chilcotin region had a smaller increase in commercial electricity use at 6%.

// Inspired Action //

What is being done?

- The BC Hydro Power Smart program has resulted in Annual Cumulative Savings of 1,957 GWh in 2005/06. This is equivalent to the output of a 250-megawatt powerplant.[3]
- Renewable energy is estimated to have provided about 14% of the energy produced in BC in 2004. Over 99% of renewable energy produced in BC is from hydroelectricity (76.5%) and biomass (22.7%).[1]
- An estimated 8.2 megatonnes of GHGs have been avoided because of BC's renewable energy sources.
- 29 local governments across BC are participating in the Community Action on Energy Efficiency program, and are developing policies and plans that increase the efficiency of buildings in their communities: www.bcclimateexchange.ca.
- BC Hydro has developed 23 Water Use Plans for its hydroelectric facilities, which are intended to provide a balance of the economic, environmental and social values related to water resources involving a broad range of local governments, government agencies, First Nations, and other interested parties.

What else can we do?

- Walk, bicycle, carpool, telecommute and take transit where available.
- Take advantage of incentives from utilities, such as the BC Hydro Power Smart program, to increase the energy efficiency of your home or business.
- Use efficient lighting such as compact fluorescent light bulbs and LEDS.
- Consider a green building rating system such as LEED® for new buildings or Built Green™ for new homes.
- Purchase Green Power Certificates to encourage the development of green power generation.

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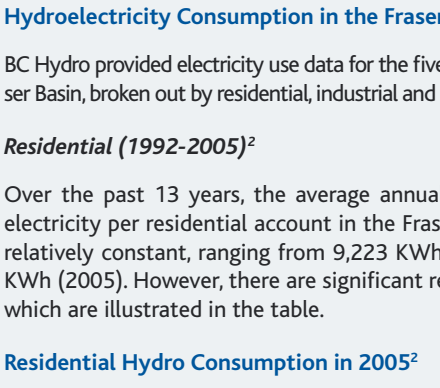
1. Nyboer, John, Jian Jun Tu, Chris Joseph. A Review of Energy Consumption and Supply in British Columbia, 1990 to 2004. Canadian Industrial Energy End-Use Data and Analysis Centre. Simon Fraser University. 2006.
2. BC Hydro. Custom Tabulation of Fraser Basin hydroelectricity consumption data (1992-2005).
3. BC Hydro. Annual Report 2006.

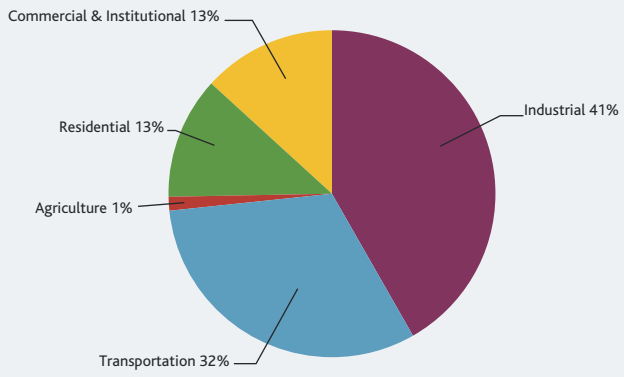


// Built Green for the Future //

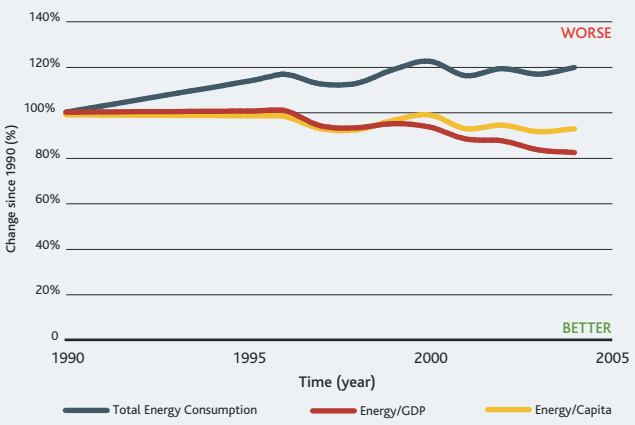
Built Green™ is an industry-driven program that encourages homebuilders to use technologies, products and practices that improve energy efficiency, reduce pollution, improve indoor air quality, reduce maintenance, and preserve natural resources. Morningstar Homes recently introduced BC's first Built Green neighourhood, Yorkson Village, in Langley. For more on Built Green, visit: www.builtgreencanada.ca.

PHOTO: A Yorkson Village Built Green home in Langley.

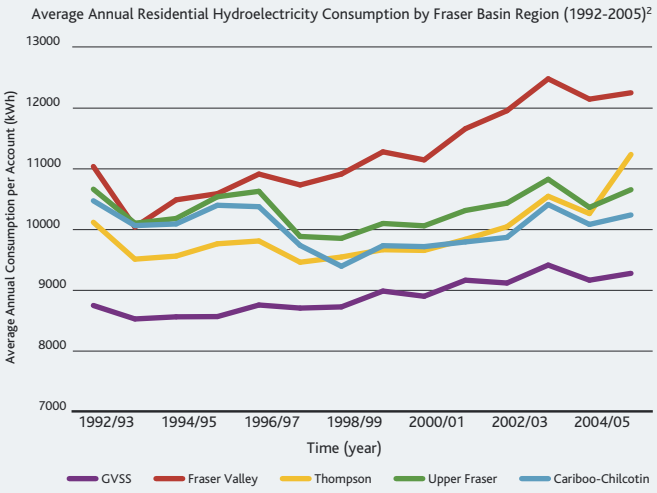
Energy Consumption in BC by Sector (2004)[1]



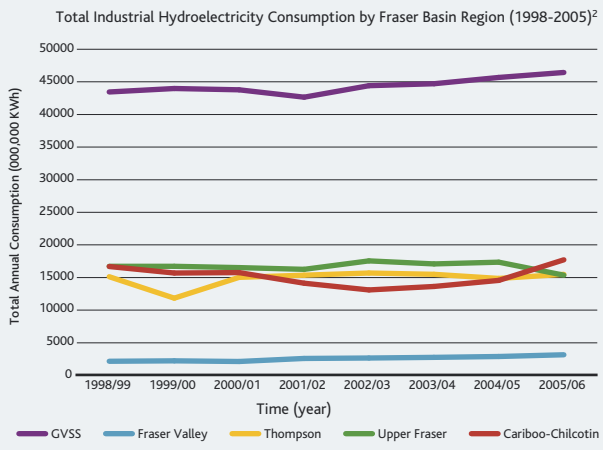
Energy Consumption and Intensity Trends in BC (1990-2004)[1]



Average Annual Residential Hydroelectricity Consumption by Fraser Basin Region (1992-2005)[2]



Total Industrial Hydroelectricity Consumption by Fraser Basin Region (1998-2005)[2]



REGIONAL SUMMARY

Here is a summary of several key indicators for each of the five Fraser Basin regions. These highlight how well each region is doing on the path to sustainability, including differences among regions.

A profile of individual regions provides useful insights, especially since overall trends in the Basin are influenced by the large population or economic profile of the GVSS region. This regional summary is not intended to be an exhaustive list of all indicators for the regions and, in some cases, data were not available to support a regional analysis. This summary focuses instead on some of the more interesting trends in the regions on a cross-section of topics in *Sustainability Snapshot 3*.

As the first step in providing more in-depth regional profiles, the Fraser Basin Council released a regional indicators report in the Thompson region—*How is our region doing?*—in June, 2005. The Council will publish an updated edition of that report and develop other regional reports in the near future.

Note on data: BC Statistics provided regional population figures, which represent estimated forecasts to 2003 for each region, based on the 2001 Population Census. For more details on specific indicators, such as information sources and definitions, see each topic in this report.

// Greater Vancouver-Sea to Sky //

The Greater Vancouver-Sea to Sky (GVSS) region encompasses the smallest area but includes the largest population of the Fraser Basin's five regions. About 2.2 million people live in the region—77.7% of the Basin's total population. In addition to the Greater Vancouver region, the northern part of the GVSS region includes the Sea to Sky corridor and the communities of Britannia Beach, Squamish, Whistler and Pemberton. This region is the most urbanized in the Fraser Basin, and although the regional economy is relatively diversified, the health of natural resource sectors in other parts of the Basin continues to have a strong influence. The 2010 Olympic and Paralympic Winter Games will be held in this region.

Energy	• Lowest average residential electricity consumption in 2005. • Highest total industrial electricity consumption in the Basin.
Health	• Longest life expectancy of all Basin regions (81.6 years). • Lowest rate of death from cancer or heart disease. • 2nd highest proportion of low-weight births and (along with the Thompson region) the 2nd greatest increase since 2000 (11%).
Housing	• Greater Vancouver had the worst rating under the housing Affordability Index in BC (2006) and had an estimated 6.4% of the population "at risk" of becoming homeless (2005). • The number of homeless in Greater Vancouver almost doubled (to 2,174) between 2002 and 2005.
Population and Consumption	• Largest population and highest rate of total municipal water use in the Basin. • 2nd greatest reduction (-23%) in solid waste disposal and the 2nd lowest per capita rate of waste disposal (2002).
Sustainability in Action	• The GVRD's Sustainable Region Initiative fosters collaboration across governments, the private sector and civil society on sustainability issues and opportunities, including advancement of a sustainability-inspired economic strategy for Greater Vancouver. • The Squamish-Lillooet Regional District is working on a Regional Growth Strategy that is guided by sustainability principles.

// Fraser Valley //

The Fraser Valley region is almost 13,000 km^2. The broad, fertile floodplain in the valley contains some of the most productive farmland in Canada. About 256,000 people, or 9.2% of the Basin's population, live in the region, and that number has risen significantly over the past two decades. The economy is based largely on agriculture and forestry, but tourism, fishing, transportation, manufacturing and service industries are also major employers. The region is a key corridor for air, rail, road and river transportation, as well as communications, natural gas and electricity utilities, connecting the interior parts of the Fraser Basin, BC and Canada to the Pacific Coast.

Agriculture and Food	• Highest number of Environmental Farm Plans completed (53% of all Basin plans). • Net decrease of almost 5,000 hectares in the ALR, with losses occurring in all land classes and 30% of the losses in prime agricultural land.
Air Quality	• $PM_{2.5}$ concentrations in Chilliwack remain relatively low and have decreased since 2000. • Ground Level Ozone (GLO) concentrations in Hope exceeded the Canada-Wide Standard of 65ppb in 2003 and 2004. GLO concentrations in Chilliwack continue to increase and were 2nd highest in the Basin in 2003 and 2004.
Natural Hazards	• Greatest vulnerability to flooding in the Basin (along with Greater Vancouver).
Population and Consumption	• 2nd largest population in the Basin. • 167% increase in total municipal water use and 21% increase in per capita water use from 1991 to 2001. • Highest average residential energy consumption in the Basin in 2005. • Most significant increase in solid waste disposal (32.6%) in the Basin.
Sustainability in Action	• The Chilliwack River Watersheds Strategy promotes a common understanding of watershed values, based on sound science and local knowledge, to assist in decision-making for the sustainability of the Chilliwack River Watershed and its residents: www.chilliwackwatershedstrategy.ca. • Circle Farm Tours encourage members of the public to visit farms in the Fraser Valley to learn about farming practices and food production, and to sample and purchase local farm produce: www.circlefarm.com.

// Cariboo-Chilcotin //

The Cariboo-Chilcotin region is the second largest region in the Fraser Basin, occupying almost 70,000 km^2. About 67,000 people—or 2.4% of the Basin's population—live in the region. Located in the BC Central Interior, the Cariboo area is the Interior plateau east of the Fraser River, while the Chilcotin is west of the Fraser. Williams Lake, Quesnel and 100 Mile House are the three largest communities. Barkerville and Wells are known worldwide as gold rush heritage sites and offer an attractive tourist destination along the historic Gold Rush trail. The economy is based mainly on the forest industry. Agriculture, mining and tourism also play an important role in the region.

Aboriginal Relations	• Significant progress in community-to-community relations. • Highest level of Aboriginal language retention in the Basin and higher than the provincial average in all 3 measures.
Air Quality	• Ground Level Ozone concentrations have been decreasing in Williams Lake since 1999. • $PM_{2.5}$ concentrations continue to increase in Quesnel and Williams Lake.
Economic Diversification/ Vulnerability	• Includes some of the least diversified communities that are highly vulnerable to the forest sector.
Health	• Low-weight birth rate was 6.1%, which is higher than the provincial average (5.6%). • Diabetes rates have more than doubled since 1995.
Sustainability in Action	• FBC worked cooperatively with the Cariboo Regional District, City of Williams Lake, University of British Columbia Alex Fraser Research Forest, and numerous participants from industry, the provincial government and others to create and implement an interface fire plan for the Williams Lake area (2005). • An interface fire plan for the Quesnel area is also near completion.

// Thompson //

The Thompson region includes about 56,000 km^2—from deep forest with white water rivers to semi-arid, desert-like terrain and rolling grasslands. The region has a population of approximately 176,000 people, or 6.4% of the total population of the Fraser Basin. Kamloops—the largest city in the region—has a diverse local economy based on forest industries, highway and rail services, mining, agriculture, regional trade, financial services, education and training, manufacturing, and recreation. Tourism, transportation, technology and financial and professional services play an increasing role.

Economic Diversification/ Vulnerability	• Economic diversification and vulnerability of communities to the forest sector varies within the region. • The North Thompson area is among the least diversified, while the Ashcroft/Cache Creek area is the most diversified in the region (2001).
Health	• 3rd longest life expectancy of 5 regions in the Basin at 78.8 years. • Smallest difference in life expectancy between Aboriginal and non-Aboriginal people, • 2nd highest increase in the rate of low-weight births (11%) since 2000 (along with the GVSS region).
Population and Consumption	• 3rd largest population in the Basin. • Most significant reduction in total municipal water use in the Basin (1991-2001).
Water Quality	• The Salmon River at Salmon Arm received the poorest Water Quality Index rating (39.8 out of 100) of 8 Basin sites. • Water quality trend analysis finds the Salmon River water quality to be deteriorating due to increased turbidity and chloride.
Sustainability in Action	• The City of Kamloops has built a state-of-the-art drinking water treatment plant, which is a LEED-certified "green building." • The Fraser Basin Council, in partnership with the Government of Canada, Province of BC, Pacific Salmon Commission, and the BC Agriculture Council, has installed 11 climate stations and 7 soil moisture stations to assist the agricultural community with their land and water management decisions.

// Upper Fraser //

The Upper Fraser region is the largest of the Fraser Basin Council's five regions, encompassing 78,164 km^2. About 117,000 people—or 4.2% of the Basin's population—live in the region. Prince George is the regional centre and largest city, with over 75,000 residents. Other communities range in size from 500 to 5,000 residents. These include Burns Lake, Fort St. James, McBride, Valemount and Vanderhoof. The forest industry is the main economic driver in the region and is important to all of its communities. Agriculture, transportation and tourism also play an important role.

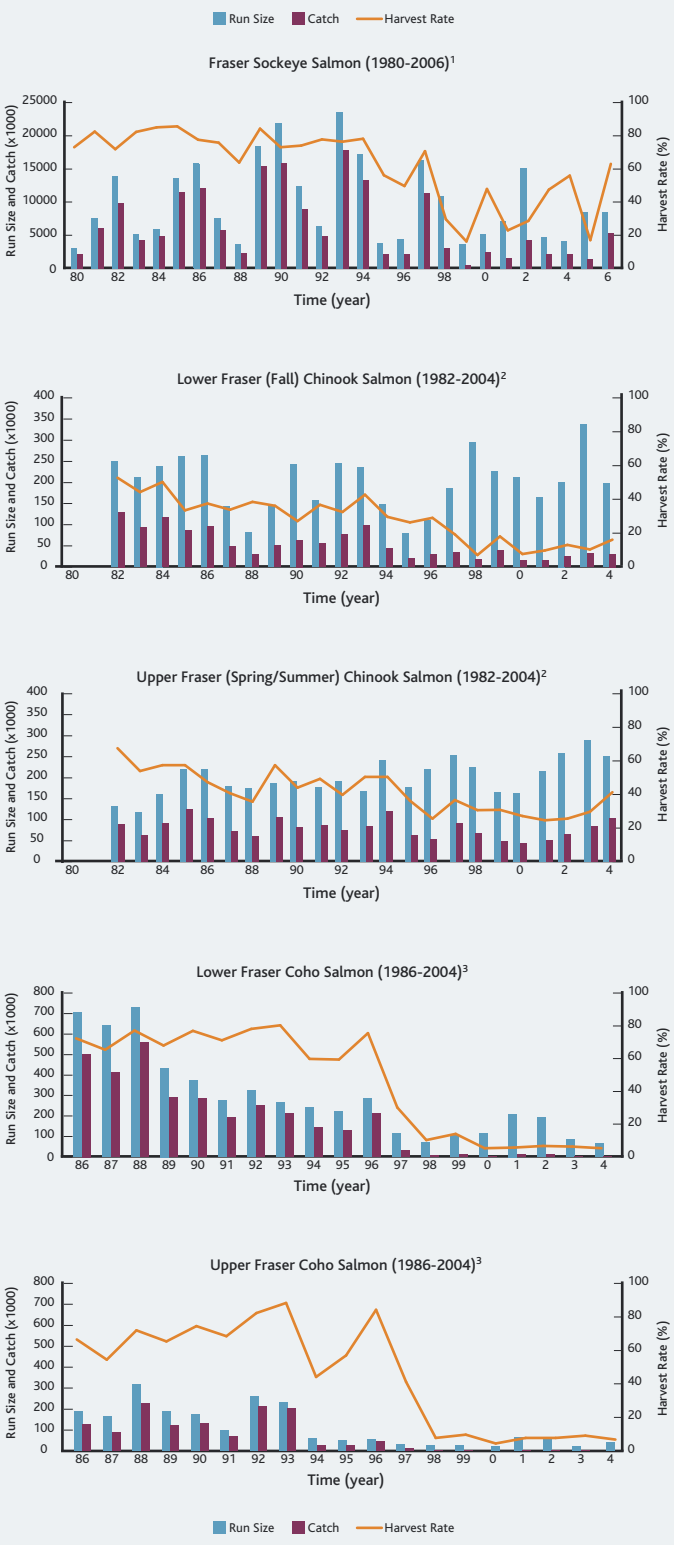
Aboriginal Relations	• Significant progress in treaty negotiations and community-to-community relations. • 2nd highest level of Aboriginal language retention in the Basin and higher than the provincial average in 2 of 3 measures.
Air Quality	• Ground Level Ozone concentrations have been decreasing in Prince George since 2000. • Prince George exceeded the Canada-Wide Standard for $PM_{2.5}$ every year since 2002.
Economic Diversification/ Vulnerability	• Includes some of the least diversified communities, including 5 of the 13 communities in BC most vulnerable to the forest sector.
Health	• Highest incidence of deaths from cancer in the Basin. • Greatest increase (18%) in proportion of low-weight births in the Basin since 2000. • Diabetes ASMR increased 63% since 1995.
Water Quality	• Highest (best) Water Quality Index scores in the Basin (ranging from 83 to 93 out of 100).
Sustainability in Action	• The Lheidli T'enneh First Nation, BC and Canada recently initialled a Final Agreement, the first under the BC Treaty Process. • The Prince George Air Quality Implementation Committee is in Phase 2 of the Air Quality Management Plan, started in 1998. Four studies related to fine particulates are underway.

FISH & FISHERIES

// Sustainability Highlights //

Fish are a key component of the Fraser River ecosystem. They also play an important role in the economic well-being and social fabric of First Nations and other BC communities. The health of fish stocks in the Basin is influenced by the quality of the water (including temperature), the volume and timing of flows, and other elements of habitat. The status of fish stocks is influenced not only by harvest rates and fishing practices, but also the protection of habitat and management of forestry, agriculture, urban development and other human activities. Fish stock abundance has a direct impact on the quality of life of those individuals and communities that rely on fishing for their livelihood.

Sockeye Salmon	**GETTING WORSE**—Between 1980 and 2006, run size, catch and harvest rates have generally declined after 25-year highs in the early 1990s.
Coho Salmon	**GETTING WORSE**—Between 1986 and 2004, run size, catch and harvest rates have declined significantly for both Interior (mostly Thompson) and Lower Fraser Coho.
Chinook Salmon	**MIXED RESULTS/POOR**—Between 1982 and 2004, catch and harvest rates have been higher and more consistent for Interior Fraser stocks than for the Lower Fraser "fall-run" stocks, especially in recent years. Harvest opportunities for fall-run stocks have been reduced because of conservation measures for other salmon stocks and steelhead.
Steelhead	**POOR**—Virtually all summer and winter run stocks are classified as of "Extreme Conservation Concern."[ii]
Fraser River White Sturgeon	**MIXED RESULTS/POOR**—All four Fraser Basin sturgeon stocks were designated as "endangered" by COSEWIC in 2003. Abundance estimates for the Lower Fraser sturgeon population show an increasing trend from 1999-2003 and a declining trend from 2003-2005.
Freshwater Fish Habitat	**MIXED RESULTS/POOR**—Freshwater habitat has been adversely impacted by a wide range of human activities, including: agriculture and flood management in the Lower Fraser region, forestry and agriculture in the Thompson region, forestry in the Cariboo-Chilcotin and Upper Fraser regions, and hydroelectric dams in the Upper Fraser and Greater Vancouver-Sea to Sky regions.



// Issues and Trends //

Salmonid Stocks

The Fraser River is home to one of the most productive salmon fisheries in the world. Salmon are a keystone species in that their migration and numbers influence and reflect the abundance and activity of numerous other species in the ecosystem. They carry special cultural significance for First Nations in the Fraser Basin where a variety of salmon stocks live and spawn. Each of these stocks plays a distinct role in the ecosystem and is subject to different environmental and human pressures. As a result, trends for the different salmon species and stocks vary considerably.

Sockeye (1980-2006)[1]

Total annual returns of Fraser River sockeye show a clear four-year cyclic pattern.[i] Since 1981, abundances have been largest on the 2005 and 2006 cycle lines. Abundant cycle lines peaked in the early 1990s at 23.5 million, but have declined in recent years to 8.5 million. The allowable harvest has decreased even more dramatically because of concerns related to high river temperatures, elevated pre-spawn mortality and management measures to protect other depleted stocks (i.e., Cultus and Sakinaw sockeye, Interior coho and steelhead). Preliminary estimates for 2006 indicate that the total sockeye return (8.4 million) was roughly half the expected level. Fortunately, water temperatures were not excessive in 2006, so in-river survival should be higher than that estimated for 2004 and 2005. Recent tagging and tracking studies have documented that in-river survival to spawning grounds is poor (<15%) for late-run sockeye that enter the Fraser River in early August, but good (>90%) for sockeye that enter in mid-late September.

Chinook (1982-2004)[2]

Trends in the abundance of Chinook salmon, catch sizes and harvest rates are very different for Interior Fraser stocks (spring-summer timing) and Lower Fraser (fall timing) stocks. Harvest rates and catches have been higher and more consistent for Interior Fraser stocks than for Lower Fraser stocks in recent years. The lower harvest rates for fall-run Chinook result largely from management measures to protect Cultus sockeye, Upper Fraser coho and steelhead.

Coho (1986-2004)[3]

High harvest rates and poor marine survival in the early 1990s are the prime reasons for the substantial declines in abundance and catches for both Interior and Lower Fraser coho stocks. Continued poor marine survival has kept most coho populations at low levels despite minimal harvests in South Coast fisheries.

Chum (1985-2003)[3]

Annual estimates of run size and catch for Fraser River chum have been highly variable since 1996. The abundance of Chum stocks has been increasing since its recent low in 2000, and returns were above the long-term average in 2002 and 2003.

Pink (1981-2003)[3]

In many years between 1981 and 2003, the numbers of pink salmon returning to the Fraser River have been greater than the combined abundance of all other salmon species. In recent years, poor market prices have resulted in limited harvesting efforts and record escapements.

Steelhead (2005)[4]

Most of the Fraser River steelhead populations are classified as of "Extreme Conservation Concern," including 12 of 14 summer-run stocks and 12 or 13 winter-run stocks).[ii] In 2005, the Nicola stock was the only steelhead population to show a significant increase in abundance.

Fraser River White Sturgeon (1995-2005)[5]

White sturgeon are the largest freshwater fish in North America, attaining lengths in excess of 6 m, weights of over 600 kg, and lifespans of over 150 years. Although they can tolerate both fresh and salt-water environments, white sturgeon spawn only in fresh water; thus, they are entirely dependant on the continued health of the freshwater ecosystem and the integrity of critical in-river habitats.

There are six distinct "stock groups" of white sturgeon in Canada: Kootenay River, Columbia River, Nechako River, Upper Fraser River, Middle Fraser River, and Lower Fraser River. In 2003, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) designated all six of these stocks as "endangered." In 2006 the federal government announced that four of the stock groups were to be "listed" and receive federal protection under the *Species At Risk Act* (SARA). The decision not to list the Middle and Lower Fraser River stocks of white sturgeon under SARA was based on potential socio-economic impacts of the listing on Aboriginal, commercial, and recreational fisheries.

Current stock status information for white sturgeon suggests that the Upper and Middle Fraser stocks of white sturgeon are low (approximately 800 and 3,700, respectively) and stable, but vulnerable to changes in habitat and environmental conditions. The Nechako River stock is critically endangered (less than 600 remaining, with little or no recruitment since the 1960s). The current population of Lower Fraser white sturgeon (approximately 49,000) is a fraction of historic abundance. Abundance estimates for Lower Fraser sturgeon population show an increasing trend from 1999-2003 and a declining trend from 2003-2005. The growth rate of Lower Fraser sturgeon individuals has also declined in recent years. Growth is likely related to availability of key food sources. Eulachon abundance in the Lower Fraser has been at critically low levels since 2002.

Freshwater Fish Habitat[6]

A wide variety of land use activities have, over many years, resulted in damage and loss of stream habitats for salmonids throughout the Fraser Basin. This is particularly evident in the Lower Fraser region where agriculture and flood management practices have resulted in fragmentation and total loss of rearing habitats. Salmon habitats in the Interior Fraser (particularly the Thompson drainage) have also been heavily impacted by forestry and agriculture, as well as linear and hydroelectric development. Excessive water withdrawals in some watersheds are an impediment to recovery of salmon. In addition, some smaller, genetically unique sockeye stocks have been seriously impacted by habitat alterations since the early 1900s, including extinction (e.g., Coquitlam, Alouette sockeye). Salmon-rearing wetlands on the Fraser have also suffered substantial human-caused losses. These impacts have been cumulative and continue to outstrip habitat recovery measures.

// Adams River Salute to the Sockeye //

In October the rich red colours of fall accent both the landscape—and the waters—of the Adams River. Sockeye salmon, dressed in crimson and green, come here to spawn and die after a gruelling 500-km river journey from the Pacific Ocean. It's a natural drama, witnessed by visitors from all over BC, other parts of North America and as far away as Japan, Tawain and Europe. The Adams River Salmon Society hosts a "Salute to the Sockeye" at Roderick Haig-Brown Park (outside Chase in the Thompson region) during the migration. The event is becoming ever more popular with families and school children who arrive in busloads to learn about salmon. With the number of visitors climbing, one of the Society's current projects is to transform a log house on the site into a permanent interpretive centre.

// Inspired Action //

What is being done?

- The Wild Salmon Policy (WSP) is intended to achieve three primary goals: 1) safeguard the genetic diversity of wild Pacific salmon; 2) maintain habitat and ecosystem integrity; and 3) manage fisheries for sustainable benefits. Successful implementation of the policy will require considerable work and leadership from all sectors. Consultations are underway regarding the definition of conservation units and management targets for Fraser salmon. The Pacific Fisheries Resource Conservation Council has commissioned several studies relating to the habitat assessment component of WSP. In 2006, workshops were conducted by DFO to develop a WSP Integrated Strategic Planning process for Fraser River sockeye. The challenge is to find the common ground among all interested parties and work together towards the successful implementation of WSP.
- The Fraser Salmon and Watersheds Program presents new opportunities to implement priority activities to advance sustainable fish stocks and fisheries in the Fraser River Basin. This program is a collaboration of the Pacific Salmon Foundation, the Fraser Basin Council, First Nations and local project partners, with funding from the provincial government, federal government, the Pacific Salmon Endowment Fund Society and others.
- The Fraser River Sturgeon Conservation Society is a not-for-profit charity dedicated to the conservation and protection of wild Fraser River white sturgeon and their habitat. This goal is addressed through stewardship activities, public education, research, communication of results and by addressing key issues facing sturgeon. The Society's volunteer-driven Lower Fraser River White Sturgeon Monitoring and Assessment Program has coordinated activities and in-kind contributions from all fishing sectors to produce one of the most comprehensive data sets on white sturgeon in the world: www.fraser-sturgeon.com/home.html.
- BC Hydro's Bridge-Coastal Restoration Program (BCRP) has funded over 100 projects addressing footprint impacts to fish and wildlife and their habitat. In accordance with BCRP watershed restoration objectives, these projects reduce impacts by maintaining or restoring natural habitat-forming processes. BCRP also supports research to fill information gaps in strategic planning, identify limiting factors and define restoration objectives and conservation measures.

What else can we do?

- Access the Think Salmon initiative to learn what individuals and communities can do to safeguard sensitive ecosystems (see cover story): www.thinksalmon.com.
- Support sustainability in the fishing sector by making informed consumer choices about seafood purchases: see Canada's Seafood Guide at www.seachoice.org.
- Contact a local stewardship group and volunteer with a habitat restoration or species recovery initiative.
- For those in government, establish incentives to promote and reward sustainable fishing practices, including the use of precautionary management principles in the fisheries, less by-catch, and better habitat protection.
- Governments can ensure that land use planning considers environmentally sensitive areas and that waste water systems do not harm fish or their habitat.
- For those who own or manage land, ensure that riparian areas are well stewarded and that water conservation measures are used.

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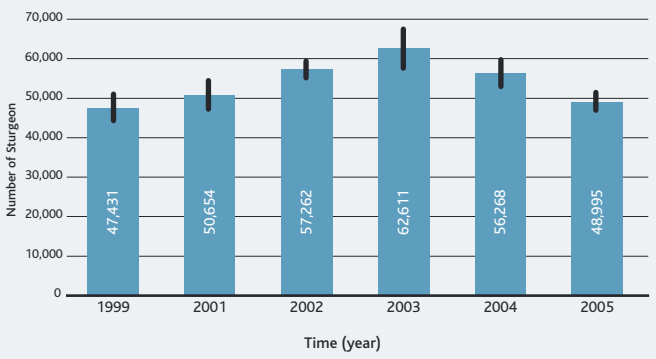
5. Sturgeon Status. Troy Nelson, Fraser River Sturgeon Conservation Society, pers. comm.).
6. Freshwater Habitat—Interior Fraser Coho Recovery Team. 2005. Species at risk proposed recovery strategy: Coho salmon interior Fraser River populations, Fisheries and Oceans Canada.

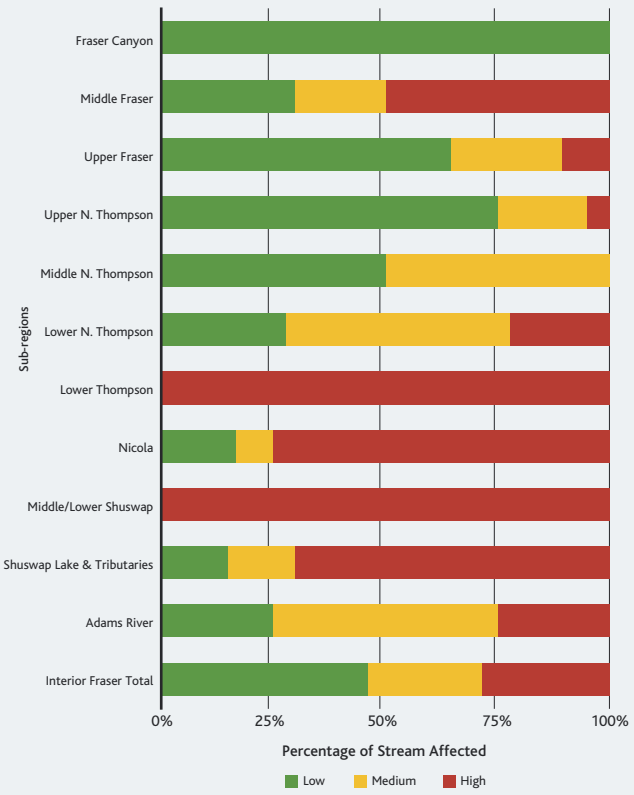
FOOTNOTES

i. Four-year cyclic pattern—a pattern in the annual sockeye returns reflecting that most Fraser sockeye mature and return to spawn at age four.
ii. Extreme Conservation Concern—Steelhead stocks believed to be at 15% or less of habitat capacity and likely subject to extinction.

Lower Fraser River White Sturgeon
Population Estimates (40-260 cm Fork Length)
(October 1999 - January 2005)[5]



Cumulative Effects of Habitat Alterations on Coho Habitat[6]



// MOU a significant step for First Nations and Commercial Fishery //

In 2006 representatives of First Nations and the commercial fishery found common ground through collaborative efforts. For the first time, the Commercial Salmon Advisory Board and First Nations on the Fraser River negotiated an MOU on conservation, management and allocation of Fraser River salmon, with an initial focus on Cultus Lake sockeye. The MOU calls for the establishment of a "Salmon Table" where the parties will work together to improve the management of Fraser River salmon fisheries through respectful dialogue, learning and action. Conservation initiatives related to Cultus sockeye include: increasing the release of smolts from 50,000 to 150,000, removing milfoil and predatory pikeminnow from Cultus Lake, and monitoring groundwater and water quality. Through the sale of sockeye in 2006, the commercial salmon industry raised $700,000 to help fund the initiatives.

FORESTS & FORESTRY

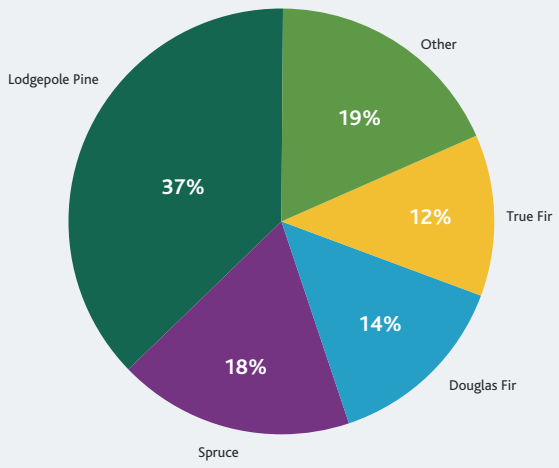
// Sustainability Highlights //

Forest covers more than 17 million hectares (75%) of the Fraser Basin, providing many social, economic and environmental benefits, such as clean water, fish and wildlife habitat, employment and recreational opportunities, as well as aesthetic and cultural value. Forest sustainability issues include the long-term ecological health of forests, ensuring the biological diversity of forest stands, the diversification of forest product development and community involvement in forest management. Forest sustainability is very important as the economy of many regions in the Basin is heavily dependent on the forestry sector and, in some communities, the forestry sector provides more than 44% of the income. Fraser Basin forests include a mix of age classes and leading (dominant) tree species.

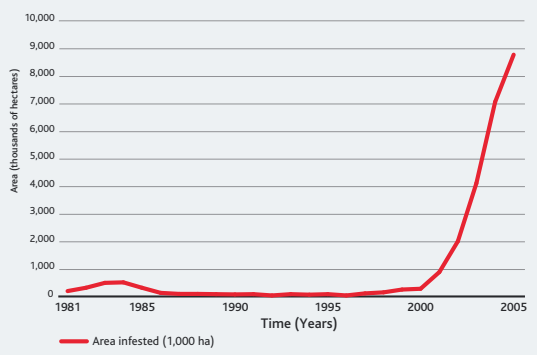
- As of 2000, 51% of Basin forests were between 21 and 140 years old, 37% older than 140 years, and 12% younger than 20 years.[1]
- Leading (dominant) species in the Fraser Basin include Lodgepole Pine, Spruce, Douglas Fir and True Fir.[1]

Extent of Mountain Pine Beetle outbreak in BC		GETTING WORSE—The area affected by MPB is 8.7 million ha, more than double the area in 2003.
Community Vulnerability to the Forest Sector in the Fraser Basin		MIXED RESULTS/POOR—Vulnerability is worst in the Upper Fraser and Cariboo-Chilcotin regions and is further compounded by Mountain Pine Beetle.
Forest Restocking in BC		FAIR/MIXED RESULTS—The area surveyed as restocked was less than the area disturbed in the 1980s, more than the area disturbed in the 1990s, and similar to the area disturbed since 2000.

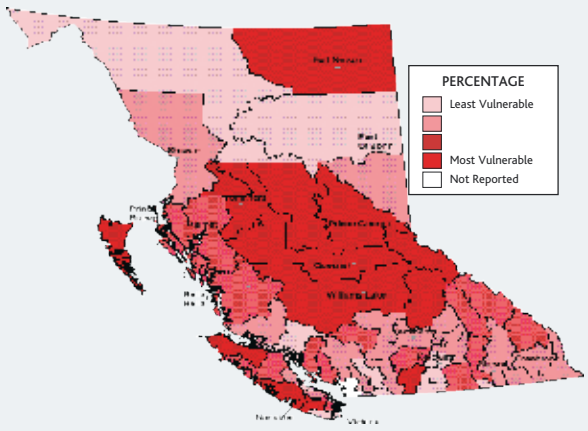
Percent Forest Cover by Leading Species in the Fraser Basin (2002)[1]



Total Hectares of Land Affected by Mountain Pine Beetle Disturbance in BC (1981-2005)[2]



Community Vulnerability to the Forest Sector in BC (2001)[4]



Surveyed Area of Forest Disturbed and Restocked in BC (1980-2004)[2]

// Issues and Trends //

Mountain Pine Beetle in BC (1981-2005)[2,3]

The area of BC forest affected by the Mountain Pine Beetle (MPB) has more than doubled, from 4 million hectares in 2003 to 8.7 million hectares in 2006, with much of this in the Fraser Basin. The MPB reduces trees' nutrient and water uptake, resulting in defoliation and tree mortality. The large areas of dead trees can increase the intensity of forest fires, change water runoff patterns and water temperature, affect soil and stream bank erosion and degrade fish habitat. The commercial value of wood is significantly reduced if affected trees are not harvested within two to five+ years of infestation. In an attempt to reduce the spread of the MPB and salvage commercially valuable wood, the Chief Forester has increased the allowable annual cut (AAC) in a number of Fraser Basin Timber Supply Areas.

In the absence of extreme cold periods that historically have controlled MPB populations, it has been projected that, by 2013, 80% of BC's central and southern interior mature pine forest could be killed by MPB. This will have significant repercussions for forestry-dependent communities, forest ecosystem health and the provincial economy.

Community Vulnerability to the Forest Economy (2001)[4]

The economy of many communities in the Fraser Basin is heavily dependent on the forest sector. This is particularly true in the Upper Fraser and Cariboo-Chilcotin regions, where Vanderhoof and Quesnel have very high Forest Vulnerability Index values (81 and 78 respectively), while the GVSS and Fraser Valley regions have relatively low levels of direct income dependence on forestry, although economic multipliers benefit all regions of the Basin. As the current MPB epidemic spreads, the economic and social impact will be greatest on communities with a high level of dependence on the forestry sector.

Forest Restocking (1980-2005)[2,i]

During the 1980s, the amount of forest disturbed by harvesting, or losses due to pests or fire was greater than the area restocked. During the 1990s, the area restocked exceeded the area disturbed/harvested as there was significant government support for replanting programs. This helped to address the shortfall in the 1980s. Since 1997 the areas surveyed as satisfactorily restocked have declined. This may be related to the increased allowable annual cut in an attempt to control the spread of MPB and salvage commercially valuable wood or perhaps reduced resources to survey restocked areas.

// Inspired Action //

What is being done?

- Sustainable forest management (SFM) certification[5] is a voluntary approach to promote and implement sustainability practices in the forest sector that is intended to assure buyers that the products are from sustainably managed forests. The three certification systems applied in BC are the Canadian Standards Association (CSA Z809); Sustainable Forestry Initiative (SFI); and Forest Stewardship Council (FSC): www.certificationcanada.org. Considerable increases have occurred between 2003 and 2006, with CSA certified areas more than doubling from 2.2 to 5.2 million ha, and increases in SFI certified areas from 4.4 to 7.6 million ha.
- The Mountain Pine Beetle Action Plan for 2006-2011 outlines seven key objectives for adapting to, and coping with, the impacts of the MPB outbreak in BC. The plan recognizes the significant and ongoing impacts of the outbreak on forestry-dependent communities, and identifies medium and long-term economic sustainability for communities as the number one objective: www.gov.bc.ca/pinebeetle.
- The Forests for Tomorrow program was set up by the provincial government in 2005 in response to the wildfires of 2003 and the MPB epidemic. The program aims to improve future timber supply and address risks to other forest values through the re-establishment of young forests on land that would otherwise remain under-productive: www.for.gov.bc.ca/hfp/fft.

What else can be done?

- Consumers can support local and regional forest economies by buying local, as well as SFM-certified wood products.
- Forest companies can involve community advisory committees to incorporate local interests and issues into their forest planning and management.
- Governments, research institutions, forest companies and community groups can continue to commit to long-term planning and research for the proactive management of MPB and its impacts on the environment and communities.
- Forest companies and certification bodies can implement rigorous monitoring, evaluation and reporting procedures for planning and management practices.

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3 BC Ministry of Forests and Range, Forest Practices Branch. 2005 Summary of Forest Health Conditions in British Columbia.
4 BC Stats, British Columbia Heartland at the Dawn of the 21st Century (2003).
5 Canadian Sustainable Forestry Certification Coalition. Certification Status Report British Columbia. June 2006. (and communication with various forestry companies to verify regional data).

FOOTNOTES

i. Not Satisfactorily Restocked (NSR) refers to forest lands that are not growing to their full potential due to an insufficient stocking of acceptable commercial tree species following disturbance (MOF Forest Practices Branch website).

// Mountain Pine Beetle //

Few stories rival BC's near-epic battle with mountain pine beetle. Under BC's 2006-2011 Mountain Pine Beetle Action Plan, efforts are now underway to harvest and use the wood of trees affected by MPB, and economic strategies are in development to stabilize communities in the longer term. The BC First Nations Leadership Council and the Cariboo-Chilcotin Beetle Action Coalition (CCBAC) are two coalitions tackling economic, social, and conservation issues. FORREX (www.forrex.org) has worked with the forest industry on management practices and operations, hydrological issues, ecosystem restoration and harvesting strategies.

PHOTO: MPB-affected forest (red-brown area) near 100 Mile House, Cariboo-Chilcotin.

HEALTH

// Sustainability Highlights //

Good health is fundamental to a good quality of life. Given the diverse factors that influence health and well-being, trends in health can be assessed in a variety of ways. One method is to evaluate population health outcomes, such as life expectancy and self-rated health. Another is to examine the presence of health determinants in the environment, such as air and water quality, or human behaviours, such as smoking or physical inactivity. The state of health can also be assessed by examining demands on the health care system and its performance.

- Life expectancy of Fraser Basin residents is high on average (81 years), but lower in rural regions and for Aboriginal people (by 6.4 years). Based on data from 2001-2005, the lowest life expectancy rate is in the Upper Fraser region, at just over 78 years and highest in the Greater Vancouver-Sea to Sky (GVSS) region (81.6).
- The leading causes of death throughout the Basin are cancer, cardiovascular (heart) disease and cerebrovascular disease (strokes).
- Mortality rates for diabetes more than doubled in the Cariboo-Chilcotin region between 1995-2005 and are 65% higher in the Upper Fraser than in the Thompson region.

Life Expectancy		GETTING BETTER—Life expectancy continues to rise in all regions of the Basin, but four out of five regions are below the BC average.
Rate of Low-Weight Births		GETTING WORSE—Except in the Fraser Valley the rate of low-weight births has increased between 9% and 11%.
Rate of Type 2 Diabetes		GETTING WORSE—The rate has increased in all regions of the Basin.

// Issues and Trends //

Life Expectancy (1987-2005)[1]

Life expectancy is one of the most frequently used indicators of a population's health status. In the Fraser Basin, life expectancies for men and women continue to rise. Between 1987-1991 and 2001-2005, the life expectancy of men increased by 5% (from 75 to 79 years) and by 3% for women (from 81 to 83 years). In all but one region, GVSS, life expectancy is below the provincial average of 80.8 years.

The Next Generation—Rate of Low-Weight Births (2000-2005)[2]

Low-weight births, another standard measure of a population's health, are on the rise in the Fraser Basin. A baby's weight at birth is indicative of the newborn's chances for survival, growth, long-term health and psychosocial development. Over the past decade, the proportion of newborns of low birth weight (less than 2,500 grams) rose by 8% in the Basin, the most significant rates being in the Cariboo-Chilcotin and GVSS regions where the rates were above the BC average of 5.6%. Since 2000, the proportion has dropped slightly in the Fraser Valley region, but has risen between 9% and 11% in all other regions.

Leading Causes of Death (1995-2005)[3]

Cancer remains the leading cause of death in the Basin, followed by cardiovascular (heart) disease and cerebrovascular disease (strokes). Looking at age standardized mortality rates (ASMRs) from 1995-2005, there have been steady decreases in mortality rates caused by both cardiovascular and cerebrovascular disease. Cancer mortality rates are 27% higher in the Upper Fraser than in the GVSS, and the rate for heart disease is 31% higher in the Fraser Valley than in the Upper Fraser.

Rising Rates of Diabetes (1995-2005)[4]

One emergent trend having a significant impact on individual health and the costs of health care is the increasing rate of diabetes. Diabetes is among the most prevalent of all chronic diseases worldwide and represents the seventh leading cause of death in the Basin. Between 1995 and 2005, the mortality rate more than doubled in the Cariboo-Chilcotin region, grew almost 63% in the Upper Fraser region, but only 7.5% in the GVSS region. Research suggests that 25-30% of the burden of diabetes in Canada can be attributed to risk factors such as smoking, physical inactivity, unhealthy eating habits, and social, economic, and cultural conditions.

Health Determinants Related to Lifestyle in BC (2003-2004)[5,6]

In 2004 in BC, 40% of adults were considered overweight and 19% were obese, while 20% of youth between the ages of two and 17 were overweight, and 7% were reported as being obese. Rates of physical inactivity are also a growing related health concern. In 2003, 41% of respondents to the Community Health Survey over the age of 30 indicated that they were inactive in their leisure time.

Health Care System Expenditures in BC (1984-2004)[7]

Since 1994, total expenditures in the health care system have increased by 71% in BC. In 2004, costs were more than double what they were 20 years earlier. On the other hand, expenditures have typically remained in the range of 6-8% of GDP over the same period.

// Inspired Action //

What is being done?

- Action Schools! BC contributes to the health of children by integrating physical activity and healthy eating education: www.actionschoolsbc.ca.
- The Women North Project is focused on building a network of women and women's organizations in northern BC to aid health-related research, action, and policy initiatives: www3.telus.net/public/wnn/index.html.
- ADAPT, of the Vancouver Native Health Society, addresses the high rates of diabetes and its complications among Métis and off-reserve Aboriginal people living in Vancouver's Downtown Eastside: www.vnhs.net/programs/diabetes.htm.

What else can we do?

- Your community can join 99 others in BC already registered in the Active Communities Initiative, aimed at improving physical activity levels of British Columbians by 20% by the year 2010: www.bchealthycommunities.ca.
- Individuals can commit to healthy eating and exercise, and schools and institutions can replace unhealthy junk food sold by their cafeterias and vending machines with more nutritious, healthier options.

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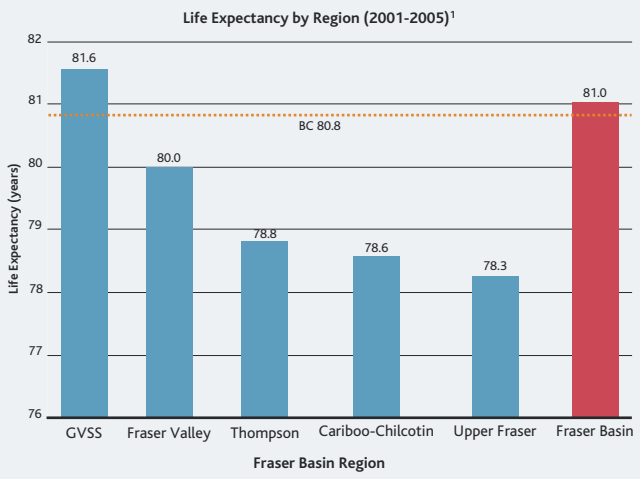
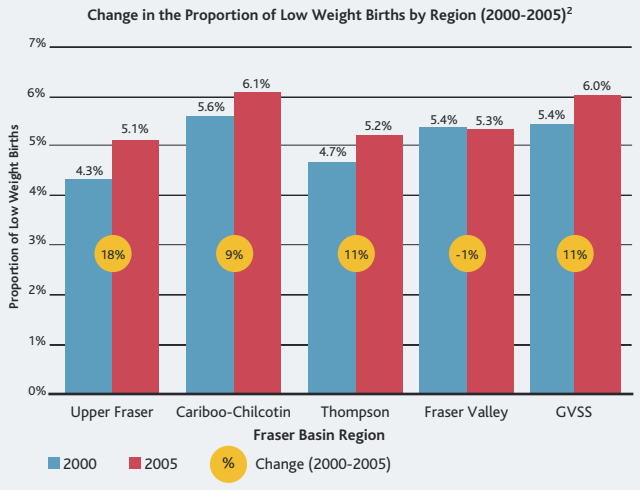
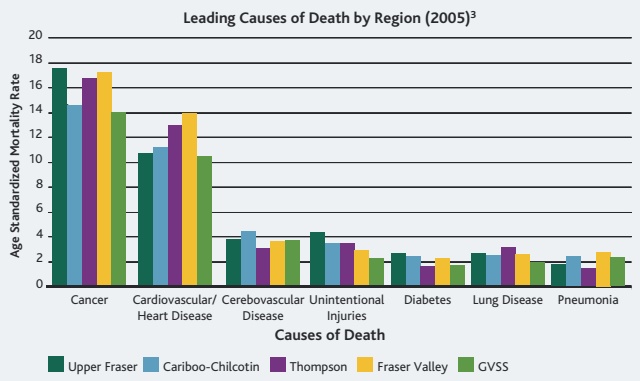
3 BC Vital Statistics. Custom tabulation: www.vs.gov.bc.ca.
4. BC Vital Statistics. Custom tabulation: www.vs.gov.bc.ca.
5 Statistics Canada, Canadian Community Health Survey, Nutrition, 2004.
6 Statistics Canada, Canadian Community Health Survey File 2003 (cycle 2.1). Also reported in the Provincial Health Officer's Annual Report 2004.
7 CIHI. National Health Expenditure Trends, 1975–2004: www.cihi.ca.

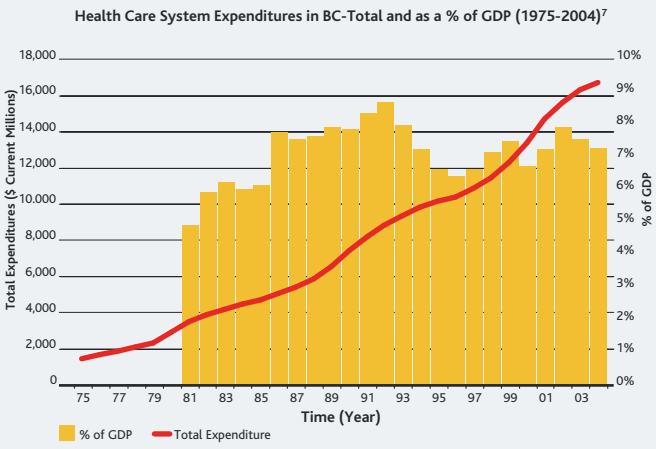
FOOTNOTES

i. Particulate Matter (PM) refers to a combination of very small solid and liquid particles that are suspended in the air we breath. The size of the particles is measured in microns, which are one millionth of a metre in size. Particles smaller that 10 microns are referred to as PM_{10}, and fine particulate matter includes particles smaller than 2.5 microns and is often referred to as $PM_{2.5}$, which is about 30 times smaller than the diameter of a human hair.
ii. The yearly $PM_{2.5}$ concentration is calculated by the average of the 98th percentile for each of the three previous years.
iii. GLO concentration is calculated by the average of the 4th highest reading for each of the three previous years.





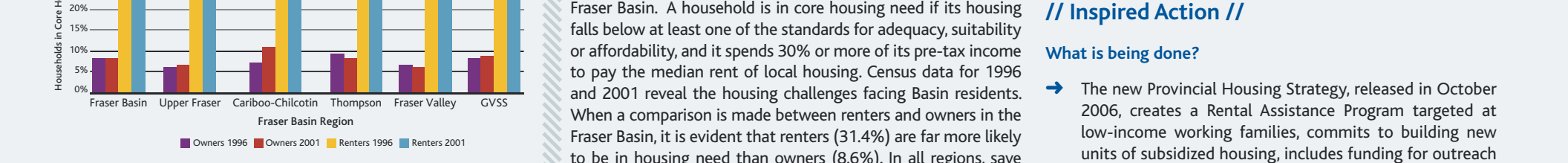




// HEAL helps northern communities combat diabetes //

Healthy Eating and Active Living (HEAL) is a network of individuals, organizations and communities from 100 Mile House to the Yukon border. Its goal is to prevent type 2 diabetes by spreading the word about the importance of healthy eating and active living. Since 2001, HEAL has provided seed money to 19 small projects ranging from community gardens and kitchens to policy development, involving 15 communities and over a thousand participants. The HEAL newsletter has built a subscriber base in 45 communities and involving 189 organizations: www.healbc.ca.

HOUSING



// Sustainability Highlights //

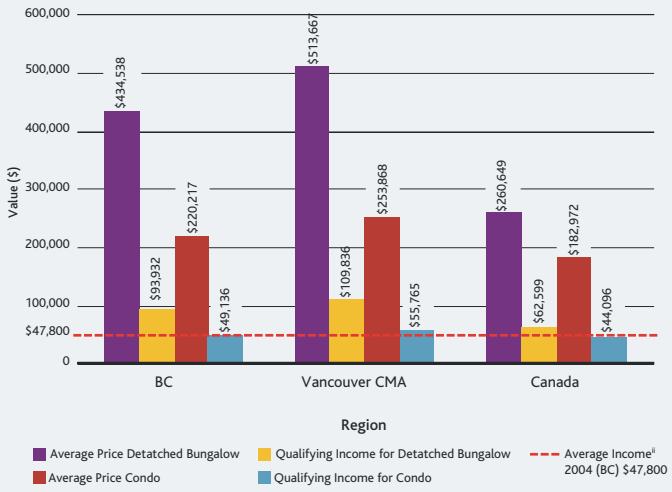
An important element of sustainable communities is an adequate supply of affordable homes, designed to suit a range of household types, and available for rent or purchase. Getting housing 'right' can support a vibrant local economy, attract talented individuals, reduce the environmental footprint associated with shelter, reduce pressure on social services, help to minimize the need to commute, help to create more healthy indoor environments, enhance community safety and security, and contribute to the overall livability of a community. Getting housing 'wrong' can result in affordability problems, car-dependent lifestyles, a lack of a sense of community, increased greenhouse gas emissions, and environmental degradation.

- The average Affordability Index for BC in 2006 for a standard two-storey home was 63.7%, meaning that a typical BC household would pay 63.7% of its pre-tax income to cover mortgage payments, property taxes and utilities.
- On average, there was a 33% increase in house selling prices in Prince George, 100 Mile House, Williams Lake and Quesnel between 2005-2006.

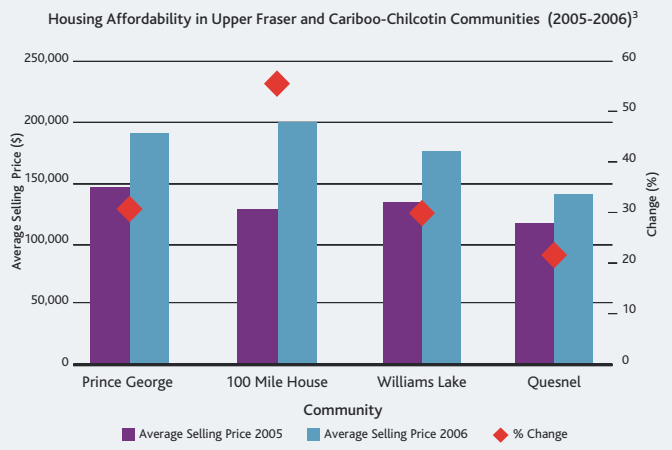
Core Housing Need	MIXED RESULTS/POOR	—In 2001, 16.5% of Fraser Basin residents were in core housing need. Rates for renters ranged between 30%-40%; slight improvements since 1996 in most regions.
Housing Affordability	POOR/GETTING WORSE	—Housing has become less affordable in all regions reported. Affordability in BC is the worst in Canada and even worse in Vancouver.
Homelessness and "at-risk" in Greater Vancouver	POOR/GETTING WORSE	—Almost a doubling of homeless between 2002-2005 and 6.4% of the GVRD population is estimated to be at-risk of becoming homeless.

Households in Core Housing Need by Tenure and Fraser Basin Region (1996-2001)[1]

Housing Affordability (2005-2006)[2]



Housing Affordability in Upper Fraser and Cariboo-Chilcotin Communities (2005-2006)[3]



// Issues and Trends //

Core Housing Need (1996-2001)[1, i]

Core housing need is a problem for many people living in the Fraser Basin. A household is in core housing need if its housing falls below at least one of the standards for adequacy, suitability or affordability, and it spends 30% or more of its pre-tax income to pay the median rent of local housing. Census data for 1996 and 2001 reveal the housing challenges facing Basin residents. When a comparison is made between renters and owners in the Fraser Basin, it is evident that renters (31.4%) are far more likely to be in housing need than owners (8.6%). In all regions, save the Cariboo-Chilcotin, the percentage of renters in core housing need dropped between 1996 and 2001. The Cariboo-Chilcotin Region has experienced an 8% increase in the number of renters in housing need between 1996 and 2001.

Housing Affordability (2005-2006)[2,3]

RBC's Housing Affordability bulletin shows that BC had the highest (worst) Affordability Index (63.7% for a standard two-storey house) in Canada in the first quarter of 2006, which means that an average BC household will pay 63.7% of its pre-tax income to cover mortgage payments, property taxes and utilities[ii]. The index is 58.1% for a detached bungalow. Housing affordability in BC has deteriorated to levels not seen since the 1980s when the province was in a recession. Compared to figures for the first quarter of 2005, monthly payments (for a two-storey home) have increased by $225 in 2006. The Affordability Index value for a detached bungalow in Vancouver was 64.4% in the first quarter of 2006, the highest in Canada.

Homelessness (2002-2005)[4,5,6]

During a 24-hour period in March 2005, 2,174 homeless people were counted in Greater Vancouver. Of particular concern is the increase in the total number of homeless—in 2005 there were over 1,000 more than in 2002. Also alarming is the number of homeless people living on the street. This number has increased 238% since 2002. 74% of homeless people in the GVRD were reported to have at least one health problem. Aboriginal people make up only 2% of the regional population yet they account for 30% of the homeless population. On the day the count was conducted, 40 families with children were enumerated. Although most were in shelters, some were among the street homeless. In the City of Vancouver alone, the cost of homelessness was estimated to be more than $51 million in 2005. In November of 2005, 127 homeless people were counted in Kamloops. The adverse impacts of homelessness may be somewhat reduced or mitigated through the provision of emergency services and affordable housing facilities.

At-Risk of Homelessness[4]

In addition to the current homeless population, the population at-risk of homelessness in the Basin is a concern for all. People who are at-risk of homelessness live in housing that is inadequate or unsuitable for their needs, and spend at least 50% of their household income on shelter. 6.4% of the GVRD population is estimated to be at-risk of becoming homeless. A recently released study estimates that by 2010 there will be two and a half times the number of homeless people on the City of Vancouver's streets as there are today.

// Inspired Action //

What is being done?

- The new Provincial Housing Strategy, released in October 2006, creates a Rental Assistance Program targeted at low-income working families, commits to building new units of subsidized housing, includes funding for outreach projects to help the homeless access necessary services, and also addresses homelessness, affordable housing, homeownership and building safety: www.bchousing.org/news/news_releases/.
- The National Homelessness Initiative (NHI) is a federal government initiative designed to enhance community capacity to address homelessness. Within the NHI is the Supporting Communities Partnership Initiative (SCPI) through which NHI funds are distributed: www.homelessness.gc.ca/home/index_e.asp.
- The Greater Vancouver Steering Committee on Homelessness (GVSCH) has been working since 2000 to bring together people and organizations operating and funding facilities, services or programs targeted toward people who are homeless or at-risk of homelessness in the GVRD. Kamloops and Prince George have established similar committees: www.gvrd.bc.ca/homelessness/.

What else can be done?

- Participate in local land use policy development processes to support housing choice.
- Encourage municipalities to create a mix of incentives and requirements for developers to incorporate affordable housing in new developments.
- Participate in Homelessness Awareness Week activities or events planned in Vancouver, Prince George and Kamloops.
- Vancouver residents can encourage the City of Vancouver to make its proposed 'Eco-Density Program' a reality.

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3. BC Northern Real Estate Board. October 2006.
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5. Social Planning & Research Council of BC. 2005. Homeless Count 2005: On Our Streets and in our Shelters.
6. True Consulting Group. 2005. Kamloops Homeless Count 2005.

FOOTNOTES

i. Core Housing Need data appeared in the Fraser Basin's 2004 Snapshot 2 report; however, due to a problem with misclassifying households Statistics Canada has re-issued 1996 and 2001 core housing need data. This 2006 report reflects the corrected data.

ii. See section on Income on page 21.

// A helping hand in a time of need //

Each year the Harvest Project in North Vancouver helps over 2,000 people at risk of homelessness. Men and women can suddenly find themselves on low incomes because of family break-ups, illness, job loss or addiction. Many who come to Harvest Project are often going without food, medicine, dental care or clothing just to pay for accommodation. The non-profit helps them through the crisis and get back on track for self-sufficiency. Services include counselling, free grocery shopping, and the "dress for success" program that provides clients with clothing suitable for job interviews: www.harvestproject.org.

INCOME

// Sustainability Highlights //

A vibrant economy that provides sufficient income to meet basic needs is critical for the well-being of individuals and families. Inadequate household income is associated with physical and mental health problems, increased reliance on social assistance and charity, and lower levels of education. Those at the lowest end of the income scale may earn income or receive social supports that do not meet basic needs. These people and families might struggle to find affordable housing, might require the use of food banks, and may face living on the streets.

- The gap between the highest and lowest income earners has widened from 1995-2004, with 16% decreases to the lowest incomes.
- In 2001, BC had the largest proportion of working poor of any province in Canada—nearly twice the national rate.[1,i]
- Food bank use in BC increased 16% from 2003-2004, with almost 8,000 more children needing emergency food; however, food bank use declined from 2004-2005.[2]

Income		**GETTING BETTER**—Average after tax income has grown 8% from 1995-2004 and was 3rd highest in Canada in 2004.
Low-Income		**POOR/GETTING WORSE**—BC has the highest rates of Low Income Cut-Off (18.4%) and the least improvement in Canada.
Economic Hardship		**FAIR/MIXED RESULTS**—Best in the GVSS and Fraser Valley regions and worst in the Cariboo-Chilcotin region.

// Issues and Trends //

Due to limited availability of current data, many of the indicators have been analyzed at the provincial level. Provincial data are more current (2004 or 2005) than data otherwise available specifically for the Fraser Basin (2001).

Real Average After-Tax Income of Families and Unattached Individuals (1995-2004)[3]

Real average after-tax income of families and unattached individuals in BC has increased 8% between 1995 and 2004. In 2004, BC had the third highest average real income in Canada, with an average after-tax income of families and individuals of $47,800.

Income Inequality (1995 -2004)[3]

Income inequality can be assessed by looking at the income gap - the difference in average income between the top 20% of the population and the bottom 20%. The income gap has widened (by $13,200) between the lowest and highest income groups between 1995 and 2004. Families and individuals in the top 20% have gained the most, with incomes increasing 12%, while those in the lowest 20% have had their incomes decrease by 16%. In 2004, the top 20% of income earners had an average after-tax income of $104,700 and the lowest 20% had $9,800.

Proportion of Families and Unattached Individuals Living Below the Low Income Cut-Off (1996-2004)[3,4]

The Low Income Cut-Off (LICO) is a measure produced by Statistics Canada to determine income thresholds at which a family would typically spend 20% more of its income than the average family to meet basic needs (food, shelter and clothing). The following table includes some examples of LICO rates.

2004 Low Income Cut-Off (Constant $1992) After Tax[3]

Size of Family Unit	Rural areas	Population 30,000 to 99,999	Population 500,000 +
1 person	$11,025	$14,075	$16,853
4 persons	$20,844	$26,613	$31,865

BC has the highest proportion of people living below the LICO of any Canadian province. In 2004, 18% of families and unattached individuals were below the after tax LICO, compared to the Canadian average of 15.2%. In Vancouver, the situation is even worse (20.5%). In BC low income rates have decreased by only 1.6% over a 10-year period, compared to decrease of 18.3% for Canada as a whole.

The National Council on Welfare released a study that reported social assistance rates in BC in 2005, adjusted for inflation, reached the lowest value since 1986. Welfare rates are not nearly sufficient to meet household needs. A couple with two children on social assistance receives income that is 48% of the LICO. A person on disability receives income that is only 51% of the LICO.[4]

Economic Hardship (2005)[5]

An index of economic hardship, produced by BC Statstistics, considers a number of indicators, including the percentage of the population on income assistance, average household income and income inequality. The index shows varying states of economic hardship in the eight regional districts within the Fraser Basin. The Squamish-Lillooett region had relatively low rates of economic hardship, while the Cariboo, Thompson-Nicola, and Fraser Fort-George regional districts experienced high rates of economic hardship.

// Inspired Action //

What is being done?

- The Economic Security Project (ESP) is working to analyze recent policy changes in BC and their effects on the economic well-being of vulnerable populations, and to present workable alternative solutions. It is a joint initiative between the Canadian Centre for Policy Alternatives and Simon Fraser University, which brings together 23 community organizations and four of BC's universities.
- CommunityLink provides funding to school boards and other community programs and services that support at-risk children and youth.
- The Vancouver Agreement is a partnership between the City of Vancouver, the BC government and the federal government to work together with communities and business in Vancouver to support sustainable economic, social and community development in an area considered to be the "poorest postal code in Canada".

What else can be done?

- Businesses can provide employees with a living wage.
- Governments and community organizations can support the provision of affordable housing, childcare, and other social services for low income people.
- Individuals can donate volunteer time, money, or food, to food banks or homeless shelters to help alleviate the impacts of poverty in the short-term.
- Governments can ensure that tax reform does not disproportionately burden low-income households.

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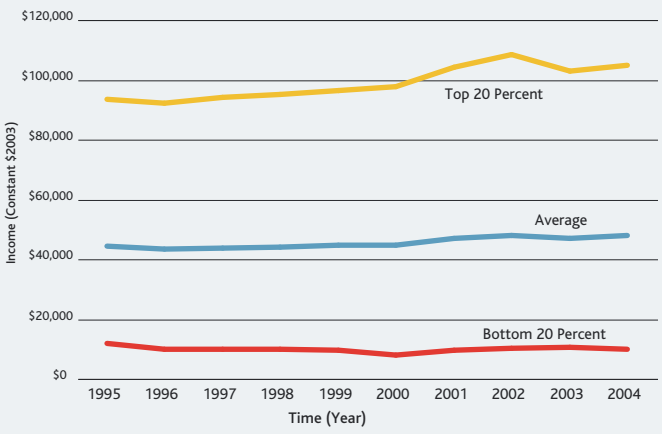
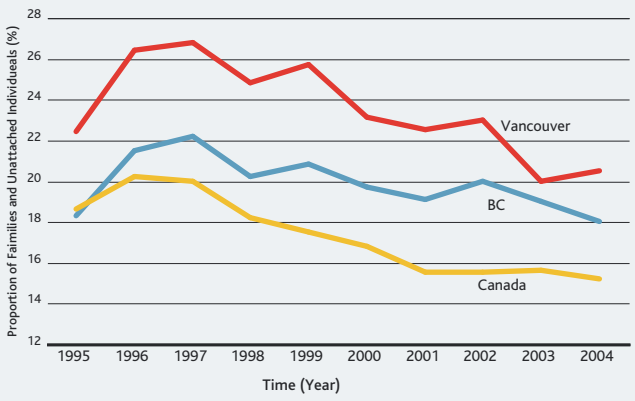
FOOTNOTES

i. The definition of poverty is based on the Market Basket Measure, which estimates the cost of basic goods (e.g., shelter, food and clothing) for each city in the country.

Avergae Annual After Tax Income for Families and Unattached Individuals In BC (1995-2004)[3]

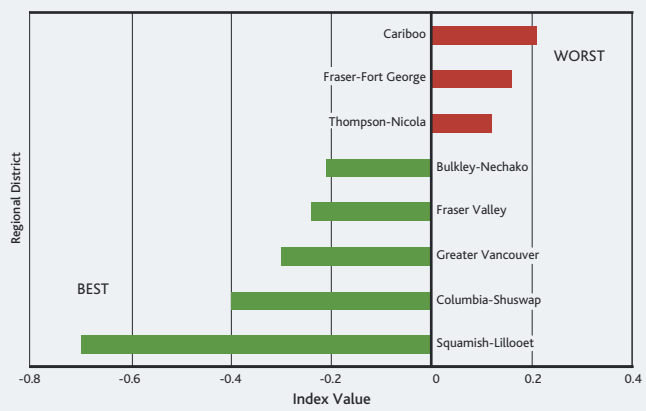


Low Income Cut-Off for Families and Unattached Individuals After Tax (1995-2004)[3]



Total Welfare Income in BC (1989-2005)[4]

Index of Economic Hardship for Regional Districts in the Fraser Basin (2005)[5]



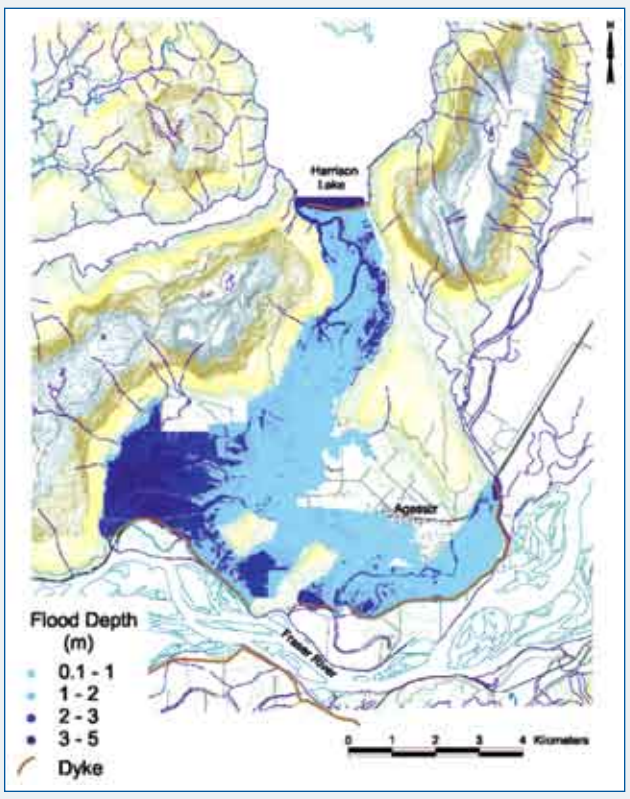
NATURAL HAZARDS

// Sustainability Highlights //

Natural hazards and disturbances—depending on their frequency, magnitude, intensity and nature—can have significant implications for the sustainability of ecosystems and communities. For example, while a moderate flood or forest fire can contribute to ecosystem health by replenishing natural resources and ecosystem function, a more significant event can also conflict with the ongoing needs of a community.

- Recent natural hazards and disturbances within the Fraser Basin include flooding, interface fires, drought, Mountain Pine Beetle infestation, and the spread of invasive plants.
- There is also the potential for catastrophic events, which are likely to occur in the future, particularly in the Fraser Valley and Greater Vancouver-Sea to Sky regions of the Fraser Basin, with the potential of a Fraser River flood of record,[i] a catastrophic earthquake, a tsunami, or a volcanic eruption of Mount Baker.
- Although Fraser River flows reached flood stage in 1999, impacting some homes and communities, there has been no catastrophic flood in the Lower Fraser since 1948, when 16,000 people were evacuated, 2,300 homes were damaged or destroyed, and direct flood damages cost $142 million (1994 dollars).[1]

Social and Economic Costs of Natural Hazards	**POOR/GETTING WORSE**—Average cost to government disaster assistance and average insurance costs are high, increasing, and in some cases unquantifiable.
Managing and Adapting to Natural Hazards	**GETTING BETTER**—Communities are assessing natural hazard risks, developing management strategies, and establishing plans to adapt, respond and prepare for hazards such as flooding, drought and interface fires.



New digital map of the floodplain in the Kent-Agassiz area of the Fraser Valley region, showing the estimated area and depth of flooding if the dikes were to fail during a Fraser River flood of record.

// Issues and Trends //

Social and Economic Costs of Natural Hazards in BC and Canada[1,2,3,4]

Natural hazard events come with varying, but significant costs. It has been estimated that average annual flood-related Disaster Financial Assistance[ii] expenditures in BC during the 1990s were $13 million.[1] Estimates of potential flood damages of a Fraser River flood of record range from $2-$6 billion, not including the indirect costs associated with disruption of critical infrastructure and the economy.[1] Using 2001 Population Census figures, about 327,000 people now live in about 120,000 dwellings in the floodplain of the lower Fraser River (increases of 68% and 81% respectively, since 1981).[2]

On average, the costs of managing forest fires in BC is $87 million; however, the total cost of fires in 2003 has been estimated at $700 million.[3] Perhaps most shocking is that disaster-related costs in Canada—including federal, provincial, and insured losses—have increased by 2,900% between 1945 and 1999.[4]

Flooding in the Fraser Basin[5]

In the winter of 2004, there was an unusually warm period in January, which resulted in ice break-up, flows, and subsequent ice jams near Hixon, in the Upper Fraser region, which also resulted in flooding. The most significant flood vulnerabilities within the Fraser Basin are in the Fraser Valley and Greater Vancouver-Sea to Sky regions. For example, in the fall of 2003, extreme storms led to floods in Squamish, Pemberton, Mount Currie, Hatzic Prairie and the Chilliwack River Valley. A new study managed by the Fraser Basin Council suggests that the predicted water levels associated with the Fraser flood of record are higher than previously thought, and several lower Fraser River communities would not be adequately protected by existing diking systems.[5]

Forest Fires and Interface Fires in BC[3,6]

Although forest fires are natural occurrences, where forested land meets urban development, interface fires can cause significant damage to property, and potentially take human life. About 49,000 hectares (ha) of forest is burnt during an average fire season in BC. The summer of 2003 witnessed a dramatic increase, with over 2,500 wildfire starts—an increase of almost 40% over the 10-year average—and over 200,000 ha of forest burned. More than 300 homes were destroyed and 45,000 people were evacuated. By comparison, the 2005 and 2006 fire seasons were relatively quiet.

Natural Disturbances

Mountain Pine Beetle[7,8]

The area of BC forest affected by the Mountain Pine Beetle (MPB) has more than doubled from 4 million ha in 2003 to 8.7 million ha in 2006. This outbreak has resulted in short-term economic benefits due to increased harvest rates of affected timber, but there will inevitably be long-term socio-economic costs as future timber harvest opportunities are lost and environmental impacts emerge: see Forests and Forestry on page 18.

Invasive Plants[9]

Numerous invasive plants—or noxious weeds—are now established in the Fraser Basin and throughout BC, resulting in a variety of environmental and economic impacts. Invasive plants threaten fragile ecosystems, reduce biodiversity and cost the economy millions of dollars due to reduced crop yields, range productivity and forest regeneration, as well as costs to control or eradicate invasive plants.

// Inspired Action //

What is being done?

Managing and Adapting to Natural Hazards[10,11]

- ➜ Following the 2003 fire season, the BC government required that all regional districts develop emergency plans. All of the eight regional districts in the Basin have completed their plans, and are now developing more detailed vulnerability assessments of fire and other risks.
- ➜ 23 local governments in the Basin have developed or initiated community wildfire plans, which include planning, communications, fire fuel treatment and other measures to reduce fire risk.
- ➜ In 2005/06 the Fraser Basin Council and Ministry of Environment assisted with the installation of 36 flood level gauges in 16 BC communities.
- ➜ 90% of local government respondents to a 2002 survey had established emergency flood plans.
- ➜ The Invasive Plant Council was formed to address the issue of invasive plants in BC with a goal to build cooperation and coordination to protect BC's environment and minimize negative social and economic impacts caused by the introduction, establishment and spread of invasive alien plants: www.invasiveplantcouncilbc.ca.

What else can we do?

- ➜ Organizations, businesses, households and individuals can develop emergency preparedness plans and supply kits to deal with various types of natural disasters.
- ➜ Local, regional and provincial emergency plans should be developed, tested, used for training, and updated on a regular basis.
- ➜ All orders of government and the private sector should explore opportunities to establish long-term, cost-shared funding programs for the mitigation of natural hazards and associated impacts. An ounce of prevention is worth a pound of cure.

// New floodplain maps //

The Fraser Basin Council, the BC Ministry of Environment and four local governments in the Fraser Valley are working together to develop new floodplain maps, using a computer model that simulates a flood scenario based on the Fraser River flood of record.

The District of Kent will use this information to develop a bylaw for the community to guide future development decisions and construction practices, including the flood construction level. The maps will also provide an invaluable resource for emergency planning and preparedness by estimating, not only the extent and depth of potential flooding, but also the timing of flooding in different parts of the community should there be a failure in the dike system. Similar maps are being prepared for Harrison Hot Springs, Mission and Abbotsford.

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11. Fraser Basin Council. Personal communication. Steve Litke, Program Manager. 2006.

FOOTNOTES

i The largest Fraser River flood on record occurred in 1894 with a peak flow of 17,000 m3/s. The second largest occurred in 1948.

ii Disaster Financial Assistance (DFA) is available to homeowners and renters, small businesses, farm operators, charitable and non-profit organizations, local government and provincial ministries. DFA provide funds to replace or restore items essential to a home, livelihood or community service that were damaged or destroyed during a disaster event.

POPULATION & CONSUMPTION

// Sustainability Highlights //

The population influences sustainability in many ways. The number of people who live, work and play in the Fraser Basin, how they are distributed throughout the region, and how the population is changing in age and ethnicity all influence the social, economic and environment challenges and opportunities in the Basin. The number and distribution of people in regions and communities affect the demand for housing, health services, land, energy, water, and other resources. While unsustainable lifestyle choices and consumer behaviour of Basin residents can have significant negative impacts on society and the environment, sustainability-wise consumer choices can mitigate those impacts and advance sustainability.

- The Fraser Basin represents about two-thirds (67%) of the population of BC.
- Future population growth in the Fraser Basin will be significantly influenced by trends in international and inter-provincial migration.
- It is important that future population growth is managed through community development policies and practices that support quality of life retain agricultural lands, protect air and water quality, maintain natural spaces, such as parks, forests, and waterways, and sustain a host of ecosystem services in the region.

Population	FAIR/MIXED RESULTS—Population growth is expected to continue in the Basin (4 million by 2031) with growth rates varying in the regions.
Consumption	MIXED RESULTS/POOR—Energy and water consumption per capita are getting better, but total consumption is getting worse.
Consumer Choices for Sustainability	GETTING BETTER—Market demand is supporting more certified organic farms and sustainable forest management as well as energy savings through the BC Hydro Power Smart Program.

// Issues and Trends //

Population Growth & Change (2001-2003)[1]

BC Statistics has estimated that the Basin population grew from 2.62 to 2.77 million between 2001-2003 (5.8% increase). The highest growth rates were in the Greater Vancouver-Sea to Sky (GVSS) (7.8%) and Thompson (6.1%) regions. In contrast, the Upper Fraser region was estimated to experience a population decrease of 13.6% in this period. The distribution of the population throughout the Basin has remained relatively the same over time, with the majority (77.7%) residing in the GVSS, 9.2% in the Fraser Valley, 6.4% in the Thompson, 2.4% in the Cariboo-Chilcotin and 4.2% and in the Upper Fraser region. Over the next 25 years, the population of the Basin is expected to grow by approximately 37%, becoming home to just under 4 million people by 2031. Seniors, as a proportion of the population, will increase significantly in every region over this period.

Urban Development[1]

Growing populations increase the demand for land, housing, infrastructure, services, and amenities. Urban sprawl can impact quality of life and environmental health through increased traffic congestion, air pollution and respiratory disease, climate change, unaffordable housing and increased public expenditures on community infrastructure and services. Smart-growth practices can contain urban sprawl and protect farmland, waterways, forests, parks, biodiversity and other ecosystem services.

Population density is one way to measure the proportion of land consumed by urban development. Population density varies widely in the Fraser Basin, ranging from as low as 1.5 people per square km in Wells in the Cariboo-Chilcotin to almost 5,000 per square km in Vancouver.

Consumption of Water and Energy[2,3]

The population of the Basin impacts sustainability through the consumption of natural resources such as water and energy. Per-capita water use in Basin communities dropped by over 7% between 1991-2001; however, total municipal water use increased by 21%. Similarly, between 1990-2004, energy consumption in BC dropped by 6% per capita and by 18% per dollar of GDP. However, total energy consumption in BC increased by 20% during the same period. These trends suggest that growth in total population and economic activity have outpaced improvements in water and energy use efficiency and conservation on a per-capita basis.

Consumers' Sustainability Choices[4,5,6]

There are numerous ways that farmers, foresters, energy providers and other businesses are advancing sustainability, and consumers are encouraging and supporting them through their purchasing choices. The following examples offer insight into how consumer preferences, and business responses are contributing to a more sustainable Basin:

- The number of certified organic farm producers in BC increased by 17% (from 377 to 442) between 2000 and 2004.[4]
- There has been a five-fold increase (from 2.6 to 12.9 million ha) in the area of certified sustainable forest management operations within the Basin since 2001.[5]
- There has been a very significant increase (over 1000%) in energy savings resulting from consumer participation in the BC Hydro Power Smart Program (from 177 GWh in 2002 to 1,957 GWh in the 2005/06 fiscal year).[6]

// Inspired Action //

What is being done?

- Smart Growth on the Ground is working to create examples of smart growth, by helping communities to prepare more sustainable neighbourhood plans—including land use, transportation, urban design, and building design plans. Examples to date in the Fraser Basin include Maple Ridge and Squamish: www.sgog.bc.ca.
- West Coast Environmental Law has developed a *Smart Bylaws Guide* to assist local governments to implement smart growth strategies through policy and bylaw changes. The Guide describes smart growth practices, and provides case studies, technical standards and bylaws that can be tailored to specific municipal circumstances: www.wcel.org/issues/urban/sbg/.
- The BC Network for Sustainability Education is a multi-sectoral, collaborative network where participants can engage in dialogue and action on sustainability education and build awareness about ways to advance sustainability, including an online meeting space: www.walkingthetalk.bc.ca/.

What else can we do?

- Take steps at home and at work to reduce the negative environmental impacts of our actions by using energy-efficient technology, reducing carbon emissions and conserving water and energy.
- Support the development of higher density residential units that will help to accommodate the growing population in the Basin within the existing urban landscape.
- Use your power as a consumer to support and promote sustainable products and services by choosing organic food, recycled and chlorine-free paper, certified forest products, public transit and other forms of alternative transportation and energy-efficient technologies.

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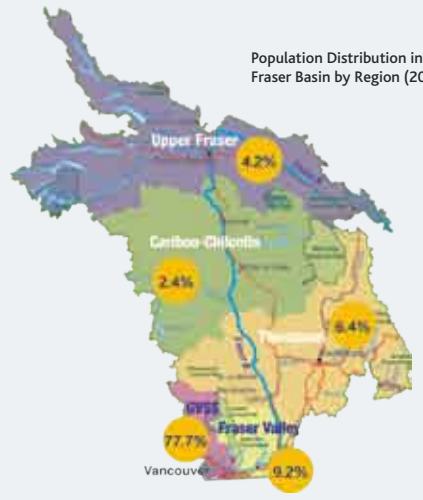
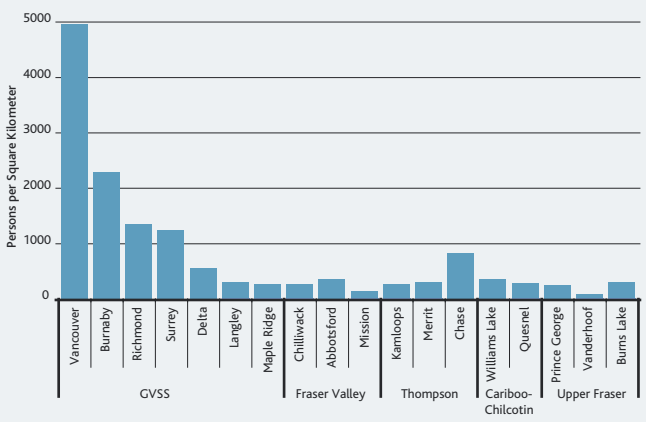
Population Distribution in the Fraser Basin by Region (2003)[1]

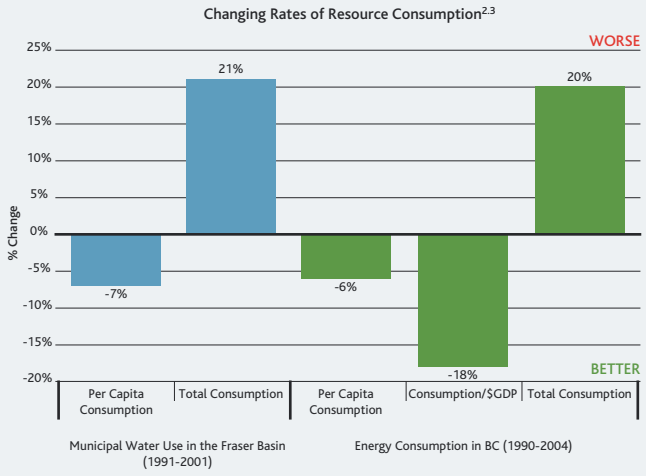


Population Density of some Fraser Basin Communities (2003)[1]



Major Communities in the Fraser Basin

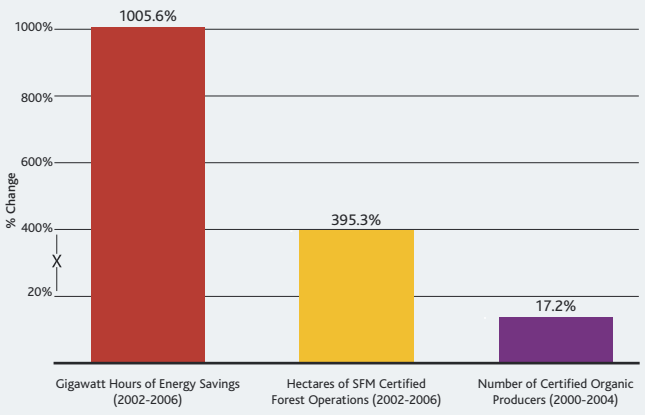
Changing Rates of Resource Consumption[2,3]



Municipal Water Use in the Fraser Basin (1991-2001)

Energy Consumption in BC (1990-2004)

% Change in Consumer Choices in Support of Sustainability[4,5,6]



Gigawatt Hours of Energy Savings (2002-2006)

Hectares of SFM Certified Forest Operations (2002-2006)

Number of Certified Organic Producers (2000-2004)

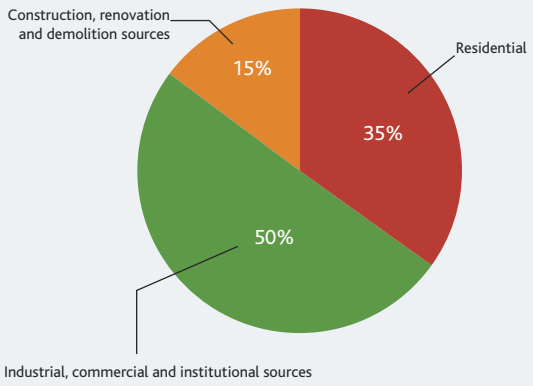
WASTES & TOXINS

// Sustainability Highlights //

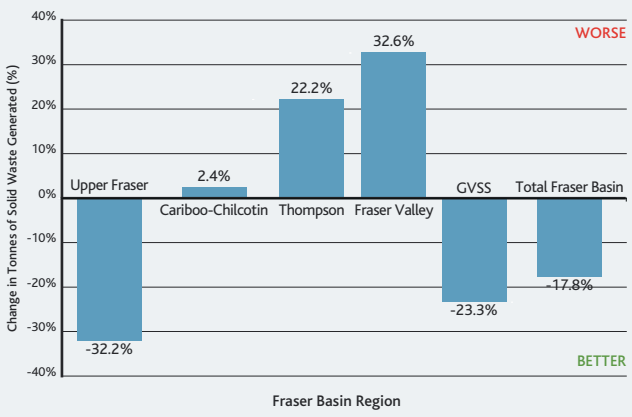
In nature, the waste from one process becomes an input to another process, supporting an ongoing cycle of decomposition and regeneration. In contrast, many waste by-products from human consumption, industrial processes, agriculture and manufacturing are not readily assimilated or utilized by natural systems. The solid, liquid and gaseous wastes generated by human activity can have significant environmental, social and economic costs. In particular, persistent and toxic substances can disrupt or damage the natural regenerative cycles of people, other species or the environment beyond repair, sometimes with significant healthcare or clean-up costs. Toxic substances can be found in food, water, air, and a wide range of consumer products. Such products include flame-retardants, non-stick cooking utensils and pesticides, which have beneficial uses but may also pose risks to human health and the environment. Waste generation and inefficient use of raw materials can also increase business costs; whereas, waste management, source control, pollution prevention and various efficiencies can help reduce operating costs and increase competitiveness among businesses and other organizations.

Solid Waste Disposal	FAIR/MIXED RESULTS—Total solid waste disposal is improving for the Fraser Basin. Per capita generation is improving in some regions and getting worse in other regions.
Greenhouse Gas Emissions	MIXED RESULTS/POOR—GHG emissions per capita and per $ of GDP are improving, but total emissions are getting worse.
Toxic Substances	POOR/GETTING WORSE—Releases and transfers of toxic chemicals increased by 49% in Canada (1995-2002). Dozens of known carcinogens and other toxins were found in a majority of volunteers tested in 2004 and 2006.

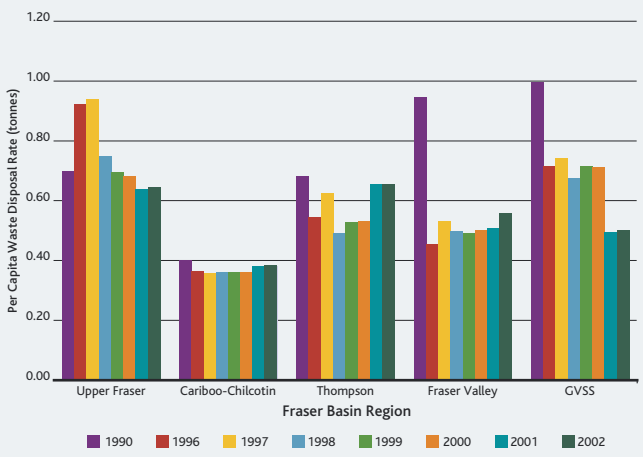
Solid Waste Produced in BC by Source (2002)[1]



% Change in Waste Disposal in the Fraser Basin and by Region (1996-2002)[2]



Per Capita Waste Disposal by Region (1990, 1996-2002)[2]



// Issues and Trends //

Solid Waste (1996-2002)[1,2]

All sources in the Fraser Basin disposed of 1.4 million tonnes of solid waste in 2002. Overall, because of increased rates of diversion (recycling and composting), this represents a reduction of 17.8% since 1996. Rates of change have varied widely across Fraser Basin regions, with significant decreases in the Upper Fraser (-32%) and Greater Vancouver-Sea to Sky (-23%) regions and increases in the Fraser Valley (33%) and Thompson (22%) regions.

When examining provincial data, the majority of solid waste (50%) in BC is generated by industrial, commercial and institutional sources, 35% by residential sources and 15% by construction, renovation and demolition activities. Of the 1.3 million tonnes of residential waste in BC in 2002, approximately two thirds was disposed in landfills or incinerated, while only 31% was diverted through recycling or composting. While BC's rate of diversion is considerably better than the Canadian average (19%), there is room for improvement.

Greenhouse Gas Emissions[3]

Greenhouse gases (GHGs) represent a significant form of waste because of their influence on climate change. GHGs are emitted by a diversity of sources, the majority of which relate to a dependence on fossil fuels, the transportation of goods and services and a variety of industrial processes. Urban sprawl, single-occupancy vehicles and shipping of goods on a global scale all contribute GHG emissions. Both the total (66.8 megatonnes) and per-capita (15.9 tonnes) annual GHG emissions have increased over time in BC and are at their highest in the last15 years. *See Climate Change on page 12.*

Toxins in Humans[4,5,6]

Some human activities generate chemical waste or by-products that are released into the air, water and ground and may be toxic. Between 1995 and 2002, the volume of chemicals reported to be released and transferred in Canada increased by 49%. The most commonly used chemicals are pesticides. While not all chemicals and pesticides are harmful, a number of these agents have been linked to growth in a variety of ailments, including several forms of cancer, reproductive disorders, birth defects, asthma and neuro-developmental disorders. Information compiled by provincial poison control centres from across the country revealed that thousands of Canadians, predominantly children, are acutely poisoned by pesticides each year. As of July 2006, there were 60 active ingredients, used in 1,130 pesticide products, registered for use in Canada that have been banned in many other western industrialized nations because of health and environmental concerns.

In 2004, a non-governmental organization—Environmental Defence—tested 11 people from across the country to examine the presence of 88 chemicals that are released into the land, air and water through industrial and agricultural processes. The study found traces of 60 of the 88 chemicals in all 11 of the volunteers: 44 chemicals detected per individual, including 41 carcinogens, 27 hormone disruptors, 21 respiratory toxins and 53 reproductive/developmental toxins.

A follow-up study conducted in 2005, examined the children, parents and grandparents from five Canadian families. On average, 32 chemicals were detected in each parent volunteer and 23 chemicals were detected in each child. In total, 38 carcinogens, 23 hormone disruptors, 12 respiratory toxins, 38 reproductive/developmental toxins, and 19 neurotoxins were detected in the study volunteers. There were several cases in which the children were more contaminated than their parents by these toxins.

// Inspired Action //

What is being done?

- BC currently has six active product stewardship initiatives for the recycling of beverage containers; solvents; flammable liquids and pesticides; used lubricating oil; consumer paints, varnishes, stains and aerosols for home and commercial use; pharmaceuticals; and tires.[6]
- A growing number of businesses, municipalities, institutions and families in BC are initiating and committing to a "zero waste" target, by closing the loop on material flows and linking communities, businesses, and industries so that the waste of one becomes another's feedstock: www.footprintbc.com/zerowastenorth/index.htm.
- As of October 2006, 122 municipalities from across Canada had passed laws prohibiting the use of pesticides for cosmetic, non-essential purposes. These laws protect over 11 million Canadians, or approximately 37 per cent of the country 's population. However, only 4 of the municipalities within the Fraser Basin have adopted such bylaws.[8]
- Concerns about the control of invasive plants warrant careful consideration about pesticide bans. Integrated pest management is one means of limiting pesticide use, while controlling invasive plants. *See Natural Hazards on page 22*

What else can we do?

- Consider employing integrated pest management practices in the environment where you live, work and play to reduce human exposure to pesticides.
- Conduct a waste assessment in your organization to reduce waste and save money. Waste assessments help determine the weight, volume and the types of waste materials being generated and identify options to reduce, reuse or recycle.
- Encourage your community to participate in Waste Reduction Week (third week of October): www.wrwcanada.com.

// E-waste finds new life //

Genesis Recycling is an electronics recycling company in Aldergrove that locally dismantles over 200,000 computers a year, recovers and sells components for recycling and keeps harmful substances out of landfill. It's a critical sustainability service. Electronic waste (e-waste) is now one of the fastest growing waste streams in North America and one that contributes to soil and water contamination because electronics contain hazardous substances that leach into the ground. Beginning in 2007, BC's Extended Producer Responsibility regulation will require the electronics industry to recycle all computers, monitors, desktop printers and TVs, and to offer e-waste collection or drop-off services. Similar industry stewardship programs already exist for paint, aerosols, medicines, pesticides, beverage containers, pharmaceuticals and oil.

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WATER QUALITY & QUANTITY

// Sustainability Highlights //

Water is one of the Fraser Basin's most precious and valuable resources. Water is essential for human health and survival. It is a critical for irrigation, industry, energy, recreation and tourism. It is also required to sustain plants, animals and ecosystems. The vast network of tributary rivers, lakes, streams, marshes, bogs, swamps, sloughs and waterways that connects the cities and towns throughout the Basin makes it appear as though water resources are pure and inexhaustible. Freshwater is however a finite and increasingly vulnerable resource. Maintaining the quality of water, and ensuring an adequate supply, requires that individuals, governments, communities and industry work together to balance the diverse short and long term needs of communities, industry and the environment. It requires ongoing monitoring and, in many cases, it requires changes in behavior, technology, process and governance to support and maintain the water needed for a sustainable region.

- Water quality has been consistently among Canadian's top environmental concerns with approximately 70% of Canadians indicating that they are "very concerned".[1]
- The majority of water consumption (63%) in the Fraser Basinis for residential use.
- In 2001, the average Canadian used 335 litres of water each day, which is more than double the water use in Europe.

Water Quality Index	FAIR/MIXED RESULTS—In 2003, 4 sites rated as Good, 3 were Fair, and 1 site was Poor.
Water Quality Trends	FAIR/MIXED RESULTS—In 2005, 1 site was Improving, 5 were Stable, and 1 site was Deteriorating.
Municipal Water Consumption	MIXED RESULTS/POOR—Total consumption has increased (21%) since 1991, but per capita consumption has dropped (7%).

// Issues and Trends //

Status of Water Quality (2001-2003)[2]

The Provincial Water Quality Index measures the impact of pollutants on water quality. Index scores rank the quality of the water against objectives, which are set for each water body based on the users of the water (humans and other life) and the waste streams entering the water body. Of the eight water bodies monitored in the Fraser Basin, four were rated 'Good', meaning that "conditions rarely depart from natural or desirable levels and that all uses are protected, with only minor threats or impairment"; three were rated 'Fair', meaning that "conditions sometimes depart from natural or desirable levels and that most uses are protected, but a few uses are threatened or impaired" and one was rated as 'Poor', which means that conditions in this water body usually depart from natural or desirable levels and most uses are threatened, impaired or even lost.

Water Quality Trends (2005)[3]

Water quality trend monitoring is used to detect subtle changes over time that may result from an ongoing activity or land-use within the catchment area of the watercourse. Trend assessments, based on data collected over the past twenty years have been conducted at eight sites throughout the Fraser Basin. The water quality at five of these sites is stable, including three in the Upper Fraser, and one in each of the Cariboo-Chilcotin and Thompson regions. Data from the site at Hope in the Fraser River shows an improving trend and that in the Salmon River at Salmon Arm in the Thompson region is deteriorating with increasing turbidity and chloride.

Drinking Water Quality (2001-2006)[4, 5]

Health Canada estimates that unsafe drinking water causes 90,000 illnesses and 90 deaths every year in Canada. The latest *Drinking Water Report Card* issued by Sierra Legal Defense Fund suggests that the regulatory systems in place to protect drinking water in BC are improving somewhat. BC's grade was raised from a 'D' in 2001 to a 'C+' in 2006. BC's accredited labs for water quality testing and operator certification were considered to be good; however, improvement was deemed necessary with respect to treatment and contaminant standards, testing and public reporting. BC's grade was near the median for Canada with five provinces receiving a higher grade and four receiving a lower grade.

Municipal Water Use (1991-2001)[6]

According to the Municipal Use Database, the quantity of water used per day by municipalities in the Basin increased by over 21% between 1991 and 2001; however, per capita use dropped by 7%. Municipalities in the Thompson region reduced both the total amount of water used per day and the per capita daily use over this decade. The Fraser Valley, however, experienced a 167% increase in total daily use and a 21% increase in per capita use. With the exception of the Cariboo-Chilcotin region, the majority of municipal water is used for domestic purposes. In 2001, residential use accounted for 63% of water expended in the Basin, 30% was used by industry, institutions or businesses and 7% was lost through system flushes, leakages or unknown sources.

// Inspired Action //

What is being done?

- Municipalities and residences are making a greater effort to monitor their water use, through the use of water meters.[6] Water metering has been proven to help reduce rates of water consumption.
- The extent of water quality monitoring has increased in BC, from sampling in 13 basins in 1998 to 20 basins in 2004.[7]
- www.waterbucket.ca is a new, interactive website designed to provide the information and resources to support integrated water management in BC through on-line dialogue and exchange of ideas. The website is a partnership involving government, Crown corporations, non-government associations and the private sector.

What else can we do?

- Fixing a tap that is leaking at a rate of only one drop per second will save more than 25 litres of water a day (10,000 litres / year). Converting to low-flow toilets (6 litres of water / flush) and showerheads (9.5 litres per minute) can save 2,000 litres of water per week.[8]
- Water audits can help businesses and institutions determine where excess water is being used and how to reduce water use through efficiency improvements.
- The establishment of province-wide standards for rainwater harvesting and water recycling would help to ensure that new developments are "water-wise".

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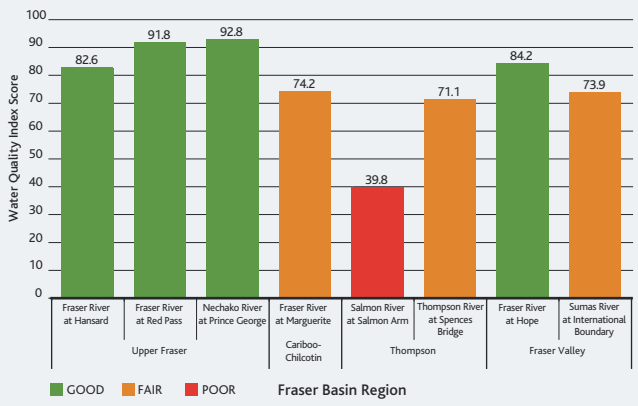
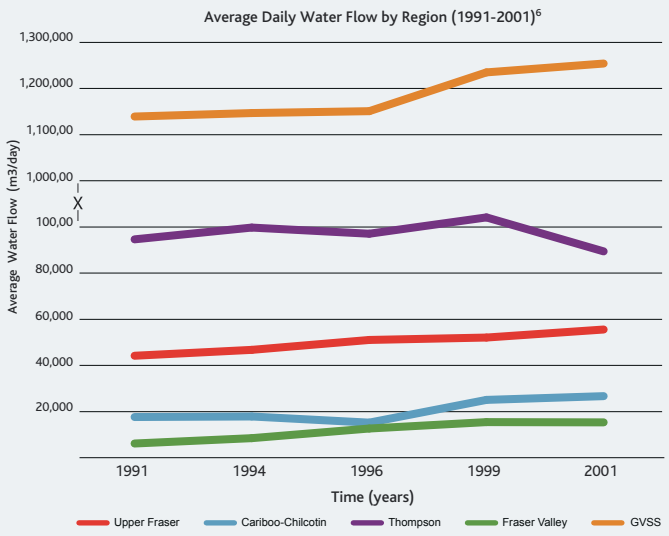
6. Environment Canada, Municipal Use Database, 1986-2001: www.ec.gc.ca/Water/en/manage/use/e_data.htm.
7. BC Ministry of Environment (2004) *Water quality in British Columbia: Objectives attainment in 2004.* Water, Air and Climate Branch, BC Ministry of Environment.
8. Statistics Canada, 2001 as reported by Environment Canada. Water Efficiency/ Conservation Resources: www.ec.gc.ca/water/en/manage/effic/e_weff.htm.

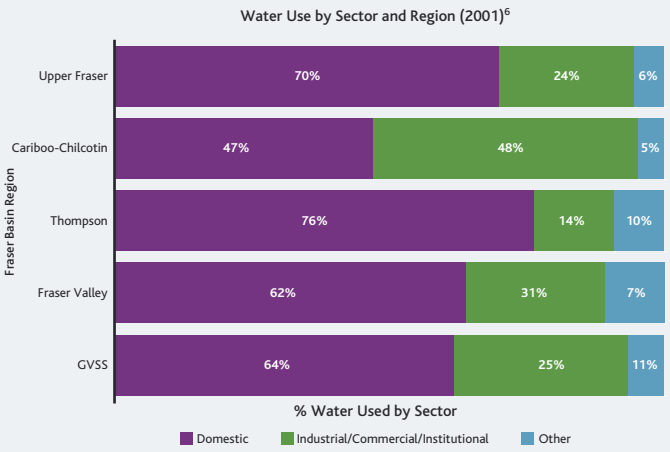
Water Quality Index Scores and Sites in the Fraser Basin (2001-2003)[2]



Average Daily Water Flow by Region (1991-2001)[6]



Water Use by Sector and Region (2001)[6]



// Langley plan to protect groundwater //

In 2006 the Township of Langley in the Greater Vancouver-Sea to Sky region began work on the province's first community water management plan under the *Water Act*. The plan is intended to address or prevent conflicts between water users, or between water users and in-stream flow, as well as risks to water quality. It was initiated in Langley as a means of addressing declining local groundwater caused by rapid urban growth and also to protect water quality.

SUMMARY OF SUSTAINABILITY HIGHLIGHTS

Aboriginal & Non-Aboriginal Relations

Life Expectancy	FAIR/MIXED RESULTS—On average, life expectancy is less for the Aboriginal than the non-Aboriginal Fraser Basin population (by 6.4 years), but the gap is narrowing.
The Next Generation (Children in Care and Highest Education Levels)	MIXED RESULTS/ POOR—An increasing proportion of children in care are Aboriginal (since 2000). Education levels attained are on average, lower than the non-Aboriginal population, but improving.
Progress in Treaty and Non-Treaty Measures, Protocols and Agreements	GETTING BETTER—Since 2002 significant progress has been made in improving relations and clarifying, respecting and accommodating title and rights.

Agriculture & Food

Agricultural Land Reserve	FAIR/MIXED RESULTS—As of 2005, there has been a net increase in the ALR in the Fraser Basin; however, there has been a net loss in prime agricultural land overall and a net loss of ALR land in 4 of 5 regions.
Agriculture and the Environment	GETTING BETTER—Significant participation rates in the Environmental Farm Plan Program; growth among certified organic producers.

Air Quality

Particulate Matter$_{2.5}$	GETTING WORSE—Since 2000 in 4 of 6 communities, with particular concerns in Prince George.
Ground Level Ozone	GETTING WORSE—Since 2000 in 6 of 8 communities, with particular concerns in the Fraser Valley and GVSS regions.

Business & Sustainability

Research and Development	GOOD—Business expenditure on R&D was 3rd highest in Canada in 2004.
Corporate Social Responsibility	GOOD—Companies based in the Fraser Basin claimed 5 of the top 11 socially responsible Canadian corporations as ranked by Stratos Inc. in 2005.
Environmental Management	FAIR/MIXED RESULTS—BC was 4th in the country in the number of ISO 14001 certificates issued, but only 6th nationally with 6.7 certificates per 1,000 enterprises.

Community Engagement

Volunteerism	GETTING BETTER—For volunteerism rates and hours volunteered in BC.
Charitable Donations	GETTING BETTER—For rates of giving and average monetary donations in BC.
Voter Turnout	GETTING WORSE—For federal, provincial and local elections in BC.

Economy

Productivity Growth	POOR—Below the national average over the past decade and minimal growth since 2002.
Unemployment	GETTING BETTER—Unemployment rates are at the lowest levels in over 20 years and dropped below the national in 2004/05.
Economic Diversity	FAIR/MIXED RESULTS—Best in the Thompson, Fraser Valley and GVSS regions and worst in the Upper Fraser and Cariboo-Chilcotin regions.

Education

Early Childhood Development	GETTING WORSE—Since 2001, there are more 5-year-olds considered as having developmental vulnerabilities in terms of "readiness for school" in all regions.
Index of Educational Concerns	MIXED RESULTS/POOR—Rural areas have higher educational concerns than urban areas.
Student–Teacher Ratios	GETTING BETTER—Since 2004, there are fewer students per teacher in all regions.

Energy & Climate Change-Climate Change

Greenhouse Gas Emissions	GETTING WORSE—In 2004 both total and per capita GHG emissions were at their highest levels reported since 1990.
Climate Change Impacts	GETTING WORSE—Average freshwater and air temperatures have already warmed over the past 50-100 years, and Fraser River flows are occurring earlier than in the past 85 years.
Climate Change Adaptations	GETTING BETTER—Communities are assessing climate risks, initiating plans to adapt, and preparing for climate-related vulnerabilities such as flooding, drought and interface fires.

Energy & Climate Change-Energy

Total Energy Consumption in BC	GETTING WORSE—Total energy consumption in BC has increased by 20% (1990-2004).
Energy Intensity in BC	GETTING BETTER—Energy consumption per capita and per $ of GDP have been reduced since 1990 (by 6% and 18% respectively)
Hydroelectricity Consumption in the Fraser Basin	GETTING WORSE—Total industrial consumption increased in 4 of 5 Fraser Basin regions and average residential consumption increased in 3 of 5 regions (1990-2004).

Fish & Fisheries

Sockeye Salmon	GETTING WORSE—Between 1980-2006, run size, catch and harvest rates have generally declined after 25-year highs in the early 1990s.
Coho Salmon	GETTING WORSE—Between 1986-2004, run size, catch and harvest rates have declined significantly for both Interior (mostly Thompson) and Lower Fraser coho.
Chinook Salmon	MIXED RESULTS/POOR—Between 1982-2004, catch and harvest rates have been higher and more consistent for Interior Fraser stocks than in the Lower Fraser "fall-run" stocks in recent years. Harvest opportunities for fall-run stocks have been reduced due to conservation measures for other salmon stocks and steelhead.
Steelhead	POOR—Virtually all summer and winter run stocks are classified as of "Extreme Conservation Concern".
Fraser River White Sturgeon	MIXED RESULTS/POOR—All four Fraser Basin sturgeon stocks were designated as "endangered" by COSEWIC in 2003. Abundance estimates for the Lower Fraser Sturgeon population show an increasing trend from 1999-2003 and a declining trend from 2003-2005.
Freshwater Fish Habitat	MIXED RESULTS/POOR—Freshwater habitat has been adversely impacted by a wide range of human activities including: agriculture and flood management in the Lower Fraser region, forestry and agriculture in the Thompson region, forestry in the Cariboo-Chilcotin and Upper Fraser regions, and hydroelectric dams in the Upper Fraser and Greater Vancouver-Sea to Sky regions.

FOOTNOTE: In the adjacent summary graph only three fish and fisheries indicators have been included for equal weighting with other topics.

Forests & Forestry

Extent of Mountain Pine Beetle in BC	GETTING WORSE—The area affected by MPB is 8.7 million ha more than double the area in 2003.
Community Vulnerability to the Forest Sector in the Fraser Basin	MIXED RESULTS/POOR—Vulnerability is worst in the Upper Fraser and Cariboo-Chilcotin regions and further compounded by Mountain Pine Beetle.
Forest Restocking in BC	FAIR/MIXED RESULTS—The area surveyed as restocked was less than the area disturbed in the 1980s, more than the area disturbed in the 1990s, and similar to the area disturbed since 2000.

Health

Life Expectancy	GETTING BETTER—Life expectancy continues to rise in all regions of the Basin, but four out of five regions are below the BC average.
Rate of Low-Weight Births	GETTING WORSE—Except in the Fraser Valley the rate of low-weight births has increased between 9% and 11%.
Rate of Type 2 Diabetes	GETTING WORSE—The rate of Type 2 Diabetes has increased in all regions of the Basin.

Housing

Core Housing Need	MIXED RESULTS/POOR—In 2001, 16.5% of Fraser Basin residents were in core housing need. Rates for renters ranged between 30%-40%; slight improvements since 1996 in most regions.
Housing Affordability	POOR/GETTING WORSE—Housing has become less affordable in all regions reported. Affordability in BC is the worst in Canada and even worse in Vancouver.
Homelessness and "at-risk" in Greater Vancouver	POOR/GETTING WORSE—Almost a doubling of homeless between 2002-2005 and 6.4% of the GVRD population is estimated to be at-risk of becoming homeless.

Income

Income	GETTING BETTER—Average after tax income has grown 8% from 1995-2004 and was 3rd highest in Canada in 2004.
Low-Income	POOR/GETTING WORSE—BC has the highest rates of Low Income Cut-Off (18.4%) and the least improvement in Canada.
Economic Hardship	FAIR/MIXED RESULTS—Best in the GVSS and Fraser Valley regions and worst in the Cariboo-Chilcotin region.

Natural Hazards

Social and Economic Costs of Natural Hazards	POOR/GETTING WORSE—Average cost to government of disaster assistance and average insurance costs are high, increasing, and in some cases unquantifiable.
Managing and Adapting to Natural Hazards	GETTING BETTER—Communities are assessing natural hazard risks, developing management strategies, and establishing plans to adapt, respond and prepare for hazards such as flooding, drought and interface fires.

Population & Consumption

Population	FAIR/MIXED RESULTS—Population growth is expected to continue in the Basin (4 million by 2031) with growth rates varying in the regions.
Consumption	MIXED RESULTS/POOR—Energy and water consumption per capita are getting better, but total consumption is getting worse.
Consumer Choices for Sustainability	GETTING BETTER—Market demand is supporting more certified organic farms and sustainable forest management as well as energy savings through the BC Hydro Power Smart Program.

Wastes & Toxins

Solid Waste Disposal	FAIR/MIXED RESULTS—Total solid waste disposal is improving for the Fraser Basin. Per capita generation is improving in some regions and getting worse in other regions.
Greenhouse Gas Emissions	MIXED RESULTS/POOR—GHG emissions per $ of GDP are improving, but total and per capita emissions are getting worse.
Toxic Substances	POOR/GETTING WORSE—Releases and transfers of toxic chemicals increased by 49% in Canada (1995-2002). Dozens of known carcinogens and other toxins were found in a majority of volunteers tested in 2004 and 2006.

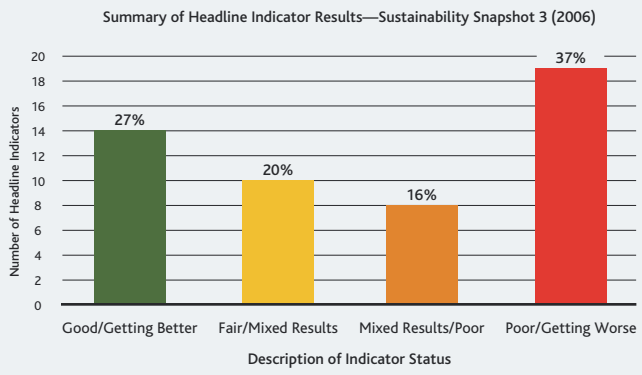
Water Quality & Quantity

Water Quality Index	FAIR/MIXED RESULTS—In 2003, 4 sites rated as Good, 3 were Fair, and 1 site was Poor.
Water Quality Trends	FAIR/MIXED RESULTS—In 2005, 1 site was Improving, 5 were Stable, and 1 site was Deteriorating.
Municipal Water Consumption	MIXED RESULTS/POOR—Total consumption has increased (21%) since 1991, but per capita consumption has dropped (7%).

The tables on these two pages represent highlights of each of the sustainability topics in this report. The highlights focus on two or three headline indicators for each topic and a description of the status of those indicators. This is intended as a helpful synthesis, not an exhaustive summary of all of the indicators or data in this report.

The status of each of the indicators is characterized using one of the following descriptions, which can be considered on a spectrum from best to worst:

- **GOOD/GETTING BETTER**—The current state is good and/or the trend is improving when comparing the present to the past. To be given this status, the data must be good or improving for the Fraser Basin as a whole, a significant majority of the Basin regions, or for British Columbia (if data are unavailable for the Basin).
- **FAIR/MIXED RESULTS**—The current state is fair and/or the trend is stable with minimal variation over time. Mixed results refer either to variations within the sub-regions of the Fraser Basin, or to variations between sub-indicators (some are getting better and some are getting worse). To be given this status, more than half of the sub-regions or sub-indicators are fair, good or improving.
- **MIXED RESULTS/POOR**—The current state is poor and/or the trend is stable or getting slightly worse over time. Mixed results either refer to variations within the sub-regions of the Fraser Basin, or to variations between sub-indicators (some are getting better and some are getting worse). To be given this status, more than half of the sub-regions or sub-indicators are poor, or deteriorating.
- **POOR/GETTING WORSE**—The current state is poor and/or the trend is deteriorating when comparing the present to the past. To be given this status, the data must be poor or deteriorating for the Fraser Basin as a whole, a majority of the regions, or for British Columbia (if data are unavailable for the Basin).



// Inspiring Others on the Path to Sustainability //

Sustainability is a journey we share. Because the journey can be long, the path full of twists and turns, and the route uncertain at times, we all benefit from help along the way.

Sustainability indicators, such as those in *Snapshot 3*, can serve as a map and compass. They are a navigational tool to help show us the direction we are headed, and alert us to deviations in course. What is critical is that we keep our references in hand as we reflect, listen to each other, and agree on the important destinations in the journey toward sustainability. Then we can use the information to decide how best to move forward. It takes both head and heart to make a start, walk with wisdom, and stay on track.

As individuals, families, citizens, employees, investors, government policy-makers and business managers, we all have choices we can make to improve the social, economic and environmental quality of the life we share. Every day it's within our power to make choices that support sustainability, and to know we have done our best to inspire action by others.

The Fraser Basin Council is committed to the vision of "social well-being supported by a vibrant economy and sustained by a healthy environment." It is in this spirit that we have devoted time, energy and thought to the indicators and reporting reflected in *Sustainability Snapshot 3*.

Let this report—and others like it—serve as one of your reference tools. May it prompt fresh reflection, new dialogue and meaningful action. Let it shape our day-to-day choices for sustainability at home, at work and at play—in all communities of the Fraser Basin.

// Acknowledgements //

The 2006 State of the Fraser Basin Report: Sustainability Snapshot 3 would not have been possible without the support of the many people who provided data and information, technical expertise, research and writing, and financial assistance. The Council would like to express its sincerest thanks and gratitude to these supporters.

In addition to the Fraser Basin Council's Board of Directors, a special committee of the Board—the Sustainability Indicators Task Committee—provided oversight for this initiative between the spring of 2005 and the fall of 2006. Other advisors contributed guidance, feedback and advice on information sources, as well as the analysis and interpretation of trends. These included Fraser Basin Council Directors, staff and numerous individuals with expertise across a wide range of sustainability issues, including indicators and reporting. For a complete list of data and information sources, see the references and footnotes for each sustainability topic.

A talented team collaborated on this report. Special thanks go to Clare Mochrie, Amy Leighton, Alastair Moore, Carley Taylor, Nathan Cardinal, Karl English, Bob Bocking and Troy Nelson, who worked with several Council staff—Steve Litke, Denise Palmer, Joan Chess and Jim Vanderwal—as researchers and contributing writers.

The Council would also like to thank Western Economic Diversification Canada, and all the sponsors noted on this page, for their financial support of the report and the 2006 State of the Fraser Basin Conference.

// We want your feedback //

This report was shaped, in part, by feedback and suggestions received following the release of the *2004 Sustainability Snapshot 2* report and dialogue at the 2004 State of the Fraser Basin Conference. The Council values the insights and perspectives of individuals, government representatives, people in the business community and those in civil society.

Once again, we invite your feedback. Please let us know:

- ➜ Is the report useful in helping you better understand sustainability?
- ➜ Is the report useful in guiding your actions and decisions to advance sustainability?
- ➜ In what ways are you using the report and the indicators?
- ➜ What suggestions do you have to improve our next Sustainability Snapshot two years from now?

A feedback form is available on the Fraser Basin Council website (www.fraserbasin.bc.ca), or by request. In addition, the Council will undertake an ongoing evaluation on the use of the Snapshot report and the sustainability indicators. If you are interested in participating in this process, please contact Steve Litke.

// More information //

For information on the Fraser Basin Council's Sustainability Indicators Program, contact:

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Email: slitke@fraserbasin.bc.ca

// Watch for the online versions //

Sustainability Snapshot 3 will be available on the Fraser Basin Council website in PDF in November, 2006. In January 2007, check back for an HTML edition, featuring an expanded version of many of the indicator reports: see "Publications" at **www.fraserbasin.bc.ca**.

// Mark your Calendars! //

The next State of the Fraser Basin Conference
January, 2009