

NEW BRUNSWICK
AND CLIMATE CHANGE
**BUILDING ON
THE FOUNDATION**

2012-2013 | **PROGRESS
REPORT**



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Executive Summary

The issue of climate change touches New Brunswickers across the province, from the people affected by sea level rise and increasing flooding to the wide-ranging actions led by industries, businesses and individuals to reduce GHG emissions.

Since the release of the first *New Brunswick Climate Change Action Plan (NBCCAP)*, New Brunswick has made significant progress in reducing greenhouse gas (GHG) emissions and increasing the climate resiliency of communities.

Several departments and agencies have collaborated on climate change adaptation and emission reduction activities across the New Brunswick government. In addition, many communities and non-governmental organizations have raised awareness and understanding of climate change issues. Detailed information about the progress reported for 2012-2013 is included in this report.



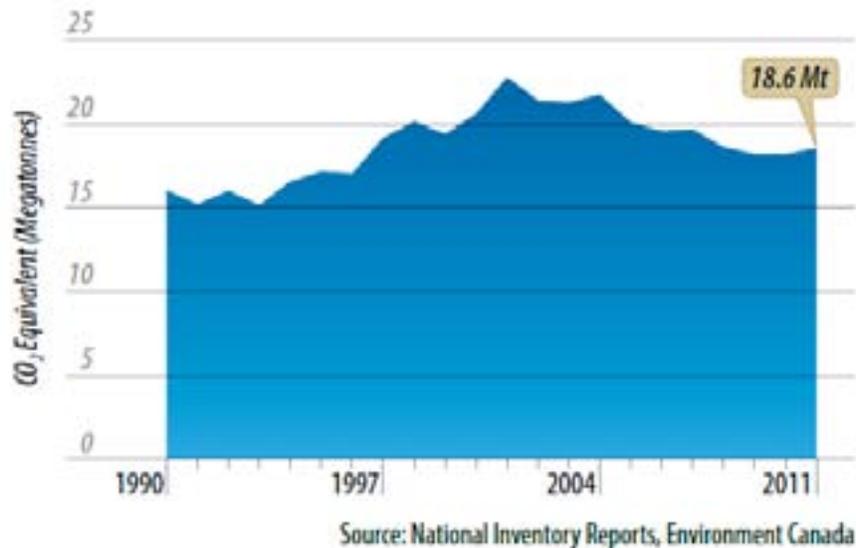
The New Brunswick Situation

New Brunswick Greenhouse Gas (GHG) Emissions

Figure 1 shows New Brunswick's Annual GHG Emissions from 1990 to 2011. In 2011, GHG emissions from all sources amounted to 18.6 megatonnes (Mt) of carbon dioxide equivalent (CO₂ eq.), 2.6 per cent of the Canadian total. In 2011*, New Brunswick total emissions returned to 2009 level with large industries and electricity generation falling by 8.9 per cent.

The GHG emissions represented in Figure 1 appear different compared to charts in previous reports, since Environment Canada modified data reporting methodology for all sectors from 1990 through to 2011. This affects the data slightly but the relative change in GHG emissions remains essentially the same.

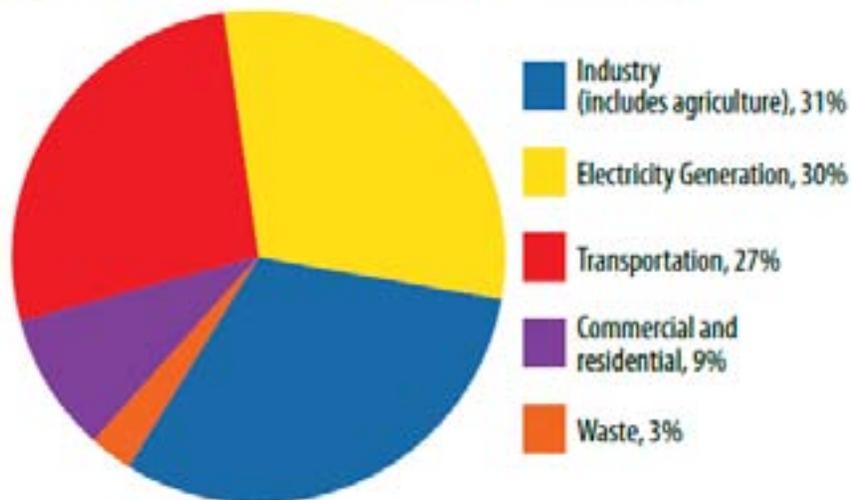
Figure 1: New Brunswick Annual GHG Emissions



*2004 data was used as the most recent baseline year available when developing the *New Brunswick Climate Change Action Plan 2007-2012*. The most recent data from Environment Canada is for 2011.

Figure 2 shows a breakdown of those emissions for 2011. Industrial emissions including agriculture accounted for 31% per cent of the province's emissions. Electricity generation accounted for 30 per cent of total emissions, down from 13 per cent in 2004. Transportation accounted for 27 per cent. Emissions from commercial and residential buildings accounted for nine per cent of the province's emissions and waste accounted for three per cent. Lower energy demand, growth in wind energy and electricity purchases from neighboring utilities contributed to the reduction in GHG emissions from electricity generation.

Figure 2: New Brunswick GHG Emissions in 2011 – 18.6 Mt



Source: National Inventory Reports, Environment Canada

Actions to Reduce or Avoid GHG Emissions

“Using Energy more efficiently is a key factor in achieving greenhouse gas emission reductions and it makes our energy system less expensive to operate”. NBCCAP

The New Brunswick Climate Change Action Plan focuses on actions to reduce current GHG emissions and to manage future emissions. The Province established GHG reduction targets in the areas of energy efficiency and renewable energy, transportation, waste management, industrial sources and electricity generation.

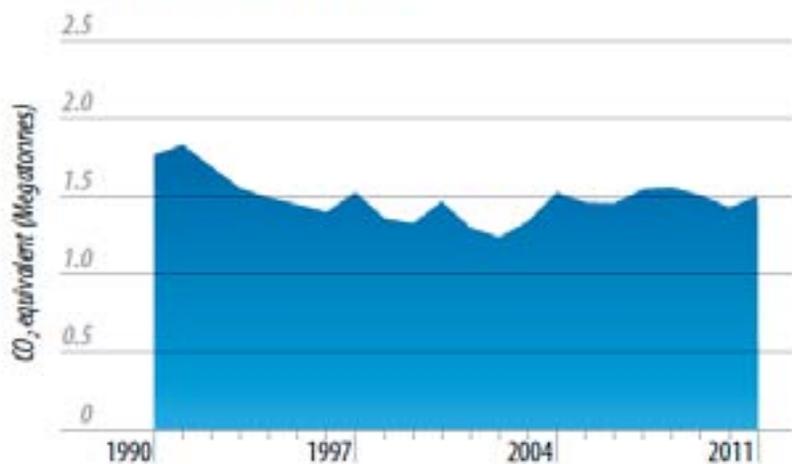
Progress in 2012-2013

Energy Efficiency and Renewable Energy

“Cleaner energy options are being made more widely available, and programs are being implemented to help ensure that all types of energy will be used more efficiently.” NBCCAP

Figure 3 shows that initiatives in energy efficiency and renewable energy have reduced GHG emissions in commercial and residential sectors over time. In 2011, total emissions from these sectors were 1.5 Mt, 300,000 tonnes lower than the 1990 level.

**Figure 3: Energy Efficiency and Renewable Energy
(commercial and residential)**



Source: New Brunswick Department of Environment and Local Government

Department of Agriculture, Aquaculture and Fisheries:

- in addition to funding available through Efficiency NB, supplied funding to three agricultural producers through the Canada-New Brunswick Growing Forward Agreement to assist them to implement energy efficiency upgrades identified in their on-farm energy audits.

Efficiency NB – Commercial Sector:

- provided assistance for 311 buildings, through the Efficiency NB's Energy Smart program (Existing Building Retrofit), by the end of 2012-2013. These buildings have reduced their annual energy consumption by 192 terajoules (TJ) and associated annual GHG emissions by 24,700 tonnes;
- increased participation in the Start Smart Modelling Path program for new buildings, resulted in 49 projects with estimated annual energy savings of 54.1 TJ and associated reductions in annual GHG emissions of 7,300 tonnes; and
- increased participation to 11 in the Core Performance Prescriptive Path program, Commercial Buildings Incentive program.

Efficiency NB – Residential Sector:

- processed 3,969 applications under Residential Energy Efficiency Programs: Existing Buildings (REEP-EB). The estimated reductions in annual GHG emissions from upgrades done as part of the existing buildings program, since program inception, equals 115,700 tonnes; and
- processed 710 applications under the Residential Energy Efficiency Programs: New Construction (REEP-NC). The estimated reductions in annual GHG emissions from construction of new residential buildings participating in REEP-NC, since inception of the new construction programs, equals 20,780 tonnes per year, which includes the reductions in GHG emissions from 10 Net Zero REEP-NC projects.

Department of Environment and Local Government:

- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided more than \$99,000 for four GHG reduction projects:
 - The NB Lung Association continued a program to reduce household electrical consumption by providing consumers with real time information about their energy usage, along with information on actions which will further reduce consumption.
 - The K.C Irving Chair in Sustainable Development at the U de Moncton examined the use of a renewable energy source, forestry biomass, in the production of electricity and heat in New Brunswick.
 - EOS Eco-Energy established and promoted a sustainable transportation system in the Tantramar region.

Department of Energy and Mines:

- through the New Brunswick Energy Blueprint required NB Power to supply renewable energy to a minimum of 40 per cent in province sales. This also includes locally owned small scale renewable energy generation opportunities for First Nations and community owned renewable energy projects.

Department of Natural Resources:

- continued to implement the Allocation of Crown Lands for Wind Power Projects policy to allocate Crown lands for wind power exploration and wind farm development. The department has 14 active license holders conducting wind exploration on approximately 71,002 hectares (ha) of Crown lands and 3 active leases on Crown lands for production of wind power with TransAlta Corporation, Caribou Wind Park GP Limited, and Acciona Lameque GP Inc. accounting for a total of 294 megawatts (MW) over an area of 87 ha; and
- continued to facilitate Tidal In-Stream Energy Conversion (TISEC) exploration and development through the issuance of appropriate tenure of submerged Crown lands.

Department of Tourism, Heritage and Culture:

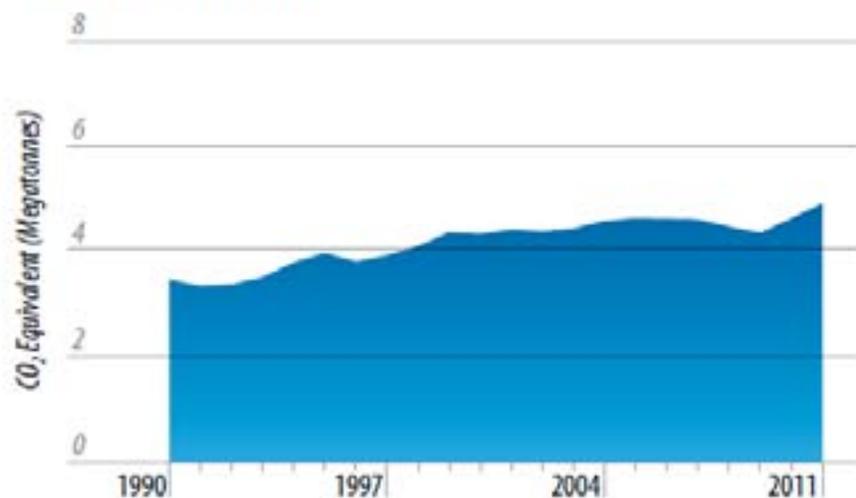
- had energy audits completed by MCW Maricor for Mactaquac and Mount Carleton provincial parks. The audit reports have assisted the Parks in updating their operations and infrastructure;
 - as a direct result of the audit, MCW identified Mactaquac as a candidate for inclusion in NB Power's Power Shift Atlantic Project. A Steffes Electric Thermal Storage unit was installed at the Park administration building;
 - more energy audits will be carried out at the Provincial Parks in the future;
- installed five solar hot water systems in the Provincial Parks, including Mactaquac, De la République, Parlee Beach and Mount Carleton. These systems were installed on the comfort stations (washrooms/showers) within the campground portions of the Parks; they will not only assist lowering utility costs and emissions, but will serve valuable awareness and learning tools for staff and visitors; and
- installed 9kW and 500W photovoltaic systems at Mount Carleton Park (www.renewablesnb.ca/en/2010/9kw-and-500w-photovoltaic-system-at-mount-carleton/). This park is investigating the possibility of installing micro-hydroelectric systems with NBCC.

Transportation

“The Province will work to improve transportation options and help consumers make informed decisions about vehicles, fuels and transportation in general.” NBCCAP

Figure 4 shows that in 2011 emissions in the transportation sector increased by 0.3 Mt compared to 2010, which is primarily due to an increase in freight transportation while emissions from passenger transportation remained relatively stable.

Figure 4: Transportation



Source: New Brunswick Department of Environment and Local Government

Department of Agriculture, Aquaculture and Fisheries:

- contributed to the promotion and awareness of local agri-food products which has resulted in an increase in the sale and consumption of local products. This reduces the food miles and transportation associated with the movement of food.

Department of Energy and Mines:

- as per Federal blending requirements, ethanol must be blended in gasoline. Biodiesel regulations will require blending in diesel by the end of 2013.

Department of Transportation:

- continued work at Weight-in-motion (WIM) sites. There are 5 WIM sites in the Province. WIM sites significantly reduce GHG emission from idling, starting and stopping of heavy commercial vehicles at conventional scales;
- continued to invest in strategic infrastructure to improve efficiency in the movement of goods and people;

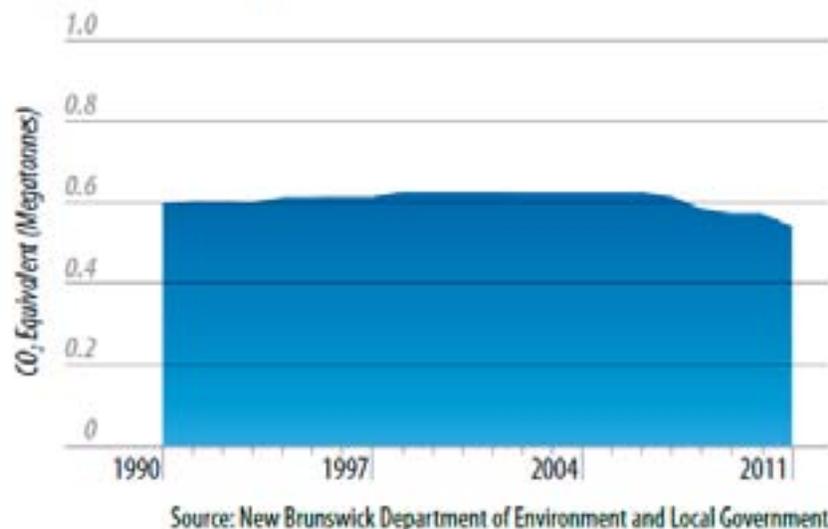
- continued to work with the Transportation and Air Quality Committee of the New England Governors and Eastern Canadian Premiers to examine options to reduce GHG emissions in the transportation sector;
- continued issuing special permits to operate long combination vehicles (LCVs) on highways in New Brunswick. This type of vehicle configuration allows greater volumes of cargo to be hauled with the same power unit and results in fuel savings of about 40 per cent; and
- continued issuing special permits for the use of single wide tires.

Waste Management

“New Brunswick has an action plan to reduce and divert waste in order to address broad waste management issues.” NBCCAP

Figure 5 shows that emissions from landfills have been declining and were 500 kilotonnes (kt) in 2011, or 100 kt below 1990 levels. This reduction is due to improved landfill gas and waste management practices.

Figure 5: Waste Management



Department of Environment and Local Government:

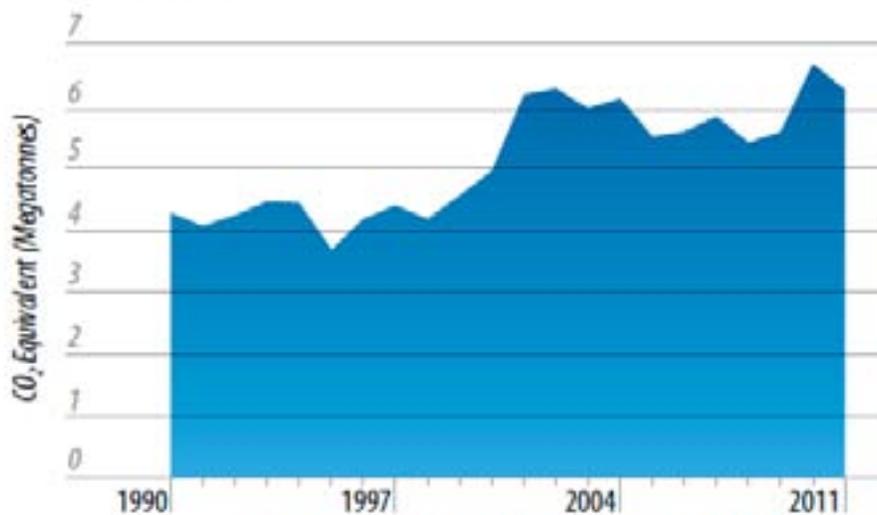
- continued to support the installation of methane management systems by the regional solid waste commissions. All six landfills located in Regional Service Commissions 1, 3, 7, 9, 10, and 11 are collecting landfill gas. Regional Service Commissions 1, 9 and 11 are using landfill gas to generate electricity. Regional Service Commission 7 is in the early implementation stage of acquiring an electricity generator.

Industry

“The Province will work with New Brunswick Industries and the federal government to help ensure there is fairness and consistency in implementing emissions standards for industrial sources among industry sectors, provinces and territories.” NBCCAP

Figure 6 depicts industry emissions (excluding agriculture) from 1990 to 2011. GHG emissions from large industrial facilities declined to 4.9 Mt in 2011, but remained 2.2 Mt higher than in 1990 due to increased activity in the resource extraction sectors.

Figure 6: Industry



Source: New Brunswick Department of Environment and Local Government

Department of Agriculture, Aquaculture and Fisheries:

- funded the continued development of Nutrient Management Planning to help producers optimize nutrient usage which reduces nitrous oxide, a potent GHG;
- continued to provide financial assistance to agricultural producers, funding of agro-environmental clubs to ensure that nutrient management expertise is available to producers, and ongoing operation of the New Brunswick Soil and Feed Laboratory; and
- funded several research projects through the Enabling Agricultural Research and Innovation Component of the Canada-New Brunswick Growing Forward Agreement. Two projects targeted improved efficiency in the use of nitrogen fertilizer and one project looked at reducing petroleum usage in the burning of blueberry fields.

Department of Economic Development:

- provided more than \$2 million in investments to more than 100 projects with New Brunswick businesses through Financial Assistance to Industry, NB Growth, and Technology Adaptation (Adoption) and Commercialization Programs; and
- through New Brunswick's export development branch, assisted firms to participate in trade development activities in international markets. The department assisted Atlantic Canadian firms to attend Green Build in San Francisco.

Efficiency NB – Industry Sector:

- implemented projects, as part of the Small and Medium Industry program which are providing annual energy savings of 54.8 TJ and associated annual reductions in annual GHG emissions of 6,100 tonnes; and
- implemented projects as part of the Large Industry program which are providing annual energy savings of 2,880 TJ and associated annual GHG reductions of 194,100 tonnes.

Department of Environment and Local Government:

- continued to ensure that emissions in the province are minimized as much as practically possible through the Environmental Impact Assessment process and other approvals processes. Approvals to Operate are only issued once an industrial operation has installed or upgraded equipment or has implemented technology that can meet air quality standards. Approvals to Operate are reviewed and issued every 5 years for each facility.

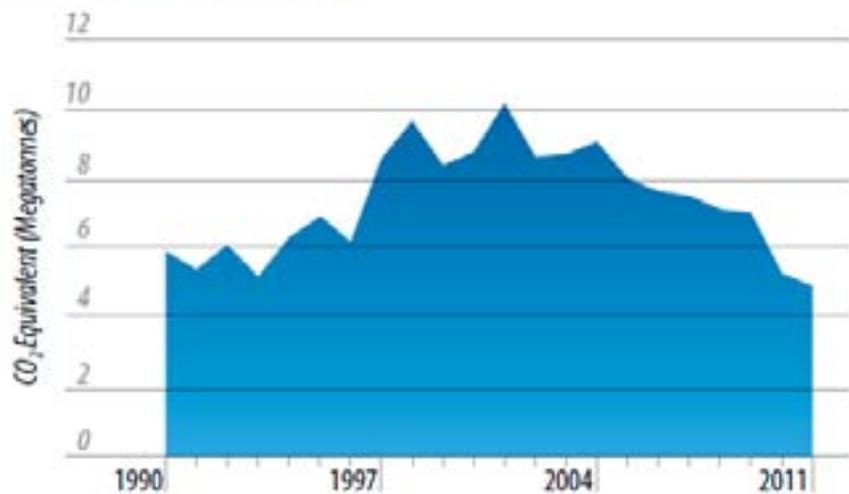
Department of Natural Resources:

- continued to work with the National Forest Carbon Sinks committee and supplied their analysts with Crown and Private forest land forecasting models. These are contributing to ongoing national forest carbon balance assessment.

Electricity Generation

Figure 7 depicts electricity generation emissions from 1990 to 2011. Electricity generation emissions were 1 Mt below 1990 levels in 2011. The reduction is due to the closure of the coal-fired power plant at Grand Lake in 2010 and an increase in renewable energy production, including wind power.

Figure 7: Electricity Generation



Source: New Brunswick Department of Environment and Local Government

NB Power:

- reduced its GHG emissions from a high of 9.94 million tonnes in 2001 to 2.88 million tonnes in 2011;
- explored other renewable energy options such as small hydro, tidal power, biomass co-firing and electricity generated from landfill gases;
- completed an Efficiency Plan in conjunction with municipal utilities and Efficiency NB. Efficiency NB is on track to begin rolling out the first of the new programs identified in the plan in the fall of 2013;
- announced the light-emitting diode (LED) Street Light Replacement Program. The current stock of 72,000, mainly High Pressure Sodium (HPS), street lights will be replaced with LED street lights over a 5 year period. Demonstration phase started on October 1, 2013 and will run for a 1 year period;
- continued with the PowerShift Atlantic project (3.5 years into a 4.5 year project). NB Power is approaching the completion of a load shift of 15 to 17 MW (across the Maritimes) which includes 1300 to 1500 customers. Focus is on load shifting of water heaters, electric thermal storage and energy management systems in buildings to off peak periods allowing NB Power to run fossil fuel power plants less;
- entered into a multi-year agreement with Siemens Canada to integrate Smart Grid technology into the province's electrical system and create a Centre of Competence. Smart

Grid programs will enable customers to control and manage their energy usage. Customers will have more choices about how and when they use their electricity in the future, including:

- smart communicating thermostats,
 - energy smart appliances,
 - self-serve options for energy shifting,
 - information dashboards,
 - modern energy thermal storage devices;
- encouraged energy-consumption awareness through Earth Hour participation on Saturday March 23, 2013 by encouraging all New Brunswickers to join the marking Earth Hour 2013 by powering down between 8:30-9:30 pm.

Future Energy Opportunities

“Acting upon and exploring future energy opportunities will contribute to providing New Brunswick with the flexibility to make future choices in growing our communities and economy. Many opportunities exist to continue developing an economically sound, diverse and sustainable electricity sector.” NBCCAP

Department of Agriculture, Aquaculture and Fisheries:

- conducted field trials on several varieties of grasses with potential use for bioenergy;
- contracted laboratory evaluation of these varieties with the Canadian BioEnergy Centre; and
- funded several research projects through the Enabling Agricultural Research and Innovation Component of the Canada-New Brunswick Growing Forward Agreement. Five projects focused on the production, harvest and evaluation of biofuels.

Government Leading By Example

“The Province will use the leadership position of the public sector to demonstrate environmental practices and encourage sustainable practices within government and beyond.”

The Government is committed to building on the progress it has already made in reducing the environmental and emission impacts from the public sector’s operations.

Department of Government Services:

- continued to incorporate environmental guidelines in procurement contracts and tenders. The department has been involved with the following initiatives:
 - approximately 40 additional government buildings have been converted to natural gas,
 - vehicle purchases and or leases by the Province are based on fuel rating and fuel economy,

- new vendor-managed inventory system included many Environmentally Friendly Products (printer paper, post-it notes, etc.),
- Central Stores contract included a minimum order quantity to decrease the number of deliveries needed,
- variety of recyclable bags inventoried for recycling programs,
- departments are being strongly encouraged to use surplus assets, and recycle furniture, rather than purchase new,
- all cleaning supplies carried at Central Stores must be Environmental Choice Eco-Logo certified;
- met an Energy Star level for rated products in contracts or purchase orders for office equipment, building equipment and lighting systems:
 - Energy Star certification is required for the majority of appliances on the Appliance Contract for the Department of Public Safety,
 - IT Hardware must meet Gartner's Leaders Quadrant requirements which include green manufacture criteria and energy ratings,
 - new floor machine contract to include Energy Star rated products;
 - continuation of the print optimization program,
 - Leadership in Energy and Environmental Design (LEED) certified furniture is required for newly constructed office buildings.

Department of Social Development:

- through the Public Low Income Housing Program, invested approximately \$550,000 on efficiency-related upgrades. An estimated 255 tonnes of GHG emissions will be saved per year; and
- through the Green Building Policy, required all new construction and some renovation projects receiving funding under provincial programs to be built in compliance with the Green Building Policy. All buildings will meet or exceed Energuide 83 standards.

Department of Transportation and Infrastructure:

- continued to design PNB building guidelines, standards and projects to meet the requirements of the Provincial Green Building Policy;
- prepared standardization of the department's buildings for Leadership in Energy and Environmental Design (LEED) and Green Globe projects for use by architects and the consulting engineers (structural, civil, mechanical and electrical);
- in conjunction with the Department of Social Development, the following buildings are occupied and were designed and constructed to meet the Green Building Policy: Loch Lomond Villa Phase 1, Nashwaak Villa, Foyer Notre dame and Bathurst. There are seven nursing homes that are under construction: Loch Lomond Villa Phase 2, Mill Cove, Victoria Glen in Perth Andover, Jodin Edmundston, Villa Maria in St. Louis de Kent and Grand Manan. There are five new nursing homes in the design phase: Boiestown, Dalhousie, Mount Saint Joseph Miramichi, Villa de Repos Moncton and Kiwanis Sussex;
- in conjunction with the Department of Education and Early Childhood Development, achieved Three Globes Verification with Green Globes Canada, through the design and construction of École Ste. Bernadette. Two schools were designed and constructed using Green Globes: Moncton High and Woodstock Centennial;
- in conjunction with projects associated with the Department of Education and Early Childhood Development, and Department Post-Secondary Education, Training and Labour, Forensic Hospitals, and Correctional Centers:

- designed and constructed the following buildings to meet the Green Building Policy using the Canadian Building Council (CaGBC) LEED Silver Rating System. These buildings achieved LEED Gold Certification:
 - Eleanor Graham School,
 - Northrup Fry School,
- designed and constructed the following buildings to the Green Building Policy using the CaGBC LEED Silver Rating System:
 - Campbellton Forensic Hospital,
 - Dalhousie Correctional Centre,
 - E-Block NBCC Moncton,
 - Fredericton North Elementary,
 - NBCC Allied Health, Saint John,
 - NBCC Grandview, Saint John,
 - Rexton Health Centre,
 - Riverview Elementary,
 - Southeast Correctional Centre,
 - Southern Carleton, Woodstock,
- designed the CCNB Edmundston building to meet the Green Building Policy,
- invested \$300,000 at the Grand Falls General Hospital to complete a wood biomass interface project. The biomass plant which is designed to utilize wood pellets is being constructed under a renewable energy agreement and is scheduled to be commissioned in December 2013. The project is expected to reduce light oil consumption of the hospital by 300,000 litres annually and GHG emissions by 8.2 kilotonnes;
- through the PowerShift Atlantic project, installed electric thermal storage units in several schools. This enables the utility to shift the time which energy is drawn from the grid to heat these facilities and run fossil fuel power plants less;
- invested in buses and plow trucks equipped with new diesel engines that are clean burning;
- constructed a secure building management network. Significant efforts were made to successfully transfer over 100 schools from a limited security network previously developed by the Department of Education and Early Childhood Development. While the network will be used to manage Education buildings it is also expandable for any other facility residing on the Government of New Brunswick network;
- continued to encourage anti-idling as part of the Green Vehicle Policy. The Green Vehicle Policy was introduced in 2006 to help make the government fleet more fuel-efficient and reduce GHG emissions. Anti-idling became effective June 1, 2007; and
- and completed the installation of GPS units on 430 plow trucks within the government fleet to reduce fuel consumption and increase operational efficiencies.

Adapting to the Impacts of Climate Change

“Climate change has already made impacts on New Brunswick communities, and they are unavoidable in the immediate future.” NBCCAP

The effects of climate change in New Brunswick are evident now, with more frequent and severe storm events, coastal erosion, and flooding. As a result, New Brunswick must continue to adapt to these changes and build resiliency to the impacts of climate change.

Progress in 2012-2013

Development of Policies

“Development in New Brunswick’s rural and urban areas must be carried out with consideration of the way it will contribute and respond to the effects of climate change.” NBCCAP

The Province must include climate change considerations in provincial plans and processes to promote its adaptive capacity. Climate-proofing development decisions are required at all levels of government.

Department of Environment and Local Government:

- continued work to develop a long-term wetland management strategy with potential to sequester GHG emissions; and
- began work on a provincial Flood Risk Reduction Strategy to address flooding of inland and coastal areas.

Managing Natural Areas

“Climate change will challenge present practices in the agriculture, aquaculture, forestry and traditional fishery sectors.” NBCCAP

Climate change will impact numerous sectors in the province.

Department of Environment and Local Government:

- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided \$41,000 for two projects in this category:
 - the Faculty of Forestry & Environmental Management at UNB:

- gathered information on the carbon sequestering properties of wetlands in order to gauge their value in terms of climate change mitigation and adaptation; and
- produced a report on the potential macro-level ecosystem change in the biota of NB terrestrial ecosystems under different global warming scenarios.

Department of Natural Resources:

- identified candidate Protected Natural Areas (PNAs) as part of the government strategy. Consultation on additional PNAs was conducted in the fall of 2012. Drafting of the legislation to designate new PNAs, aimed at doubling the Crown PNA land base, is to be completed in 2014-2015;
- adjusted field activities to enhance the work on general detection of declining forest health and forest insect and diseases given that there are a large number of insects and diseases pests for which the department cannot do targeted surveys; and
- improved the process for general surveillance, and Pest Management to ensure early detection of potential threats to forest health.

Risks and Damages

“It is important to transfer our scientific knowledge of how our environment is being affected by climate change to the development of applied solutions for government, businesses, and communities.” NBCCAP

Identifying and assessing both potential risks and opportunities of climate change is critical. A number of communities have become engaged to reduce the risks and maximize opportunities arising from a changing climate. The following includes progress in regards to monitoring, research, and planning for risks and damages.

Monitoring

Department of Environment and Local Government:

- continued the review and strengthening of monitoring networks, both internal and external to department:
 - efforts continued to improve the assessment of lakes and their vulnerabilities to algal blooms and establish partnerships with local lake associations for monitoring and stewardship,
 - a standardized river ice observation system was tested to improve the quality and availability of ice cover condition data for current use and future trending,
 - snow pack water equivalency monitoring was extended to additional areas for improved seasonal monitoring of precipitation for assessments of water availability and flood risk,
- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided \$36,000 for two projects:

- Mount Allison University monitored and collected data on the use of breaching dykes as a method of restoring salt marshes and adaptation to sea level rise and climate change.
- The Société des Estuaires et du Littoral extended the study area of its coastal erosion monitoring program.

Research

Department of Environment and Local Government:

- continued the testing and configuration of flood forecast models using a new forecasting platform within the Hydrology Center. Parallel forecasting comparisons under various climate and runoff scenarios assisted in ongoing model refinement and adjustments. Improved reporting capabilities were delivered by the new forecasting environment; released a comprehensive database on historic floods in the province via a web portal, which will help inform communities of current and future flood vulnerabilities;
- updated a map of ice jam dates and locations for the Saint John River and posted on the web;
- produced several modeled future water temperature scenarios to understand thermal aquatic temperature vulnerabilities and impacts on aquatic life systems;
- in collaboration with R.J. Daigle Enviro, released the document *Sea Level Rise and Flooding, What They Mean for New Brunswick's Coastal Communities* (November 2012);
- oversaw the management of numerous projects supported the Atlantic Regional Adaptation Collaborative (RAC). Final reports were submitted to Natural Resources Canada summarizing the work completed and key findings and recommendations. All reports, maps, tools and other outputs were organized on a common web portal at <http://atlanticadaptation.ca/>;
 - Acadian Peninsula:
 - *Érosion et infrastructures à Sainte-Marie-Saint-Raphaël, Péninsule Acadienne, Nouveau Brunswick, Université de Moncton (Campus de Shippagan, Moncton) et Geomediatrix Innovations Inc., Novembre 2012;*
 - *Projet de la Péninsule acadienne, Rapport de recherche technique équipe « Photographie et cartographie », Université de Moncton, GeoLittoral Consultants, Mai 2012;*
 - Moncton:
 - *Climate Change Adaptation and Flood Management Strategy, City of Moncton, June 2013;*
 - Richibucto:
 - *A Case Study of Coastal Aquifers near Richibucto, New Brunswick, Saline groundwater Occurrence and Potential Impacts of Climate Change on Seawater Intrusion, October 2012;*
 - Tantramar:
 - *Forecasting Economic Damages from Storm Surge Flooding : A Case Study in the Tantramar Region of New Brunswick, Mount Allison University, October 2012;*
 - *Tantramar Dyke Risk Project: The Use of Visualizations to Inspire Action, Mount Allison University, August 2012;*
 - *Visualizations and their Role in Communicating the Risk of Coastal Flooding: a Tantramar Case Study, Mount Allison University, October 2012;*
 - *Food, Floods and Farms: Agricultural Vulnerability to Sea-Level Rise in New Brunswick's Tantramar Dykelands; Mount Allison University – Master's Thesis, May 2013;*

- Climate Change Adaptation – A Toolkit for Sackville, Port Elgin, Dorchester, Memramcook, EOS Eco-Energy Inc, April 2013;
- worked in collaboration with the other three Atlantic Provinces to produce the final regional report summarizing all outcomes and learnings of the RAC projects from 2009-2012. This report was completed and submitted to Natural Resources Canada in accordance with the RAC contribution agreement;
- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided \$95,000 for four projects:
- the Restigouche River Watershed Management Council undertook a geomatic analysis to identify thermal refuges on the river system. Data will be utilized in the protection of Atlantic Salmon habitat;
- the Miramichi Salmon Association continued to examine water temperature data in relation to fish health on the Miramichi River system;
- the University of New Brunswick undertook an evaluation of the economic impact of climate change on the New Brunswick and Nova Scotia transport corridor; and
- the Université de Moncton studied the impact of climate change on the quality of surface and drinking water by developing and applying a model to predict water temperature from air temperature.

Planning

Department of Agriculture, Aquaculture and Fisheries:

- assisted the Department of Transportation and Infrastructure with the completion and construction of dykes upstream of the Petitcodiac causeway to meet future sea level rise predictions for the protection of farmland as part of the Petitcodiac Restoration; and
- continued to support Environmental Farm Plans and Beneficial Management Practices implementation including those aimed at mitigating and adapting to climate change.

The Department of Environment and Local Government:

- completed the development of and launched a web-based information tool providing information on current climate conditions in New Brunswick and predicted future climate to the year 2100. Information is presented in the form of maps with accompanying text. Mapping was completed for four time periods, two GHG emission scenarios and 14 climate parameters;
- finalized and released a web page providing detailed information on climate change indicators (figure 8 - extreme rainfall indicator). The web page provides local information to help New Brunswickers better understand how the climate is changing. Each indicator shows a chart to demonstrate what is happening in New Brunswick, why it is important, and what is predicted. The web page can be found at: www.gnb.ca/climatechange;

Figure 8 – Extreme Rainfall Indicator



Source: New Brunswick Department of Environment and Local Government

- in collaboration with the Atlantic Climate Adaptation Solutions Association (ACASA), Natural Resources Canada, and the Department of Public Safety organized a major conference, *Preparing for Climate 2100 – Tools for NB Communities*. The conference was held in Fredericton and showcased the results of the New Brunswick Regional Adaptation Collaborative. It was attended by over 200 participants and featured presentations from experts in the field of climate change, and panels moderated by leading practitioners. Presentations and workshop materials are available on the ACASA website at: <http://atlanticadaptation.ca/node/260>;



- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided more than \$484,300 for 13 projects:
 - The City of Miramichi developed a Climate Change Adaptation Strategy to facilitate decision making in matters related to the changing climate.
 - Mount Allison University:
 - utilized LiDAR elevation data to produce land cover mapping and develop climate change adaptation strategies for the Tantramar dykelands;
 - expanded their prototype web-based map viewer for the communication of climate change-related risks to other areas of the province.
 - The Faculty of Forestry & Environmental Management at UNB:
 - continued mapping and classifying potential inland and coastal hydrological risks for the NB coastline using provincial data layers and images;
 - continued LiDAR-based mapping across the Province.
 - The University of New Brunswick provided academic support on climate change adaptation in coastal and river system areas.
 - The Institut de recherche sur les zones côtières worked with municipalities and scientists in developing planning tools to address the impacts of climate change.
 - EOS Eco-Energy established a collaborative forum including wide representation in the Tantramar community to foster community-directed priorities and actions in response to the challenges of climate change.
 - Ducks Unlimited investigated controlled breaching of sections of agricultural dykes on the Beausejour Marshland, and developed best management practices for future dyke realignments in the Bay of Fundy.
 - The Association des résidents et résidentes du Cap Bimet undertook measures to protect the dune at Cap Bimet.
 - The Coalition des bassins versants de Kent-sud assessed the effectiveness of various types of sand dune restoration.
 - The Plage Nicholas Beach Residents Association protected the dunes and increase public awareness of this sensitive natural area.
 - The Town of Tracadie-Sheila studied coastal infrastructure and erosion in the context of climate change adaptation and long-term planning.

Department of Health:

- in partnership with Health Canada, further developed the Heat Alert and Response System (HARS) in Fredericton to reduce the rate of heat-related illness in the province. Due to climate change, forecasters predict that Fredericton will have a significantly greater number of days exceeding a humidex of 40°C; and
- developed a new category of licensed on-site sewage system installer for non-conventional sewage disposal systems. This will be beneficial to property owners who may experience a reduction in lot size as a result of climate change (e.g. flooding, sea level rise) and will assist in reducing risks to public health and the environment.

Department of Public Safety – New Brunswick Emergency Measures Organization (NB EMO):

- continued to improve the regionalization of emergency services that was initially started with the Charlotte County Project in 2011, and hired six Regional Emergency Management Coordinators. These coordinators are located throughout the province and their role is to work collaboratively with local and municipal governments or their agents to enhance and standardize emergency readiness on a regional basis. This capability will complement the new regionalization of government services and serve as a vehicle through which municipalities, rural communities, local service districts, non-government agencies and industry can plan and pool resources in order to enable a more effective and uniform response to emergency situations across the region and the province. The coordinators will have four main areas of responsibility; emergency planning, leading emergency response operations, recovery assistance and emergency training coordination, and will create an integrated Regional Emergency Plan that conforms to the provincial standard for each of the 12 regions that will support the Government Renewal Office initiative to improve regional emergency response capacity;
- continued to work with municipalities to enhance flood mapping predictions and warning. NB EMO has developed a new flood warning mapping application using Service New Brunswick's (SNB's) GeoNB mapping service which provides improved situational awareness and flood alerts during River Watch; and
- in partnership with Environment and Local Government, used SNB's GeoNB platform to create flood maps in areas prone to flooding using past events as a reference point.

Department of Tourism, Heritage and Culture:

- continued to adjust the Provincial Tourism Strategic Plan to accommodate climate change adaptation strategies and realign tourism product development actions to reflect climate change impacts;
- continued to monitor potential impacts of climate change on provincial tourism assets; and
- considered the impacts of climate change, as provincial parks complete lifecycle infrastructure upgrades.

Partnerships and Communications

“Our ability to manage our environment in a sustainable manner, reduce emissions and adapt to climate change impacts relies on our recognition that acting to protect the environment is a shared responsibility.” NBCCAP

Collaboration is an important element in climate change actions. Cooperation with partners and communities and the ability of New Brunswickers to build relationships are key factors in the success of the province’s ability to adapt through a changing climate.

Progress in 2012-2013

Partnerships with Communities and Working with Stakeholders

“The Province acknowledges that communities will play a critical role in greenhouse gas emissions reductions and adaptation strategies to address climate change impacts.” NBCCAP

While the provincial government has an important role to play in ensuring New Brunswick is resilient to climate change, some of the most important decisions will be made by individuals and groups at the local level.

Department of Agriculture, Aquaculture and Fisheries:

- worked with the New Brunswick Agri-food Industry Market Development Advisory Committee on developing and improving local markets and the "Buy Local" campaign. The Agri-food Market Development Program provided assistance to producers for the promotion and awareness of local agri-food products which resulted in an increase in sales and consumption.

Department of Environment and Local Government:

- administered the Gas Tax Fund in 2012, which supported 53 projects to reduce GHG emissions;
- continued to work with communities and developers and provided information and training sessions to numerous partners and stakeholders in partnership with the Canada Mortgage and Housing Corporation, Efficiency NB, and the Association of Municipal Administrators of New Brunswick to encourage the implementation of sustainable community design (SCD) at the local level;
- presented workshops on “Place and Health: Shaping the Built Environment of New Brunswick and Prince Edward Island” exploring how to use design to build healthier environments that fit with the governmental and local response to climate change;

- promoted the concept of integrated planning in relation to climate change for projects, reviews, and working committee groups; and
- in conjunction the Association of Municipal Administrators continued to administer a project funded by the New Brunswick Environmental Trust Fund, which will promote the use of the conservation design concepts in the development of subdivisions.

Public Education and Outreach

“The Province recognizes that public awareness and education initiatives are essential in engaging people in making choices that both reduce greenhouse gas emissions and respect the challenges of a changing environment.”

There is an increasing need for the collection, organization, and dissemination of climate change information and tools throughout the province. Departments, agencies and non-governmental organizations assisted in disseminating climate change information and delivering climate change education and outreach.

Department of Environment and Local Government:

- with support of the RAC program, provided funding and logistical support for the production of a series of high-quality film documentaries on climate change in New Brunswick and Atlantic Canada. An associated photo exhibit was also produced. The film and photo material was launched in November 2012 in Fredericton and subsequently toured around the region;
- developed a series of 11 information banner displays presenting results of projects completed through the RAC initiative in New Brunswick. The displays were toured to numerous locations including government and municipal offices;
- delivered presentations at workshops, conferences, information sessions, home shows and events to raise awareness of GHG emissions reduction and climate change adaptation;
- developed partnerships with various agencies, communities, departments, groups, organizations and schools to assist in delivering climate change outreach initiatives;
- continued to administer projects funded by the New Brunswick Environmental Trust Fund, which provided more than \$630,335 for 29 projects:
 - Bathurst Sustainable Development:
 - partnered with the local solid waste commission to assist local elementary schools in implementing green plans; and
 - continued to operate a Climate Change Action Centre which provided information to the public about climate change, energy efficiency, reducing GHG emissions, and programs available to help address climate change.
 - Cape Jourimain Nature Centre:
 - partnered with other organizations to deliver environmental educational programs with an emphasis on climate change;
 - promoted the use and adoption of renewable energy technologies at a provincial level.
 - Falls Brook Centre:
 - continued to operate a Renewable Energy Information and Assistance Centre for North-Western New Brunswick. The centre provided information on renewable

- energy technologies, linked people with demonstration sites, and provided advice on adopting renewable technologies; and
 - o collaborated with various education facilities to help them reduce their energy consumption.
- The City of Fredericton, Green Matters program,
 - o expanded its outreach to include more discussion on broad spectrum sustainability, including energy efficiency; and
 - o attracted businesses to Green Shops, program aimed at assisting businesses reduce their GHG emissions) and non-commercial organizations to the program by expanding on their existing outreach and educational endeavors.
- Nature NB - Species at Risk raised awareness on the importance of the role of sand dunes in the protection of coastal areas from storms and inclement weather.
- The Association of New Brunswick Land Surveyors developed material about property transaction issues in flood plains and areas affected by storm surges.
- The Bathurst College Foundation developed a manual on greenhouse culture and also raised awareness amongst youth and adults about undesirable environmental practices regarding energy, air and water management.
- The Canadian Parks and Wilderness Society raised awareness regarding implementation of the NB Climate Change Action Plan as it relates to natural areas conservation, forest management, community planning and smart growth.
- The Climate Change Hub continued to improve public education and build capacity among communities with regard to reducing GHG emissions.
- The Conservation Council of New Brunswick continued a Renewable Energy Assistance Hub for Southwestern New Brunswick. The Council served as a clearinghouse of information on renewable energy, linked people with technology demonstration projects and provided advice on adopting renewables.
- The Edmundston area Chamber of Commerce worked with its members to help them adapt to the impacts of climate change and adopt better environmental practices.
- The Fundy Biosphere Reserve reviewed their collection of local knowledge and data sets to gain a better understanding of regional climate change.
- The Gaia Project offered sustainability education programs in schools. Students collected data on energy and water consumption, waste production, transportation and food in their schools and monitored improvements after changes had been implemented.
- The Groupe littoral et vie worked with coastal communities on the Northumberland Strait to better prepare them for the impacts of climate change.
- The Meduxnekeag River Association examined and raised awareness of the changes in weather and seasonal climate patterns over time.
- The NB Lung Association expanded upon the SIMPLE Driver Stewardship Program which is designed to encourage drivers to reduce fuel consumption and GHG emissions through the way they drive, maintain and purchase their vehicles.
- The New Brunswick Environmental Network engaged environmental groups in order to build public understanding of climate change impacts and support for adaptation activities at the community level.
- The Shediac Bay Watershed Association conducted educational sessions in schools and local businesses in order to promote energy and water conservation.
- The Société des Estuaires et du Littoral raised awareness of the impacts of climate change.
- The Sustainable Energy Group - Carleton Chapter:
 - o developed a sustainable energy guidebook promoting eco-friendly and sustainable living in NB; and

- held a trade show promoting eco-friendly and sustainable living in NB.
- The Tabusintac Watershed Association increased awareness and provided education on areas impacted by climate change.
- The Université de Moncton:
 - developed online course sessions on the impacts of climate change; and
 - examined the progress that NB families are making with regards to reducing GHG emissions and mitigation and adaptation to climate change.
- Vision H₂O educated students, businesses and the general public about energy conservation, climate change and GHG emissions.

Moving Forward

Accountability

“A Climate Change Secretariat has been created to help co-ordinate activities of government departments, to develop and implement initiatives for achieving the objectives of the Climate Change Action Plan and to raise awareness of climate change issues.” NBCCAP

New Brunswick will continue to contribute to regional and national initiatives to address climate change and continue track progress of reducing GHG emissions and increasing resiliency to climate impacts.

The Climate Change Secretariat coordinates the on-going activities of the Interdepartmental Committee on Climate Change and the provincial government’s commitments with respect to the Climate Change Action Plan.

Many communities, industries, businesses, non-profit organizations and individuals have also contributed to climate change efforts. These ongoing partnerships between governmental departments and nongovernmental partners are essential to the success of the Plan.

New Brunswick Climate Change Secretariat

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The summary and progress report are also available electronically.

