

# PRAIRIES REGIONAL ADAPTATION COLLABORATIVE (PRAC)

## ADAPTATION TO CLIMATE CHANGE ON THE CANADIAN PRAIRIES

# Proceedings

*Delta Hotel, Regina, Saskatchewan, February 15 and 16, 2012*

A PARTNERSHIP OF:



Saskatchewan  
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## EXECUTIVE SUMMARY

**T**he Prairies Regional Adaptation Collaborative (PRAC) held the Adaptation to Climate Change on the Canadian Prairies Forum at the Delta Hotel in Regina, Saskatchewan on February 15 and 16, 2012. The Forum aimed to provide updates on findings for each PRAC theme group—Water Resources, Drought and Excessive Moisture (DEM) and Terrestrial Ecosystems—and to explore how impacts and adaptation can be converted into actual practice using an inter-jurisdictional and collaborative approach. The updates included:

1. Reports on inter-provincial collaboration.
2. Sharing successes/best practices/challenges in addressing targeted policies.
3. A review and discussion of the draft synthesis report.
4. How adaptive collaboration on the Canadian Prairies can continue to move forward.

Fifty-nine participants representing provincial government agencies were in attendance from: Alberta Agriculture and Rural Development; Alberta Environment and Water; Alberta Sustainable Resource Development; Manitoba Conservation; Manitoba Local Government; Manitoba Agriculture Food and Rural Initiatives; Manitoba Water Stewardship; Saskatchewan Environment; Saskatchewan Agriculture; Saskatchewan Research Council; Saskatchewan Urban Municipalities Association; Saskatchewan Association of Rural Municipalities; Saskatchewan Watershed Authority; Saskatchewan Association of Watersheds. Federal government departments were also represented: Natural Resources Canada, Environment Canada, Agriculture and Agri-Food Canada. There was also representation from the University of Calgary, University of Saskatchewan, University of Regina, University of British Columbia and, from non-government organizations.

This 1.5-day forum was structured into provincial and federal program updates, including presentations on:

- Findings and progress in the Water Task, Water Demand and Water Supply Studies;
- Findings and progress in DEM Task;
- Findings and progress in Terrestrial Ecosystems;
- Alberta, Saskatchewan and Manitoba Adaptation Perspectives;
- Environment Canada and Natural Resources Canada Adaptation Perspectives;
- National Water Adaptation Guidance; and

- The PRAC Draft Synthesis Report.

These updates provided the context for the second day parallel theme break-out group discussions. Day 1 concluded with an after dinner speaker from Environment Canada, Climate Research Division, whose goal was to help participants “think outside the box” through *measures of adaptation effectiveness*.

Day 2 began with progress presentations on where adaptation is headed in each province. A facilitated table break-out discussion of the draft synthesis report initiated conversation leading to the break-out sessions in the later afternoon. The afternoon break-out sessions were divided into the three parallel theme groups: Water Resources, DEM and Terrestrial Ecosystems. Each theme group discussion answered four prepared questions about progression in adaptation to climate change on the Canadian prairies, specifically:

1. Priorities;
2. Impacts → adaptation;
3. Adaptation using an inter-jurisdictional/collaborative approach; and
4. Collaboration barriers → overcoming them.

Each theme group briefly reported the highlights of their table discussions, followed by a facilitated open discussion on moving adaptation forward within and across themes and governments. Concluding remarks by Dr. Norman Henderson brought the forum to a close.

## INTRODUCTION

**T**he Prairies Regional Adaptation Collaborative (PRAC) is a three-year inter-provincial project funded by National Resources Canada, (NRCAN) Regional Adaptation Collaboratives program intended to enhance climate change adaptation decision-making in water resources management, drought, excessive moisture and terrestrial ecosystems.

The objective of the PRAC is to advance climate change adaptation decision-making in relevant policy areas. This objective will lead to the development of targeted policies and other instruments that encourage appropriate adaptation responses to current and foreseen climate change.

Specific activities of the PRAC include refining policy questions, building the knowledge base through use of appropriate modelling tools at appropriate scales, economic analysis, developing policy options, and engaging decision makers and stakeholders through discussions and forums. The PRAC has three areas of climate change focus:

- Water resource management;
- Drought and excess moisture management; and
- Terrestrial ecosystems adaptation.

Forum activities common to all three themes are designed to encourage knowledge transfer as well as develop adaptation options for dealing with climate change risks and opportunities. PRAC participants include provincial governments, Crown Corporations, industry, universities and climate research institutions.

The February 15–16, 2012 Adaptation to Climate Change on the Canadian Prairies Forum held at the Delta Hotel in Regina, Saskatchewan was an update on actions developed from the September 20–21, 2011 Combined Water, Drought and Excessive Moisture Forum in Winnipeg, Manitoba. The 2012 Adaptation to Climate Change Forum sought to:

- Provide updates on findings for Prairies Regional Adaptation Collaborative theme results – Water Resources, Drought and Excessive Moisture (DEM), Terrestrial Ecosystems (forests and grasslands) and Coordination and Governance;
- Report on inter-provincial collaboration, impacts and adaptation partnerships;
- Share successes/best practices, lessons learned, challenges, gaps and opportunities in addressing targeted policies, potential policy options and recommendations;
- Review the draft synthesis report targeted to policy and decision-makers with adaptation policy options and recommendations relating to climate change risks and opportunities for water and terrestrial ecosystem management; and
- Explore how Prairies impacts and adaptation actors can best move forward.

This forum, with the aim of moving collaborative adaptation forward in response to conditions on the prairies resulting from climate change, brought together fifty-nine representatives from: Alberta Agriculture and Rural Development; Alberta Environment and Water; Alberta Sustainable Resource Development; Manitoba Conservation; Manitoba Local Government; Manitoba Agriculture Food and Rural Initiatives; Manitoba Water Stewardship; Saskatchewan Environment; Saskatchewan Agriculture; Saskatchewan Research Council; Saskatchewan Urban Municipalities Association; Saskatchewan Association of Rural Municipalities; Saskatchewan Watershed Authority; Saskatchewan Association of Watersheds. Federal government departments were also represented: Natural Resources Canada, Environment Canada, Agriculture and Agri-Food Canada. There was also representation from the University of Calgary, University of Saskatchewan, University of Regina, University of British Columbia and, from non-government organizations.

**Appendix A** shows the Forum agenda.

*Summary of Forum Proceedings***DAY 1, FEBRUARY 15, 2012 (WEDNESDAY)**

**D**r. Norman Henderson, executive director of the Prairie Adaptation Research Collaborative (PARC) opened with welcoming remarks and introductions of all the individuals involved with organizing the forum. A brief overview of the objectives and agenda were discussed. The draft synthesis report was provided at the beginning of the workshop for all participants to review prior to day 2 in preparation of the break-out sessions.

*Updates on Water Theme Work***Dr. Dave Sauchyn**

Prairie Adaptation Research Collaborative (PARC)

Presentation: *Summary of Water Task Findings*[CLICK HERE FOR PRESENTATION](#)

Dr. Sauchyn recapped the need for knowledge of recent trends and variability in surface and soil water balances, and projections of future water supplies to bring forward to decision makers. He discussed much of the work done at PARC for agencies in Saskatchewan and Alberta and focused the discussion more on the south of the Saskatchewan River basin.

He noted the following points on water task findings:

- The data from the 2006 WSC Hydrometric Network as it existed in 2006 showed the design of the water survey network was to serve the needs of the railroads, not for climate change.
- 500 water gauges have been recording continuous data for 20 years, while only 40 gauges have been operating for the last 50 years. There are relatively few locations in Canada that provide information useful in the context of climate change.
- The Bow River at Calgary gauge shows low frequency variability with periods of 20–25 years of high flows and 20–25 years for low flows.
- The Pacific Decadal Oscillation (PDO) is a major factor controlling Canadian Prairie precipitation and streamflow. Scientists in Washington discovered an approximate 60 year PDO cycle has a profound impact on the weather.
- There were significant relationships between streamflow and the PDO in the 85 naturally-flowing rivers of the three Prairie Provinces. Flow records in the Old Man River show a declining trend when natural fluctuations in climate are removed to isolate the effect of climate change. There is a need to consider the impact of climate change in the context of these natural fluctuations.

Dr. Sauchyn believes we should use past information, but not rely on it. Climate models can project 100 years into the future. The Pacific Ocean generates our climate and consequently it is believed the PDO oscillations will change with climate change, but it is unknown how they will change. It has been found that due to global warming, water levels have dropped and greater departures from the average can be expected into the future. Probability/density data have shown there is a 40% chance there will be no water in the Oldman River, although this likely will not happen because the basin has already been closed to further extraction licences.

Dr. Sauchyn concluded with the following questions: Do companies and corporations know of climate change concerns and water levels? Five potash mines are being proposed in the prairies and plans are to use the same water source that supplies the City of Regina. Will there be enough water to support these mines and the City of Regina in the future?

### **Mr. Bob Harrison**

Surface Water Management Section

Manitoba Conservation and Water Stewardship

Presentation: *Assiniboine River Water Demand and Water Supply Studies*

[CLICK HERE FOR PRESENTATION](#)

Mr. Bob Harrison discussed how the Assiniboine River water demand study was used to project future water uses with and without climate change. The Assiniboine water supply study was used to assess the potential effects of climate change on the surface water supply and soil moisture.

He noted the following points on the studies:

- The socio-economic factors for the studies included concerns for the future and growth rates. Some provincial attributes such as the recent global recession, diversified economy and strong resource sectors led by agriculture, hydro and mining were considered. Some study area attributes included communities, water availability, superior soils within the lower Basin and access to American mid-west markets.
- Future climate change projections found temperatures to increase in each season ranging from 1 to 6° C. Regular precipitation reductions are predicted for the summer season and increases are predicted for the other three seasons, with the largest increases in the spring. In general, it is anticipated we will see more frost-free days, earlier seeding opportunities, increased potential for spring flooding, and an increased potential for summer droughts.
- The water demand study projected sectoral water demands for the Assiniboine River for the periods 2010, 2020, 2050, and 2080 through an analysis of population, economic growth, agricultural trends and climate change.

- The water supply study modelled the hydrologic aspects of climate change based on the Canadian Regional Climate Model (CRM) and used the DHI MIKE-SHE computer model. The periods from 1961-1990 and 1991-2003 were calibrated and a comparison of unregulated simulated and observed flows was reviewed. Only one CRM model and run was assessed.
- Streamflow variability was reviewed at Headingly for three historical periods and three future periods. The comparison found future scenarios are within historical natural variation with no apparent significant trend.
- The water supply study found soil moisture in the Manitoba basin would not decline until later in the 21<sup>st</sup> century. The Souris River basin will generally become drier in the latter third of the 21<sup>st</sup> century and the Qu'Appelle River sub-basin will decrease in the first and last third and increase in the second third of the 21<sup>st</sup> century.

The water demand from the river will continue to increase. Without climate change, the water demand will exceed its available yield by 2080, and worse, by 2050 with climate change. The instream ecological needs of the river are not well quantified and should be studied further. Mr. Harrison stated that accessing easy-to-use climate projection data was a challenge. A region-specific climate projection data inventory is currently not available or accessible to the public, but if available would be a very important resource for assessors and in adaptation planning efforts.

The predicted warmer summers and falls would result in a decline in summer and fall soil moisture, the greatest decline will take place after 2070, most noticeably in the western part of the basin. Future stream-flow variation will not differ significantly from historic variation. Decreases in soil moisture in the late summer and fall have the potential to decrease streamflow in the spring. Mr. Harrison concluded that future extreme floods may be slightly higher than in the past.

Questions raised by the participants pertained to municipal consumption and the different models and methods applied to the studies.

### *Updates on DEM Theme Work*

#### **Mr. Tom Harrison**

Saskatchewan Watershed Authority

Presentation: *Summary of Findings in DEM Task*

[CLICK HERE FOR PRESENTATION](#)

Mr. Tom Harrison presented a progress update on adaptation for DEM in all three Prairie Provinces.

He noted the following points on each province:

- Alberta Agriculture and Rural Development (ARD) focused more on risk management and less on the water theme due to their drought of 2000 and 2003. The ARD established a significant weather station network, implemented a quality control program and established the *Versatile Soil Moisture Budget* (VSMB), a Canadian soil water balance model to form the basis of addressing agricultural risk management adaptation issues.
- Saskatchewan's *Agricultural DEM Monitoring Action Plan* was initiated by the Minister of Agriculture and has a committee of external agencies involved.
- An evaluation of DEM monitoring was completed to find the right indicators and to determine if the network was appropriate. Findings included the need to use a multi-index approach for operational monitoring of moisture conditions and increasing the usage of other weather networks through a network of networks.
- Saskatchewan developed an Adaptive Policy Assessment Tool to determine if the policies/ programs were adaptive and capable of supporting anticipated climate change adaptations.
- DEM preparedness planning partnered with local watershed stewardship agencies to deliver workshops for engaging local stakeholders and resource managers to provide direction on adaptation, and develop recommendations for provincial policy to help facilitate local adaptation.
- Water demand was analyzed in Saskatchewan's major drainage basins to provide projections for potential future demand based on various economic growth scenarios. It is still being worked on.
- *The Mainstreaming Adaptation in Water Use Across Sectors* study in Saskatchewan was developed to engage sector stakeholders to incorporate beneficial water use practices across sectors. Focus groups included representatives of irrigation interests, urban municipalities and power generation. All groups have completed their work and a cost-benefit analysis is underway.
- Manitoba organized a Drought Management Plan to mitigate drought effects and complement existing provincial water resource management and emergency plans. The plan is in its preliminary stages.
- Manitoba also formed a *Municipal Adaptive Planning Project* based on a 2011 survey on current vulnerabilities in municipal Manitoba to identify current and future climate extreme risks. The leading current vulnerabilities found were flooding and aging infrastructure. The leading potential future climate change impacts found were variability of weather and flooding.
- Manitoba is moving ahead with provincial planning on adaptation for excessive moisture in the Inter-lake Region to assist in development of a Provincial excessive moisture strategy. The case study along with other PRAC projects will help inform the development of a larger provincial DEM strategy for Manitoba.

Mr. Harrison stated that the DEM adaptation objectives and progress are similar between all three provinces. There is an interest in an evaluation of tools and in engaging stakeholders and communities.

Questions and discussion after the presentation touched on how existing programs can be further developed and how adaptation to DEM is an easier "sell" because the information is real.

## Updates on Terrestrial Ecosystems Theme Work

### Dr. Jeff Thorpe

Saskatchewan Research Council

Presentation: *Summary of Findings and Progress: Grasslands*

[CLICK HERE FOR PRESENTATION](#)

Dr. Thorpe discussed grassland work carried out by PRAC. Areas of work focused on modeling the native prairie grasslands' response to climate change including:

- **CHANGES IN PRODUCTION FORAGE:** is lower in a drier climate affecting livestock producers. A model was developed to predict the changes in production due to climate change with a 2080s scenario based on cooler versus warmer temperatures. The result either way is big changes in vegetation with a predicted shift from the taller grasses to shorter grasses.
- **THE CARBON FERTILIZATION EFFECT:** The overall effect is uncertain, but carbon fertilization may help to offset the effect of a drier climate.
- **EFFECTS OF EXTREME EVENTS:** The indications point to variability of such events and influence the changes in average productivity.
- **INVASIVE PLANTS:** Invasive species are more resistant to climate change and are a stressor to native plant communities.

Adaptation options were examined through the three Rs:

- **RESISTANCE:** The short-term actions of producers would be to cope with extreme events such as drought by reducing numbers of livestock, moving livestock to alternate grazing locations, purchasing feed and hauling water.
- **RESILIENCE:** The medium-term actions by producers and governments would be to increase the resilience of the system with actions such as changing herd structures, planning for increased feed reserves, detection and control of invasive species and drought monitoring and prediction tools.
- **RESPONSE:** The long term actions should focus on being aware of changes through monitoring systems in order to adjust policies accordingly.

Alberta Sustainable Resource Development's (ASRD) Rangeland Management Program has led the way in developing an adaptation framework to incorporate climate change into their business areas. ASRD is currently working on the vulnerability of species at risk, while Manitoba Agriculture, Food and Rural Initiatives (MAFRI) together with Manitoba Conservation have directly engaged policy-makers and external stakeholders with PRAC's work on grassland vulnerability and adaptation.

Questions raised by participants pertained to what SW Saskatchewan needs to focus on, and applications of current models to land, crops, and monitoring indicators.

**Dr. Mark Johnston**

Saskatchewan Research Council

Presentation: *Forestry Component of the PRAC Terrestrial Theme*[CLICK HERE FOR PRESENTATION](#)

Dr. Johnston provided an overview of forestry activities and case studies for all three Prairie Provinces, stating that forestry related work was a small component of the PRAC program.

He noted the following points on each province:

- Alberta Sustainable Resource Development (ASRD) produced a literature review of the impacts on ecosystem services, risk assessment and adaptation options of the western Canadian southern boreal forest fringe. The approach is to forget about adaptation and instead deliver sustainable forest management with climate change. An ongoing study of fire season length, wind speed and atmospheric moisture has found an increase in fire season length which is also important in allocating budgets and preparedness planning.
- Manitoba Conservation's Forestry Branch has undertaken a vulnerability assessment for the Sandilands area in SE Manitoba with a focus less on adaptation and more on continuing sustainability.
- Saskatchewan's Environment Forest Service is working on the multiple vulnerabilities of Saskatchewan's Island Forests under climate change. Trees do not regenerate in these drought-prone sandy soils after fires, which is of concern to a large number of Aboriginal communities.
- Saskatchewan's LANDIS-II forest succession model provides information on how forests regenerate after disturbances. Other models such as the PnET provide results that will be incorporated into a 20-year forest management plan for island forests.

Dr. Johnston provided example yield curves for jack pines with constant and increasing CO<sub>2</sub> suggesting that with the higher CO<sub>2</sub>, growth may decrease but then later recover due to an increase in nutrient value. He concluded by expressing that it is very difficult to understand what will happen.

Questions raised pertained to succession rules, generation failures and the value of the wood in the island forests.

**Guest Speaker: Dr. Stewart Cohen**[CLICK HERE FOR PRESENTATION](#)

Day 1 wrapped up with dinner and special guest speaker, Dr. Stewart Cohen, a senior researcher with AIRD/Environment Canada, and an Adjunct Professor with the Department of Forest Resources Management of the University of British Columbia.

Dr. Cohen discussed how there is a need to translate climate scenarios beyond indicators of impact into measures of adaptation effectiveness. The climate change damage report needs to be brought to decision-makers in terms that will attract their attention. Debate is needed to compare the cost of doing nothing with the cost of doing something. Dr. Cohen concluded that better preparation involves more training and career development together with the expansion of networks and links between the climate change community and the data/modeling community.

**DAY 2, SEPTEMBER 21, 2011 (WEDNESDAY)**

Dr. Norman Henderson welcomed the participants back and reviewed the agenda, objectives and process, adding that Day 1 was about where we were, and Day 2 was about where we were going.

*Alberta Adaptation Perspectives***Dr. Bob Manteaw**

Adaptation Strategy Coordinator  
Alberta Environment

Presentation: *Learning to Adapt to a Changing Climate: An Alberta Perspective*

[CLICK HERE FOR PRESENTATION](#)

Dr. Manteaw shared the different directions Alberta Environment and Water (AEW) is progressing towards in mitigation and adaptation. Adaptation policy processes have been evolving, vulnerability studies and risk assessments have been adopted by nine provincial departments, and better awareness through PRAC has helped Alberta move forward in adaptation to climate change.

Dr. Manteaw discussed AEW's key adaptation projects. He also introduced the Climate Change and Emissions Management Corporation (CCEMC), an organization central to Alberta's Climate Change Strategy and which manages Alberta's independent technology innovation fund.

Some of the key features of where AEW and CCEMC are heading are:

- AEW has given attention to mitigation and adaptation policy through *The 2008 Climate Change Strategy* and is continuing to evolve through planned phases in research, learning, knowledge development, institutional capacity building and action. AEW also established Alberta's Climate Change Adaptation Team (ACCAT).
- AEW's Vulnerability Study is focused on Economics, Biophysical and Social assessments. Departmental risk assessment processes are almost complete with the following nine departments involved: ARD, AEW, SRD, TPR, MA, ENERGY, Transportation, Infrastructure and Health and Wellness. The departmental strategies will be synthesized to create a broader provincial adaptation strategy. This draft strategy is planned for next summer followed by public consultation processes.
- AEW's key projects in Water Resources Management plan to use data from hydroclimatic studies in northern and southern Saskatchewan to pilot a socio-economic analysis to further advance their Water for Life Strategy.
- Alberta Sustainable Resource Development (ASRD) is working on producing new generation year-round soil moisture and drought monitoring models.
- CCEMC, a not-for-profit independent organization with a mandate to expand climate change knowledge, develop new "clean" technologies and explore practical ways of implementing them, is currently funding some adaptation projects in biodiversity management, watershed management and tree species risk management.

Dr. Manteaw concluded that there are still political, policy, cultural and cognitive barriers, but that significant progress has been made through programs like RAC.

### *Saskatchewan Adaptation Perspectives*

#### **Mr. Tom Harrison**

Director Partnerships and Plan Implementation  
Saskatchewan Watershed Authority  
Presentation: *Saskatchewan Adaptation Perspectives*

Mr. Harrison discussed the synthesis report for activities under PRAC being developed by Jeremy Pittman of Rescan Environmental Services Ltd. He reviewed the importance of education in any adaptation strategy and noted that there needs to be a “no regrets” principle. Past work with PRAC should have included industries such as irrigation and mining in order that they would be informed of the value of water in preparation for the future. Other sectors to consider are: economics, forestry and First Nations – a very vulnerable community.

### *Manitoba Adaptation Perspectives*

#### **Mr. Randall Shymko**

Climate and Green Initiatives  
Manitoba Conservation  
Presentation: *Manitoba Adaptation Perspectives*

Mr. Shymko discussed the completion of the PRAC program in the next few months with a final Manitoba PRAC workshop in March and the development of a Manitoba synthesis report. The expansion of the Manitoba Adaptation Framework is underway to produce an action plan with a few required key components, such as:

- The PRAC synthesis report;
- Leveraging the expertise of the expanded network;
- Expanding a higher level network;
- Impacts and adaptation teams to help move forward; and
- Priorities

Mr. Shymko noted the importance of mainstreaming partners to build upon lessons learned from other projects, focusing more on northern aboriginal issues, having economics play an important role for decision-makers, and to align better with NRCan’s initiative and those of other agencies.

In conclusion, Mr. Shymko pointed out the need to expand and improve our communications to be successful in moving adaptation forward.

## Federal Adaptation Perspectives

### Mr. Matt Parry

Policy Development

Environment Canada

Presentation: *Overview of Federal Climate Change Impacts and Adaptation Activities*

[CLICK HERE FOR PRESENTATION](#)

Mr. Parry provided an overview of federal impacts and adaptation activities, including the Federal Adaptation Policy Framework.

Some key notes of his presentation were:

- The federal government has a long history of working on impacts and adaptation stemming from physical impacts since 1978, NRCan's Climate Change Impacts and Adaptation Program in 1998, investments in six adaptation programs in 2007, to recent federal products providing an information foundation.
- The National Round Table on the Environment and the Economy (NRT) *Climate Prosperity* program features three of six reports on climate change impacts and adaptation.
- Environment Canada (EC) has a mandate to provide the science foundation for impacts and adaptation research and planning in Canada. EC provides this information to the public, other departments and organizations to inform decision-making. It also coordinates environmental policies and programs for the federal government and leads policy development on adaptation.
- The Federal Adaptation Policy Framework was developed to support internal federal adaptation planning, and highlights the importance of incorporating climate risk into decision-making. EC is developing guidance on how to conduct a departmental climate change risk assessment to advance the mainstreaming element of the Framework.
- The Framework helps guide the Government's efforts on adaptation but is not a comprehensive adaptation strategy because it does not identify specific priorities, establish quantified measures, targets or timelines, or establish coordination mechanisms.
- The government as an institution is resilient to a changing climate and needs a better understanding of climate change implications for federal policies, federal infrastructure and resources at risk.
- Some new programs based on knowledge gaps and organized around science, health, the North and economic competitiveness were developed in the context of the Federal Adaptation Policy Framework.

Mr. Parry ended his presentation noting the Minister of the Environment announced the Government will spend \$148.8 million over the next five years on 10 adaptation programs in nine departments and agencies, although some of these programs have not yet been announced. The bulk of the funding is for national programs.

Comments from participants referred to the fact that there was no funding through these new programs for the agricultural sector.

**Dr. Niall O’Dea**

Director, Climate Change Impacts and Adaptation Division

Natural Resources Canada

Presentation: *Advances in Adaptation – A National Perspective*

[CLICK HERE FOR PRESENTATION](#)

Dr. O’Dea provided a Natural Resources Canada (NRCan) perspective on adaptation in Canada, how it has informed NRCan’s approach to adaptation programming under the RAC program and how it will guide where NRCan is headed now. NRCan’s primary mechanism to advance adaptation is to promote collaboration among competing interests. Collaboration is evolving through the RAC program, generating results across diverse themes and regions, and offering opportunities for knowledge exchange.

Dr. O’Dea provided an example of collaboration leading to policy change with respect to the sea level rise in southern British Columbia. The engagement of all levels of government addressed issues in: engineering, planning, parks and culture, police, and fire and legal services.

NRCan’s next step is to launch a program in March 2012 that reflects the changing landscape of adaptation in Canada through the Adaptation Platform, a structure designed to channel diverse sources of knowledge into focused action.

Questions raised by participants focused on the Adaptation Platform and water and agriculture’s involvement within that Platform.

*Towards National Water Adaptation Guidance*

**Mr. Harris Switzman**

Toronto and Region Conservation Authority

Presentation: *The National Adaptation to Climate Change Forum*

[CLICK HERE FOR PRESENTATION](#)

Mr. Switzman announced the upcoming National Water Adaptation to Climate Change Forum. The forum’s objective is to share experiences and knowledge in climate change adaptation in water resources and focus on tools, methods and case studies. The outcome of this forum is to design and review a national compendium and summary report on the state of practice in water adaptation in Canada.

The forum is planned for March 22 and 23, 2012 in Toronto, Ontario.

## *Draft Synthesis Report on PRAC project*

### **Mr. Jeremy Pittman**

Rescan Environmental Services Ltd.

Presentation: *Advancing Adaptation on the Canadian Prairies*

[CLICK HERE FOR PRESENTATION](#)

Mr. Pittman provided a review of the preliminary findings of the prairies-level draft synthesis report, with the purpose of ensuring proper interpretation and feedback on the Annotated Draft Report. The Annotated Draft Report was provided on Day 1 for all participants to review.

In reviewing the draft, Mr. Pittman discussed the following sections of the report intended to facilitate discussion:

- A synthesis of lessons learned;
- Current context for adaptation;
- Institutional arrangements;
- Priority areas and actions;
- Barriers and challenges; and
- Approaching adaptation effectively.

Mr. Pittman outlined that the next steps for the report were to receive and integrate feedback on the Annotated Draft Report, complement results with secondary sources, prepare the full draft report for feedback and prepare the final report for mid-to-late March 2012.

## *Discussion of Draft Synthesis Report*

Mr. Sheldon McLeod introduced himself as the facilitator of the draft synthesis report table discussion and afternoon break-out session. He posed the following question to the participants: “What have we learned from working together? And, have the forums facilitated learning?” Responses were:

- Different views on what adaptation means;
- Funding leveraged between provinces;
- Framing important;
- Re-frame projects;
- General awareness, tools, approaches, methodologies;
- More mitigation—awareness of what is happening in each province;

- Challenge—selling Climate Change;
- Able to borrow framework and use it within different organizations;
- Need to expand collaboration;
- Each province has different regulatory requirements;
- Collaboration is difficult due to funding limitations.

“Were the forums a good idea? Could they have been made better?”

- Would like to have looked at specific policies in different provinces to see connections;
- Forums too far apart, then we need to spend wasted time re-focusing. Need a focus area to drill deeper;
- Need to communicate our findings to other colleagues across the provinces;
- Forums are important to connect all of the different perspectives;

The second question raised was: “The draft report identifies a number of barriers and challenges. As you heard Jeremy speak of them, did others come to mind that may have been missed or not emphasized enough?” Responses were:

- How to take adaptation to transformation;
- Lack of bottom-up support in Saskatchewan;
- Institutional barriers;
- Gap between research and the public without preaching to them;
- Manitoba Government perspective has no coordinated approach;
- Move adaptation from “added on” to seeing it as a part of the process;
- We’ve adapted to the environment but not in touch with the environment;
- Adaptation is a long-term process;
- Identifying action items among all the different disciplines.

The third question posed to the participants was: “With whom and how can collaboration be expanded within your jurisdiction?” Responses were:

- Funding, we need to get to the municipal groups;
- Need to do more such as creating projects that must interest the municipal groups;
- Interdepartmental working groups to get the word out and connect with different stakeholders;
- Bridge the gap to the public and get over competition to really become collaborative;
- Re-evaluate and assess the goal, ensuring that it is clear. For example, having relationships that go beyond serving a particular need;

- Develop networks for regional understanding between groups and exploring roles between boundary organizations;
- Engage the public through events such as a speaker’s forum so as not sell climate change, but discuss current issues;
- More effort has to be made to be efficient;
- Make stronger links with academic researchers and policy makers.

### Water, Dem and Terrestrial Parallel Break-Out Sessions

The participants were divided into the three parallel theme groups: Water Resources, DEM and Terrestrial Ecosystems. Each theme group was asked to respond to the questions below:

1. What are the priorities in each task area?

WATER	DEM	TERRESTRIAL
<ul style="list-style-type: none"> <li>• Intersection of 3 water/ health priorities</li> </ul>	<ul style="list-style-type: none"> <li>• Looking at existing programs and finding the gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding the role of climate change in biodiversity</li> </ul>
<ul style="list-style-type: none"> <li>• Baseline data sharing between sectors</li> </ul>	<ul style="list-style-type: none"> <li>• Improving monitoring and modelling to meet end users’ needs</li> </ul>	<ul style="list-style-type: none"> <li>• Better work around policy and planning</li> </ul>
<ul style="list-style-type: none"> <li>• More knowledge on the demand side</li> </ul>	<ul style="list-style-type: none"> <li>• Need to promote transfer of knowledge in the scientific community</li> </ul>	<ul style="list-style-type: none"> <li>• Enhancing productivity</li> </ul>
<ul style="list-style-type: none"> <li>• Exploring social value of water use</li> </ul>	<ul style="list-style-type: none"> <li>• Finding collaborative opportunities with municipalities</li> </ul>	<ul style="list-style-type: none"> <li>• More information on terrestrial ecosystem responses to climate change</li> </ul>
<ul style="list-style-type: none"> <li>• Understand each other’s perspectives (i.e. industry vs. government)</li> </ul>	<ul style="list-style-type: none"> <li>• Better understanding of how vulnerabilities shift</li> </ul>	<ul style="list-style-type: none"> <li>• Engage public /bottom-up pressure for political action</li> </ul>
<ul style="list-style-type: none"> <li>• Shared governance across jurisdictions on the Prairies</li> </ul>	<ul style="list-style-type: none"> <li>• Understanding impact of events beyond direct crop losses</li> </ul>	<ul style="list-style-type: none"> <li>• Fill in the gaps for the agricultural theme</li> </ul>

2. How can knowledge of impacts and adaptation be converted into actual adaptation in each task area?

WATER	DEM	TERRESTRIAL
<ul style="list-style-type: none"> <li>Uptake of new approaches, integrated Manitoba watershed plans</li> </ul>	<ul style="list-style-type: none"> <li>Assess what is currently going on in terms of adaptation</li> </ul>	<ul style="list-style-type: none"> <li>Engaging with watershed groups</li> </ul>
<ul style="list-style-type: none"> <li>Who are the players to build scales of policies and processes</li> </ul>	<ul style="list-style-type: none"> <li>Need to identify unnecessary adaptation, i.e. building homes in flood-prone areas</li> </ul>	<ul style="list-style-type: none"> <li>Implementing new technology and understanding traditional knowledge</li> </ul>
<ul style="list-style-type: none"> <li>Renewed recognition of the value of water</li> </ul>	<ul style="list-style-type: none"> <li>Need for more municipal information to mainstream</li> </ul>	<ul style="list-style-type: none"> <li>More flexible policies</li> </ul>
<ul style="list-style-type: none"> <li>Uptake of cumulative effect monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Improve current programs</li> </ul>	<ul style="list-style-type: none"> <li>Policy review with climate change lens</li> </ul>

3. To what extent can this be done using an inter-jurisdictional and collaborative approach?

WATER	DEM	TERRESTRIAL
<ul style="list-style-type: none"> <li>Mis-match between the need for collaboration – what we really need and what we are getting</li> </ul>	<ul style="list-style-type: none"> <li>A threats-based approach can provide a more focus on the issue</li> </ul>	<ul style="list-style-type: none"> <li>Lessons learned within RAC</li> </ul>
<ul style="list-style-type: none"> <li>Need provinces and the federal government at the table in a formal dialogue</li> </ul>		<ul style="list-style-type: none"> <li>Provide examples of items done in each jurisdiction</li> </ul>
		<ul style="list-style-type: none"> <li>Federal-provincial agricultural support programs</li> </ul>
		<ul style="list-style-type: none"> <li>Collaborate on high-level policy, but keep local scale policy separate</li> </ul>

4. What barriers may exist to effective collaboration; can these be addressed, and if so, how?

WATER	DEM	TERRESTRIAL
<ul style="list-style-type: none"> <li>Differences in barriers</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring good communication</li> </ul>	<ul style="list-style-type: none"> <li>Collaboration is expensive</li> </ul>
<ul style="list-style-type: none"> <li>Fear of loss was sometimes more important than the gain in collaboration</li> </ul>	<ul style="list-style-type: none"> <li>Potential legal barriers—solved by results-based regulatory framework to help benchmark progress</li> </ul>	<ul style="list-style-type: none"> <li>Differences among jurisdictions</li> </ul>
<ul style="list-style-type: none"> <li>Require systems-thinking all the time</li> </ul>		<ul style="list-style-type: none"> <li>Culture clashes, getting the right mix and number of people</li> </ul>
<ul style="list-style-type: none"> <li>Long-term issue of adaptation does not fit with short-term collaboration and funding</li> </ul>		<ul style="list-style-type: none"> <li>Lack of long-term thinking</li> </ul>
		<ul style="list-style-type: none"> <li>Need buy-in from all parties</li> </ul>
		<ul style="list-style-type: none"> <li>Lack of understanding climate change</li> </ul>
		<ul style="list-style-type: none"> <li>Bureaucracy overload</li> </ul>

*Open Discussion*

Participants noted the following critical areas that need attention and further synthesis:

- Make this is a core responsibility, not a pilot, not a project, not a program to encourage long-term funding;
- Funding is very linear, needs to be improved;
- Adaptive process is complex. We need to apply systems thinking, more flexibility and adaptive knowledge;
- Communication issues due to culture clash, value to each culture and knowing your audience.

A final question was posed to the participants: “In light of this forum’s material and discussion, how can we move adaptation forward within and across themes and within and across governments?” Participant responses were:

- With emerging initiatives;
- NRCan is a huge driving force;
- Flexibility: have an awareness of how we communicate to make our issues fit into the big picture;
- Incorporating climate change considerations in forest management such as the 20-year management plan. Regulators require plans of those companies;
- We all think in shorter time-frames and start losing people when we start discussing the long term;
- See the trap. Every time there is a drought, we focus on climate change. It may be problematic when there is a cool year and therefore is important to know the long-term;
- The City of Regina tends to be collaborative (Councillor perspective);
  - Ideology with climate change is a challenge
  - Need to have champions
  - Concept of sustainability is becoming more understood but not sure if it will last
  - Talking to municipal politicians works because it gets the issues around water in a broad discussion so we can bring it to the table
  - Mitigation conversation – reduce CO<sub>2</sub>, then add adaptation, then add resilience
  - How to communicate what the scientists are learning and incorporate that into policy
  - Long term monitoring and funding are issues because of the difficulty in keeping them at the same level of importance with changes in government
  - Have the same vision – we have focused on sustainability
  - Make it real – cannot change some things such as infrastructure in the city due to funding
- Plan for cycles—pictures are helpful with stakeholders for understanding—knowing your audience;
- Discuss threats to stakeholders and decision-makers; and should we use the term climate change?

In closing, Dr. Norman Henderson thanked all the participants for attending and also thanked the forum organizers. Mary-Ann Wilson of Natural Resources Canada commented on the event being a success and a useful tool to help with the efforts of the RAC program.

## Appendix A: Workshop Agenda

## DAY 1: FEBRUARY 15

FEBRUARY 15	TOPICS	SPEAKERS
1:15-1:30	Welcome, introductions, overview of Forum	Norm Henderson, Prairie Adaptation Research Collaborative (PARC), University of Regina
1:30-2:30	Summary of findings and progress in the Water Task	Dave Sauchyn, Prairie Adaptation Research Collaborative (PARC), University of Regina
2:30-3:30	Summary of findings and progress in DEM Task	Tom Harrison, Saskatchewan Watershed Authority
3:30 – 4:00	BREAK	
4:00 – 5:00	Summary of findings and progress in Terrestrial Ecosystems	Mark Johnston and Jeff Thorpe, Saskatchewan Research Council
5:00 – 5:15	Wrap up	Norm Henderson
5:15 – 6:00	PRE-DINNER SOCIAL TIME (CASH BAR)	
6:00	GROUP DINNER (DINNER PROVIDED)	
7:00	after dinner speaker	Stewart Cohen, Environment Canada

## DAY 2: FEBRUARY 16

FEBRUARY 16	TOPICS	SPEAKERS
7:45-8:15	LIGHT BREAKFAST (PROVIDED)	
8:15-8:30	Review Day One outcomes; Day 2 meeting objectives/process	Norm Henderson
8:30-8:40	Alberta Adaptation Perspectives	Bob Manteaw, Adaptation Strategy Coordinator, Alberta Environment
8:40-8:50	Saskatchewan Adaptation Perspectives	Tom Harrison, Director Partnerships and Plan Implementation, Saskatchewan Watershed Authority
8:50-9:00	Manitoba Adaptation Perspectives	Randall Shymko, Climate and Green Initiatives, Manitoba Conservation
9:00-9:20	Adaptation: an Environment Canada Perspective	Matt Parry, Policy Development, Environment Canada
9:20-9:50	Advances in Adaptation: A National Perspective	Niall O'Dea, Director, Climate Change Impacts and Adaptation Division, NRCan
9:50-10:00	Towards National Water Adaptation Guidance	Harris Switzman, Toronto and Region Conservation Authority
10:00-10:30	BREAK	
10:30-11:30	Presentation on the draft RESCAN Synthesis Report on the Prairies Regional Adaptation Collaborative project, including recommendations	Jeremy Pittman, Rescan
11:30-12:30	Discussion of RESCAN Synthesis Report and recommendations	Sheldon McLeod (facilitator)
12:30-1:30	LUNCH (PROVIDED)	
1:30- 2:45	Water, DEM, and Terrestrial Theme parallel break-out sessions (what are the priorities in each Task area, and how can impacts and adaptation knowledge be converted into actual adaptation in each Task area?)	
2:45-3:15	BREAK	
3:15-3:45	Task break-out sessions report back	
3:45-4:30	Open discussion: In the light of this forum's material and discussion, how to move adaptation forward within and across themes and how to work within and across governments?	Sheldon McLeod (facilitator)
4:30-4:45	Wrap up and Adjournment	Norm Henderson, et al