# SUMMARY REPORT

Manitoba Agriculture Food and Rural Initiatives
and Manitoba Conservation
Prairies Regional Adaptation Collaborative

## Workshop: Exploring Options for Manitoba's Forage and Beef Sectors to Adapt to Climate Change

Winnipeg, Manitoba
February1, 2012
Winnipeg Winter Club

**A project in partnership with:**

Manitoba Alberta SRC

University of Regina

PARC Prairie Adaptation Research Collaborative

Saskatchewan Watershed Authority

***With funding support provided by:***

Natural Resources Canada / Ressources naturelles Canada

Canada

**Technical Assistance provided by:** Deloitte. iisd International Institute for Sustainable Development / Institut international du développement durable

## EXECUTIVE SUMMARY

On February 1st, 2012 Manitoba Agriculture, Food and Rural Initiatives (MAFRI) hosted a half-day workshop, which was facilitated by Deloitte as part of the Terrestrial (forests and grasslands) component of the Prairies Regional Adaptation Collaborative (PRAC) initiative. The workshop focused on soliciting stakeholder feedback on climate change impacts and responses for the beef and forage sectors identified in previous workshops. This workshop was attended by 25 participants, consisting of representatives from the Government of Manitoba, the Federal Government, academia, conservation organizations, and commodity groups within Manitoba. This workshop was the second in a series of workshops and intended to build upon the PRAC November 2011 workshop, and was followed by another Workshop geared toward Manitoba Government Decision-makers.

This workshop was designed to: 1) create awareness among stakeholders in the forage and beef sectors regarding impacts that may result from climate change; 2) to obtain feedback from stakeholders on additional climate impacts they are currently observing in the forage and beef sectors; 3) to allow stakeholders to share ideas on the risks faced by the forage and beef sectors resulting from climate change; 4) to communicate and discuss potential adaptation options to minimize these risks; and 5) to provide stakeholders with the opportunity to identify additional adaptation options and discuss how MAFRI could support these adaptation options.

The workshop began with Geneva Claesson, Sustainability and Climate Change specialist with Deloitte, providing introductions, workshop objectives and background on the November 2011 workshop geared toward Government of Manitoba decision-makers. Following introductions, presentations were given by Dr. Danny Blair and Dr. Jeff Thorpe on '*Current and Projected Temperature and Precipitation Trends in Manitoba*' and '*Future Impacts to the Forage and Grasslands Sectors'*, respectively (See Appendix B for agenda).

Participants reconvened following a break to discuss current impacts and risks to the forage and beef sectors related to climate change. Impacts and risks identified by stakeholders were very similar to those identified during the November workshop. Dr. Thorpe gave a second presentation on potential adaptation options for Manitoba grasslands. This was followed by a final session where participants were asked to identify adaptation options that they were currently applying and that MAFRI could potentially support to assist the forage and beef sectors to adapt to climate change. Adaptation options were heavily focused on water management and the identification of long-term adaptation options that will minimize the use of Business Risk Management (BRM) Programs. Overall, stakeholders were very engaged and interested in the process.

Outputs obtained from the workshop included: a list of impacts that stakeholders in the forage and beef sector are currently experiencing, a list of potential risks to the sectors as a result of climate change, a list of sector based adaptation solutions, which includes research, on-farm adaptation, industry adaptation, and suggested adaptation options for MAFRI.

The following report gives a detailed summary of the stakeholder adaptive planning workshop.

## BACKGROUND

Manitoba is a key partner in the Prairies Regional Adaptation Collaborative (PRAC), which is a joint partnership with Alberta, Saskatchewan and Natural Resources Canada. The PRAC has three main themes: water resource management, drought and excess moisture management, and terrestrial ecosystems adaptation. The PRAC was initiated to build capacity among decision-makers in order to incorporate adaptation in to current policies and programs, to encourage knowledge transfer, and to develop adaptation options that mitigate risks and enhance opportunities resulting from climate change in the three Prairie Provinces.

In November 2010, MAFRI and Manitoba Conservation held a successful Inter-departmental Workshop on Climate Change Adaptation in Winnipeg as part of the Terrestrial component of the PRAC. The purpose of this workshop was to demonstrate the use of an adaptation framework as a decision-making tool to four provincial departments (MAFRI, Conservation, Water Stewardship, and Local Government), and to develop adaptation options using this framework for the grassland and forest ecosystems using Manitoba's Parkland Region as a case study area. This workshop provided a preliminary assessment of the adaptation framework and in November, 2011 MAFRI hosted a second workshop geared toward Government or Manitoba decision-makers to build upon the November 2010 workshop.

In order to further develop the combined outputs from the prior decision-makers' workshops, MAFRI hosted a follow-up workshop to engage stakeholder's involved in Manitoba's forage and beef sectors. This workshop was held in Winnipeg on February 1$^{st}$, 2012 where 25 participants (Appendix A) convened with representation from research scientists, industry, Conservation organizations, commodity groups, and producers. The workshop objectives were as follows:

1. Create awareness among stakeholders in the forage and beef sectors regarding impacts that may result from climate change;
2. Obtain feedback from stakeholders on additional climate impacts they are currently observing in the forage and beef sectors;
3. Allow stakeholders to share ideas on the risks faced by the forage and beef sectors resulting from climate change;
4. Communicate and discuss potential adaptation options to minimize these risks;
5. Provide stakeholders with the opportunity to identify additional adaptation options and discuss how MAFRI could support these adaptation options.

Material provided to participants prior to, during and following the workshop included:

1. The workshop agenda (Appendix B);
2. A summary of projected climate impacts for Southern Manitoba (Appendix C)
3. A copy of the presentations given by Dr. Blair and Dr. Thorpe.

**Summary of Workshop Proceedings**

Geneva Claesson initiated the workshop by providing the objectives for the two days, the agenda and the background information obtained from the prior adaptation workshops. She then introduced the two morning presenters, Dr. Danny Blair, and Dr. Jeff Thorpe, who provided the background on projected temperature and precipitation trends and future scenarios for Manitoba's grasslands, respectively.

## Presentations on Temperature and Precipitation Trends, and Climate Change Impacts on Grasslands

The two presentations provided workshop participants with background information required to help identify impacts and risks to the forage and beef sectors in Manitoba.

**Dr. Danny Blair**
Acting Associate Dean of Science, Principle of the Richardson College for the Environment
University of Winnipeg
Presentation: *Current and Projected Temperature and Precipitation Trends in Manitoba*

Dr. Blair began his presentation by highlighting that 2011 was the 9$^{th}$ warmest year on record globally, at 0.51ºC warmer than the 1951-1980 baseline temperatures. He indicated that the climate system is complex and has many drivers of variability such as El Niño and La Niña, volcanic eruptions, and the sun, however he emphasized that these additional factors are not driving climate change. He indicated that atmospheric $CO_2$ has now reached 390 ppm and rising, and that there is no quick solution to minimize the warming. He also indicated that Canada will experience greater warming than the rest of the world. He went on to provide information on current and projected temperature and precipitation trends in Manitoba. He highlighted the expected increase in overall variability of weather patterns, increased annual temperatures, increased risk of excess moisture, flooding and drought. He ended by indicating how these changes in climate may impact the agriculture industry.

Following Dr. Blair's presentation participants were interested in knowing whether the climate models have ever been applied on a regional basis. Dr. Blair indicated that very little has been done in Manitoba and that there are large differences between western and eastern Manitoba. They are hoping to do more regional modeling in the future. Dr. Blair projected that Manitoba would resemble Western Nebraska and Colorado by the end of the century.

**Dr. Jeff Thorpe**
Principle Research Scientist
Saskatchewan Research Council (SRC)
Presentation: *Grasslands and Climate Change: Vulnerability and Adaptation Options*

Dr. Thorpe presented on the vulnerability of native grasslands to future climate change based on different temperature and precipitation scenarios for the 2080s. He explained that even in the coolest scenarios vegetation types from the US may expand into Canada, and that even in the warm-dry scenarios the decrease in grassland productivity is not as great as expected. He highlighted the impact of extreme events, indicating that past droughts have caused a shift in prairie grassland species and contributed significantly to tree mortality. Additionally, there is much more research currently focused on drought compared to excessive moisture. Typically moisture is associated with increased forage production; however excess moisture can be

detrimental to forages, which includes compromising the quality and productivity of forages. A problem that was highlighted was invasive species and their improved ability to adapt to climate change.

Dr. Thorpe's presentation generated many questions from participants surrounding the grassland/forest interface, such as how it may manifest and how grassland species would move northward. Dr. Thorpe indicated that with general climatic drying, some aspen groves may die out and there may be patches of shrubs where trees once were. He indicated that prairie grass species differ from forest grass species and that in order for these grassland species to replace the forest species there would need to be good tracts of native prairie adjacent to the forest land, however the problem is that there tends to be poor native grassland connectivity and that forest islands are often surrounded by tame pasture.

Following the two presentations, participants took part in a discussion surrounding the identification of impacts and risks to the forage and beef sectors. They were provided with the following outputs from the November 2011 workshop (Tables 1 & 2) and asked to build on the list of climate impacts and risks. Their results are summarized and provided in point form below.

**Table 1:** Climate Impacts to Manitoba's Forage and Beef Sectors as Identified during MAFRI's November 2011 Agricultural Climate Change Adaptation Workshop

| Impacts to the Forage Sector in Manitoba | Impacts to the Beef Sector in Manitoba |
|---|---|
| • Decrease in quality and palatability<br>• Increase in winter rainfall impacting yields<br>• Increase variability in the yield<br>• Impact to storage capabilities<br>• Increase in invasive species<br>• Increase risk of disease<br>• Increase in grassland acreage<br>• Longer growing season | • Access to forage during freezing rain<br>• Decreased availability of high quality water<br>• Increase in parasites due to mild winters<br>• Heat stress to pastures or crops<br>• Access to water and/or storage<br>• Potential opportunities to look at new cattle types<br>• Longer grazing season<br>• Reduction in feed requirements during milder winters |

**Table 2:** Projected Risks to MAFRI as a Result of Climate Change Impacts to Manitoba's Forage and Beef Sector - Identified during MAFRI's November 2011 Agricultural Climate Change Adaptation Workshop

| Risks due to Forage Sector Impacts | Risks due to Beef Sector Impacts |
|---|---|
| • Extreme events leading increased use of BRM programs requiring MAFRI to secure more funding and capacity.<br>• Current location of offices may change due to shifting vegetation patterns causing a change in regional farming practices<br>• Less able to provide regular forage extension programs because staff are responding to crisis situations | • Increasing incidence of disease leading to decline in farmer livelihood means MAFRI has to extend support programs.<br>• Increasing public demand for food safety and tracking supply chain requirements. This will impact existing budgets.<br>• Increasing disease outbreaks resulting in increased demand for vet services provided by MAFRI (more staff and funds required). |

**Climate change impacts as identified by beef and forage stakeholders:**
Participants were asked: "What climate change-related impacts are you currently experiencing? The following reflect the stakeholder responses:

- More frequent extreme events
- Lost forage acreage
- High moisture events
- Flooding
- Back-to-back events (droughts, floods, excess moisture)

**Risks and opportunities as identified by beef and forage stakeholders:**
Participants were asked: "What are the risks and opportunities to your sectors based on current and projected climate change impacts? (e.g., economic, social, environmental). Table 3 reflects the stakeholder responses.

**Table 3.** Risks and Opportunities to the Forage and Beef Sectors Resulting from Climate Change - Identified by Workshop Participants

| Opportunities for Forage and Beef Sectors | Risks to Forage and Beef Sectors |
|---|---|
| • The warming climate will provide more opportunity to take part in other markets<br>• Internalize ideas such as EG&S into the larger economy.<br>• Decreased amount of feed required in the winters<br>• Decreased costs associated with overwintering cattle (e.g., because cattle are in the fields more often in warmer winters, the manure is on the landscape and does not need to be moved – saving time, fuel and money)<br>• Incorporation of fringe land into agricultural land may allow increased production | • Water management systems will be required in order to deal with projected drought and excessive moisture to maintain productivity in the future.<br>• Variability in weather is more of a problem than gradual warming<br>• Need for increased food production in the future<br>• If government mandates policies to reduce emissions this could lead to decreased financial viability.<br>• Research will be required to help farmers plan, however, there is limited access by producers to the latest research. Increased extension and knowledge sharing between producers, industry, government and academics will be required.<br>• Reduced pasture productivity will lead to reduced livestock numbers, this net reduction in production per acre will require more extensive range management.<br>• Financial viability becomes a problem during back to back events because BRM programs are focused on 5 year incomes. If margins are constantly going down, then the existing programs can work counter to adaptation<br>• More risk management will be required, however; producers will be required to obtain the skills and knowledge to do this. |

Participants were asked: "What adaptation options do the forage and cattle sectors need to respond to climate risks? What has been done to-date to adapt? (e.g., research, on-farm, and

industry – producer groups). How can MAFRI support the flexibility, resiliency and economic viability of Manitoba's forage and beef sectors?" Table 4 reflects stakeholder responses.

**Table 4. Stakeholder Identified Adaptation Options for the Sector and for MAFRI to Implement**

| Sector-based adaptation solutions | Ideas for MAFRI adaptation options |
|---|---|
| • Increased collaboration between farmers and ranchers<br>• Short term response to feed shortage would be to carry over 1/3 feed supply<br>• Growing forage during drought years does better than annuals – complete shift in agricultural practice<br>• Wetland restoration, enhancement and protection to provide multiple EG&S benefits<br>• Directing aquifer recharge to build water reserves as buffer for future water stress conditions<br>• Increased perennial forages to improve water management<br>• Shallow pipelines for drier field (for livestock drinking water)<br>• Canadian Cattlemen's Association (CCA) supports education on climate change | **Research**<br>• Maintain quality forage lands (e.g., fund research, land use planning, and education)<br>• Improve soil mapping and analysis for future land use planning<br>• Long term funding programs for forage research (variety breeding and adaptability)<br>• Ecological Goods and Services (EG&S) Policy and Program<br>• Heritage breeds (highland cattle – more resilient, needs less water, healthier)<br>• Collect on farm research/facilitate sharing of solutions<br>• Information required – climate change impacts at a meaningful scale (eg. Local, regional, etc.)<br>• Conduct research on water stressed regions in other jurisdictions and potentially applicable solutions.<br>• Partnerships with other jurisdictions on research agendas<br>• More research on sector profitability with climate scenarios<br>• Applied research – demo sites, pilots, adoption on farms<br>**BRM Programming**<br>• BRM programming to incent sustainable crop rotations (e.g., annual poly cropping; perennial grains)<br>• Change crop insurance: pay for fences around hay storage rather than paying for losses to wildlife<br>• Integrate adaptation and risk management considerations in all policies and programs to prevent unintended consequences<br>• Include long term options – awareness of pressure to maintain status quo but stress that adaptive planning must occur<br>• Examine program effectiveness – ensure right and timely information is disseminated on the ground<br>• Examine existing policies that may discourage adaptation<br>**Crown Lands**<br>• Work with federal government to continue community pasture programs<br>• Support for community pasture programs – they are under used now but may be a valuable buffer in the future<br>• Crown land in the North with potential for multi-use system/land use |

| | |
|---|---|
| | **Other Policies**<br>• Water availability strategy for cattle<br>• Monitoring program for existing and emerging diseases<br>• Range land health assessment guide<br>• Multi-use land use planning (e.g., water, biodiversity, agriculture uses, etc.)<br>• Infrastructure support (e.g. build permanent roads in northern regions)<br>• Quantify EG&S benefits of land management practices<br>• Support for diverse agricultural landscape – communicate benefits to producers and develop pilot landscapes to show benefits<br>• Support shift in ag-producer mindset that they only produce ag-commodities – other income generating options would help diversify their income<br>• Support improved market connections for producers<br>• Support other ag-sectors (e.g. sheep)<br>• More collaboration with other departments and industry |

Tony Szumigalski, Policy Analyst with MAFRI concluded the workshop by thanking all participants and presenters. He mentioned that the results from this workshop would be used in part for the development of an adaptation strategy for MAFRI.

**Lessons Learned and Next Steps:**

Overall participants appreciated being included in the discussion on the development of an adaptation strategy for the province. Similar to the November 2011 'decision-maker's workshop', participants felt that government is very much caught in crisis mode, and that the reliance on government BRM programming did not provide producers with the long term solutions that they required. It was brought up on multiple occasions that government policies should be reviewed for their likelihood to produce unintended consequences and to dis-incent producers from adapting to environmental changes. Other policy recommendations included: providing incentives for young farmers, and providing incentives for ecosystem good and services (EG&S).

Collaboration, research, information sharing, and the use of community pastures were other topics that participants focused on. It was emphasized that focus on information and research should given to regional climate modeling, and the impact of climate on water resources. It was also suggested to investigate how other jurisdictions handled severe drought situations to determine whether the same adaptive actions could be applied in Manitoba. Information sharing between producers and knowledge transfer from academics to the producer level were thought to be of increasing importance to allow producers to make educated management decisions. Additionally, on-farm research, possibly using community pastures was suggested

and in this case could be used to display the benefits of certain management practices for extension purposes.

The information obtained during this stakeholder workshop was very valuable and will be used to inform MAFRI on future adaptation work and policy analysis. In the coming months, the MAFRI adaptation team specifically will be reviewing various adaptation frameworks and planning for future climate change adaptation work. The adaptation options suggested during this stakeholder workshop and the previous decision-maker adaptation workshop will inform implementation of future adaptive actions following departmental risk assessments. MAFRI's adaptation team will be consulting with specialists within MAFRI, and other provincial departments to determine the sectors within MAFRI's mandate that are most at risk from the impacts of climate change. Adaptation options will be developed for those sectors and sub-sectors which are deemed most at risk.

Future meetings will be required to determine how this process fits into the provincial and departmental planning process.

## Appendix A – Participants

**Steering Committee:** Randall Shymko (CON-WS), Tony Szumigalski (MAFRI), Ainsley Little (MAFRI), Matthew Wiens (MAFRI), Ramon Sales (CON-WS), Scott Stothers (MAFRI), Roselle Miko (MAFRI)

**Presenters:** Jeff Thorpe (SRC), Danny Blair (U of W)

**Facilitator:** Geneva Claesson (Deloitte)

**Other Participants:** Kim Ominski (Department of Animal Science, U of M), Martin Entz (Department of Plant Science, U of M), Hushton Block (AAFC), Stan McFarlane (AAFC), Henry Nelson (Manitoba Forage Council), Brent McCannell (Manitoba Forage Council), Lorne Rossnagle (KAP), Dave Koslowsky (MB Beef Producers), Kevin Teneycke (Nature Conservancy), Stephyn Carlyle (MHHC), Greg Bruce (DUC),

## Appendix B – Workshop Agenda

| | |
|---|---|
| 8:15 – 8:45 a.m. | Registration , Coffee/Tea, Muffins |
| 8:45-9:00 a.m. | **Agenda and Workshop Purpose & Outcomes**<br>• Geneva Claesson - *Deloitte* |
| 9:00 – 9:35 a.m. | **Current and Projected Climate Trends**<br>• Dr. Danny Blair – *University of Winnipeg* |
| 9:35 – 10:15 a.m. | **Future Impacts to Forage and Grassland Sectors**<br>• Dr. Jeff Thorpe – *Saskatchewan Research Council* |
| 10:15 – 10:30 a.m. | Health Break |
| 10:30 – 11:00 a.m. | **Discussion on Climate Impacts and Risks to the Forage and Beef Sectors**<br>• Facilitation: Geneva Claesson **-** *Deloitte* |
| 11:00 – 11:20 a.m. | **Potential Adaptation Options**<br>• Jeff Thorpe **–** *Saskatchewan Research Council* |
| 11:25 – 12:15 p.m. | **Discussion on Potential Adaptation Options and MAFRI's Support for Adaptation**<br>• Facilitation: Geneva Claesson - *Deloitte* |
| 12:15 – 12:20 p.m. | **Closing Remarks**<br>• Tony Szumigalski - *MAFRI* |
| 12:20 – 1:20 p.m. | **Networking Lunch** |