Changing Climates in Alberta

**Agricultural Context**

*Climate change is a long-term shift in weather conditions identified by changes in temperature, precipitation, winds and other indicators. Climate change can involve changes in average conditions as well as changes in extreme events.*

Agricultural production is highly dependent on weather and climate and will be affected by changing trends. There are indications that changes in rainfall and temperature patterns have occurred in Alberta. Impacts differ within each of Alberta’s nine ecoregions, with individual farm management decisions, and with influences of new technologies, markets, trade and policies.

**PAST TRENDS**

It’s very challenging to compare historical weather data measured at only a few locations using dated technologies with more modern and plentiful methods. However, generalized comparisons in a study by Shen et al 2005 indicated that increases in temperature and rainfall had occurred since 1985 in Alberta. Impacts differ within each of Alberta’s nine ecoregions, with individual farm management decisions, and with influences of new technologies, markets, trade and policies.

- The largest rainfall increases appeared to be in the north, northwest and southeast and appeared smaller in the central and southern parts of Alberta.
- The growing season in northeastern Alberta appeared to have increased by 3 to 9 days and by 0 to 3 days in the Boreal Transition and Aspen Parkland ecoregions.

More recently, Vincent et al (2012) identified trends between 1900 and 2010 of increasing annual mean daily minimum temperatures, with the greatest warming occurring in winter and spring.

*Temperature trends between 1900 and 2010. Upward (red) triangles show positive temperature trends and downward (blue) triangles show negative trends, with the size of the triangle indicating the amount of the trend.*

**PRESENT CONDITIONS**

Temperature, moisture and growing degree days are very different between years and locations in Alberta. Near-real-time climate information is collected at more than 350 stations is available from the Alberta Climate Information Service (ACIS), see: [http://agriculture.alberta.ca/acis/](http://agriculture.alberta.ca/acis/).

**POSSIBLE FUTURE TRENDS**

Agriculture and Agri-Food Canada have studied a number of possible future climates, see: [https://www.ec.gc.ca/sc-cs/default.asp?lang=En&n=FE6B6E6B-1](https://www.ec.gc.ca/sc-cs/default.asp?lang=En&n=FE6B6E6B-1)
Most climate change models project the possible warmer future conditions with small increases in precipitation for most regions in the Prairies.

- Warming trends could expand the growing season due to milder and shorter winters, although this could also promote moisture losses from soil and vegetation.
- Timing and amounts of precipitation could also change and extreme events may be more likely.
- Related impacts may include the need for new crop types as well as ways to combat new weeds, insects and diseases.

Preparing for a range of possible future conditions is needed to prevent unfavorable impacts of future climates, see: Adapting to Changing Climates.

FOR MORE INFORMATION

Alberta Climate Change Office is monitoring work currently underway to assess potential impacts, risks, challenges and opportunities that may result from a changing climate, see: www.climate.alberta.ca


Kulshreshtha, S.N. 2011. Climate Change, Prairie Agriculture and Prairie Economy:


Prairie Adaptation Research Collaborative of governments of Canada, Alberta, Saskatchewan and Manitoba pursue climate change impacts and adaptation research in the Prairie Provinces, at: http://www.parc.ca/


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