The Agroclimate Impact Reporter

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Overview

• This presentation is both about a project and about how the project fits into the overall picture of agroclimate monitoring.
• It is not about research but it touches tech transfer because it allows farmers to contribute to painting the picture of agroclimate conditions.
• The project is brand new, and therefore does not have a long operational history upon which it can be evaluated.
Agricultural Land in Canada

Total amount of agricultural land in Canada: 374,000,000 acres
National Agroclimate Information Service

• Key Functions
  – Monitoring agroclimate conditions in Canada
  – Developing tools and techniques to improve the Canadian Agriculture Sector’s ability to adapt to climate variability
  – Not a forecasting service
  – Greater focus in on agroclimate monitoring:
    • Monitoring current state of conditions
    • Developing better early warning tools
Why Agroclimate Monitoring Matters

• Key input to agricultural production estimates
• The ability to distinguish, identify, and measure areas of important crops in Canada and globally, as well as reliable production estimates, make for more robust decision-making around some of agriculture’s most pressing issues:
  – Climate variability and severity of weather events.
  – Population growth and the need, according to the FAO, to increase food production by 70% by 2050 to meet demand
  – Competition for land resources dedicated to the production of fuel vs. food vs. other uses
  – Arable land and water availability
  – Global markets and price volatility
  – Rising energy costs
Example of impact of climate on price volatility

Monthly Wheat Prices 1960-2011($/Metric Ton)
Source: World Bank

- 2008 Price hikes
  Droughts: Australia & Ukraine
- 2010/11 Price hikes
  Drought: Russia
- 1971/2’s price hike
  Drought: Russia

Landsat 1 Launched (1972)

Nominal wheat price in US $/metric Ton
Why Agroclimate Monitoring Matters

• At the farm level, agroclimate information helps the farmer make more informed farm management decisions.

• At larger scales,
  – it helps the farmer make more informed marketing decisions.
  – it is essential for anticipating imbalances, enhancing policy responses and providing market intelligence to the sector.

• The NAIS products are targeted to:
  – Farmers, media and the public
  – Policy
  – Other agricultural industries
    • Commodity trading
    • Transportation
  – International cooperative efforts
Integration of Agroclimate Monitoring

• NAIS integrates its work with geomatics and earth observation teams to develop a package of innovative agricultural monitoring capabilities that are, or are near, operational:
  – Annual Crop Inventory
  – Near Real Time Weekly Crop Condition Assessment
  – Crop yield forecasting
  – Climate and soil moisture monitoring

• These contribute to a national picture of crops and crop production estimates that serves not only Canada but contributes to global agricultural monitoring through GEOGLAM.

• We are still challenged with verifying our information at the local level and answering the question “what are the impacts?”
Agoclima Impact Reporter (AIR)

- The Agroclimate Impact Reporter (AIR) application is an online tool for the collection and reporting of agroclimate impact information (like droughts and floods) across Canada.
- AIR represents a fundamental change in how the Canadian agricultural Department can collect on-the-ground information in order to understand what is happening on the landscape.
- Impact reports are collected through a network of registered users as well as anonymous and media input.
- The information gathered by AIR plays a significant and valuable role in evaluating weather and climate-related risks to Canadian agriculture and supports multi-million dollar policy and program decisions.
What is AIR?

- On-line geospatial tool
- Automated system to collect, analyze and display agroclimate information across Canada
- Allows a network of users to input information about conditions on their farm
- Allows better understanding of impacts and risk of weather and climate variability
AIR Basics

• AIR allows for customized collection of on-the-ground input from a standing network of registered volunteers, from public crowdsourcing, and from media articles.

• Results are mapped with GIS; all users can view and query the results.

• The online approach is modeled after the U.S. Drought Impact Reporter.

• AIR reports can be submitted anonymously through the web site or producers can sign up to receive a short monthly questionnaire.
AIR Basics

• The AIR network currently consists of approximately 300 producers across the Prairie provinces of Alberta, Saskatchewan, and Manitoba, as well as part of British Columbia.

• Tested on the Canadian Prairies in 2012, become operational for Canada in 2013

• Discussions aimed at generating interest and expanding the network across Canada are ongoing.
Key Features

• The online AIR application offers users access to multiple levels of information. Users are able to:
  – **Register Online**: AIR enables interested producers, producer groups, municipal government, etc. to register online;
  – **Submit a Report**: of weather impacts by province/census district/municipality, by category/severity of impact, and by time period;
  – **Classify Impacts**: resulting from drought, flooding, excessive moisture, frost, heat stress, severe weather, and other agroclimate risks;
  – **View Results**: counts of impacts at a variety of spatial levels, categories, and time periods by a variety of user inputs (registered, public, or media);
  – **Search Results**: the ability to query on one or multiple locations; and
  – **Import Data**: overlay existing and custom geospatial layers and datasets.

• AIR administration tools are built-in and are very flexible, allowing administrators to develop new questions, surveys, and templates. Surveys can easily be tailored and assigned to different user groups.
Successes

• It was a big project
  – Completed within budget and on time
  – Integrated the business processes of two government Branches and capitalized on their strengths
• Initial results from the prototype were highly successful in providing accurate timely data that was used by multiple levels of government
• Network of volunteer farmers were satisfied
• Generating high level of interest
• Won our Department’s highest award
Things to Know

• It was a big project
  – Required full time devotion to project management
  – Communication was essential: weekly meetings

• Capable programmers were hard to find
  – Contracted out to programmers for most of the build

• Operations have been mostly on but sometimes off
  – Fragile to system changes, software & server updates
  – Robustness is improving

• Some non-essential features are not yet completed
Next Steps

• The top priority for AIR
  – expand the network of reporters.
  – Working with local producer groups and various levels of local government,
  – Goal is to establish a national network across Canada to provide agricultural impact information.

• Expanding input capabilities to include mobile devices;

• Incorporating additional info layers to increase viewing capabilities;

• Providing the capability for users to upload photos
Summary

• NAIS monitors agroclimate conditions for a wide ranges of users, including farmers
• Targeted on-farm service is the realm of provincial and municipal agencies and private sector
• Increasing demand for impacts of extreme weather/climate conditions
• AIR provides a means to involve farmers and the public in reporting impacts and local conditions, detect their location and process the information quickly to provide even more effective monitoring.
Thank you!

Our website: Drought Watch: www.agr.gc.ca/drought

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