



CWB Weather Outlook & Weather Network Initiative

January 11, 2008



Prairie strong, worldwide

Weather Outlook...

- **Fall and Winter Situation in Western Canada**
- **Global Crop/Weather Situation**
- **Strong La Nina off South America**
- **Impacts for Western Canada and Australia**



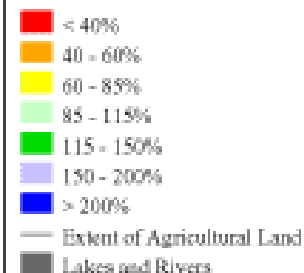
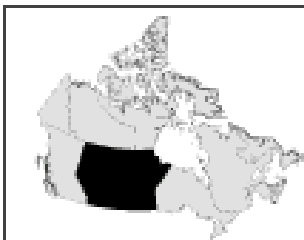
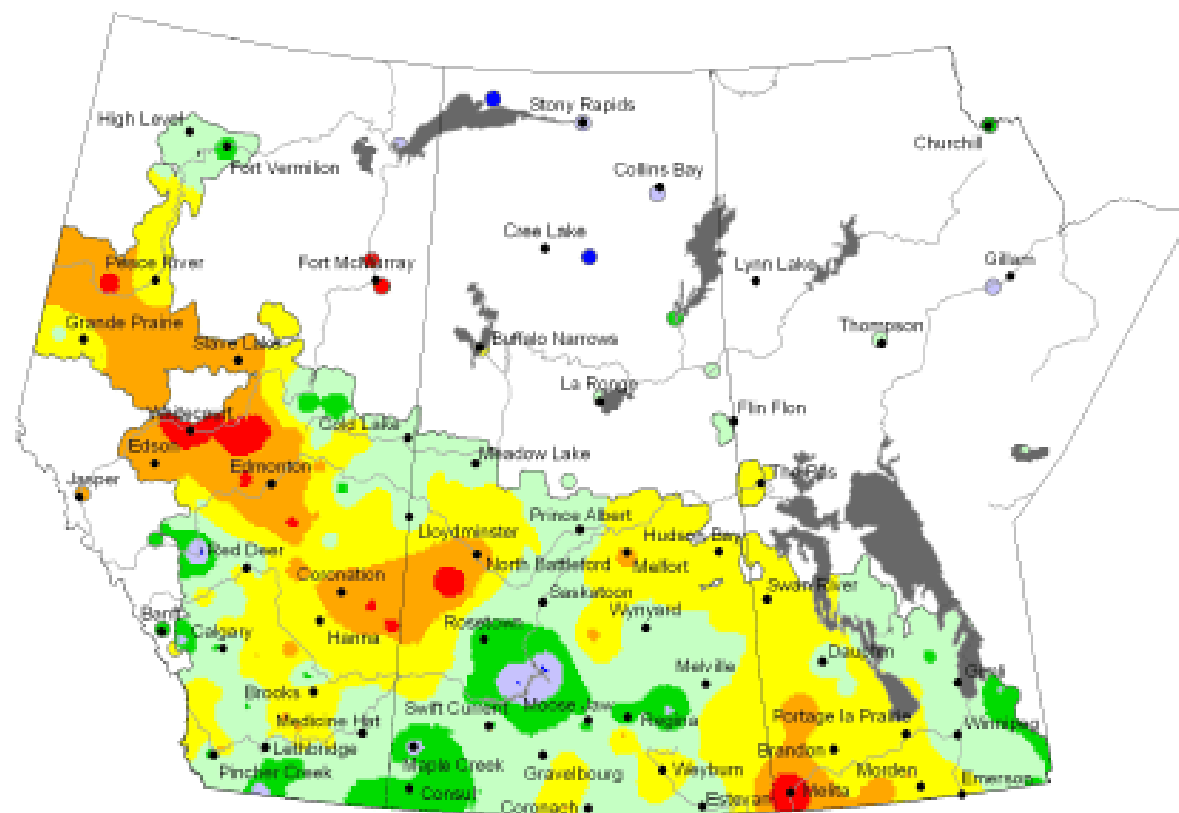
Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada

Canada

Percent of Average Precipitation (Prairie Region)

September 1, 2007 to October 31, 2007



Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

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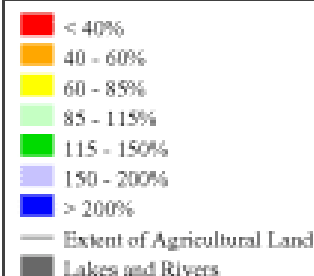
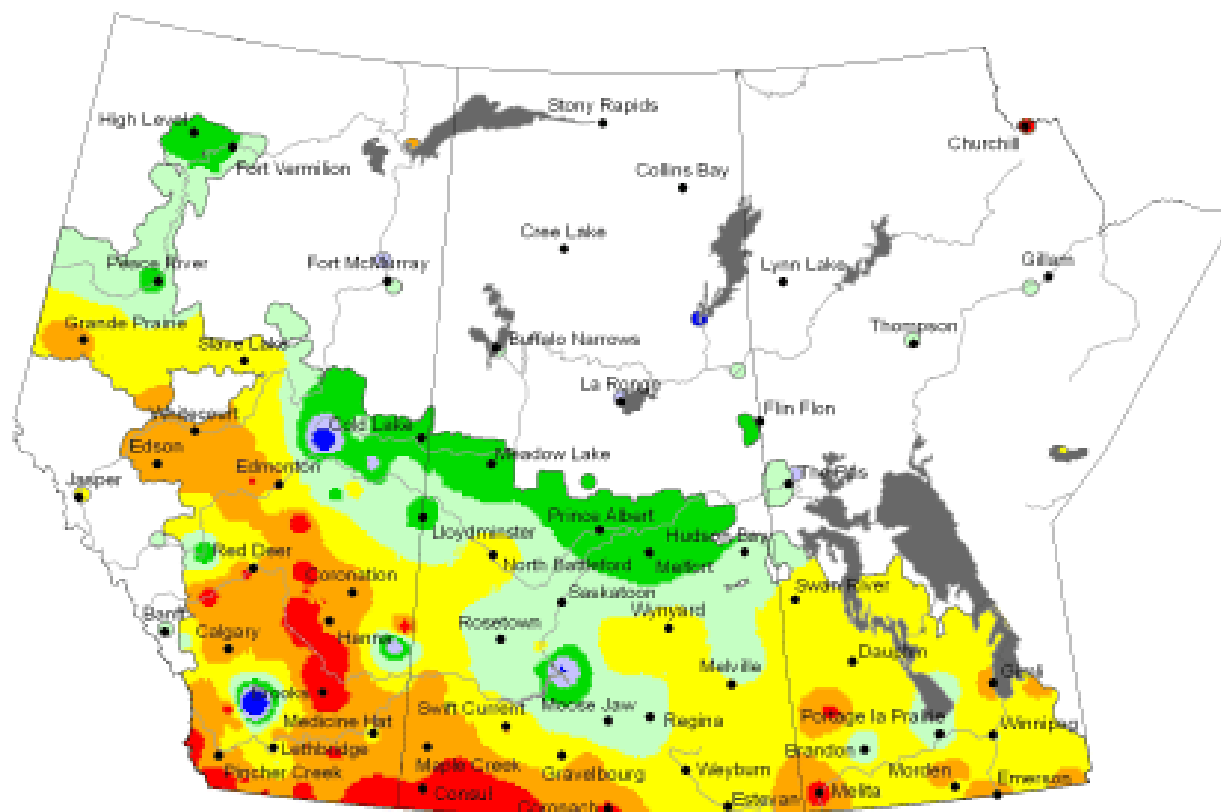
Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Data provided through partnership with Environment Canada, Natural Resources Canada, and many Provincial agencies.

Created: 11/01/07
www.agr.gc.ca/pfra/drought



Percent of Average Precipitation (Prairie Region)

November 1, 2007 to January 8, 2008



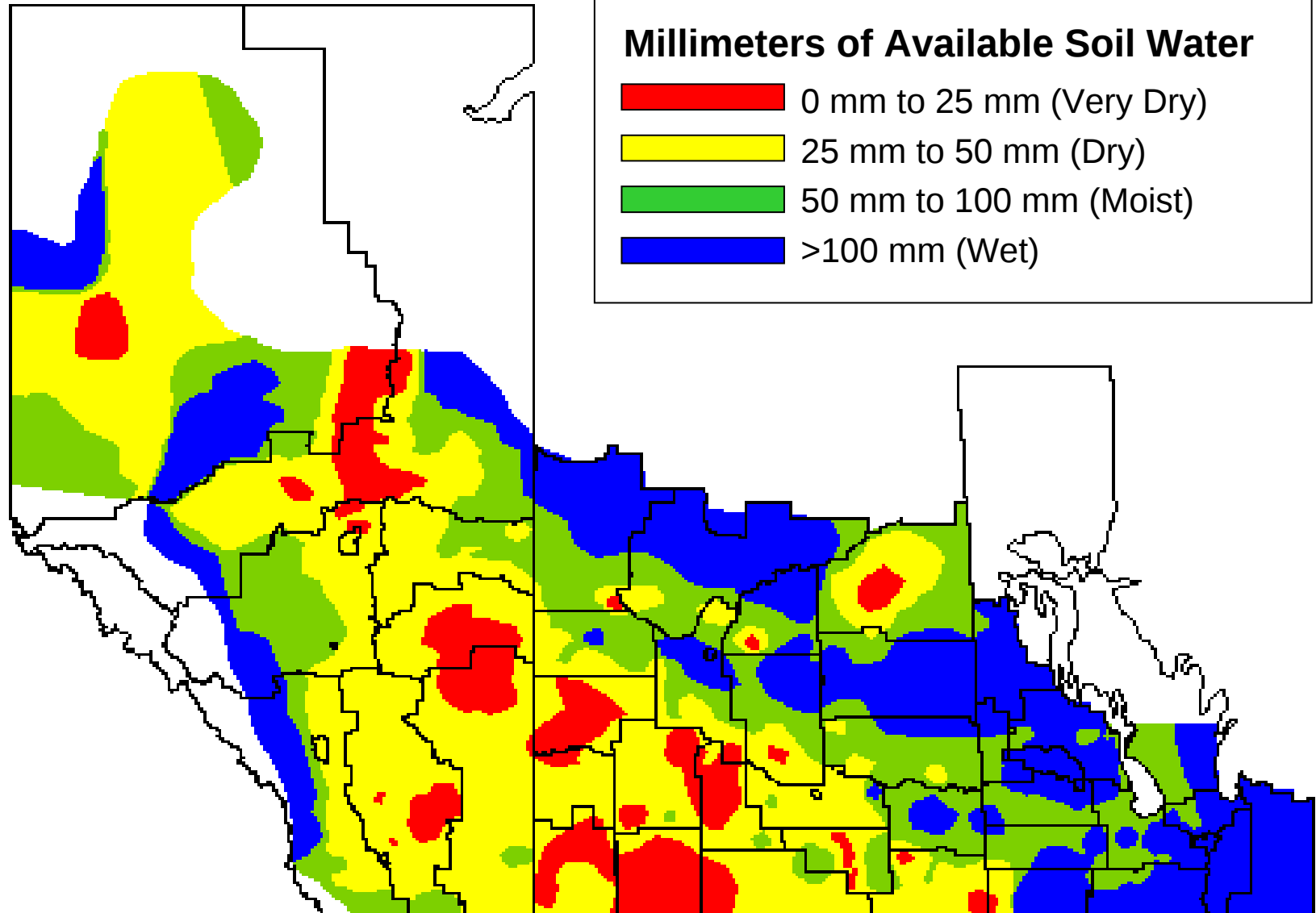
Produced using near real-time data that has undergone initial quality control. The map may not be accurate for all regions due to data availability and data errors.

Copyright © 2008 Agriculture & Agri-Food Canada

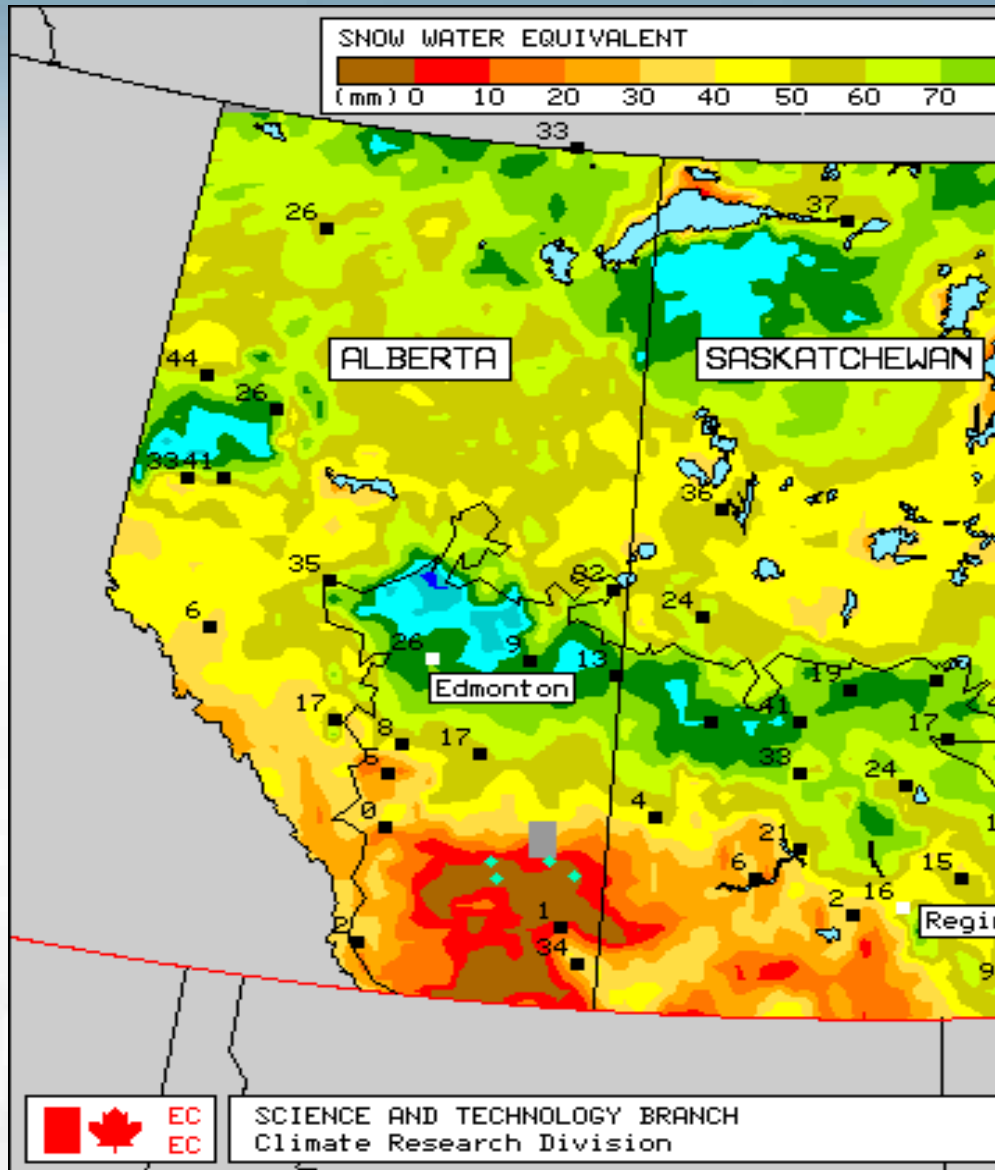
Prepared by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Data provided through partnership with Environment Canada, Natural Resources Canada, and many Provincial agencies.

Created: 01/08/08
www.agr.gc.ca/pma/drought

Available Soil Moisture – November 1, 2007



Snow Water Equivalent – Jan. 08, 2008 & 2007



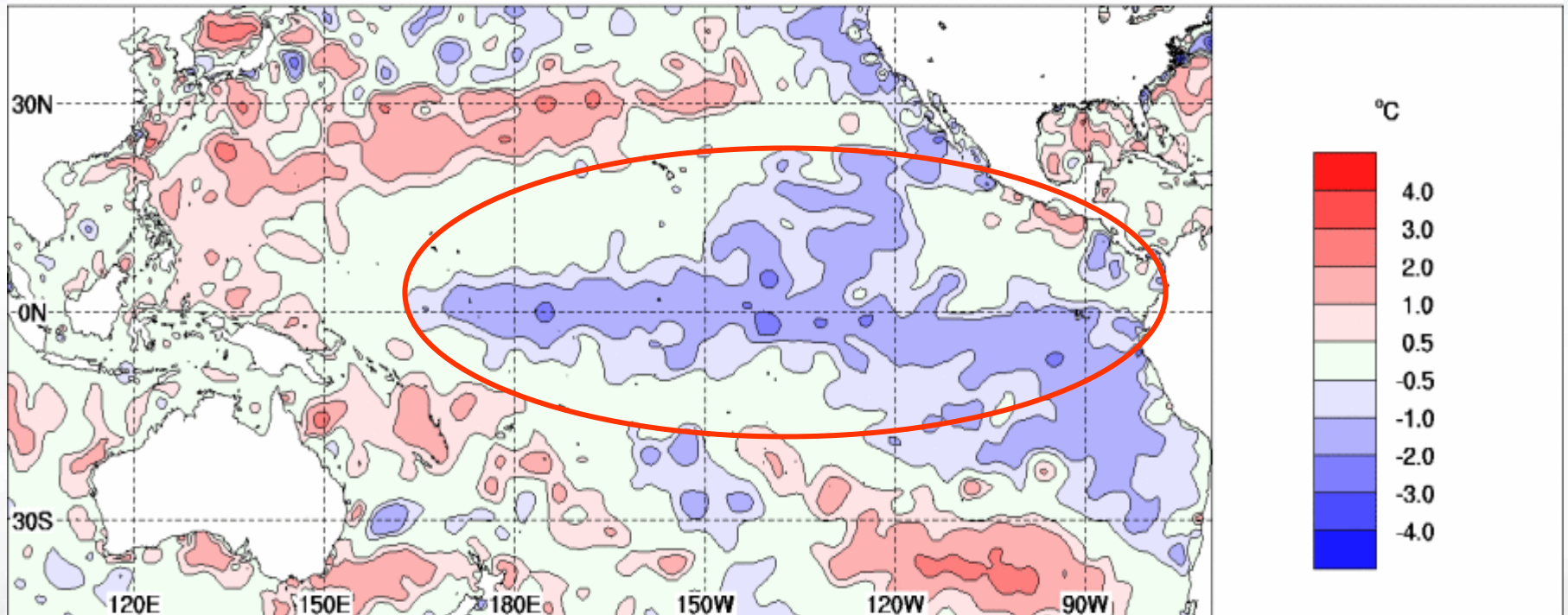
Weather Outlook....



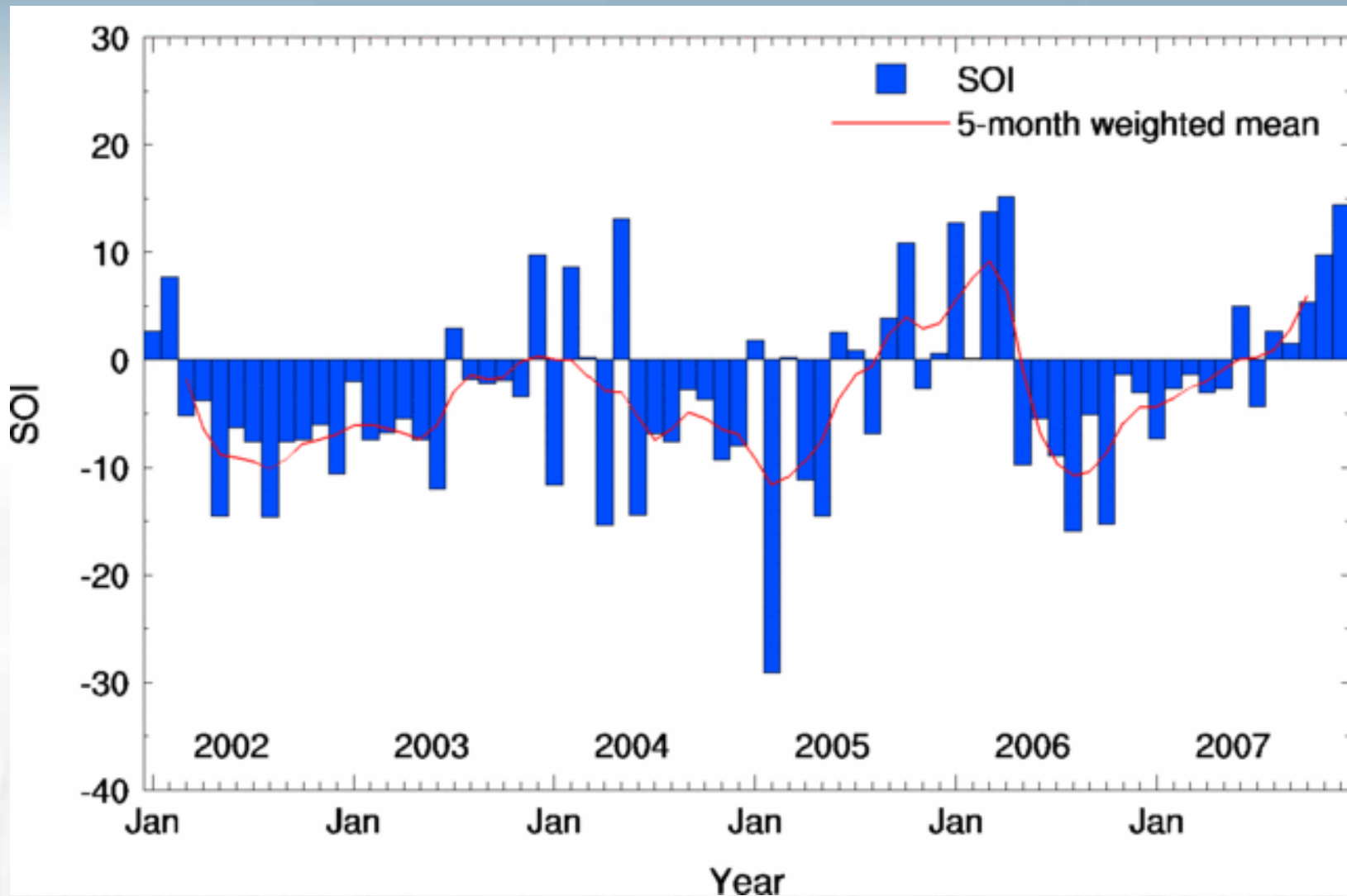
Weather Outlook

Sea Surface Temperature Anomalies – Jan. 1, 2008

La Nina Event

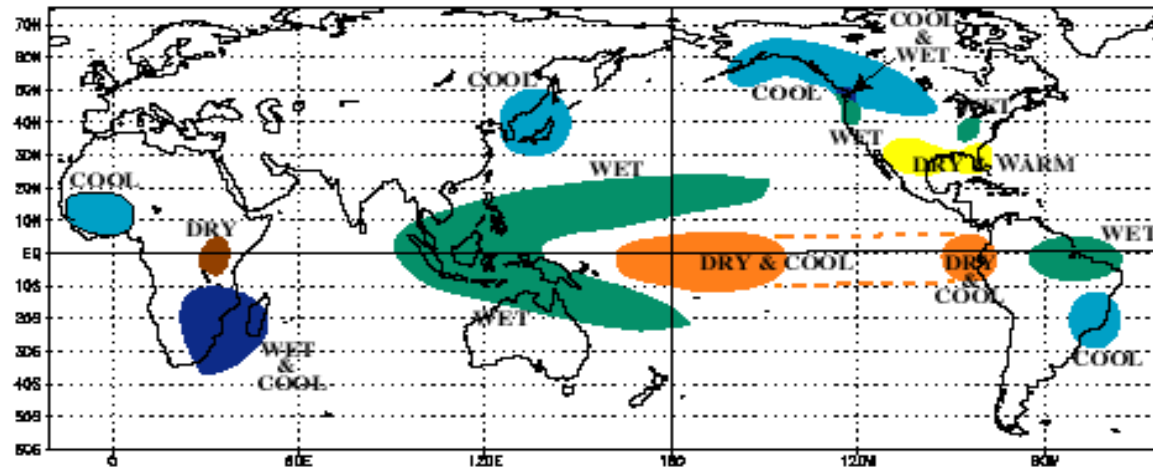


Southern Oscillation Index (SOI)

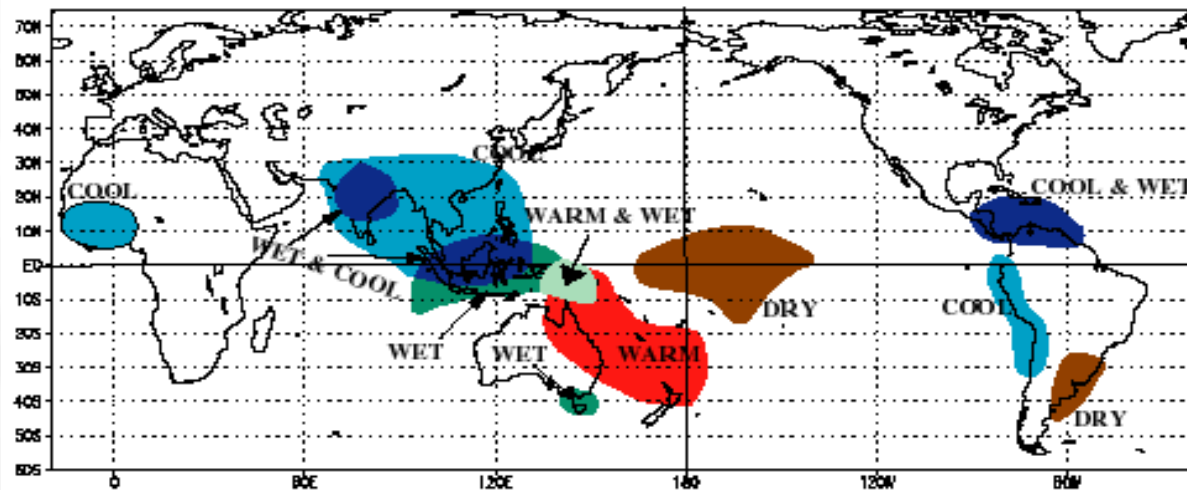


La Nina – Related Global Surface Temperature and Precipitation Patterns

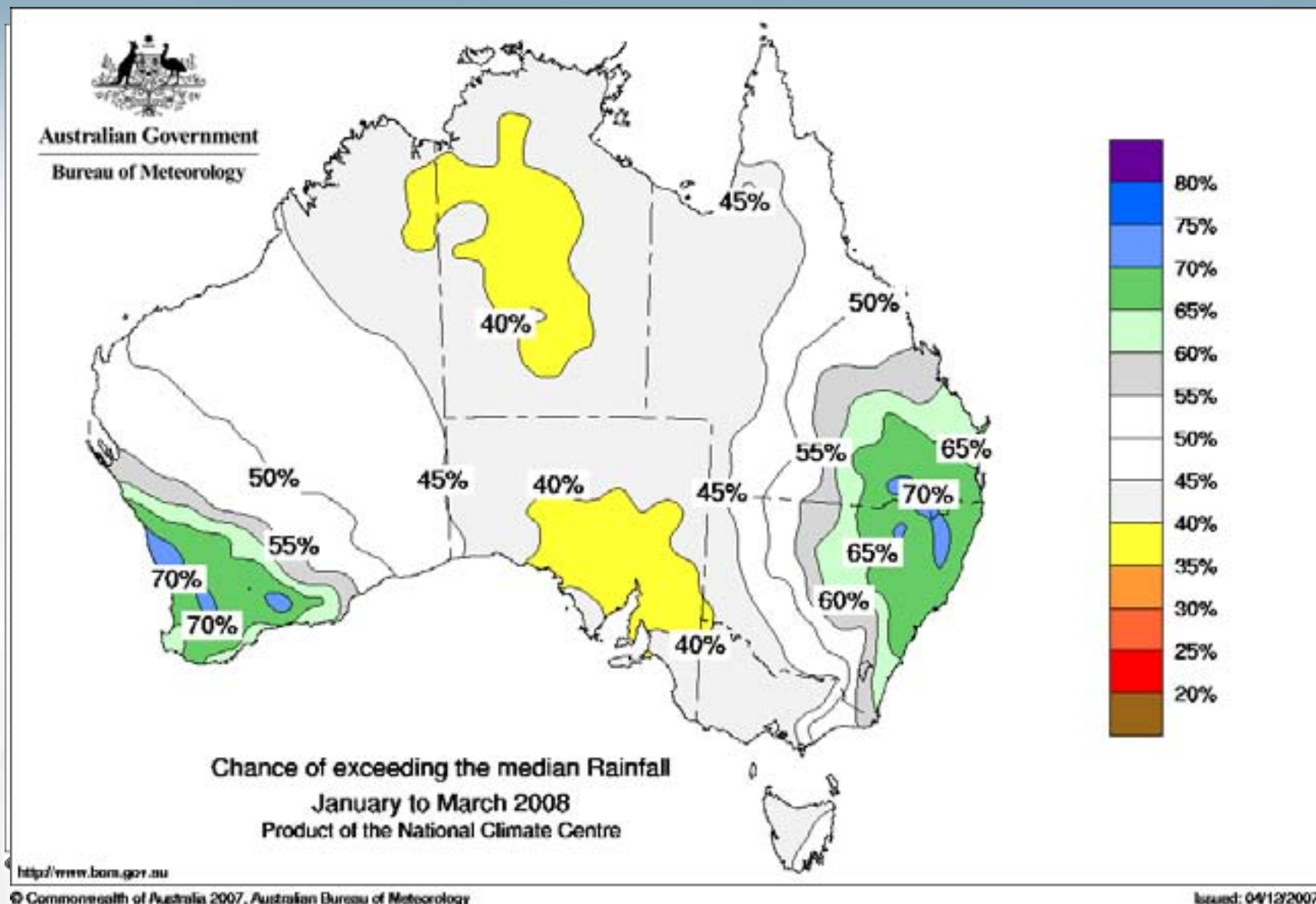
COLD EPISODE RELATIONSHIPS DECEMBER - FEBRUARY



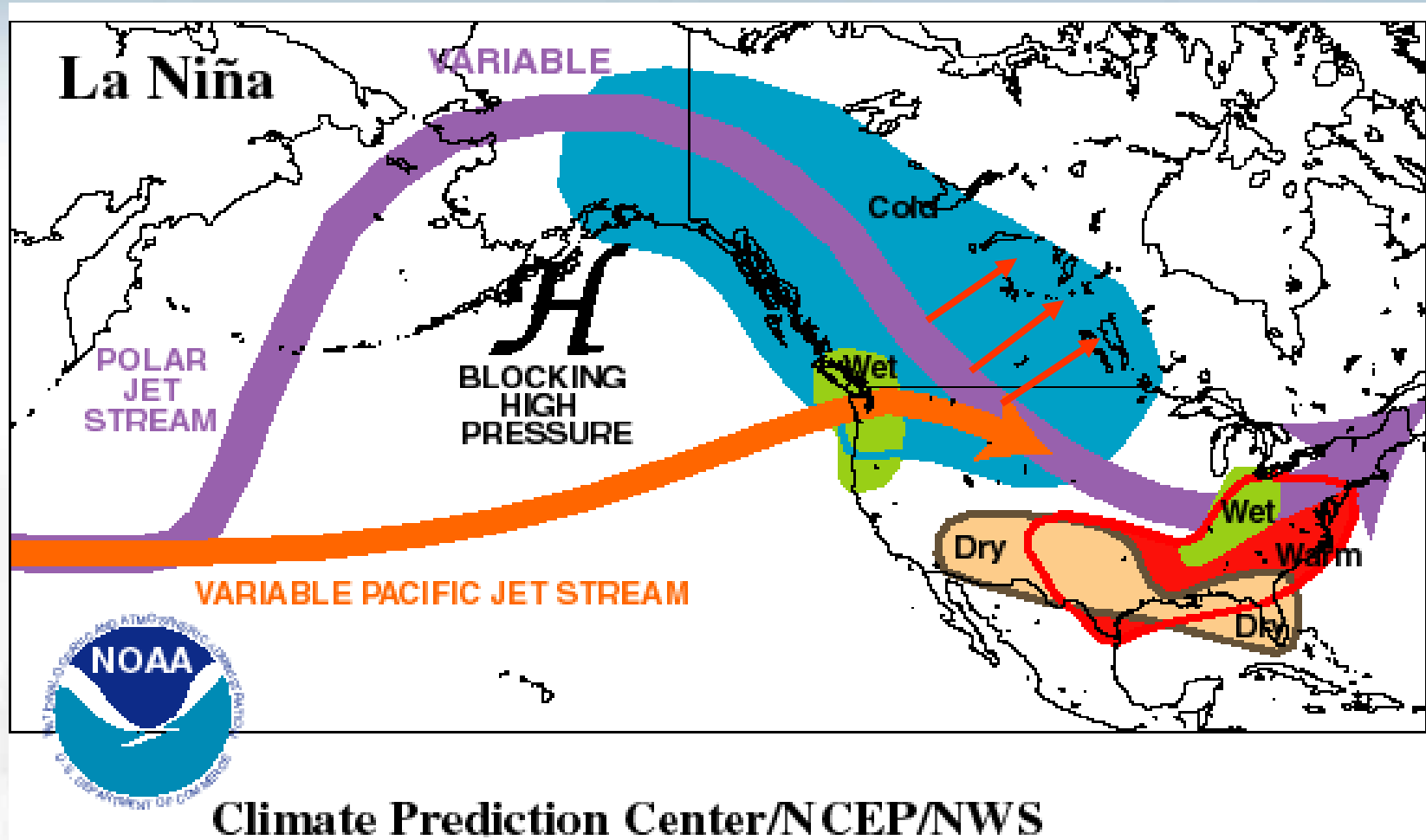
COLD EPISODE RELATIONSHIPS JUNE - AUGUST



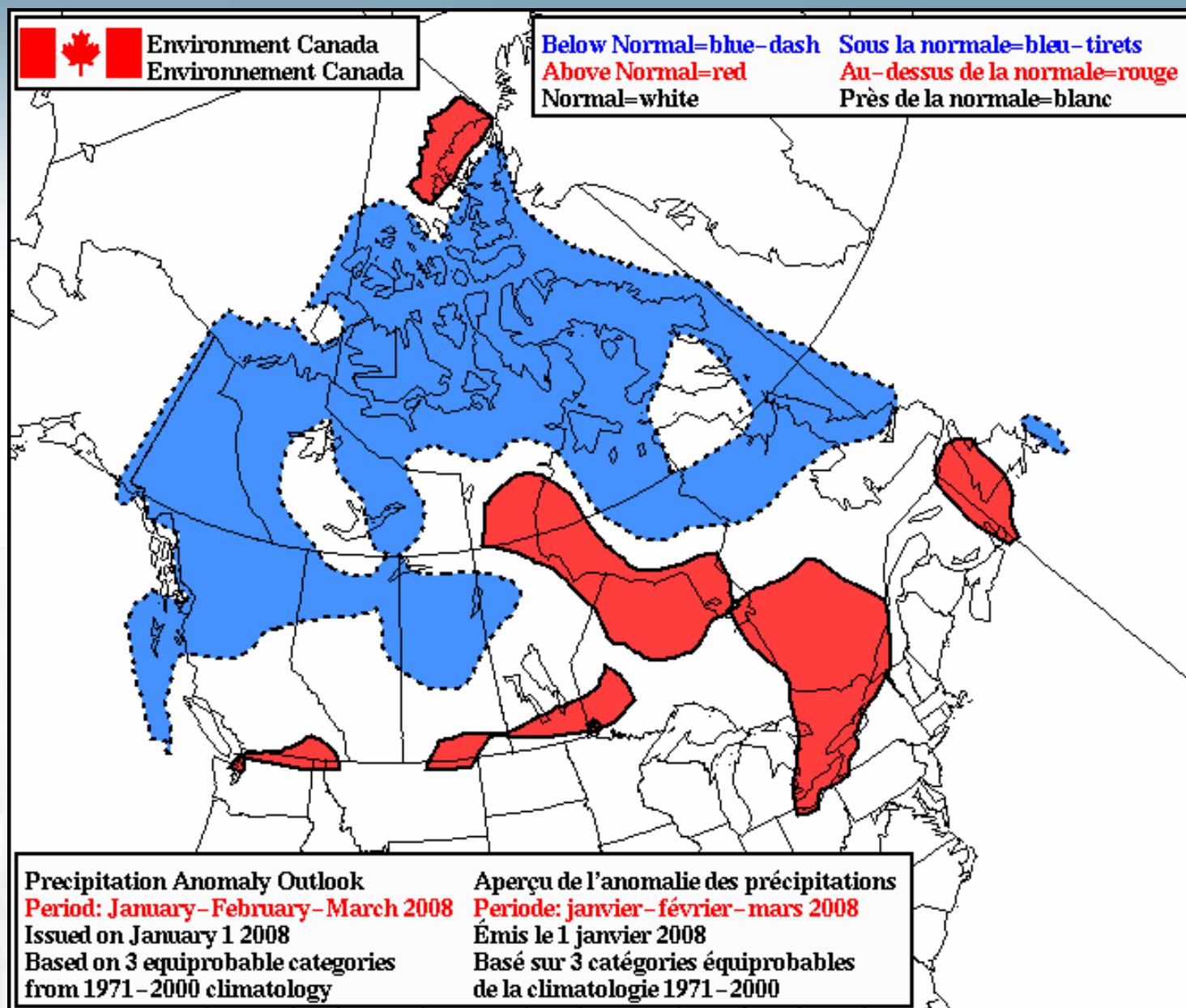
Australian Situation...



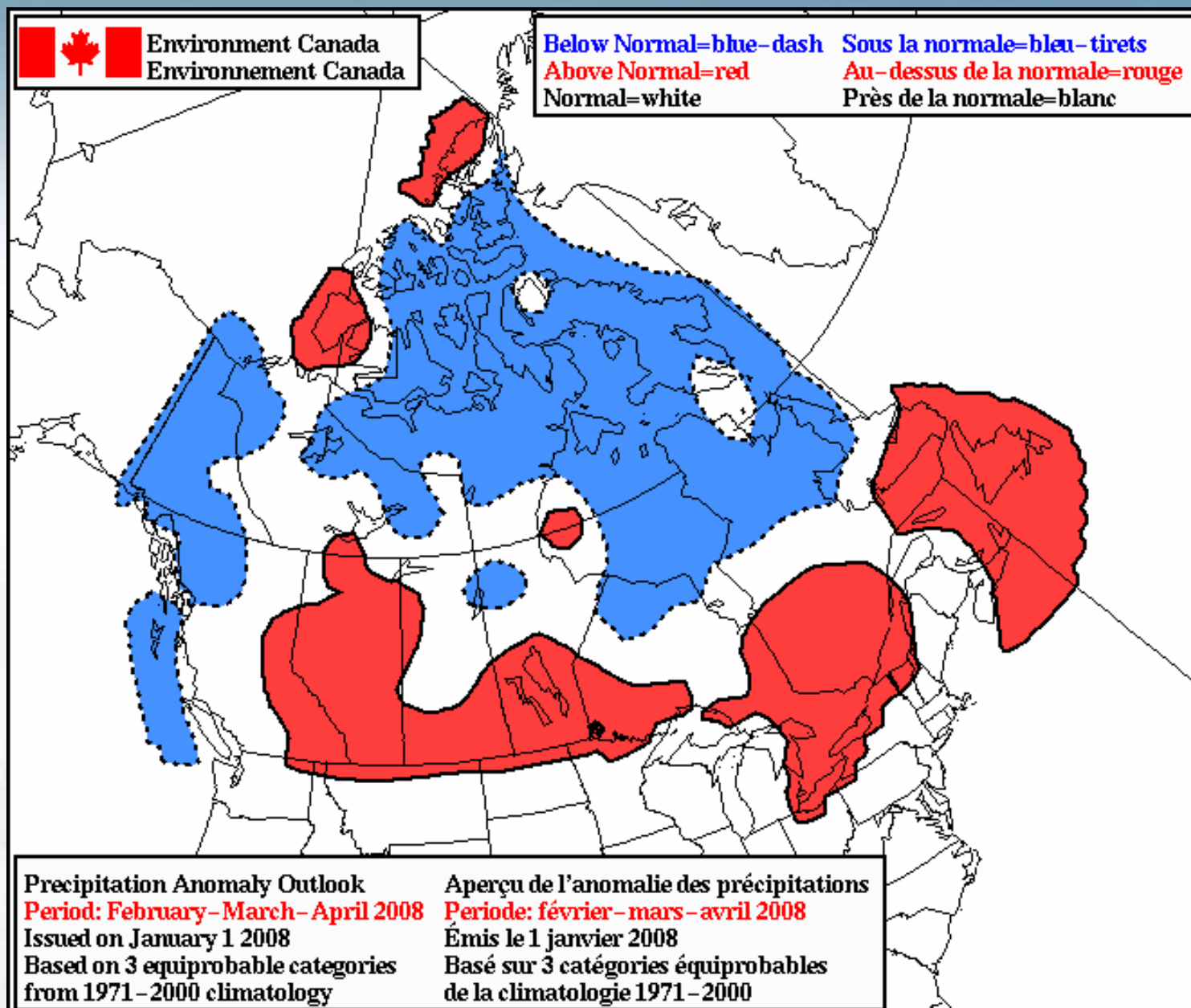
Typical January-March Weather Anomalies and Atmospheric Circulation During Moderate to Strong La Niña's



Environment Canada Seasonal Forecasts...



Environment Canada Seasonal Forecasts...



Summary:

- Dryness continues in Alberta and Southern Saskatchewan
- Forecast calls for continued cold temperatures across most of the Prairies.
- La Nina event will continue at least to March-April.
- Chance for above normal precipitation in parts of Australia.
- US – Dryness and drought continues in western regions of HRW. Poor stand hardiness – lower yields and winterkill potential?
- World – dryness in southern Europe, poor monsoon in NW India, poor soil moisture though Middle East, poor planting conditions in the Ukraine.

CWB Weather Network Initiative

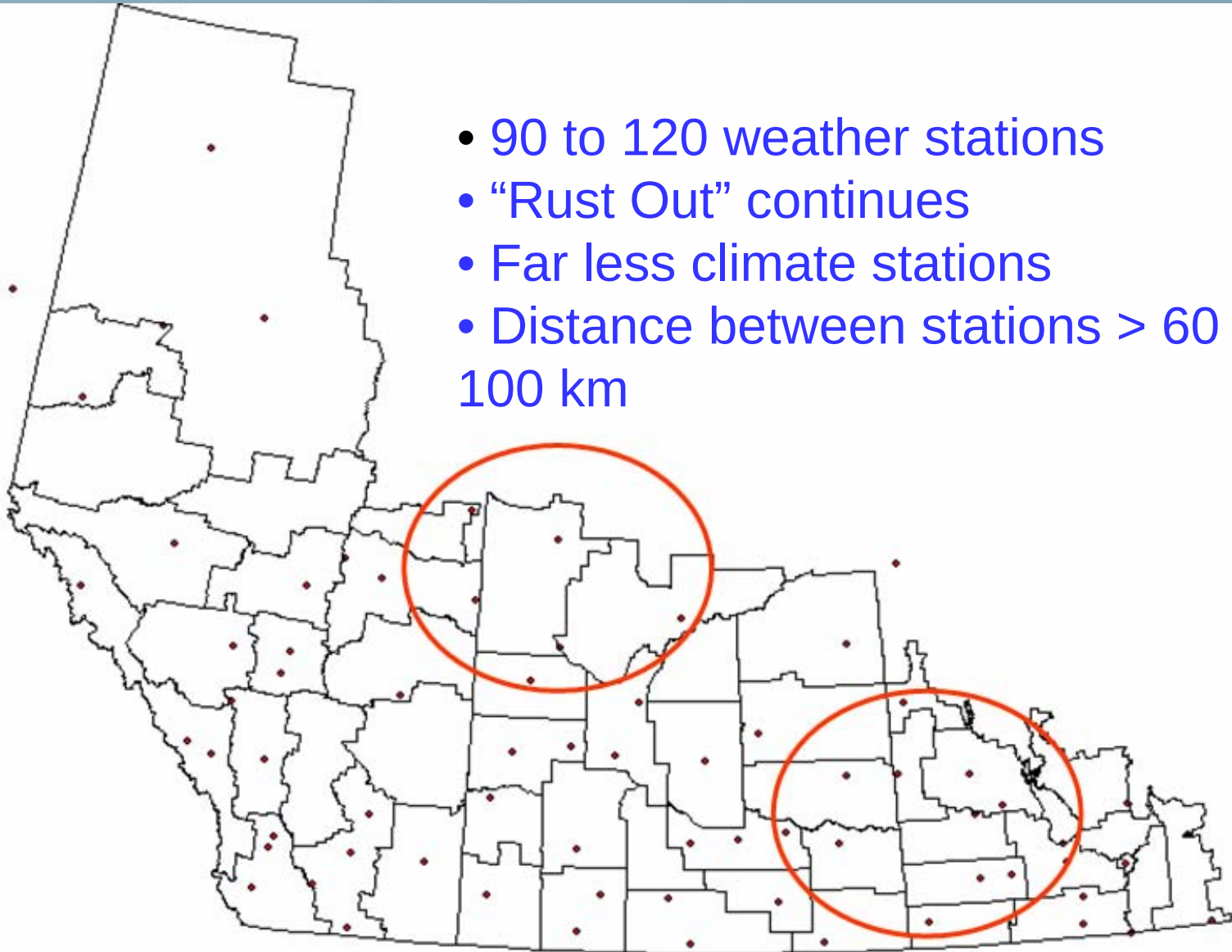


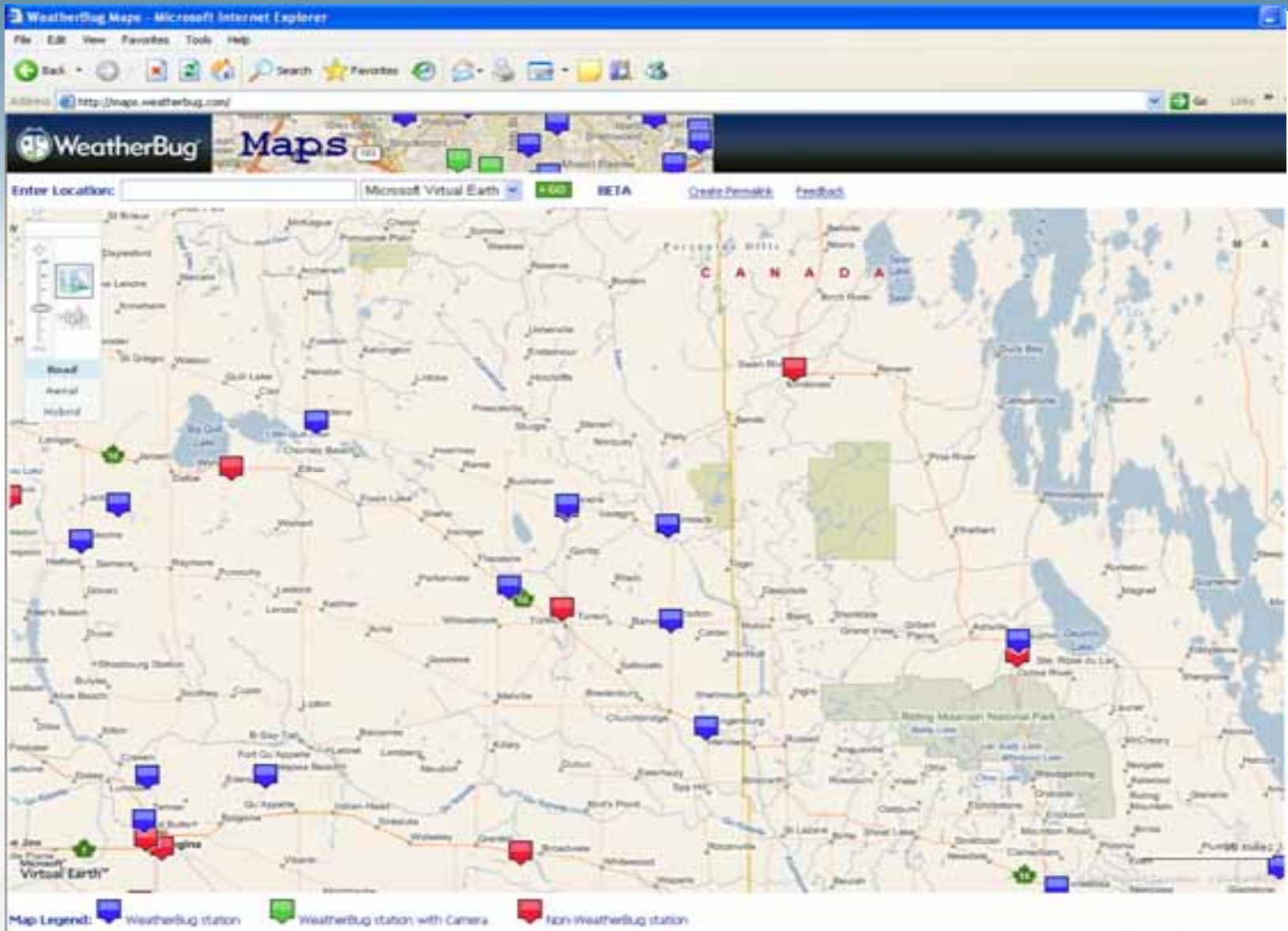
Guy Ash
Project Manager



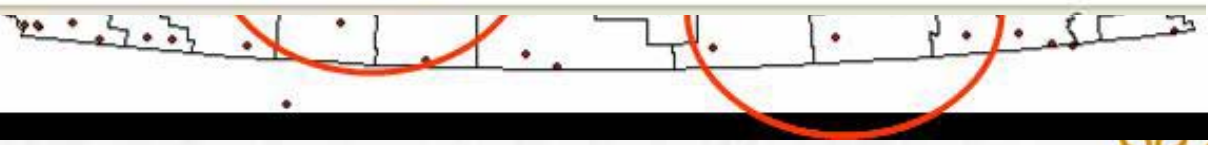
Environment Canada Mainline Weather Station - 2006

- 90 to 120 weather stations
- “Rust Out” continues
- Far less climate stations
- Distance between stations > 60 to 100 km





- 2006



- As a result, Private Networks have been deployed across Western Canada.
 - The issue - private networks, mean private funds.
 - Generally no access to data and not willing to cooperate.
 - Expensive to operate independently.
- CWB and co-operators purpose a low cost, real-time, spatial intensive solution to the problem.
- Ongoing operational costs will be generated through advertising, sponsorship and specialized products.
- Cooperators include CWB, Farmers, JRI, Manitoba & Saskatchewan Water Stewardship, local schools, numerous Inland Terminals, Co-op Ag Centre's, numerous RM's, Parkland Agri Services.....
- **600 to 700 stations over the next two years**



WeatherBug Overview

Education—8,000 schools

Consumers—Millions everyday rely on WeatherBug's Web, Desktop and Mobile solutions to plan a head with confidence.

Media—Used by 100+ local television stations reaching over 80 million households

Government—Over 200 government agencies

Professional—Critical weather data and analysis to businesses and minimize risk

International—Weather information for every location on the planet



Real-Time Network Solution

Live Observations



AWS Real-Time Network



Central Data Center

Software Tools

- Automated Monitoring and Support System
- Network Ops staff
- QA/QC system
- Remote Calibration and Diagnostics

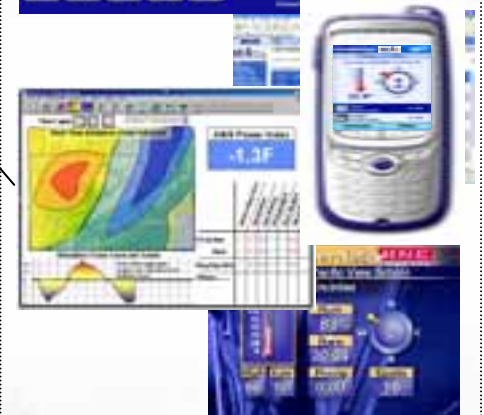


Network and Repository

- Captures Real-Time data every second
- Historical database
- Redundant data centers



User Applications



Applications

- Mobile weather
- On-line Weather Center
- Command Center
- Custom applications and data feeds

Commercial Tracking Station



- Commercial grade instrumentation
- Records 27 live measurements
- Highly reliable and accurate
- Roof Mounted and hard wired
- Connected directly to the internet to stream live data to WeatherBug data centers and end users
- Includes Digital Display
- Can be combined with cameras for security and weather surveillance

On-Farm Weather Station



- Easily deployed and expandable
- Wireless and solar powered
- Uses wireless repeaters to boost distances from ½ to 10+ km.
- Connects to the internet via your PC.
- Includes Digital Display
- Connected to the WeatherBug Network
- Measures wind speed/direction, temperature, relative humidity, barometric pressure, precipitation and rates of change
- Additional Sensors – Solar energy, UV, soil temperature & moisture, leaf wetness.

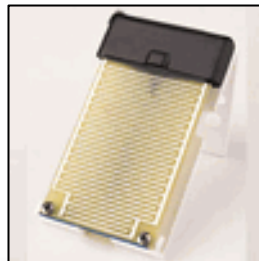
Short and Long Range Telemetry Options



Additional Sensors and Applications:



Leaf Wetness



Disease Forecasting

Soil Moisture



Irrigation Scheduling

Soil Temperature



Fertilizer Applications



WeatherBug.com

- Provides access to live weather conditions from any of the 8,000+ stations on the WeatherBug network
- All new stations installed are automatically integrated and can be viewed on the site
- Includes a detailed 7-day forecast and satellite information
- Enhanced Canadian content – radar, hourly forecast, severe weather warnings and other content.

The screenshot shows the WeatherBug website for Saskatoon, Canada. The browser title is "Saskatoon, Canada weather, powered by WeatherBug - Microsoft Internet Explorer". The address bar shows the URL: <http://weather.weatherbug.com/Canada/Saskatoon-weather.html?code=25009&stat=P0010>.

The website features a navigation bar with links: Home, Local Weather, Detailed Conditions, Historical Weather, Forecast, Radar & Maps, Cold & Flu, Weather Cameras, Traffic Cameras, Community, Video, News & Features, Travel, and Weather Glossary. There is also a "Our Company" section with a "Desktop Application" download link.

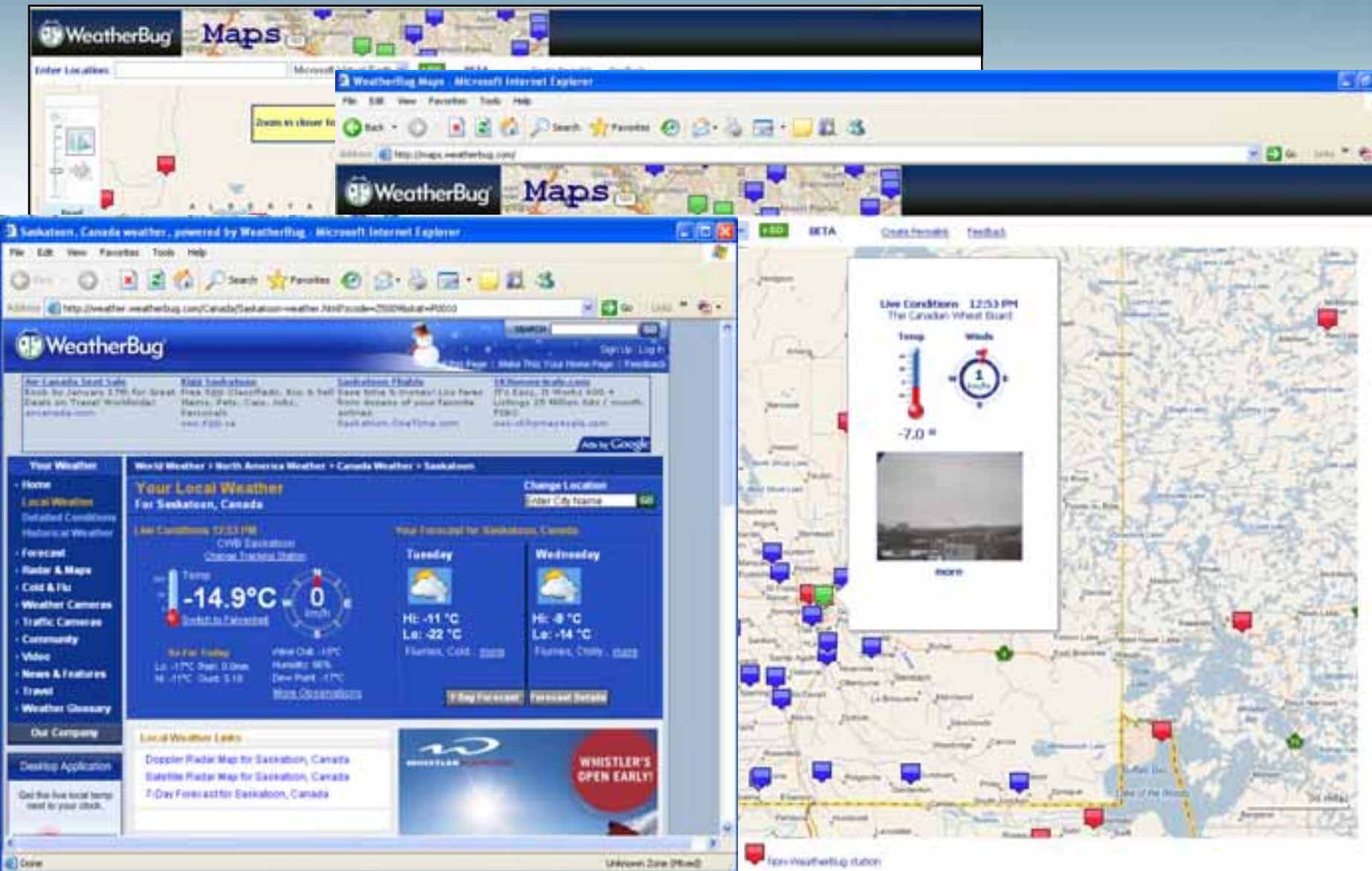
The main content area displays "Your Local Weather For Saskatoon, Canada". The live conditions at 12:58 PM show a temperature of -14.7°C (5°F) with a wind speed of 3 km/h. The forecast for Tuesday and Wednesday shows high and low temperatures and precipitation chances.

Local Weather Links include: Doppler Radar Map for Saskatoon, Canada; Satellite Radar Map for Saskatoon, Canada; and 7-Day Forecast for Saskatoon, Canada.

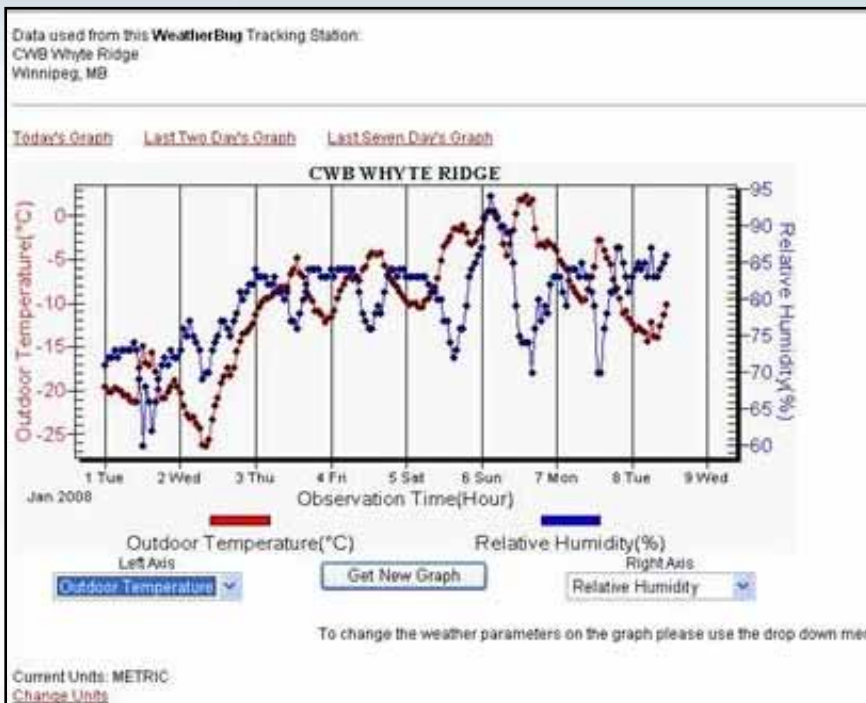
WeatherBug Community Links include: Visit the Community; Weather Community Photos; Weather Video Gallery; Weather youCaster Gallery; and Weather Chat Block Party.

A large advertisement for Whistler's Open Early! is visible on the right side of the page, featuring a skier and the text "5TH NIGHT FREE BOOK BY JANUARY 15".

Other Web Sites and Tools



Online Weather Center



- Stand-alone branded web page for weather station owners
- Will include navigable map, meta data for weather stations, radar, satellite, graphs and links to other information
- Expected availability – 01/15/2008

Online Weather Center

CWB Online Weather Center powered by **WeatherBug** PROFESSIONAL

[Reset Page](#)

Live Conditions: 12:55 PM
CWB Whyte Ridge
Winnipeg, MB

Temp: -9.3°C
[Switch to Fahrenheit](#)

So Far Today
Rain: 0.0mm Gust: 8 MPH

Hi:	Low:
Temperature: -9°C	-14°C
Relative Humidity: 88.0%	82.0%
Pressure: 1010.94mb	1010.94mb

WindChill: -9°C
Humidity: 87%
Dew Point: -11°C
Avg Wind: 0 MPH
Pressure: 1016.93mb
Sunrise: 12:00 AM
Sunset: 12:00 AM
RainMonth: 2mm
MoonPhase:
Elevation: 5m
Lat: 0.0000
Lon: 0.0000

Maps **Stations**

Legend:
WeatherBug Station w/Camera
WeatherBug Station
NWS Station

[Daily City](#) | [Monthly City](#) | [Station Details](#)

7 Day Forecast

Day	Icon	Hi: Lo:	Loc:	Notes
Tuesday		Hi: -5° Lo: -13°	Loc: 13°	Furries More...
Wednesday		Hi: -9° Lo: -18°	Loc: 18°	Furries More...
Thursday		Hi: -8° Lo: -15°	Loc: 15°	Furries More...
Friday		Hi: -7° Lo: -15°	Loc: 15°	Mostly Sunny More...
Saturday		Hi: -12° Lo: -18°	Loc: 18°	Furries More...
Sunday		Hi: -14° Lo: -19°	Loc: 19°	Furries More...
Monday		Hi: -15° Lo: -21°	Loc: 21°	Furries More...

Monthly Observations

Data used from this **WeatherBug** Tracking Station:
CWB Whyte Ridge
Winnipeg, MB

September October November December January

Observation Date	Max Temp °C	Min Temp °C	Rain / Month cm	Rain / Year cm	Wind Gust km/h	Last Light	Min Pressure hPa	Max Pressure hPa	Min Hum %
January, 2008									
01/01/2008	-14.67	-21.56	0.00	0.00	0.00	12:00 AM	102.91	102.91	57.9
01/02/2008	-11.45	-26.43	0.00	0.00	0.00	12:00 AM	104.18	104.18	66.9
01/03/2008	-4.73	-12.26	0.00	0.00	47.26	12:00 AM	101.63	101.63	72.9
01/04/2008	-4.81	-11.56	0.00	0.00	36.33	12:00 AM	101.18	101.18	73.9
01/05/2008	-1.06	-10.81	0.00	0.00	32.10	12:00 AM	100.62	100.62	76.9
01/06/2008	2.33	-4.56	0.20	0.00	21.87	12:00 AM	99.11	99.11	69.9
01/07/2008	-2.78	-12.29	0.20	0.00	17.64	12:00 AM	100.14	100.14	68.9
01/08/2008	-9.23	-14.45	0.20	0.00	7.76	12:00 AM	101.09	101.09	62.0

All times data may be incomplete because of occasional power outages and/or technical problems with the weather instruments.

Current Units: METRIC
[Change Units](#)

Weather Maps [+ Tool](#) [Close Window](#)

Infrared Satellite 12:43 PM EST **WeatherBug**

Map Controls

[Satellite Image](#)
[Satellite Image](#)
[Satellite Image](#)
[Satellite Image](#)
[Satellite Image](#)

[Reset View](#)

For more information visit www.weatherbug.com

http://www.weathercenter.weathernet.com - Daily Observation Summary - Microsoft Internet Explorer

Daily Observation

[Print](#) [Close Window](#)

Current Units: Metric (Celsius, mm)

Data used from this **WeatherBug** Tracking Station:
THE CANADIAN WHEAT BOARD WINNIPEG, MB

Time	Temp °C	Rel Humid %	Dew Point °C	Wind Dir °C	Wind Speed km/h	Wind Gust km/h	Sea Pres: hPa	Bar: hPa	Bar: hPa	Bar: hPa	Light %	Temp Rate °C/h	Humidity Rate %/h	Pressure Rate hPa/h
Thursday, January 03, 2008														
00:00	-7.3	82.7	-5.7	-5.5	WVW	5.8	-10.74	100.80	0.00	0.00	0.0	0.1	0.1	0.00
01:00	-6.8	86.1	-5.7	-5.7	WV	6.8	-10.36	100.81	0.00	0.00	0.0	-1.4	3.8	0.00
02:00	-7.7	85.7	-6.8	-6.6	WV	5.8	-10.63	100.81	0.00	0.00	0.0	1.1	-0.5	0.00
03:00	-8.1	87.8	-6.7	-6.9	WVW	12.1	-14.77	101.82	0.00	0.00	0.0	-1.4	3.1	0.07
04:00	-10.5	82.9	-11.4	-11.0	WVW	6.8	-14.67	101.88	0.00	0.00	0.0	-1.2	4.1	0.07
05:00	-10.3	100.0	-10.3	-10.3	NE	4.2	-10.33	101.72	0.00	0.00	0.0	0.1	7.8	0.00
06:00	-8.7	83.7	-10.5	-10.1	NEW	5.0	-12.63	101.72	0.00	0.00	0.0	0.8	-6.8	0.00
07:00	-10.7	86.0	-11.2	-10.8	NEW	7.4	-14.86	101.22	0.00	0.00	0.0	-0.8	3.1	0.10
08:00	-10.8	85.8	-11.4	-11.0	NEW	5.0	-10.58	101.35	0.00	0.00	0.0	0.1	-1.9	0.14
09:00	-10.4	86.0	-11.9	-11.2	NEW	6.8	-10.27	101.42	0.00	0.00	1.0	0.1	-4.7	0.07
10:00	-9.6	87.2	-11.3	-10.4	WVW	4.2	-9.96	101.46	0.00	0.00	3.7	0.8	-0.6	0.07
11:00	-8.7	91.8	-10.4	-9.1	WVW	6.8	-10.81	101.46	0.00	0.00	13.2	2.7	-4.4	0.00
12:00	-7.7	86.4	-10.2	-9.4	WVW	1.1	-7.87	101.42	0.00	0.00	16.4	-0.8	0.6	-0.07

[Previous](#)

Specify Date (MM/DD/YYYY): 1/6/2008 1:38:53 PM

WeatherBug PROFESSIONAL

Powered by WeatherBug Professional. © 2008 CompuLink Technology, Inc. 2008-2009

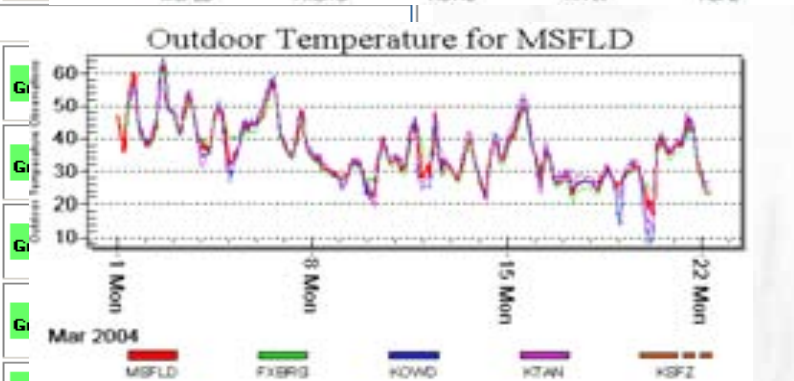
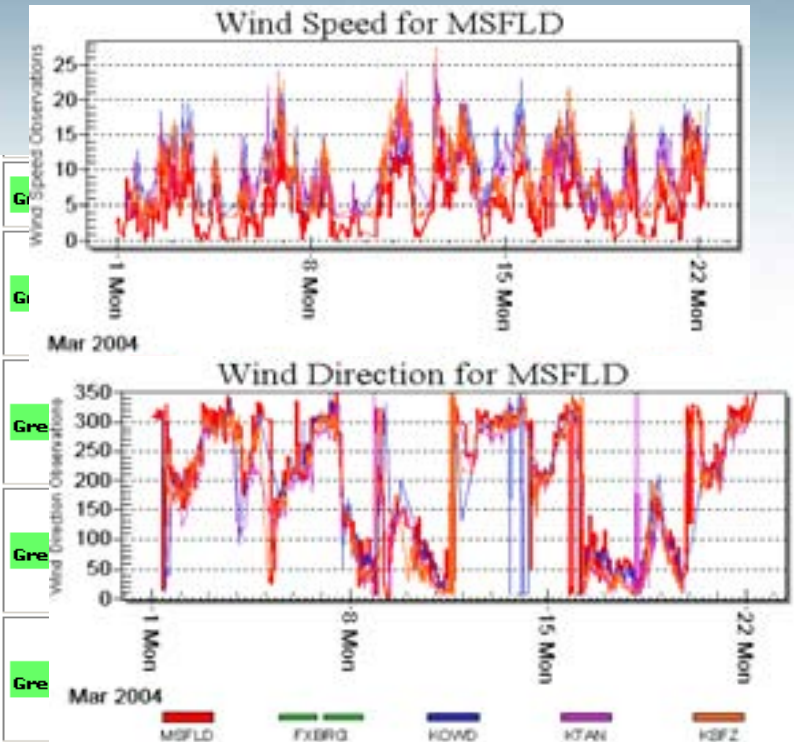
Internet

WeatherBug Mobile



- Full range of WeatherBug content available on Brew or Smartphone enabled handsets.
- International Blackberry functionality to be added this spring
- Java apps to be added soon

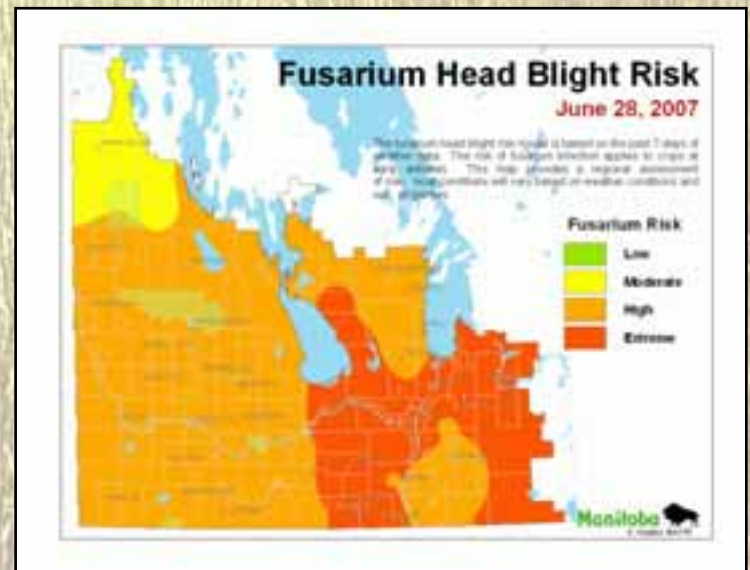
Quality Assurance/Control



Site Sensors B Update	
23. Distance to North Obstruction:	1500
Closest North Obstruction:	
24. Distance to South Obstruction:	1500
Closest South Obstruction:	
25. Distance to West Obstruction:	1500
Closest West Obstruction:	
26. Distance to East Obstruction:	1500
Closest East Obstruction:	
27. Distance to Heat Source:	0

Future Agriculture Applications:

- 1) Cereal Disease Models – e.g. leaf, fusarium-scab, rust
- 2) Growing Degree Days/Growth Stages – cereals and/or forages, insect models
- 3) Crop Specific Agronomic Models – e.g. soil moisture, moisture stress, bio-meteorological time scales.



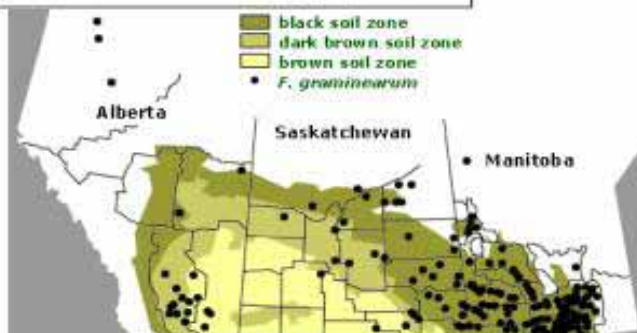
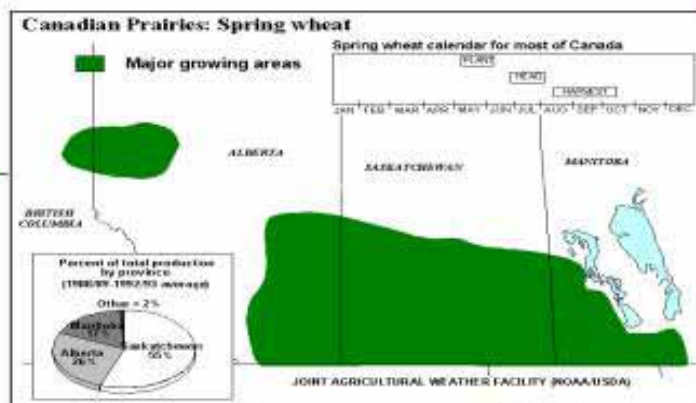
Cereal Disease Models...

Distribution of Wheat and Fusarium in Western Canada

MONHEIM - 2005



Source: Randy Clear, Canadian Grain Commission;
www.grainscanada.gc.ca/Pubs/fusarium/fusarium-ed.html



■ Fusarium head blight primarily found:

- Manitoba, but some occurrences in Saskatchewan and Alberta
- Found in bread wheats, durum, and barley

■ Distribution of *Fusarium graminearum* and soil zones in Western Canada in 2003

NDSU
Extension Service
North Dakota State University



Bayer CropScience





Epidemiology and Crop Management Disease Forecasting

- **Disease Forecasting** information tells farmers about risk of infection at critical growth stages & allows more informed fungicide decisions
- **Current forecasting systems in US and Western Canada** based on RH, temperature, + duration of rainfall in previous 7 days - to predict risk of infection

North Dakota Risk map address:

www.ag.ndsu.nodak.edu/cropdisease/

U. S. Wheat and Barley Scab Initiative system:

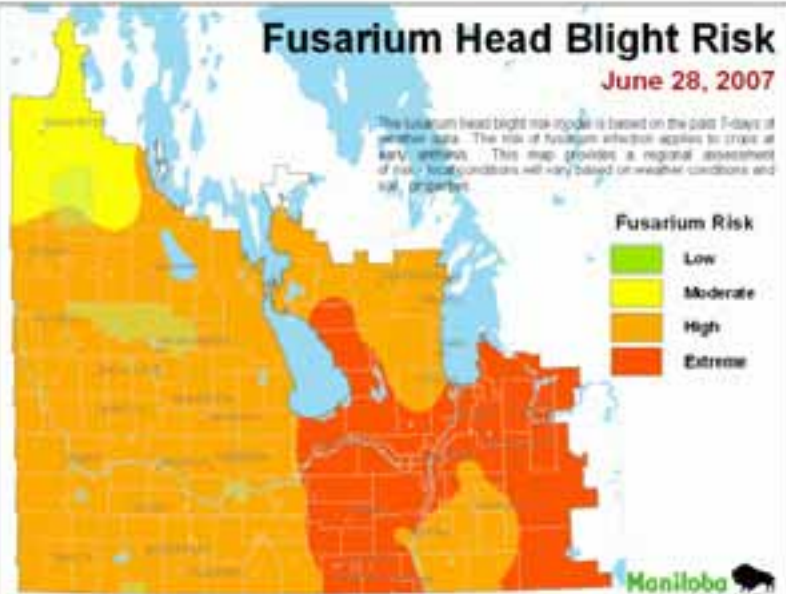
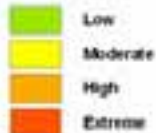
www.wheatscab.psu.edu/

Fusarium Head Blight Risk

June 28, 2007

The fusarium head blight risk model is based on the past 7-days of weather data. The risk of fusarium infection applies to crops at early anthesis. This map provides a regional assessment of risk; local conditions will vary based on weather conditions and soil properties.

Fusarium Risk

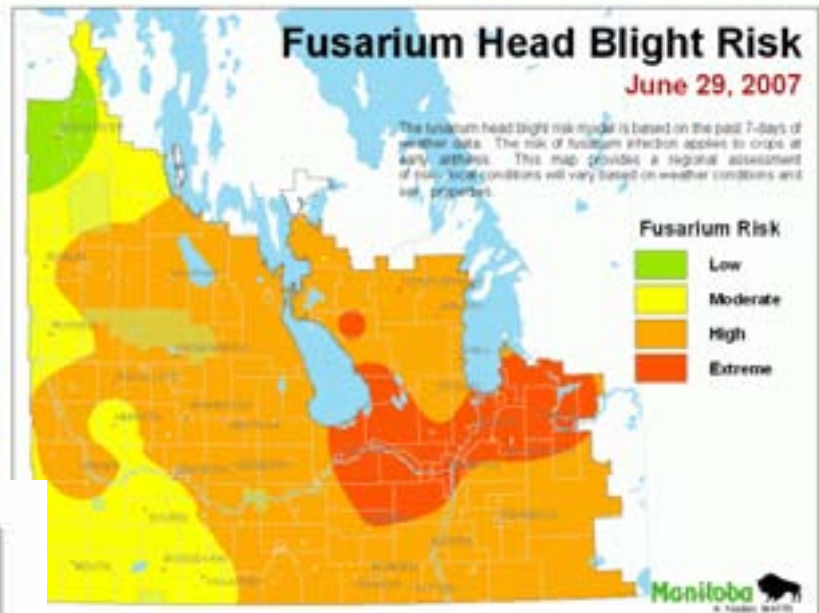


Fusarium Head Blight Risk

June 29, 2007

The fusarium head blight risk model is based on the past 7-days of weather data. The risk of fusarium infection applies to crops at early anthesis. This map provides a regional assessment of risk; local conditions will vary based on weather conditions and soil properties.

Fusarium Risk

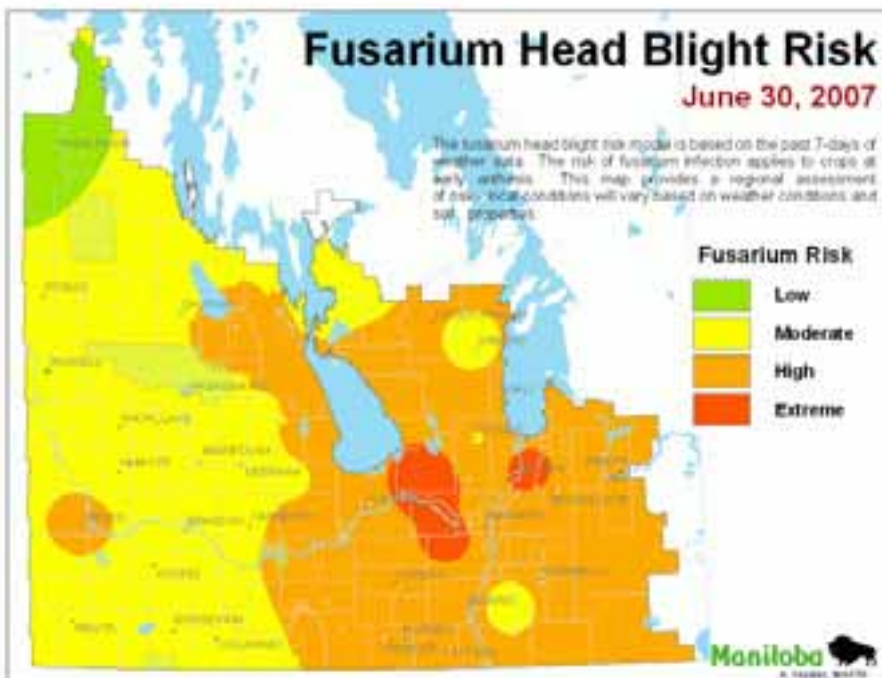


Fusarium Head Blight Risk

June 30, 2007

The fusarium head blight risk model is based on the past 7-days of weather data. The risk of fusarium infection applies to crops at early anthesis. This map provides a regional assessment of risk; local conditions will vary based on weather conditions and soil properties.

Fusarium Risk



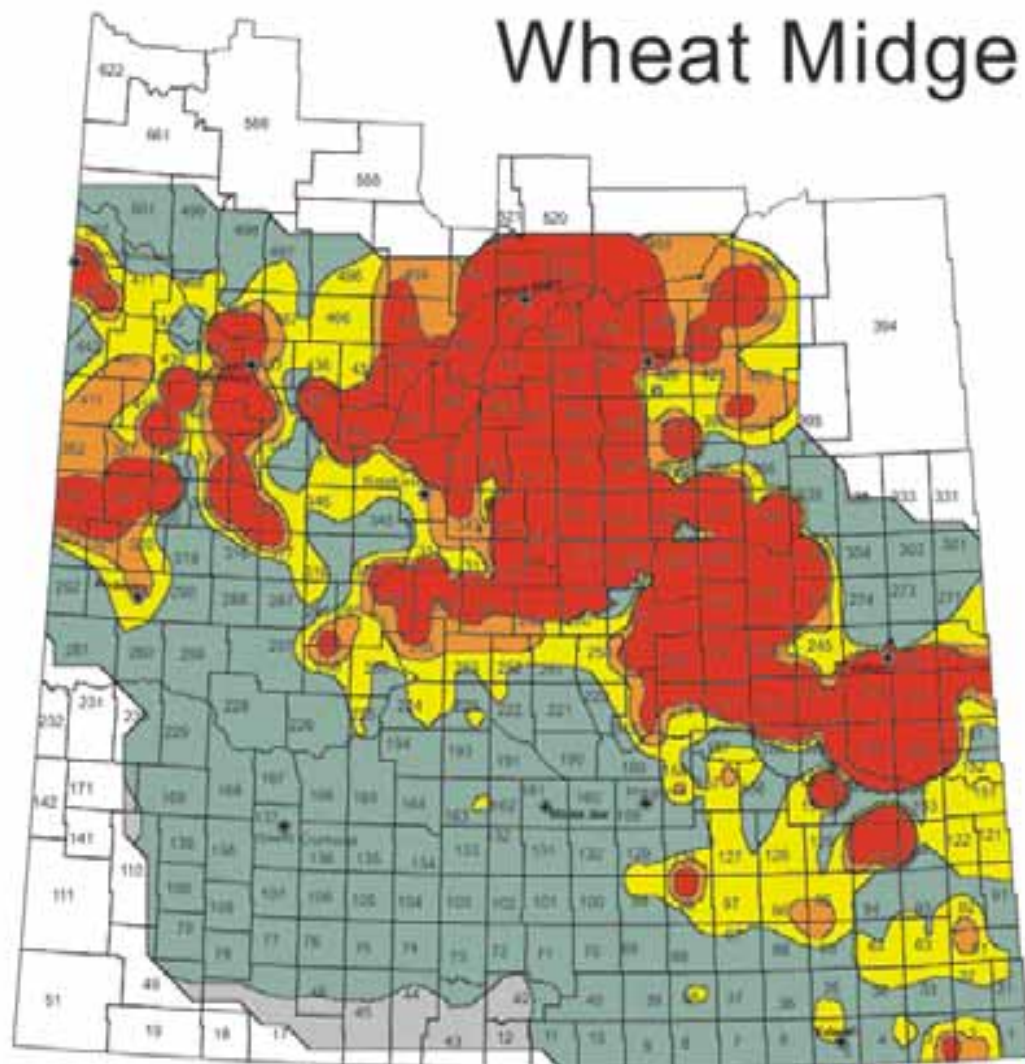


Wheat Midge Forecast 2008

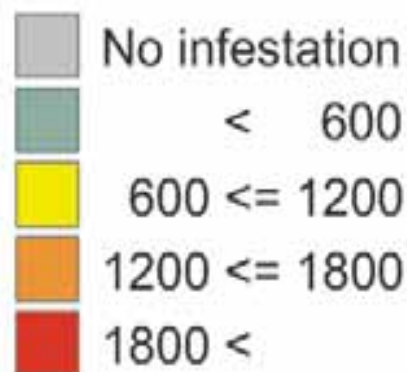


Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



Midge / m²



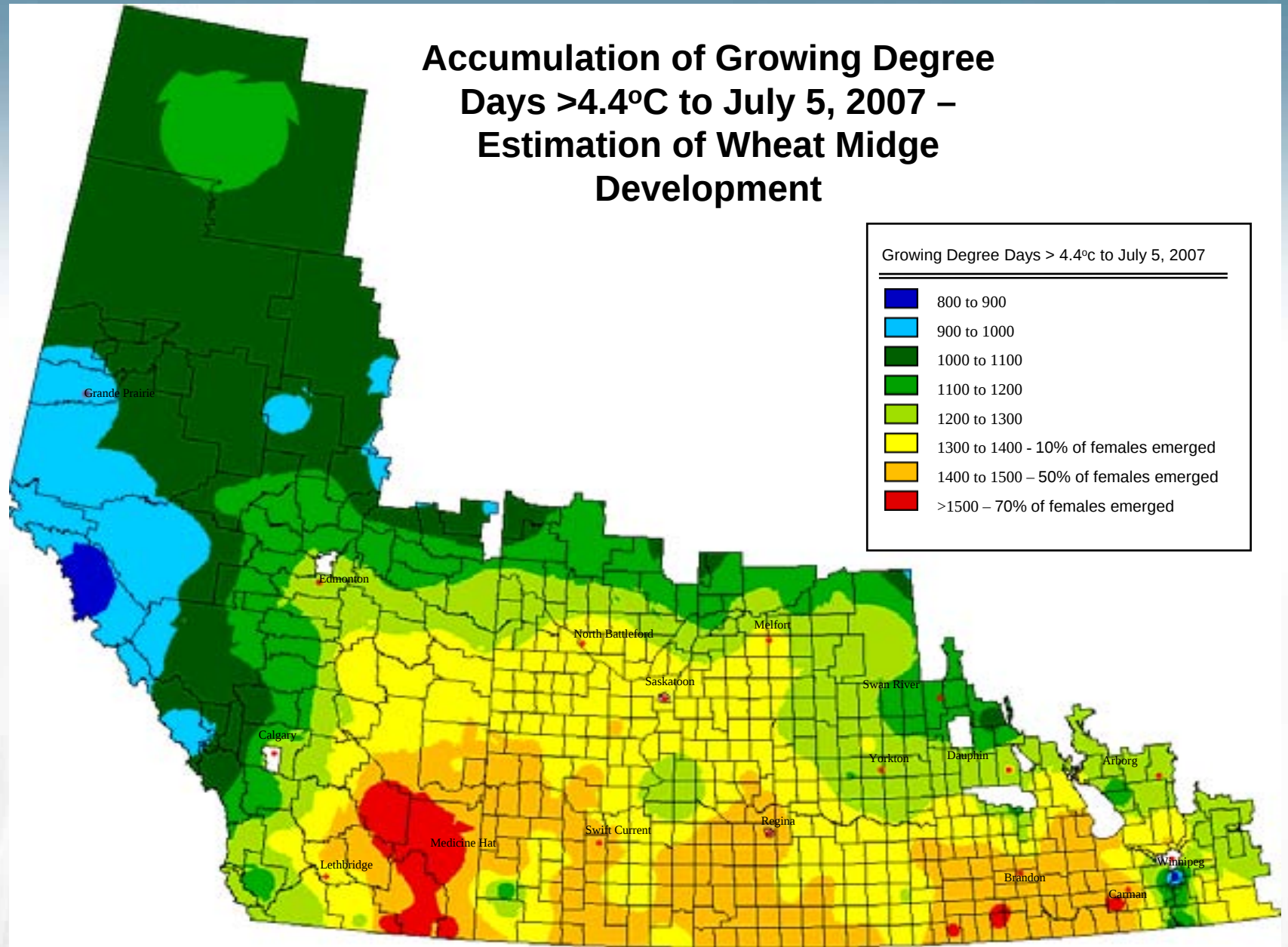
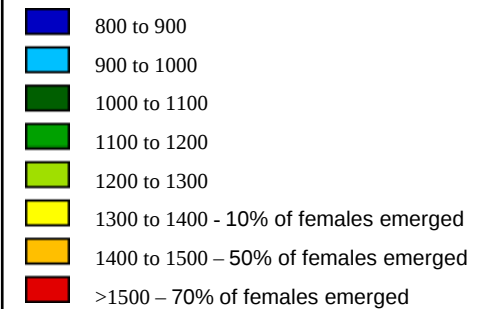
CANADA - SASKATCHEWAN
Crop Insurance



**Saskatchewan
Ministry of
Agriculture**

Accumulation of Growing Degree Days >4.4°C to July 5, 2007 – Estimation of Wheat Midge Development

Growing Degree Days > 4.4°C to July 5, 2007



Weather Station Benefits:

- 1) Access to instantaneous updates of local weather conditions for numerous agronomic & marketing decisions.
- 2) Localized forecast information - updated hourly.
- 3) Information accessible via many sources – Internet, PDA, and cell phones.
- 4) Detailed record of past weather conditions - record management tool. Spray drift concerns, herbicide complaints from frost events, etc.
- 5) Part of a growing weather network across Western Canada.
- 6) Cost effective solution to a long overdue problem.

Pricing....

On-Farm Weather Stations (Basic)	\$900.00
Installation (Free by CWB Staff ** long waiting list)	\$700.00
Short Range Repeaters	\$250.00
Additional Sensors	**Priced on Request
Commercial Tracking Station	\$5,000.00
Installation	\$1,000.00
Ongoing Network Access and Support (includes Online Weather Center and access to other online services)	\$100.00 yearly
Mobile Application (annual contract required)	**Price based on service provider
GIS Services – price customized depending on scope of services	

Contact Information

Guy Ash
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