

Alberta's Agriculture Drought and Excess Moisture Risk Management Plan



The ADEMRRMP is a pro-active, effective, and risk management approach to mitigating the effects of drought and excess moisture on Alberta's agricultural areas.

Acronyms used in this Report

AAFC	Agriculture and Agri-Food Canada
AAMD&C	Alberta Association of Municipal Districts and Counties
ACIS	AgroClimatic Information Service
ADMC	Alberta Drought Management Committee
ADEMRMP	Agriculture Drought and Excess Moisture Risk Management Plan
ADRMP	Agriculture Drought Risk Management Plan
AEP	Alberta Environment and Parks
AF	Alberta Agriculture and Forestry
AFSC	Agriculture Financial Services Corporation
AH	Alberta Health
BMP	Beneficial Management Practices
DEMAG	Drought and Excess Moisture Advisory Group
EFP	Environmental Farm Plan
AEP	Alberta Environment and Parks
GDP	Gross Domestic Product
GIS	Geographic Information System
NRT	near real time
RTW	Ropin' the Web

Acknowledgements

Drought and Excess Moisture Advisory Group

Thanks also to the many others who helped in reviewing the information.

Revised May 2016

Executive Summary

Extreme weather events create challenging decision-making situations for the agriculture industry. The effect of weather extremes can be seen during all seasons, particularly during the growing season. Within the Province of Alberta, extremely dry and extremely wet conditions can exist concurrently during the same season.

Although extremely dry or drought conditions can begin slowly and subtly, experience has proven that the impact can be as significant as other more dramatic disasters. Reduced crop, forage, hay productivity and lack of livestock water are examples of impacts.

Excess moisture conditions can result from both dramatic flooding and extreme, intense precipitation conditions which can damage agricultural crops, prevent seeding, and carry away top soil, as well as damaging infrastructure and property.

In the past, reactive measures and emergency responses were costly and often provided only short-term solutions. In contrast, the current pro-active risk management approach prepares for and mitigates short term and long-term impacts; as well as, long term vulnerability to extreme weather events.

The Agriculture Drought Risk Management Plan (ADRMP), implemented in 2001-2002, was built upon the province's experiences with drought and government responses, beginning with the mid-1930's *Prairie Farm Rehabilitation Act*.

Building on past experiences, the ADRMP was updated in 2010 and focused on planning and preparedness measures; further developing the risk management approach.

As the agricultural industry experienced excess moisture events, the need to plan for these extreme events resulted in another update. This version of the plan, the **Agriculture Drought and Excess Moisture Risk Management Plan (ADEMRMP)**, continues to provide a framework for a coordinated, pro-active approach to reduce the short and long-term effects of drought and excess moisture on Alberta farmers and ranchers. It will guide government agencies in assisting producers to more effectively reduce the impacts before, during and after an adverse event, and will help the agricultural industry to be more prepared and less vulnerable to moisture extremes.

The intent is to continue with the three strategies of preparedness, monitoring and reporting, and response. Throughout the implementation of ADEMRMP strategies, awareness of, and alignment with, the other policy frameworks of government will promote the adaptability of the ADEMRMP.

Farmers and ranchers manage operations in an increasingly uncertain world. ADEMRMP tools help agricultural producers make informed business decisions.

Risk management strategies described in this document are available not only for farmers and producers, but also for government. The idea behind this approach to moisture extremes is to expect the events and plan around them, rather than regard them as crises requiring ad hoc measures.



Risk management not only reduces the impact of drought on producers in the short and long term, it is also more fiscally responsible and a better fit under global trade rules that can penalize agriculture programs. Risk is a shared responsibility.

Table of Contents

Acronyms used in this Report	1
Acknowledgements.....	1
Executive Summary.....	i
Table of Contents.....	ii
Why the updated ADEMRMP?.....	1
What Can We Expect in the Future?	2
Drought	3
Excess Moisture.....	3
The Agriculture Drought and Excess Moisture Risk Management Plan.....	4
Vision	4
Goals.....	4
Partner Agencies	4
The Drought and Excess Moisture Advisory Group	4
Risk Management Actions.....	5
Moisture Conditions.....	5
Risk Management Actions	6
Preparedness.....	6
Agricultural Moisture Monitoring and Reporting	8
Response	12
Action Plan	14
Actions During Normal or Near Normal Conditions.....	15
Actions During Exceptional or Notable Conditions.....	16
Actions During Extreme Conditions	18
Appendices	20
Appendix 1: Definitions.....	20
Appendix 2: Government Resources	22
Appendix 3: Science Based Drought Indices.....	27
Appendix 4: Agricultural Drought Program History in Alberta.....	29
Appendix 5: Agriculture Drought and Excess Moisture Risk Management Plan.....	30

Why the updated ADEMRMP?

The Government of Alberta released the Agriculture Drought Risk Management Plan (ADRMP) in 2001. Its Drought Action Plan promoted a consolidated and science-based approach to managing the effects of drought in Alberta. Since that time, not only has the science improved, but our understanding of climate change, the limitation of our water resource, changing agricultural practice, and our learning from the ADRMP have prompted the reissuing of the plan.

The ADRMP was re-issued in 2010 and changes focused on preparedness, monitoring and reporting, and response strategies.

Now the excess moisture theme has been incorporated because risk management and preparedness strategies are similar for both moisture extremes, resulting in the Agriculture Drought and Moisture Risk Management Plan (ADEMRMP).

The 2016 ADEMRMP key strategies continue to address preparedness, monitoring and reporting, and response for moisture extremes or extreme weather events; moisture conditions that deviate significantly from the long term normal.

The Plan acknowledges that moisture extremes are a recurring phenomenon in Alberta and that these events may increase in frequency. The ADEMRMP is government's management plan for working together with agricultural producers to plan for, mitigate the effects of, and adapt to moisture condition extremes. The responsibility for risks associated with moisture extremes is shared.



What Can We Expect in the Future?

Planning for drought and excess moisture is a dynamic process that evolves through trial and error. As we continue to learn about the regional and continental scale of weather and climate dynamics and its effect on the water and energy cycle over the province, the ADEMRMP will adapt. Planning for drought and excess moisture can be linked to planning for climate change because increased risk of moisture extremes for Alberta producers seems likely as climate changes.

Continued improvement of the ADEMRMP is intended through regular review by DEMAG member agencies, AF and AFSC.



Drought and Excess Moisture, like climate change, are not problems to be solved; rather, they are risks that must be managed.

Drought

There is no definitive definition of drought. Research in the early 1980s uncovered more than **150 published definitions of drought**, definitions that reflect differences in regions, needs, and disciplinary approaches.

The huge range in the perception of drought depends on the individual's experiences and the climatic region where they live. Some people may have a 'feeling' that they are experiencing drought after just a few weeks of no rain; whereas others may consider drought to occur only when paddocks are denuded of grass.

Drought is commonly considered to be a deficiency of moisture when compared to some normal or expected amount over an extended period of time.

Some repercussions of drought include:

- Decreased agricultural production: crops, livestock, range / pasture
- Decreased water supplies: wells, dugouts, streams, lakes, wetlands
- Increased fire
- Increased pests, such as grasshoppers
- Long-lasting effects: soil erosion
- Multi-sector effects resulting in:
 - o Decreased employment
 - o Net farm losses
 - o Decreased GDP

These repercussions may be complicated by overgrazing and tillage practices.

Dry periods can also result in water shortages for licensed water users and can affect municipal and industrial water supplies and impact on lake, river, reservoir and groundwater levels. Water allocation and water shortage is managed under the *Water Act*.

For the purposes of this plan, Drought is defined as an extended period of below-normal precipitation resulting in decreased soil and subsoil moisture levels and diminished surface water supplies affecting crop growth, livestock water or irrigation water.

Excess Moisture

Similar to drought, repercussions of excess moisture can also have a negative impact on agricultural production, and managing this risk is now included in the ADEM RP.

Repercussions of excess moisture may include:

- Damaged (decreased) agricultural production: crops, livestock, range / pasture
- Erosion
- Waterlogging
- Multi-sector effects resulting in:
 - o Decreased employment
 - o Net farm losses
 - o Decreased GDP
- Inability to access saturated land
- Seeds washed away
- Plants drowned out or washed away
- Re-management of reservoir systems to attenuate early-season flood risk can reduce water supplies available for irrigation later in the growing season

For the purposes of this plan, Excess Moisture is defined as excess rains or sudden melting of snow or river or lake floods, resulting in water covering land that is normally dry land.

The Agriculture Drought and Excess Moisture Risk Management Plan

Vision

The Agriculture Drought and Excess Moisture Risk Management Plan (ADEMRMP) is a proactive and fiscally responsible approach to mitigating the effects of drought and excess moisture on Alberta's agricultural areas.

Goals

- The drought and excess moisture risk management planning and actions of government are:
 - communicated to the agricultural industry,
 - coordinated and effective,
 - consistent over time, and amongst departments, and
 - moisture situation monitoring and reporting is effective and timely, thereby supporting planning and action.
- Alberta's agricultural producers have access to and use the knowledge and tools provided to manage risk associated with moisture extremes like periodic drought and excess moisture; and are therefore more prepared and less vulnerable to those extremes.

Partner Agencies

AF
AFSC
AAMD&C
AEP
AAFC
Crop Sector
Livestock Sector
Irrigation Sector

The Drought and Excess Moisture Advisory Group

In an effort to draw on the best possible external advice for government to address the short and long-term implications of drought, and to oversee the implementation of the ADEMRMP, the standing multi-stakeholder Alberta Drought and Excess Moisture Advisory Group (DEMAG) was formed.

The DEMAG is co-chaired by AF and AAMD&C and reports to the Deputy Minister of AF. Its membership is comprised from a cross-section of industry stakeholders including; AF, AAMD&C, AFSC, AEP, AAFC, and the livestock, crop, and irrigated crop sectors.

The mandate of the DEMAG is to provide consistent and consolidated advice and recommendations to complement government actions on drought and excessive moisture related issues affecting the agricultural producers in Alberta and to advise and provide recommendations to government on long-term strategies for mitigating the effects of drought and excessive moisture. The DEMAG will do this by facilitating two-way communication that is effective, timely, respectful and clear, and by working with industry organizations to identify how to best assist producers in preparing for and coping with drought and excessive moisture, and develop these discoveries into recommendations.

Risk Management Actions

The ADEMRRMP is supported by three approaches to risk management actions that are in turn linked to the three levels of moisture conditions:

Preparedness

Drought or excess moisture preparedness focuses on year-round efforts, especially during near normal conditions, to increase the level of resilience of the agricultural community and government to mitigate the effect of the extreme moisture event.

Monitoring and Reporting

Agricultural moisture monitoring and reporting includes ongoing monitoring, evaluation and reporting on soil moisture conditions, precipitation amounts, and temperature regimes in the agricultural areas of Alberta.

Response

Response involves taking appropriate action during and immediately following a drought or excess moisture event to reduce negative impacts on producers.

When drought or excess moisture occurs, farm managers are impacted not only by the extreme moisture conditions, but by other aspects of the weather, the global economy, and the political will of various leaders responding to the moisture conditions making this a complex issue.

Moisture Conditions

The three levels of moisture or hydrometeorological conditions that are addressed in the risk management action plan and that are used throughout the reporting mechanisms of the ADEMRRMP are:

Normal or Near Normal Conditions

- Precipitation amounts and soil moisture reserves are near normal
- Crops and pastures are not showing moisture stress
- Temperature regime is near normal
- Normal releases from reservoirs

Exceptional / Notable Conditions

- The province or a portion of the province is operating under the potential for drought or potential excess moisture conditions
- Precipitation amounts and soil moisture reserves are either low to very low or high to very high
- Crops and pastures are beginning to show moisture stress
- Declining stream flows and water shortages beginning to emerge or moisture levels are in excess of normal and effects are noticed
- Temperature regime may be higher or lower than normal

Extreme Conditions

- The province or a portion of the province is suffering drought or excess moisture
- Precipitation amounts and soil moisture reserves are extremely low or high
- Crops and pastures are suffering moisture stress with significant yield reductions expected to occur
- Severe water supply (reservoirs, streams, irrigation) deficits that affect agricultural production.
- Water surplus is obvious and affecting crops and access
- Temperature regime may be extremely high

or low

Risk Management Actions

Preparedness

In order to be prepared when extreme moisture conditions occur, farm managers make the decision to use, or not to use, a number of mitigation tools as best fits their risk management plan.

The following describes preparedness actions that may be undertaken. In addition to implementing some of these actions, insurance programs can serve as the first line of defense against agricultural production losses due to drought or excess moisture.

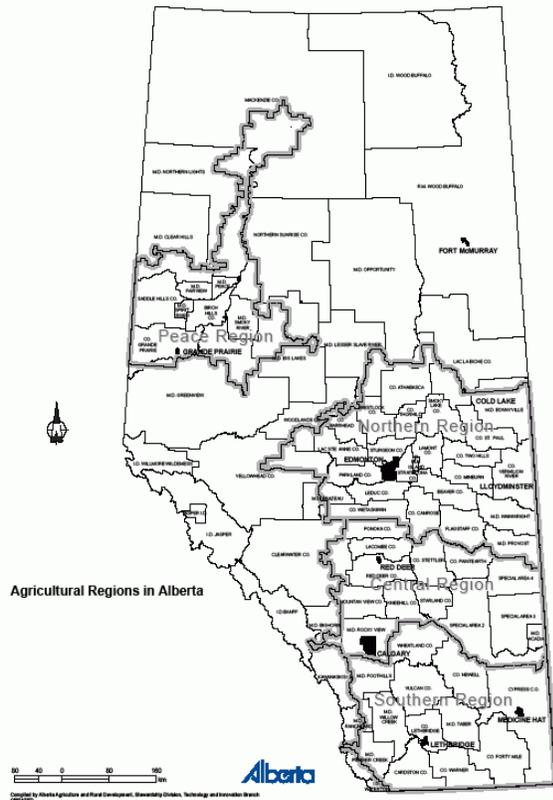
Action	Agent
Goal: Actions before, during, and after drought or excess moisture are coordinated and effective.	
Participate in AFSC insurance and risk management programs.	Producers
Continue to provide AFSC insurance and risk management programs.	AFSC
Continue to review the suite of risk management products.	AFSC
Assess risk/impact of drought/excess moisture to individual operation.	Producers
Determine and develop mitigation strategy/modified practices/innovation for addressing the assessed risks.	Producers
Develop secure water supply infrastructure to improve water supply security.	Municipalities and individual water users
Improve agricultural industry water conveyance efficiencies.	Irrigation Districts, Municipalities, and individual water users
Develop and use risk assessments for use in water development planning, such as Long Term Water Management Plans and Environmental Farm Plans.	Producers
Goal: Producers are able to manage periodic drought and excess moisture conditions; are prepared and less vulnerable to significant departures from normal. (continued on page 7)	
Provide relevant and accessible drought and excess moisture preparedness and management information through: Ropin' the Web , Alberta Environment and Parks - Water , and other websites; newspapers, including AgriNews; television and radio; and seminars and school programs.	Alberta and federal government agencies
Package existing information on drought management and water conservation to target specific agriculture sectors under various drought conditions.	
Promote water conservation to irrigation districts and private irrigators.	
Encourage the development of secure long-term water supplies.	

Action	Agent
Goal: Producers are able to manage periodic drought and excess moisture conditions; are prepared and less vulnerable to significant departures from normal. (Continued from page 6)	
Form partnerships with the agricultural community, seed plants, and others to promote water conservation and drought management.	Alberta and federal government agencies
Package existing information on excess moisture management to target specific agriculture sectors under various excess moisture conditions.	
Select appropriate crop types and varieties, herbicides/pesticides/fertilizers, make appropriate decisions about timing of planting/harvest, infrastructure choices like type of machinery and buildings.	Individual producers Agricultural industry organizations
Provide technical and financial assistance to secure water supplies or increase water use efficiency through various programs, including the Growing Forward 2 Water Management Programs.	AF
Although parameters of highest importance are yield and quality, testing of new cereal plants materials includes the assessment of genetic traits that reflect tolerance to drought, pests, flooding, disease, and water use efficiency.	AF
Goal: Government planning and preparedness for drought and excess moisture is consistent.	
The DEMAG communicates and coordinates preparedness information, where possible, including timely meetings and correspondence.	Alberta Government and Industry partners
Increase access to alternate water supply infrastructure, such as truck fill stations.	Municipalities
Ongoing monitoring, evaluation and reporting of precipitation and soil moisture conditions. <ul style="list-style-type: none"> • AgroClimatic Information Service • Alberta River Basins – Maps and Data Summaries 	AF AEP
Farm Flooding Preparedness Information is maintained by AF: <ul style="list-style-type: none"> • Farm Flooding Preparedness • Flood Information, 	AF
Flood information is maintained by the Federal Government: Floods – What to do?	Government of Canada
Water management infrastructure is operated to mitigate both drought and flood risk.	AF, AEP, and Irrigation Districts
Infrastructure development in floodways is appropriate.	Municipalities

Agricultural Moisture Monitoring and Reporting

This area of focus includes ongoing monitoring, evaluation and reporting on soil moisture conditions, precipitation amounts and patterns, snowfall accumulations and air temperature regimes in the agricultural areas of Alberta.

[Agro Climatic Information Service \(ACIS\) web site](#) provides near real time meteorological data from more than 387 meteorological stations across the province and weekly maps provide up-to-date information.



Monitoring includes routine measurement of meteorological and agricultural parameters useful in developing adequate drought indicators. Many of these measurements are collected in near real time and are quality controlled. The quality controlled parameters are used to run weather analysis, soil water balance, and drought indices models that are interpreted to determine the start, intensity, extent, and ending of drought or excess moisture conditions. Some of these parameters are also used to produce weather based insurance products. The weather analysis and drought indices are summarized into regular moisture situation updates. In addition, AF's

The moisture situation updates use a combination of scientific drought indices to objectively and accurately determine drought severity, extent and duration. Combining indices provides a more accurate assessment of drought severity. AF will collect, analyze and distribute up-to-date information, publish regular reports and update maps and data on the ACIS web site. The combined information will help define development of any extreme conditions in order to guide appropriate and informed responses by government agencies and the agricultural community to existing situations. The moisture situation updates (available to the public) includes precipitation received and frequency of occurrence, soil moisture conditions, snow pack conditions, and temperature trends and regimes; and moisture situation updates are forwarded to the Minister and rural MLAs.

In addition to the moisture situation updates, other reports may include the following:

- Regional crop condition reports
- AEP Surface Water Reports
- Interpretation of impact, based on field information from municipality field staff for the affected areas concerning the following resources:
 - o surface water, dugout and reservoir supplies
 - o feed supply
 - o crop and pasture condition
 - o wildfire risk
 - o grasshopper levels

Alberta's weather monitoring capabilities are

Action	Agent
Goal: Moisture Situation Updates for the Agricultural Region of Alberta	
<p>Moisture Situation Updates for the Agricultural Region of Alberta describe current soil moisture and precipitation conditions. The updates include maps of recent precipitation patterns, snow pack accumulations, temperature regimes, soil moisture conditions and drought indices that all help to define the severity and extent of adverse moisture conditions across the province. Under normal conditions, the updates are generally produced regularly from May 1 to August 31, with monthly updates during the winter. As conditions become notably above or below normal, updates become more frequent and more detailed.</p> <p>Moisture Situation Updates and related maps are sent to the Minister of Agriculture and Forestry and his rural caucus colleagues, as well as key AF and AFSC staff. These regular Moisture Situation Updates are also posted to Ropin' the Web.</p> <p>Each week, or when conditions change significantly, more than 40 new maps will be published to the ACIS web site allowing users to track conditions between moisture situation updates. The ACIS on online station viewer allows even finer resolution, allowing users to see what's happening at any one of more than 380 stations in Alberta with data usually only a few hours old.</p>	AF
<p>Indices – Maps are created using science-based drought indices to determine the level, extent, and duration of drought. Each index provides an objective, consistent approach to assessing the level of drought. AF evaluates a variety of indices and then model and upgrade selected indices to suit Alberta's climatic conditions and meet its information needs. Using a combination of indices provides more accurate assessments of the level of drought. See Appendix 3 for more information on drought indices.</p> <p>Severity maps – show the extent and severity of current conditions based on the values of several indices. These maps are produced year round, and are based on state-of-the-art drought science that is supported by a high quality meteorological network.</p>	AF
Goal: Timely Release of Quality Controlled Spring Soil Moisture (SSM) and Precipitation Data to AFSC	
Provide soil moisture and precipitation data to AFSC to facilitate timely payments under AFSC's weather based insurance products. This information is used to make payments that are generated part way through a growing season and shortly after the growing season.	AFSC

Action	Agent
<p>Goal: The maps and data are available to help farmers with short and long-term planning and decision-making throughout the year.</p>	
<p><u>AgroClimatic Information Service (ACIS)</u> is an interactive web tool that helps producers, farm consultants, and researchers create maps, obtain historical and near real time weather data, climate summaries and a wide range of maps that depict historical and current precipitation patterns, snow pack accumulations, soil moisture conditions and trends, temperature regimes and drought indices. The weather data and maps help farmers understand their climatic regimes and put current conditions, into perspective, thus helping them with long-term planning and decision-making.</p> <p>Users can also view and obtain historical and near real time weather data from over 380 meteorological stations. The maps and data help farmers with their long-term planning and decision-making throughout the growing season. Additionally AF quality controls data for AFSC precipitation-based insurance products.</p> <p>AF's current meteorological program, with increased station density and the addition of measurements like solar radiation, together with new data processing systems, have led to enhanced model accuracy and reporting products and services providing the necessary support for superior drought and excess moisture preparedness and response decisions.</p>	<p>AF website <u>Ropin' the Web</u></p>
<p>Goal: AFSC Monitoring and Reporting</p>	
<p>AFSC utilizes its network of field office staff, and numbers of pre harvest claims to assess drought severity. This information is used to deploy resources to affected areas and determine if there is a need for expedited processes to provide timely service to clients.</p>	<p>AFSC</p>
<p>Goal: Alberta Environment and Parks Monitoring and Reporting</p>	
<p>Near real-time reporting of water supply conditions are available to the public through <u>Alberta Environment and Parks's website</u>. Maps and Data Summaries and Water Supply Outlooks and Forecasts are provided online. Hydrometric, meteorological, snow conditions, and reservoir and lake level data are continually updated.</p> <p>AEP provides an <u>Alberta Rivers: Data and Advisories Mobile Application</u> to obtain the latest information about Alberta's rivers, including flood advisories and comments issued by Alberta's River Forecast Centre.</p>	<p>AEP</p>

Response

The Response Toolbox provides possible actions to respond to drought and excess moisture conditions and can help identify meet local needs; from mitigation during the early stages of soil moisture stress to financial stabilization during and following

more severe moisture conditions. The DEMAG works with representatives from adversely-affected municipalities to identify support options for recommendation to Ministers.

Action	Agent
Goal: Producers are aware of government response.	
The DEMAG member agencies provide information on existing programs and government policy to affected producers.	DEMAG
Changes to water distribution or allocation in response to water shortage will be communicated by the agency responsible for that water supply.	Municipalities AEP Irrigation Districts
Goal: Provide information on business risk management programs.	
Federal and provincial business risk management programs are available through AFSC; including Insurance and AgriStability, and are managed to respond to exceptional conditions in a timely manner.	AFSC
Goal: Provide timely, relevant information to affected farmers/producers.	
Sources of information are developed and provided, such as: <ul style="list-style-type: none"> A list of resources for farm crisis, mental health and financial and debt counseling agencies Livestock owners may access the Hay, Straw and Pasture Listings (including standing annual crops) for available feed Emergency Water Supply Options During Drought 	AF AHS AFSC AAFC
Goal: Provide access to information on available feed supplies.	
Livestock owners may access the Hay, Straw and Pasture Listings (including standing annual crops) for available feed.	AF
Goal: Deliver the AF Water Pumping Program.	
AF Water Pumping Program is available to producers for replenishing dugout levels and may be used during periods of excess moisture in agricultural areas.	AF
Goal: Deliver the AEP Pumping Program.	
Emergency water pumping equipment is available as part of the provincial flood response. Information available through Alberta Emergency Management Agency (AEMA) Assistance and Recovery Support .	AEP AEMA
Goal: Recommend tax deferral from sale of breeding stock.	
AF and AAFC monitor hay and pasture yields, and soil moisture and precipitation in drought-affected areas or areas of excess moisture and, if required, Alberta (AF and AFSC) will recommend areas to be included in tax deferral designated areas to AAFC.	AF AFSC AAFC DEMAG

Action	Agent
Goal: Implement a drought or excess moisture recovery loan program.	
<p>During Extreme Conditions, the DEMAG works with municipal representatives to determine if a government loan program should be recommended for the affected area. This program would loan money to eligible farmers at a reduced interest rate to help them recover after a drought or excess moisture event and has been administered by AFSC Lending.</p>	<p>DEMAG Municipalities AFSC</p>
Goal: Implement other programs as appropriate.	
<p>The DEMAG will consider a variety of response options and recommend possible responses to the appropriate Ministers.</p> <p>Options that have been considered in the past include:</p> <ul style="list-style-type: none"> • initial assessment for tax deferral on breeding stock • drought disaster loans • grazing on unallocated public land • grazing/haying Ducks Unlimited acreage • municipal roadside grazing/haying • feed/livestock freight assistance • emergency water hauling • reduced rates for dugout water pumping • grasshopper control options. 	<p>DEMAG</p>

Action Plan

Taking all of the strategies and actions described by Preparedness, Monitoring and Reporting, and Response, the Action Plan describes how these strategies can be applied on a scenario basis as described by the three moisture levels:

- Normal or Near Normal Conditions
- Exceptional / Notable Conditions
- Extreme Conditions.

These three levels are determined by the current levels of soil moisture and recent precipitation and temperature trends.

There is no single map, or any simple and consistent way (using maps alone) to determine Normal or Near Normal Conditions, Exceptional / Notable Conditions, and Extreme Conditions.

In fact, the suite of maps that we use to determine the current “conditions” with respect to soil moisture varies with time of year and the type of water shortage (acute or chronic) for crop, livestock, farm water supplies, etc.

From a scientific perspective, the maps help describe how the current conditions developed, and the severity and extent of the “condition”. The final assessment of the “Condition” is ultimately a decision driven by many different factors including maps, social, economic and political considerations.

When each of the levels of moisture conditions is identified through monitoring, the Action Plan identifies the possible actions of the DEMAG and partner agencies.

Actions During Normal or Near Normal Conditions

- Normal precipitation / weather patterns / hydrologic conditions

Described by:

moderately low
near normal
moderately high

Frequency of condition occurrence

drier than this, on average, less than once in 3 years
on average, this occurs 1 in 3 years
wetter than this, on average, less than once in 3 years

Reporting Frequency:

May 1 to August 31: regularly, with maps available through ACIS

September 1 to April 30: regularly, with maps available through ACIS

Preparedness Actions	Monitoring/Reporting Actions	Response Actions
<p>Producers have access to technical expertise and financial assistance to assist with switching from drought-prone water supplies to more secure water supplies.</p> <p>DEMAG member agencies provide access to up-to-date information for producers in the agriculture sector on the actions needed to prepare to deal with the variability in soil moisture on an on-going basis.</p> <p>Producers have tools to evaluate water supplies and water use needs.</p> <p>Producers are encouraged to participate in risk management/insurance programs offered by AFSC.</p> <p>The DEMAG coordinates an independent evaluation of activities during the previous drought and Excess moisture events and recommends changes to improve the ADEMRRMP.</p>	<p>DEMAG member agencies monitor and assess drought-related provincial weather data.</p> <p>DEMAG member agencies provide reports to the DEMAG and stakeholders about current conditions.</p> <p>Maps describing Alberta's weather, climate and related agriculture features can be accessed with AgroClimatic Information Service (ACIS).</p> <p>Moisture situation updates for the agricultural region of Alberta posted on Ropin' the Web, with highlights of the update and maps sent to the Minister of Agriculture and Rural Development and his rural caucus colleagues.</p>	<p>DEMAG member agencies work on policy issues as required.</p>

Actions During Exceptional or Notable Conditions

- The province or a portion of the province is operating under the potential for drought or excess moisture conditions.
- Lower or higher than normal precipitation and soil moisture levels.

Described by:	Frequency of condition occurrence
low	drier than this, on average, less than once in 6-years
very low	drier than this, on average, less than once in 12-years
high	wetter than this, on average, less than once in 6-years
very high	wetter than this, on average, less than once in 12-years

Reporting Frequency:

May 1 to August 31: regularly, with weekly maps available through ACIS

September 1 to April 30: regularly, with weekly maps available through ACIS

Preparedness Actions	Monitoring/Reporting Actions	Response Actions
<p>The DEMAG will advise the Ministers of the partner agencies of the critical soil moisture conditions, and provide reports on preparedness, policies and currently available programs through the report to Ministers of partner agencies.</p> <p>DEMAG member agencies provide preparedness material specific to affected areas (geographic, soil, and climate zones), through a variety of media.</p> <p>AF will prepare communications for producers, affected municipalities and other stakeholders on the soil moisture conditions.</p> <p>The DEMAG, with municipal input, will identify possible actions suited to the needs of</p>	<p>Increased monitoring and reporting described for normal conditions.</p> <p>DEMAG member agencies monitor and assess soil moisture-related weather data from across the province, but with increased focus on the areas facing low moisture conditions.</p> <p>DEMAG member agencies provide reports to the Ministers of the partner agencies, DEMAG and other stakeholders about current conditions biweekly from May 1 to August 31 and monthly from September 1 to April 30.</p> <p>Moisture Situation Updates for the agricultural region of Alberta posted on Ropin' the Web, and sent to the Minister of Agriculture and Forestry and his</p>	<p>The DEMAG works with municipal representatives to identify appropriate options for action in the affected areas.</p> <p>Information flow is through, but not limited to, media and internet.</p>

<p>the affected areas.</p> <p>Producers can access information through the internet at Ropin' the Web, by calling the Ag-Info Centre, listening to Call of the Land, and through other media.</p> <p>Producers have access to the AF Water Pumping Program to top-up dwindling dugouts or to remove excess moisture.</p>	<p>rural caucus colleagues.</p>	
--	---------------------------------	--

Actions During Extreme Conditions

- The province or a portion of the province is suffering drought; according to the indices.
- Severe soil moisture shortages and precipitation deficits.
- Severe moisture surplus and flooding
- Preparedness Actions no longer apply, Reporting and Response Actions are required.

Described by:

Extremely low

Extremely high

Frequency of condition occurrence

drier than this, on average, less than once in 25-years

wetter than this, on average, less than once in 25-years

Reporting Frequency:

May 1 to August 31: frequently, with weekly maps available through ACIS

September 1 to April 30: regularly, with weekly maps available through ACIS

Monitoring/Reporting Actions	Response Actions
<p>DEMAG member agencies monitor and assess soil moisture-related weather data from across the province, adding impact analysis for drought-affected areas and information from field reports.</p> <p>Moisture Situation Updates for the agricultural region of Alberta are sent to the Minister of Agriculture and Forestry and rural caucus colleagues, and posted on Ropin' the Web.</p> <p>DEMAG member agencies provide additional updates to the MLAs, Ministers of the partner agencies, the DEMAG, and to other stakeholders about current conditions.</p> <p>DEMAG member agencies prepare communications for producers, affected municipalities and others on the drought situation and drought-related activities.</p> <p>The DEMAG recommends possible drought response options to the appropriate Minister.</p> <p>Communicate/share current conditions and possible options to the Alberta Association of Municipal Districts and Counties, and to other affected provinces.</p>	<p>AF prepares AgriNews submissions and Call of the Land radio spots to inform the agricultural community of decision-making options during the situation.</p> <p>Provide timely information on risk management programs at extension meetings.</p> <p>Attend industry led meetings to provide risk management information.</p> <p>Livestock owners can access a hay listing on Ropin the Web for some available feed sources.</p> <p>Municipalities and partner agencies assess available feed and water supplies and make information available to affected producers.</p> <p>Producers have access to information and programs that will help to reduce the impact of extreme conditions.</p> <p>Deliver AF's water pumping program.</p> <p>Emergency water pumping equipment is available as part of the provincial flood response.</p>

	<p>AFSC's claim processes are reviewed and adjusted during drought conditions to provide timely responses to producers without unduly increasing program risk.</p> <p>Provide timely precipitation and soil moisture, as well as anecdotal, information as recommendations to AAFC for municipal designation for the federal tax deferral benefit.</p> <p>Work with DEMAG member agencies to explore options such as:</p> <ul style="list-style-type: none">• access to public pasture• access to Ducks Unlimited acreage• roadside grazing/haying opportunities• water pumping priorities. <p>To assist in facing the effects of moisture extremes, information should include Mental Health Line at 1-877-303-2642.</p>
--	--

Appendices

Appendix 1: Definitions

ADAPTATION

Adaptation is the adjustment in natural or human systems in response to actual or expected effects of climate change and variability, which moderates harm or exploits beneficial opportunities.

ADAPTIVE CAPACITY

The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences, is adaptive capacity.

AGROCLIMATIC INFORMATION SERVICE

The AgroClimatic Information Service (ACIS) is an interactive tool that can help the DEMAG, producers, farm consultants, and researchers create maps that help with long-term planning and decision-making throughout the year.

CLIMATE

Climate is the meteorological condition in a given region over a long period of time. It is also defined in statistical terms as the mean and/or variability of relevant variables over a period of time ranging from months to thousands or millions of years.

CLIMATE CHANGE

Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

DISASTER

An event that exceeds the ability of the local community to cope with the harmful effects and

requires extraordinary response and recovery measures is a disaster.

DROUGHT

For the purposes of this plan, “Drought” is defined as an extended period of below-normal precipitation resulting in decreased soil and subsoil moisture levels and diminished surface water supplies affecting crop growth, livestock water and irrigation water. – *depleted water resources for agricultural needs*

DROUGHT INDEX

Numerical scales used to describe the severity of drought. Indices combine one or more meteorological or hydrological variables into a single value that can be easily understood and presented in a map or table. The resulting values are typically related to a normal or average condition and describe the current condition, relative to normal or average condition. Indices used by the ADEMRRMP range from simple percentile based indices for precipitation, temperature and snow packs to more complex indices based on soil water modeling exercises such as standardized precipitation index.

EXCESS MOISTURE

Moisture in excess of normal on agricultural lands from precipitation or flooding that delays or prevents access to fields causing late or no planting, soil fertility issues, management of weeds, diseases, or insects, stored grain or pesticide herbicide containers.

NEAR REAL TIME MONITORING STATION

Near-Real-Time (NRT) is a relative term and in the context of the ADEMRMP and the current weather station technology used in Alberta, it refers to data that is less than 24-hours old. Most of the stations used in ADEMRMP reporting structure report hourly with observations available on ACIS that are typically no more than 2 hours old.

MITIGATION (CLIMATE CHANGE)

In the context of climate change, mitigation is an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases.

PREPAREDNESS

Preparedness is the state of having been made ready or prepared for use or action.

VULNERABILITY

Vulnerability to climate change is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes.

WEATHER

Weather is the state of the atmosphere at a given time and place with regard to temperature, air pressure, humidity, wind, cloudiness and precipitation. The term “weather” is used mostly for conditions over short periods of time



Appendix 2: Government Resources

A number of government agencies participate in drought and excess moisture risk management activities either directly or indirectly. This appendix summarizes the resources and activities of these agencies for reference purposes.

Government of Canada

Agriculture and Agri-Food Canada (AAFC) – Science and Technology Branch

Part of AAFC's mandate is to enhance the sector's resiliency, foster new areas of opportunity, and support sector competitiveness. Specifically on water, soil and climate, AAFC's mandate includes investing in agricultural research to support the discovery of science and innovation, and helping the sector adjust to climate change and to better address water and soil conservation and development issues. Ongoing activities related to drought management include:

- providing information on management and adaptation practices related to climate extremes and the sustainability of agricultural land and water resources;
- expanding the suite of geospatial and earth-observed data, products, tools and capabilities;
- maintaining and improving the AAFC Drought Watch website, www.agr.gc.ca/drought ;
- monitoring and reporting the impacts of weather and climate conditions and events on agriculture; and
- providing technical support to determine the areas eligible for the livestock tax deferral provision.

AAFC Drought Watch

The [Drought Watch web site](#) provides timely information and tools on weather and climate relevant to the agricultural sector in Canada. The impacts of weather and climatic variability and extreme events such as droughts and floods can be very significant and are valuable information for

agricultural production and planning. This site allows users to view current and historic weather and climate conditions, to see how current conditions differ from normal, to see where and how weather and climate conditions and events are impacting the sector, to view short-term forecasting products, and to learn about ways to mitigate and adapt to the impacts of weather and climate on agricultural operations.

Canadian Drought Monitor - monthly map products of the extent and intensity of drought across Canada. Maps are posted on the Drought Watch web site and are also contributed to North American Drought Monitoring. This activity also includes development of drought indices; [Agroclimate Impact Reporter \(AIR\)](#), - an online tool for the monitoring and reporting the on-the-ground impacts of weather and climate from a network of volunteers. The information and resultant map products are posted online.

The [Emergency Water Supply Options During Drought](#) website offers some temporary options that have been used and recommended by livestock producers to supply water to livestock during drought periods.

Government of Canada – Get Prepared

Floods are the most frequent natural hazard in Canada. They can occur at any time of the year and are most often caused by heavy rainfall, rapid melting of a thick snow pack, ice jams, or more rarely, the failure of a natural or man-made dam.

[Floods – What to do?](#)

Agriculture and Agri-Food Canada (AAFC) – Growing Forward 2

AAFC's Growing Forward 2 integrates programs and tools to address extreme conditions more effectively than in the past. The Business Risk Management suite includes four programs; two of which are delivered by AFSC in Alberta.

AgriInvest is a savings account for producers, supported by governments, which provides coverage for small income declines and allows for investments that help mitigate risks or improve market income.

AgriRecovery is a framework that will allow governments to respond to disasters by providing rapid assistance, filling gaps not covered in existing programs.

AgriStability, delivered by AFSC in Alberta, provides support when a producer experiences larger farm margin declines. The program covers declines of more than 15 percent in a producer's average margin from previous years.

AgriInsurance is an existing program, also delivered by AFSC in Alberta, that includes insurance against production losses for specified perils (weather, pests, disease) and is being expanded to include more commodities.

Environment Canada

Environment Canada supports provincial initiatives for managing water supplies and resolving existing and potential problems associated with droughts. To this end, the department will:

- provide raw data from its network of weather monitoring stations;
- encourage water demand management approaches and conservation technology with a view to extending the use of limited supplies;
- undertake, support and promote research into improving understanding of drought;
- encourage the development and dissemination of water conservation technologies and practices to promote the best use of current supplies; and
- encourage an integrated approach to planning and managing the augmentation and allocation of water supplies.

Government of Alberta

Alberta Agriculture and Forestry

Environmental Stewardship Branch (ESB)

ESB advances sustainable agriculture systems for the benefit of the environment, the agriculture industry and Albertans. Sustainable systems are advanced through policy, science, innovation and information systems, and extension. ESB leads the monitoring and much of the reporting actions within the ADEM RMP and the activities related to drought management, include:

- Operate and maintain a state of the art meteorological network across the agricultural areas of the province;
- Collect and quality control weather data from all available near real time weather stations in the province;
- Maintain and enhance soil moisture, drought indices and weather analysis models;
- Drought reporting (analyzing and interpreting weather and climate conditions; and mapping drought severity and extent and its impact on crops); and
- Deliver weather data, Ag Climate related products and maps online through the AgroClimatic Information Service (ACIS).

Other ESB activities include the development and promotion of beneficial management practices including delivery of the Stewardship Programs within Growing Forward 2, as well as climate change mitigation and adaptation strategies.

Growing Forward 2 Programs

The Government of Alberta manages Growing Forward 2 programs through Agriculture and Forestry. Growing Forward 2 allocates funds for producers and processors focused on research and innovation, competitiveness and market development, and adaptability and Industry capacity.

GF2 programs that may be relevant to drought and excess moisture preparedness and management include:

- On-Farm Water Management,
- On-Farm Stewardship,
- Irrigation Efficiency,
- Agricultural Watershed Enhancement, and
- Regional Water Supply.

Irrigation and Farm Water Branch (IFWB)

IFWB provides technical water management assistance, including water conservation measures, to agricultural producers.

The Branch has taken a leadership role in coordinating the DEMAG activities and coordinating policy recommendations related to drought and excess moisture.

This Branch also develops programs, services, information and regulations that lead to the environmentally sustainable expansion of the agricultural industry in Alberta. Activities include:

- providing technical water management assistance, including water conservation measures, to agricultural producers;
- amending the Agriculture Drought and Excess Moisture Risk Management Plan;
- quantifying water requirements of irrigated crops in southern Alberta;
- delivering the AF Water Pumping Program
- providing technical assistance on farm water management;
- assist producers with the development of Long-

- Term Water Management Plans; and
- delivery of Growing Forward 2 On-Farm Water Management Program, Irrigation Efficiency Program, and the Regional Water Supply (Strategic) Program.

Environmental Stewardship Branch (ESB)

Activities include:

- assisting in delivery of AEP led Agricultural Watershed Enhancement Program.

Policy, Strategy and Intergovernmental Affairs Branch

The Branch's role in coordinating the ADEMRRMP from the policy perspective activities include:

- managing the Ropin' the Web Internet pages on "Preparing for drought";
- supporting delivery of the Growing Forward 2 Water Management Program; and
- coordinating other Growing Forward 2 Programming.

Extension and Communications Services Division

The Division takes a leadership role in coordinating extension and communications activities including:

- providing drought preparedness and management information through the Ag-Info Centre, AF website, AgriNews and Call of the Land radio show; and
- providing a team of resource agents and specialists in field crops, forages, beef, new ventures, irrigated special crops and business management as a first stop for Ministry and agricultural production and program information.

Agriculture Financial Services Corporation (AFSC)

Agriculture Financial Services Corporation (AFSC) is a provincial crown corporation that administers the crop insurance and AgriStability programs in Alberta, as well as providing loans to farmers, agribusiness, and small business. In 2009, AFSC also introduced the Cattle Price Insurance Program (CPIP).

AFSC has provided Alberta farmers with hail insurance for over 70 years, and has grown into a diverse Corporation with several core businesses: crop insurance, farm loans, commercial loans and farm income disaster assistance.

AgriInsurance is a voluntary program that provides protection against yield and quality risk for crop producers.

AFSC notes that even with a variety of programs available, not all losses may be covered; therefore, producers must have their own plans in place to deal with some of their drought-induced income loss. It is to the producer's advantage to plan ahead to reduce risks and thereby decrease losses from drought. Crop producers can protect from significant losses by participating in insurance programs. Livestock producers who grow their own feed can also insure these feed crops.

This agency administers the following programs in partnership with Agriculture and Agri-Food Canada:

- AgriStability is a margin-based program that addresses declines of more than 15 percent in a producer's average margin from past years. AgriStability provides protection for those larger losses that were previously covered under CAIS.
- AgriInsurance includes existing crop insurance, production insurance and other products currently offered and will expand to include other commodities. With the exception of some minor crops, most crops are eligible for insurance including hay and pasture crops

- AgriRecovery - a framework that will allow governments to respond to disasters by providing rapid assistance, filling gaps not covered in existing programs. www.agr.gc.ca

AFSC also offers low-interest loans through the Disaster Assistance Loan - Crop Loss Option program. This program assists producers who have suffered an agricultural disaster resulting from severe crop losses over several years.

Alberta Environment and Parks

Alberta Environment and Parks is involved in preserving and enhancing Alberta's environment and in the wise management of our natural resources. Activities include:

- providing Monthly Water Supply Forecasts including Mountain Snow Conditions and Water Supply Outlook;
- providing raw data from its network of weather monitoring stations;
- administering the *Water Act* (e.g., use of water by irrigation districts would be regulated when water supply is low or reservoirs are down);
- issuing weather advisories and warnings; and
- providing water quality protection and enforcement;
- a mobile application for Alberta Rivers: Data and Advisories providing the latest information about Alberta's rivers, including flood advisories and comments issued by [Alberta's River Forecast Centre](#).
- with support of ESB, lead delivery of Agricultural Watershed Enhancement Program.

[Alberta Municipal Affairs – Alberta Emergency Management Agency \(AEMA\)](#)

- During Provincial emergencies resources may be available at AEMA.

Alberta Association of Municipal Districts and Counties (AAMD&C)

AAMD&C has representatives on the DEMAG who:

- Co-Chair DEMAG
- provide municipal and regional perspective; and
- provide input to DEMAG decision making and action plans.

Municipalities – Agricultural Service Boards (ASBs) and Ag Fieldman

Municipalities provide programs for weed, disease and pest control, and soil and water conservation.

Activities include:

- providing input to the federal and Alberta governments on local conditions and needs;
- conducting pest monitoring programs; and
- working with AF to provide information to producers for dealing with drought.



July 22 2011
County of Barrhead
edmontonjournal.com

Appendix 3: Science Based Drought Indices

Based on scientific reasoning, drought indices help us define the onset, severity and extent of drought across the regions of the province and help to guide the ADEMRRMP strategies.

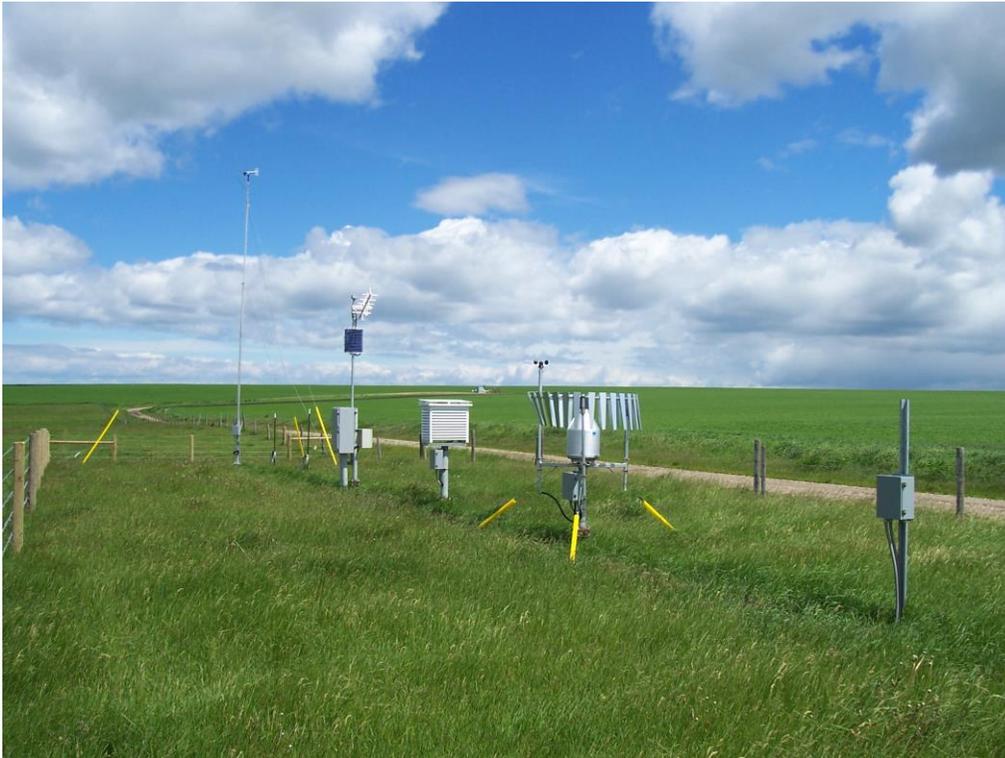
Drought is a complex phenomenon that is difficult to define and is often politically sensitive. A strict scientific definition of drought remains elusive and is complicated by the fact that droughts (water shortages) are often use-specific, with impacts varying from location to location. For example, following a dry year, low snow pack accumulations and below average spring runoff can have severe and adverse effects on reservoir supplies, lake levels and on farm water supplies, yet crop yields may be adequate if timely rainfall occurs and temperatures remain moderate. Conversely, a period of hot and dry weather in the middle of a “normal period” during the critical stages of crop development may produce acute and severe water stresses resulting in serious yield losses, which can prompt proclamations of drought. Unfortunately no single index has yet been identified that adequately quantifies drought. In fact, most jurisdictions adopt multiple and blended drought indicators and produce maps that attempt to reflect the general severity, extent and location of the drought-stricken areas. AF has developed and tested several drought indicators and continues to evaluate their effectiveness relative to current and past conditions. This work is ongoing and additional suitable drought indices will continue to be adopted and tested with the cooperation of DEMAG member agencies.

Currently, agriculture drought severity maps and interpretations presented in the reports are based on a combination of several drought indices. These rely on characterizing precipitation (snowfall and rain), soil moisture and temperature anomalies. In addition to

reporting the current conditions of these elements, AF uses a percentile index, expressed as a “frequency of occurrence” measure, to rank current conditions against those that have occurred in the past. This allows comparable mapping products across all major elements that are easy to put into context and easy to understand. For example, growing season precipitation percentiles are tracked by ranking the precipitation accumulation during similar periods, dating back from 1961 to present. The current accumulation is compared to the ranked values, yielding the frequency of occurrence. The percentile points are then put into arbitrary, but intuitive classification fields that describe the current state as drier, near to or wetter than the long term normal, together with the frequency of occurrence as listed below:

Category	Description
driest	drier than this, on average, less than once in 50-years
extremely low	drier than this, on average, less than once in 25-years
very low	drier than this, on average, less than once in 12-years
low	drier than this, on average, less than once in 6-years
moderately low	drier than this, on average, less than once in 3-years
near normal	on average, this occurs at least once in 3-years
moderately high	wetter than this, on average, less than once in 3-years
high	wetter than this, on average, less than once in 6-years
very high	wetter than this, on average, less than once in 12-years
extremely high	wetter than this, on average, less than once in 25-years
wettest	wetter than this, on average, less than once in 50-years

Similarly, soil moisture conditions, snow pack accumulations and temperature regimes are classified according to this scheme, with appropriate descriptions following each category.



Appendix 4: Agricultural Drought Program History in Alberta

Although southern Alberta is more likely to be affected by drought, other areas of the province experience drought as well. The two most significant droughts occurred from 1929 to 1937 (the Dirty Thirties), and from 1983 to 1988. Scientists say the 1980's drought was more severe than the Dirty Thirties, but the impacts were less due to improved soil conservation methods, better economic times and government assistance programs in place. The current ADEMRRMP formalizes the efforts to continue to improve drought preparedness and response. Other droughts have occurred since the 1980s, including droughts in southern and northeastern Alberta in the 1990s, across the entire province in 2001 and 2002, in the Peace Region in 2008, and in the Central and Northern Regions in 2009.

In the mid-1930s, the *Prairie Farm Rehabilitation Act* was put in place by the federal government to assist in land reclamation, soil conservation and water management strategies. Early programs included construction of water sources, expansion of irrigation districts and shelterbelt plantings. More recently, the Permanent Cover Program was implemented to encourage farmers to seed drought-prone land to forage. On behalf of Canada Revenue Agency, Agriculture and Agri-Food Canada (AAFC) currently administers the federal Tax Deferral Program for farmers who are forced to sell breeding stock due to drought.

The severe drought during the 1980s resulted in an era of ad hoc programs for farmers. Programs put into place in the 1980s, 1990s, and early 2000s covered crop yield loss, livestock feed, water shortages, conservation planning, financial counseling and interest-free loans.

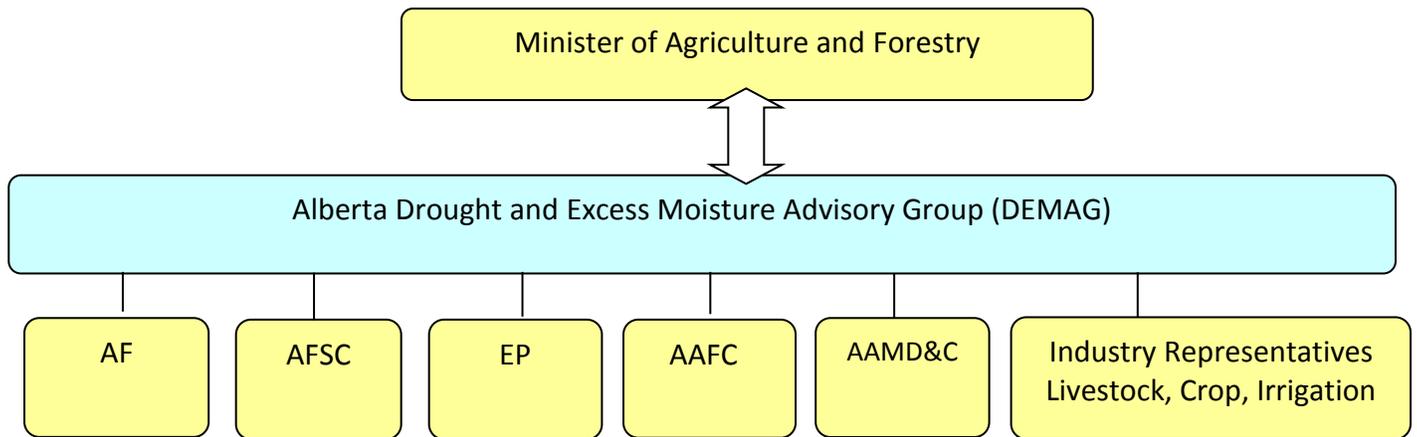
In 1990, the Drought Working Committee, made up of representatives from Agriculture Financial Services Corporation (AFSC) and Alberta Agriculture and Forestry (AF), convened. The committee assessed the impact of the multi-year drought in southeastern Alberta and developed the Southeastern Alberta Disaster Assistance Program.

Continuing drought in the mid-1990s prompted requests by industry for an improved safety net package and a long-term plan to deal with drought. As a result, the Drought Working Committee formed the Drought Plan Development Team. The team, called the Alberta Drought Management Committee (ADMC), had representation from AF, Alberta Environment and Parks (EP) and Agriculture and Agri-Food Canada (AAFC), and Association of Alberta Municipal District and Counties (AAMD&C) and its efforts resulted in this revised ADEMRRMP.

Dry conditions that affected Alberta producers in 2009, and that could threaten production in the 2010 season, have resulted in a shift in the membership and focus of the committee, and the evolution of the ADCM into the Alberta Drought Advisory Group (DAG). Significant changes are the inclusion of industry representation and a revised mandate.

Early in 2011, the DAG evolved to include excess moisture and became the Drought and Excess Moisture Advisory Group (DEMAG).

Appendix 5: Agriculture Drought and Excess Moisture Risk Management Plan



ADEMRMP Vision

The ADEMRMP is a pro-active, effective, fiscally responsible approach to mitigating the effects of drought and excess moisture on Alberta's agricultural areas.

ADEMRMP Goals

The drought and excess moisture risk management planning and actions of government are:

- communicated to the agricultural industry,
- coordinated and effective,
- consistent over time, and amongst departments, and
- moisture situation monitoring and reporting is effective and timely, thereby supporting planning and action.

Alberta's agricultural producers have access to and use the knowledge required to manage periodic drought with its natural variability in soil moisture conditions; and are therefore more prepared and less vulnerable to drought.

ADEMRMP evaluation and improvement is ongoing, with new activities being added as they are developed.

Approaches/Action Areas

- Risk management is a shared responsibility.
- Preparedness: year-round efforts, especially during times of no moisture extremes, to increase the level of readiness of the agricultural community and government to respond to the next drought or Excess moisture event.
- Reporting: ongoing monitoring, evaluation and reporting on soil moisture conditions and precipitation amounts in the agricultural areas of Alberta.
- Response: taking appropriate action during and immediately following a drought or excess moisture event to reduce impacts on producers.



County of Warner June 14, 2011