

ISO 19131 Agroclimate Data – Data Product Specification

Revision: A

Data specification: *Agroclimate Data*

- Table of Contents -

1.	OVERVIEW	3
1.1.	Informal description.....	3
1.2.	Data product specification metadata	3
1.3.	Terms and definitions.....	5
1.4.	Abbreviations	5
2.	SPECIFICATION SCOPE.....	5
3.	DATA PRODUCT IDENTIFICATION.....	6
3.1.	Precipitation	6
3.1.1.	Accumulated Precipitation (mm) (agclimate_ac).....	6
3.1.2.	Percent of Average Precipitation (agclimate_av).....	7
3.1.3.	Departure from Average Precipitation (agclimate_dnp).....	8
3.1.4.	Precipitation Percentile (agclimate_pe).....	9
3.1.5.	Dry Spell (agclimate_ds)	10
3.2.	Temperature	11
3.2.1.	Maximum Temperature (°C) (agclimate_tx).....	11
3.2.2.	Minimum Temperature (°C) (agclimate_ti).....	12
3.2.3.	Heat Wave (agclimate_hw).....	13
3.2.4.	Crop (Corn) Heat Units (agclimate_ch).....	14
3.2.5.	Growing Degree Days (agclimate_gd).....	15
3.2.6.	Mean Temperature Difference From Normal (agclimate_dnt)	16
3.3.	Drought Indicator	17
3.3.1.	Palmer Hydrological Drought Index (agclimate_phdi).....	17
3.3.2.	Palmer Modified Drought Index (agclimate_pmdi).....	18
3.3.3.	Moisture Anomaly Index (agclimate_mai_pdi)	19
3.3.4.	Total Soil Moisture (mm) (agclimate_tsm_pdi).....	20
3.3.5.	Percent of Normal Soil Moisture (agclimate_pnm_pdi).....	21
3.3.6.	Difference from Normal Soil Moisture (mm) (agclimate_dnm_pdi).....	22
3.3.7.	Standardized Precipitation Index (SPI) (agclimate_spi).....	23
3.3.8.	Standardized Precipitation Evapotranspiration Index (SPEI) (agclimate_spei).....	24
3.3.9.	Blended Index – Short Term (agclimate_st_bi).....	25
3.3.10.	Blended Index – Long Term (agclimate_lt_bi)	26
4.	CONTENT AND STRUCTURE	27
4.1.	Feature-based application schema.....	27
4.2.	Feature catalogue – Drought Watch Interactive Mapping	28
4.2.1.	Feature attributes	28
4.2.1.1.	Date of Observation (dDate).....	28
4.2.1.2.	Period Type Code (tType).....	29

5.	REFERENCE SYSTEM	30
5.1.	Spatial reference system	30
5.2.	Temporal reference system	30
6.	DATA QUALITY	30
6.1.	Completeness	30
6.2.	Logical consistency	30
6.3.	Positional accuracy	30
6.4.	Temporal accuracy	30
6.5.	Thematic accuracy	30
6.6.	Lineage statement	31
7.	DATA CAPTURE	31
8.	DATA MAINTENANCE	31
9.	PORTRAYAL	31
10.	DATA PRODUCT DELIVERY	32
11.	METADATA	32

Data product specification: Agroclimate Data

1. OVERVIEW

1.1. Informal description

The impact of climatic variability on the environment is of great importance to the agricultural sector in Canada. Monitoring the impacts on water supplies, soil degradation and agricultural production is essential to the preparedness of the region in dealing with possible drought conditions.

The 'Agroclimate Data' products are a series of agroclimate-themed datasets for precipitation, temperature, growing degree day, and other variables. These datasets are key to understanding the conditions, risks and potential impacts of weather and climate on agriculture in Canada.

1.2. Data product specification metadata

This section provides metadata about the creation of this data product specification.

Data product specification title:	Agroclimate Data
Data product specification reference date:	2021-11-17
Data product specification responsible party:	Agriculture and Agri-Food Canada
Data product specification language:	English, French
Data product specification topic category:	Climatology/Meteorology/Atmosphere

1.3. Terms and definitions

- Feature attribute
characteristic of a feature
- Class
description of a set of objects that share the same attributes, operations, methods, relationships, and semantics [UML Semantics]
NOTE: A class does not always have an associated geometry (e.g. the metadata class).
- Feature
abstraction of real world phenomena
- Object
entity with a well-defined boundary and identity that encapsulates state and behaviour [UML Semantics]
NOTE: An object is an instance of a class.
- Package
grouping of a set of classes, relationships, and even other packages with a view to organizing the model into more abstract structures

1.4. Abbreviations

AAFC Agriculture and Agri-Food Canada

2. SPECIFICATION SCOPE

This data specification has only one scope, the general scope.

NOTE: The term 'specification scope' originates from the International Standard ISO19131. 'Specification scope' does not express the purpose for the creation of a data specification or the potential use of data, but identifies partitions of the data specification where specific requirements apply.

3. DATA PRODUCT IDENTIFICATION

3.1. Precipitation

3.1.1. Accumulated Precipitation (mm) (agclimate_ac)

Title	Accumulated Precipitation (mm)
Alternate Title	agclimate_ac
Abstract	Accumulated Precipitation represents the amount of total precipitation in mm (solid and/or liquid) which has been recorded over a given period of time. Products are produced for the following timeframes: Agricultural Year, Growing Season, Winter Season, as well as rolling products for 7, 14, 30, 60, 90, 180, 270, 365, 730, 1095, 1460 and 1825 days.
Purpose	These values are intended to provide users with a general idea of the amount of precipitation that has been received by a region over the given timeframe.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.1.2. Percent of Average Precipitation (agclimate_av)

Title	Percent of Average Precipitation
Alternate Title	agclimate_av
Abstract	Percent of Average Precipitation represents the accumulation of precipitation for a location, divided by the long term average value. The long term average value is defined as the average amount over the 1981 – 2010 period. Products are produced for the following timeframes: Agricultural Year, Growing Season, Winter Season, as well as rolling products for 30, 60, 90, 180, 270, 365, 730, 1095, 1460 and 1825 days.
Purpose	These values are intended to provide users with a general idea of the how the amount of precipitation that has been received by a region over the given timeframe compares to the amount which is generally received.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.1.3. Departure from Average Precipitation (agclimate_dnp)

Title	Departure from Average Precipitation (mm)
Alternate Title	agclimate_dnp
Abstract	Departure from Average Precipitation represents the accumulated precipitation value for a location, subtracted by the long term average value. The long term average value is defined as the average amount over the 1981 – 2010 period. A negative value indicates that the location has received less than the normal amount of precipitation (mm) for that timeframe. A positive value indicates that the location has received more than the normal amount of precipitation (mm). Products are produced for the following timeframes: Agricultural Year, Growing Season, Winter Season as well as rolling products for 30, 60, 90, 180, 270, 365, 730, 1095, 1460 and 1825 days.
Purpose	These values are intended to provide users with a general idea of the how the amount of precipitation that has been received by a region over the given timeframe compares to the amount which is generally received.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.1.4. Precipitation Percentile (agclimate_pe)

Title	Precipitation Percentile
Alternate Title	agclimate_pe
Abstract	<p>Precipitation Percentiles represents the accumulated precipitation (mm) for the time period compared to historical information for the same time period. This comparison ranks the current precipitation amount and assigns it a percentile value based on a historic record.</p> <p>Products are produced for the following timeframes: Agricultural Year, Growing Season and Winter Season as well as rolling products for 30, 60, 90 and 180 days</p>
Purpose	These values are intended to provide users with a general idea of the how the amount of precipitation that has been received by a region over the given timeframe compares to the amount which has been received in the historical record.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.1.5. Dry Spell (agclimate_ds)

Title	Dry Spell
Alternate Title	agclimate_ds
Abstract	Dry spell periods are defined as the number of days (April 1 – October 31) where daily precipitation is less than 0.5 mm. This is not an accumulation of precipitation, simply a count of days. Dry spell products are only generated during the Growing Season, April 1 through October 31.
Purpose	The accumulation of too many consecutive dry days can be an indicator of crop stress in the growing season and can also signal the presence of various types of drought.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.2. Temperature

3.2.1. Maximum Temperature (°C) (agclimate_tx)

Title	Maximum Temperature (°C)
Alternate Title	agclimate_tx
Abstract	Maximum Temperature represents the highest recorded temperature value (°C) at each location for a given time period. Time periods include the previous 24 hours and the previous 7 days from the available date where a climate day starts at 0600UTC.
Purpose	These values can provide a user with a measure of daytime temperature highs.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.2.2. Minimum Temperature (°C) (agclimate_ti)

Title	Minimum Temperature (°C)
Alternate Title	agclimate_ti
Abstract	Minimum Temperature represents the lowest recorded temperature value (°C) at each location for a given time period. Time periods include the previous 24 hours and the previous 7 days from the available date where a climate day starts at 0600UTC.
Purpose	These values can provide a user with a measure of (generally) overnight temperature lows.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	Grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	Series
Feature Attribute Names	tType, dStart

3.2.3.Heat Wave (agclimate_hw)

Title	Heat Wave
Alternate Title	agclimate_hw
Abstract	Heat Wave represents the consecutive number of days (April 1 – October 31) where the maximum daily temperature is greater than 25 or 30 degrees respectively. Heat wave products are only generated during the Growing Season, April 1 through October 31.
Purpose	The accumulation of too many consecutive hot days can be an indicator of heat stress on some crops in the growing season.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.2.4.Crop (Corn) Heat Units (agclimate_ch)

Title	Crop (Corn) Heat Units
Alternate Title	agclimate_ch
Abstract	<p>Crop Heat Units (CHU) are calculated on a daily basis, using the maximum and minimum temperatures in order to account for a crop's negative response to higher temperatures. The formula used to calculate the CHU value for a day is:</p> $(1.8 \times (\text{Minimum Temperature} - 4.4) + 3.33 \times (\text{Maximum Temperature} - 10) - 0.084 \times (\text{Maximum Temperature} - 10)^2) \div 2.0$ <p>CHU values are only accumulated during the Growing Season, April 1 through October 31.</p>
Purpose	To provide information that will allow users of the data to select crop varieties and hybrids that will be successful in a particular area.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.2.5. Growing Degree Days (agclimate_gd)

Title	Growing Degree Days
Alternate Title	agclimate_gd
Abstract	Growing degree days (GDDs) are used to estimate the growth and development of plants and insects during the growing season. Growing Degree Day are computed by subtracting a base value temperature from the mean daily temperature and are assigned a value of zero if negative. Base temperatures are a point below which development does not occur for the organism in question. Growing Degree Day products are created for base 0, 5, 10 and 15 degrees Celsius. GDD values are only accumulated during the Growing Season, April 1 through October 31.
Purpose	To provide information that will allow users of the data to select crop varieties and hybrids that will be successful in a particular area.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation
Scope identification	series
Feature Attribute Names	tType, dStart

3.2.6. Mean Temperature Difference From Normal (agclimate_dnt)

Title	Mean Temperature Difference From Normal
Alternate Title	agclimate_dnt
Abstract	Mean Temperature Difference From Normal values are computed by subtracting the normal monthly average temperature from the average monthly temperature of the month. The average monthly temperature is computed by obtaining the mean value of average daily temperatures for a month. If the month was colder than normal the value computed will be negative and if it was warmer the value will be positive.
Purpose	These values are intended to provide users with a general idea of the temperature variation for the month when compared to the average conditions experienced.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Monthly
Scope identification	series
Feature Attribute Names	tType, dStart

3.3. Drought Indicator

3.3.1. Palmer Hydrological Drought Index (agclimate_phdi)

Title	Palmer Hydrological Drought Index
Alternate Title	agclimate_phdi_pdi
Abstract	<p>The term "Palmer Drought Index" has been used collectively to represent multiple indices. This index is simply a water balance model which analyzes precipitation and temperature, and used as a tool to measure meteorological and hydrological drought across space and time. All versions of the index uses the Versatile Soil Moisture Budget to model the movement of water within the system, and a daily Priestly-Taylor model to estimate evapotranspiration. The Palmer Drought Index (PDI) uses monthly temperature and precipitation data to calculate a simple soil water balance. The index is a relative measure that typically ranges from -4 (extremely dry) to +4 (extremely wet) and represents how soil moisture availability differs from that expected for a given place and time of year. The PDI includes a "memory" component that considers past conditions and persistence of soil moisture surplus or deficit.</p> <p>The Palmer Hydrological Drought Index (PHDI) is a specific version of the PDI that accounts for longer-term drought that reduces surface and groundwater supply.</p>
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	<p>The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.</p>
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	<p>Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Palmer, Drought</p>
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.2. Palmer Modified Drought Index (agclimate_pmdi)

Title	Palmer Modified Drought Index
Alternate Title	agclimate_pmdi_pdi
Abstract	<p>The term "Palmer Drought Index" has been used collectively to represent multiple indices. This index is simply a water balance model which analyzes precipitation and temperature, and used as a tool to measure meteorological and hydrological drought across space and time. All versions of the index uses the Versatile Soil Moisture Budget to model the movement of water within the system, and a daily Priestly-Taylor model to estimate evapotranspiration.</p> <p>The Palmer Drought Index (PDI) uses monthly temperature and precipitation data to calculate a simple soil water balance. The index is a relative measure that typically ranges from -4 (extremely dry) to +4 (extremely wet) and represents how soil moisture availability differs from that expected for a given place and time of year. The PDI includes a "memory" component that considers past conditions and persistence of soil moisture surplus or deficit. The Modified Palmer Drought Index (PMDI) is obtained from the sum of the wet and dry terms weighted by probability values. The PMDI has the same value as the PDI during established dry or wet spells but can be different during transition periods.</p>
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	<p>The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.</p>
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	<p>Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Palmer, Drought</p>
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.3. Moisture Anomaly Index (agclimate_mai_pdi)

Title	Moisture Anomaly Index
Alternate Title	agclimate_mai_pdi
Abstract	The Moisture Anomaly Index (Palmer-Z) is an estimate of the moisture difference from normal (a 30-year mean). It attempts to express conditions for the current month regardless of what may have occurred before the month in question.
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Palmer, Drought
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.4.Total Soil Moisture (mm) (agclimate_tsm_pdi)

Title	Total Soil Moisture (mm)
Alternate Title	agclimate_tsm_pdi
Abstract	Total soil moisture is the modelled amount of plant available water (mm) in the root zone of the soil. The value given is the amount calculated to be present on the modeled day of the product. Values are computed using the Versatile Soil Moisture Budget (VSMB)
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Palmer, Drought
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.5. Percent of Normal Soil Moisture (agclimate_pnm_pdi)

Title	Percent of Normal Soil Moisture
Alternate Title	agclimate_pnm_pdi
Abstract	Percent of normal soil moisture is the modelled amount of plant available water (mm) in the root zone of the soil, divided by the average amount that has historically been available on that day. This value is intended to provide users with a representation of conditions above or below normal as a percentage. Values are computed using the Versatile Soil Moisture Budget (VSMB)
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Soil Moisture
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.6. Difference from Normal Soil Moisture (mm) (agclimate_dnm_pdi)

Title	Difference from Normal Soil Moisture(mm)
Alternate Title	agclimate_dnm_pdi
Abstract	Difference from normal soil moisture is the modelled amount of plant available water (mm) in the root zone of the soil, minus the average amount that has historically been available on that day. This value is intended to provide users with a representation of conditions above or below normal and by the amount of water (mm). Values are computed using the Versatile Soil Moisture Budget (VSMB)
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region and is based on daily precipitation and temperature values.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	The Versatile Soil Moisture Budget (VSMB) is a soil water budget model that is continuous and deterministic in nature and was developed by AAFC. It is based on the premise that the water available for plant growth is gained by precipitation or irrigation, and lost through evapotranspiration and runoff as well as lateral and deep drainage. The daily net loss or gain is added or subtracted from the water already present in the rooting zone. Water is withdrawn simultaneously, but at different rates, from different soil depths, depending on the potential evapotranspiration, the stage of crop development, the water release characteristics of each soil layer and the available water.
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, Soil Moisture
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.7. Standardized Precipitation Index (SPI) (agclimate_spi)

Title	Standardized Precipitation Index (SPI)
Alternate Title	agclimate_spi
Abstract	The Standardized Precipitation Index (SPI) has been recognized as the most accessible index for quantifying and reporting meteorological drought. On short timescales, the SPI is closely related to soil moisture, while at longer timescales, the SPI can be related to groundwater and reservoir storage. The model uses observed historical precipitation amounts to compute probability distributions which are then normalized using an incomplete gamma function over a range of timescales. The values can be interpreted as the number of standard deviations by which the observed anomaly deviates from the long-term mean. where positive values (greater than zero) result from above average conditions.
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region over a given timeframe.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, SPI
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.8. Standardized Precipitation Evapotranspiration Index (SPEI) (agclimate_spei)

Title	Standardized Precipitation Evapotranspiration Index (SPEI)
Alternate Title	agclimate_spei
Abstract	The Standardized Precipitation Evapotranspiration Index (SPEI) is computed similarly to the SPI. The main difference is that SPI assesses precipitation variance, while SPEI also considers demand from evapotranspiration which is subtracted from any precipitation accumulation prior to assessment. Unlike the SPI, the SPEI captures the main impact of increased temperatures on water demand.
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region over a given timeframe.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, SPEI
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.9. Blended Index – Short Term (agclimate_st_bi)

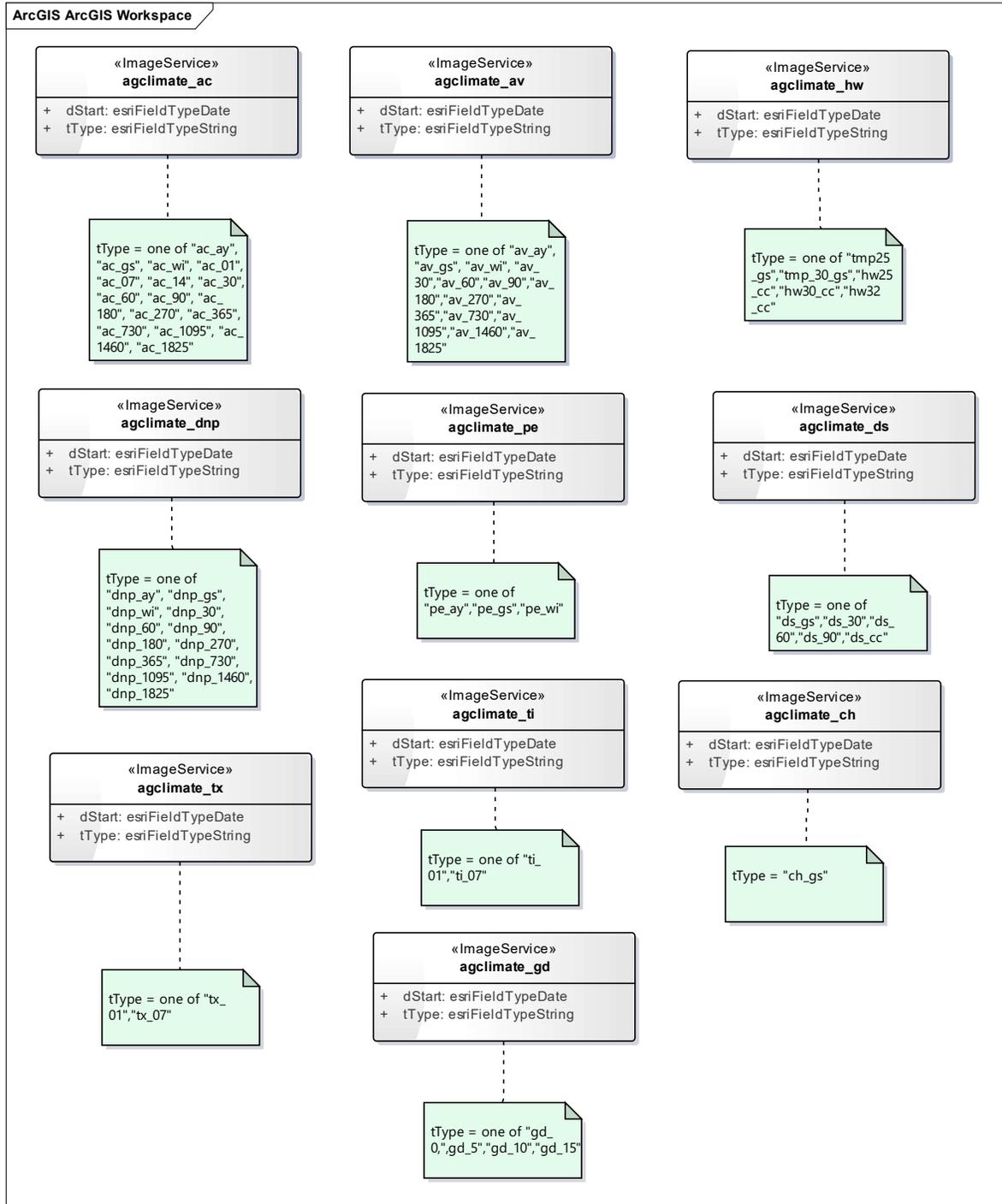
Title	Blended Index – Short Term
Alternate Title	agclimate_st_bi
Abstract	The Blended Index (BI) is a model which employs multiple potential indicators of drought and excess moisture, such as the Palmer drought index, rolling precipitation amounts and soil moisture, and combines them into a weighted, normalized value between 0 and 100. The inputs and weights used in this model are subject to change periodically as it is optimized to best represent extent, duration and severity of impactful weather conditions. The blended index is deployed as two variations; short term (st) focusing on 1 to 3 months, and long term (lt) focusing on 6 months to 5 years.
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region over a given timeframe.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, BI
Scope identification	series
Feature Attribute Names	tType, dStart

3.3.10. Blended Index – Long Term (agclimate_lt_bi)

Title	Blended Index – Long Term
Alternate Title	agclimate_lt_bi
Abstract	The Blended Index (BI) is a model which employs multiple potential indicators of drought and excess moisture, such as the Palmer drought index, rolling precipitation amounts and soil moisture, and combines them into a weighted, normalized value between 0 and 100. The inputs and weights used in this model are subject to change periodically as it is optimized to best represent extent, duration and severity of impactful weather conditions. The blended index is deployed as two variations; short term (st) focusing on 1 to 3 months, and long term (lt) focusing on 6 months to 5 years.
Purpose	These values are intended to provide users with a general idea of the agricultural growing conditions for a region over a given timeframe.
Topic Category	Climatology/Meteorology/Atmosphere
Spatial Reference Type	grid, vector
Spatial Resolution	5000m
Geographic Description	Canada
Supplemental Information	
Constraints	Data are subject to the Government of Canada Open Data License Agreement: http://www.data.gc.ca
Keywords	Thesaurus: Government of Canada Core Subject Date: February 1, 2000 Keywords: Farmlands, Crop, Agriculture, Temperature, Precipitation, BI
Scope identification	series
Feature Attribute Names	tType, dStart

4. CONTENT AND STRUCTURE

4.1. Feature-based application schema



4.2. Feature catalogue – Drought Watch Interactive Mapping

Title	Agroclimate – Feature Catalogue
Scope	
Version Number	1
Version Date	2013-04-10
Producer	Agriculture and Agri-Food Canada, Government of Canada

System-generated attributes (for example, OBJECTID, Shape, Shape Length and Area) are not defined in the feature catalog.

4.2.1. Feature attributes

4.2.1.1. Date of Observation (dDate)

Name	Date of observation (dDate)
Definition	Date of observation
Aliases	
Producer	<i>Agriculture and Agri-Food Canada</i>
Value Data Type	Date
Value Domain Type	0
Value Domain	

4.2.1.2. Period Type Code (tType)

Name	Period Type Code (tType)		
Definition	A unique code based on the combination of the product type code (i.e. the 2 character image service suffix) and the period type code. For example the tType code for the previous 7 days Maximum Temperature Image Service would be "tx_07".		
Aliases			
Producer	<i>Agriculture and Agri-Food Canada</i>		
Value Data Type	String		
Value Domain Type	1		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition
		ay	agricultural year (September 1 to August 31)
		gs	growing season (April 1 to October 31)
		wi	winter season (November 1 to March 31)
		cc	number of consecutive days
		im	instantaneous measurement
		01	24 hours previous to the date of the raster
		07	Seven days previous to the date of the raster
		14	Fourteen days previous to the date of the raster
		30	Thirty days previous to the date of the raster
		60	Sixty days previous to the date of the raster
		90	Ninety days previous to the date of the raster
		180	One hundred and eighty days previous to the date of the raster
		270	Two hundred and seventy days previous to the date of the raster
		365	Three hundred and sixty five days previous to the date of the raster
		730	Seven hundred and thirty days previous to the date of the raster
		1095	One thousand and ninety-five days previous to the date of the raster
		1460	One thousand four hundred and sixty days previous to the date of the raster
		1825	One thousand eight hundred and twenty-five days previous to the date of the raster
		gd_0	Base 0° Celsius
		gd_5	Base 5° Celsius
		gd_10	Base 10° Celsius
		gd_15	Base 15° Celsius

5. REFERENCE SYSTEM

5.1. Spatial reference system

Horizontal coordinate reference system: WGS 84

Map projection: Web Mercator Auxiliary Sphere; EPSG: 3857; Version 8.1.4

5.2. Temporal reference system

Gregorian calendar

6. DATA QUALITY

6.1. Completeness

Measure not used at this time

6.2. Logical consistency

Measure not used at this time

6.3. Positional accuracy

This digital geo-spatial product was interpolated from ECCC/MSC station data with unknown positional accuracy (latitude, longitude and elevation). Latitude and longitude values are given to the nearest 1/100 of a degree.

6.4. Temporal accuracy

Measure not used at this time

6.5. Thematic accuracy

Measure not used at this time

6.6. Lineage statement

Lineage Statement	<p>Raw in-situ climate measurements of daily maximum and minimum temperature and daily total precipitation are gathered each day from multiple sources (data owners) including Environment & Climate Change Canada (ECCC), CoCoRHaS, Alberta Agriculture, Manitoba Agriculture, Environment Saskatchewan and the Quebec Mesonet. Data are collected for the most recent completed climate day which is defined by a 0600 UTC start time (this will generally occur five hours after the climate day has completed) as well as for one or more previous climate days – extra historic collections are frequently gathered to obtain any available updates from the source; as a general rule, the further removed from the time period of interest you move, the more information about the period becomes available.</p> <p>Once this daily information has been collected from all available sources, it is transferred to a common format to be processed by the system. This processing is done through a QAQC (Quality Assurance Quality Control) program which analyses the data in an automated fashion searching for any possible errors which may exist within the data using assessments against historic values, recent values and surrounding values. Any values which are found to be a potential source of error are flagged by the automated system. Once the automated system has completed its analysis, it opens up a graphical user interface which can be further examined and manipulated by an operator who manually searches through all flagged information and resolves the identified issue by either committing the value as acceptable, by removing the data in question or by entering a more suitable replacement value. During this manual inspection, operators consult historic, spatial, forecast and remote sensed (RADAR and satellite imagery) and employ the combined information to select the most likely scenario for each datum in question. Upon release of all flagged information, and any extra checks which may be performed by the operator to ensure the best possible representation of the climate day being assessed, the system is prompted to interpolate any missing information where sufficient surrounding information is available to satisfactorily do so. When this process is completed, the operator then uses the program to initiate the final step which is to upload the final products to multiple destinations for archival and graphical (map) product creation.</p>
Scope	Series

7. DATA CAPTURE

The most recent information available is generally captured and stored approximately five hours after the event (the climate day) has completed. For the purposes of this project a climate day is set to begin at 0600 UTC.

Data are obtained from various sources using an input program which is capable of polling multiple internet sources for information in many formats. Information is currently obtained from comma delimited text files, XML files, amorphous climate objects and spreadsheets. All available information is processed into a single source output file which is then made available for further downstream processing.

8. DATA MAINTENANCE

No Maintenance

9. PORTRAYAL

Not applicable.

10. DATA PRODUCT DELIVERY

TIF

format name: Tag Interleaved File:
version: 6.0
specification: GeoTIFF is format extension for storing georeference and geocoding information in a TIFF 6.0 compliant raster file by tying a raster image to a known model space or map projection.
languages: eng
character set: utf8

11. METADATA

The metadata requirements follow the Government of Canada's Treasury Board Standard on Geospatial Data (ISO 19115).