

*ISO 19131 SMAPVEX16-MB Crop  
Biomass Dataset – Data Product  
Specifications*

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Revision: A

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## Data product specifications: SMAPVEX16-MB Crop Biomass Dataset

### - Table of Contents-

1.	Overview .....	4
1.1.	Informal description .....	4
1.2.	Data product specification - metadata .....	4
1.3.	Terms and definitions .....	4
1.4.	Abbreviations .....	5
2.	SPECIFICATION SCOPE .....	5
3.	DATA PRODUCT IDENTIFICATION.....	6
3.1.	Data series identification.....	6
3.2.	Data product identification .....	7
3.2.1.	SMAPVEX16-MB Crop Biomass Dataset.....	7
4.	DATA CONTENT AND STRUCTURE.....	8
4.1.	Feature-based application schema.....	9
4.2.	Feature catalogue – SMAPVEX16-MB Crop Biomass Dataset.....	10
4.2.1.	Feature attributes.....	10
4.2.1.1.	SITE_ID .....	10
4.2.1.2.	DATE .....	10
4.2.1.3.	CROP .....	10
4.2.1.4.	GROWTH_STAGE.....	11
4.2.1.5.	PLANT_TYPE .....	11
4.2.1.6.	OVEN_DRY_COR.....	11
4.2.1.7.	PLANT_WATER_CONTENT_PERCT .....	12
4.2.1.8.	PLANT_WATER_CONTENT_AREA.....	12
4.2.1.9.	TOTAL_WET_BIOMASS_WEIGHT .....	12
4.2.1.10.	TOTAL_WET_BIOMASS_AREA .....	13
4.2.1.11.	TOTAL_DRY_BIOMASS_WEIGHT .....	13
4.2.1.12.	TOTAL_DRY_BIOMASS_AREA.....	13
5.	REFERENCE SYSTEMS .....	14
5.1.	Spatial reference system .....	14
5.2.	Temporal reference system.....	14
6.	DATA QUALITY .....	14
6.1.	Completeness.....	14
6.2.	Logical consistency.....	14

- 6.3. Positional accuracy..... 14
- 6.4. Temporal accuracy ..... 14
- 6.5. Thematic accuracy..... 14
- 6.6. Lineage statement ..... 14
- 7. DATA CAPTURE ..... 14
- 8. DATA MAINTENANCE ..... 14
- 9. PORTRAYAL..... 15
- 10. DATA PRODUCT DELIVERY..... 15
- 11. METADATA ..... 15

# Data product specifications: SMAPVEX16-MB Crop Biomass Dataset / Spécifications de contenu informationnel

## 1. Overview

### 1.1. Informal description

The Soil Moisture Active/Passive Validation Experiment 2016-Manitoba (SMAPVEX16-MB) was conducted in the Carman/Elm Creek region. The purpose of the experiment was to collect a variety of ground measurements with coincident remotely-sensed data to calibrate and increase the accuracy of the National Aeronautics and Space Administration (NASA)'s Soil Moisture Active/Passive (SMAP) soil moisture products.

This dataset summarizes the wet, dry/oven dry biomass values and plant water content from field collected data for the field campaign SMAPVEX16-MB project.

### 1.2. Data product specification - metadata

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

Data product specification – title:	SMAPVEX16-MB Crop Biomass Dataset
Data product specification - reference date:	June 13, 2016 to July 21, 2016
Data product specification - responsible party:	AAFC STB
Data product specification – language:	English
Data product specification - topic category:	geoscientificInformation

### 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
GPS	Global Positioning System
NASA	National Aeronautics and Space Administration
SMAP	Soil Moisture Active/Passive
SMAPVEX16-MB	Soil Moisture Active/Passive Validation Experiment 2016-Manitoba
STB	Science and Technology Branch

## 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. Data series identification

Title	SMAPVEX16-MB Crop Biomass Dataset
Alternate Title	SMAPVEX16-MB Crop Biomass Data
Abstract	SMAPVEX16-MB was conducted to assess and increase the overall accuracy of the soil moisture retrievals produced using the SMAP satellite. The records contained within this dataset include crop biomass data collected on vegetation sampling days during the SMAPVEX16-MB campaign.
Purpose	This dataset is used to assess and increase the overall accuracy of the SMAP soil moisture product.
Topic Category	geoscientificInformation
Spatial Representation Type	textTable
Spatial Resolution	
Geographic Description	Carman/Elm Creek, Manitoba, Canada
Supplemental Information	<p>Principle Investigators:  Heather McNairn - Agriculture and Agri-Food Canada;  Tom Jackson - United States Department of Agriculture;  Co-Investigators(Canada):  Amine Merzouki, Anna Pacheco, Jarrett Powers - Agriculture and Agri-Food Canada;  Stephane Belair, Peter Toose - Environment and Climate Change Canada;  Monique Bernier - Institut National de la Recherche Scientifique(INRS);  Aaron Berg, Tracy Rowlandson - University of Guelph;  Paul Bullock - University of Manitoba;  RoTimi Ojo - Manitoba Agriculture;  Alexandre Roy - University of Montreal;  Ramata Magagi - University of Sherbrooke;  Co-Investigators(United States):  Alicia Joseph, Peggy O'Neill - NASA Goddard Space Flight Centre;  Andreas Colliander, Sab Kim - NASA Jet Propulsion Lab;  Mike Cosh - United States Department of Agriculture;  Co-Investigators(International):  Giuseppe Satalino - National Research Council of Italy (ISSIA-CNR)</p>
Constraints	SMAPVEX16-MB field data will be placed on the University of Sherbrooke website. Access will be limited by password that will be provided to principle and co-investigators listed below. Principle and Co-Investigators are to ensure that staff, graduate students and post docs respect the terms of the agreement on usage and distribution. Access to the website will be restricted until August 1, 2017 for preliminary research and quality control. After August 1, 2017 all field data will be transferred to the National Snow and Ice Data Centre to be made

	publically available.
Keywords	SMAPVEX16-MB, Crop Biomass, Vegetation Growth, BBCH, Wet Dry Biomass
Scope identification	series

### 3.2. Data product identification

#### 3.2.1. SMAPVEX16-MB Crop Biomass Dataset

Title	SMAPVEX16-MB Crop Biomass Dataset
Alternate Title	SMAPVEX16-MB Crop Biomass Data
Abstract	This dataset contains crop biomass data collected on vegetation sampling days.
Purpose	SMAP produces global soil moisture products. This dataset is used to assess and increase the overall accuracy of the SMAP soil moisture product.
Topic Category	geoscientificInformation
Spatial Representation Type	textTable
Spatial Resolution	
Geographic Description	Carman/Elm Creek, Manitoba, Canada
Supplemental Information	<p>Principle Investigators:  Heather McNairn - Agriculture and Agri-Food Canada;  Tom Jackson - United States Department of Agriculture;  Co-Investigators(Canada):  Amine Merzouki, Anna Pacheco, Jarrett Powers - Agriculture and Agri-Food Canada;  Stephane Belair, Peter Toose - Environment and Climate Change Canada;  Monique Bernier - Institut National de la Recherche Scientifique(INRS);  Aaron Berg, Tracy Rowlandson - University of Guelph;  Paul Bullock - University of Manitoba;  RoTimi Ojo - Manitoba Agriculture;  Alexandre Roy - University of Montreal;  Ramata Magagi - University of Sherbrooke;  Co-Investigators(United States):  Alicia Joseph, Peggy O'Neill - NASA Goddard Space Flight Centre;  Andreas Colliander, Sab Kim - NASA Jet Propulsion Lab;  Mike Cosh - United States Department of Agriculture;  Co-Investigators(International):  Giuseppe Satalino - National Research Council of Italy (ISSIA-CNR)</p>
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	website will be restricted until August 1, 2017 for preliminary research and quality control. After August 1, 2017 all field data will be transferred to the National Snow and Ice Data Centre to be made publically available.
Keywords	SMAPVEX16-MB, Crop Biomass, Vegetation Growth, BBCH, Wet Dry Biomass
Scope Identification	dataset
Feature Attribute Names	SITE_ID, DATE, CROP, GROWTH_STAGE, PLANT_TYPE, OVER_DRY_COR, PLANT_WATER_CONTENT_PERCT, PLANT_WATER_CONTENT_AREA, TOTAL_WET_BIOMASS_WEIGHT, TOTAL_WET_BIOMASS_AREA, TOTAL_DRY_BIOMASS_WEIGHT, TOTAL_DRY_BIOMASS_AREA

#### 4. DATA CONTENT AND STRUCTURE

## 4.1. Feature-based application schema

Figure <#> - <Insert dataset title> UML Class Diagram

## 4.2. Feature catalogue – SMAPVEX16-MB Crop Biomass Dataset

Title	SMAPVEX16-MB Crop Biomass Feature Catalogue
Scope	series
Version Number	1
Version Date	December 19, 2016
Producer	AAFC

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. SITE\_ID

Name	Site Identification (SITE_ID)		
Definition	Unique ID to identify the site where sampling occurs. Each field has 16 sampling locations.		
Aliases	SITE_ID		
Producer	AAFC		
Value Data Type	String		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

#### 4.2.1.2. DATE

Name	Date (DATE)		
Definition	Date of sampling (YY-MM-DD).		
Aliases	DATE		
Producer	AAFC		
Value Data Type	Date and time		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

#### 4.2.1.3. CROP

Name	Crop (CROP)
Definition	Crop that was grown in 2016.

Aliases	CROP		
Producer	AAFC		
Value Data Type	String		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.4. GROWTH\_STAGE**

Name	Growth Stage (GROWTH_STAGE)		
Definition	Growth stage (BBCH Scale).		
Aliases	GROWTH_STAGE		
Producer	AAFC		
Value Data Type	String		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.5. PLANT\_TYPE**

Name	Plant Type (PLANT_TYPE)		
Definition	Plants were partitioned (stems, leaves, flowers, heads/pods) and weighed separately.		
Aliases	PLANT_TYPE		
Producer	AAFC		
Value Data Type	String		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.6. OVEN\_DRY\_COR**

Name	Oven Dry Correction Factor (OVEN_DRY_COR)		
Definition	Oven dry correction factor that is applied to the air dry weights.		
Aliases	OVEN_DRY_COR		
Producer	AAFC		
Value Data Type	Double		

Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.7. PLANT\_WATER\_CONTENT\_PERCT**

Name	Plant Water Content Percent (PLANT_WATER_CONTENT_PERCT)		
Definition	Plant water content (%). Calculated as net wet sample weight minus net dry sample weight divided by net wet sample weight.		
Aliases	PLANT_WATER_CONTENT_PERCT		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.8. PLANT\_WATER\_CONTENT\_AREA**

Name	Plant Water Content Area (PLANT_WATER_CONTENT_AREA)		
Definition	Plant water content expressed in kg/m2.		
Aliases	PLANT_WATER_CONTENT_AREA		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.9. TOTAL\_WET\_BIOMASS\_WEIGHT**

Name	Total Wet Biomass Weight (TOTAL_WET_BIOMASS_WEIGHT)		
Definition	Total net wet biomass weight (kg).		
Aliases	TOTAL_WET_BIOMASS_WEIGHT		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			

	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.10. TOTAL\_WET\_BIOMASS\_AREA**

Name	Total Wet Biomass Area (TOTAL_WET_BIOMASS_AREA)		
Definition	Total net wet biomass expressed in kg/m2.		
Aliases	TOTAL_WET_BIOMASS_AREA		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.11. TOTAL\_DRY\_BIOMASS\_WEIGHT**

Name	Total Dry Biomass Weight (TOTAL_DRY_BIOMASS_WEIGHT)		
Definition	Total net dry biomass weight (kg).		
Aliases	TOTAL_DRY_BIOMASS_WEIGHT		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**4.2.1.12. TOTAL\_DRY\_BIOMASS\_AREA**

Name	Total Dry Biomass Area (TOTAL_DRY_BIOMASS_AREA)		
Definition	Total net dry biomass expressed in kg/m2.		
Aliases	TOTAL_DRY_BIOMASS_AREA		
Producer	AAFC		
Value Data Type	Double		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

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## 5. REFERENCE SYSTEMS

### 5.1. Spatial reference system

Not applicable.

### 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

A handheld Garmin Global Positioning System (GPS) device was used to navigate to each sampling point. The device is accurate to within approximately 3m.

### 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	Biomass data was collected between the dates of June 13, 2016 to July 21, 2016 during the SMAPVEX16-MB project. The date corresponding to each biomass sample was recorded and attached to the record.
Scope	

## 7. DATA CAPTURE

Wet, dry/oven dry biomass data and plant water content data were collected fore the SMAPVEX16-MB field campaign and stored within SMAPVEX16-MB Crop Biomass Dataset.

## 8. DATA MAINTENANCE

Not planned.

## 9. PORTRAYAL

Not applicable.

## 10. DATA PRODUCT DELIVERY

Csv  
Format name: Comma Delimited  
Format version: 1.0  
Specification: A delimited data format that has fields/columns separated by the comma character.  
Languages: eng  
Character set: utf8

## 11. METADATA

Not applicable.