

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

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Revision: A

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

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# Data product specifications: SMAPVEX16-MB Crop Density 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 information on crop density, row direction, spacing and seeding date. Observations were made prior to the start of the SMAPVEX16-MB field campaign.

### 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 Density Dataset
Data product specification - reference date:	December 19, 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 Density Dataset
Alternate Title	SMAPVEX16-MB Crop Density Data
Abstract	SMAPVEX16-MB was conducted to assess and increase the overall accuracy of the soil moisture retrievals produced using the SMAP satellite. This dataset contains records of crop information pertaining to the sampling fields.
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 Density
Scope identification	series

### 3.2. Data product identification

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

Title	SMAPVEX16-MB Crop Density Dataset
Alternate Title	SMAPVEX16-MB Crop Density Data
Abstract	This dataset contains information on crop density, row direction, row spacing and seeding date.
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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	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 Density
Scope Identification	Dataset
Feature Attribute Names	FIELD_ID, CROP, ROW_SPACING, ROW_DIRECTION_SAMPLE_DISTANCE, PLANT_COUNT, SEED_DATE

#### 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 Density Dataset

Title	SMAPVEX16-MB Crop Density 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. FIELD\_ID

Name	Field Identification (FIELD_ID)		
Definition	Unique ID that was developed from current/previous campaigns to identify the field.		
Aliases	FIELD_ID		
Producer	AAFC		
Value Data Type	Integer		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

#### 4.2.1.2. 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

#### 4.2.1.3. ROW\_SPACING

Name	Row Spacing (ROW_SPACING)
Definition	Average distance (cm) between seed rows.

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

#### 4.2.1.4. ROW\_DIRECTION

Name	Row Direction (ROW_DIRECTION)		
Definition	Crop row direction (degrees).		
Aliases	ROW_DIRECTION		
Producer	AAFC		
Value Data Type	Integer		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

#### 4.2.1.5. SAMPLE\_DISTANCE

Name	Sample Distance (SAMPLE_DISTANCE)		
Definition	Distance (m) that plant counts were taken.		
Aliases	SAMPLE_DISTANCE		
Producer	AAFC		
Value Data Type	Integer		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

#### 4.2.1.6. PLANT\_COUNT

Name	Plant Count (PLANT_COUNT)		
Definition	Average plant count.		
Aliases	PLANT_COUNT		
Producer	AAFC		
Value Data Type	Double		

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

**4.2.1.7. SEED\_DATE**

Name	Seed Date (SEED_DATE)		
Definition	Date crop was seeded (YYYY-MM-DD).		
Aliases	SAMPLE_DISTANCE		
Producer	AAFC		
Value Data Type	Date and time		
Value Domain Type	0 (not enumerated)		
Value Domain			
	Feature Attribute Value		
	Label	Code	Definition

**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) was used by each field crew to navigate to the sampling location. 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	The crop density, row direction, row spacing and seeding date observations recorded within this dataset were made prior to the start of the SMAPVEX16-MB field campaign.
Scope	

**7. DATA CAPTURE**

Crop density, row direction, row spacing and seeding date observations were made through in-situ measurements as well as by contacting land owners.

**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.