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First edition  
2018-09

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# Geographic information — Imagery sensor models for geopositioning —

## Part 1: Fundamentals

*Information géographique — Modèles de capteurs d'images et  
géopositionnement —*

*Partie 1: Principes de base*



Reference number  
ISO 19130-1:2018(E)

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Published in Switzerland

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

This first edition of ISO 19130 cancels and replaces ISO/TS 19130:2010, which has been technically revised.

The main changes compared to the previous edition are:

- part number 1 was added to reflect that ISO 19130 is now divided into several parts;
- normative references are updated to reflect revisions;
- [Annex B](#) is updated to reference the updated versions of the ISO geographic information standards.

A list of all the parts in the ISO 19130 series, can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

The purpose of this document is to specify the geolocation information that an imagery data provider shall supply in order for the user to be able to find the earth location of the data using a Physical Sensor Model (PSM), a True Replacement Model (TRM) or a Correspondence Model (CM). Detailed PSMs are defined for passive electro-optical visible/ IR sensors (frame, pushbroom and whiskbroom) and for an active microwave sensing system (SAR). A set of components from which models for other sensors can be constructed is also provided. Metadata required for geopositioning using a TRM, a CM, or ground control points (GCPs) are also specified. The intent is to standardize sensor descriptions and specify the minimum geolocation metadata requirements for data providers and geopositioning imagery systems.

Vast amounts of data from imaging systems are collected, processed and distributed by government mapping and remote sensing agencies and commercial data vendors. In order for this data to be useful in extraction of geographic information, it requires further processing. Geopositioning, which determines the ground coordinates of an object from image coordinates, is a fundamental processing step. Because of the diversity of sensor types and the lack of a common sensor model standard, data from different producers can contain different parametric information, lack parameters required to describe the sensor that produces the data, or lack ancillary information necessary for geopositioning and analysing the data. Consequently, a separate software package often has to be developed to deal with data from each individual sensor or data producer. Standard sensor models and geolocation metadata allow agencies or vendors to develop generalized software products that are applicable to data from multiple data producers or from multiple sensors. With such a standard, different producers can describe the geolocation information of their data in the same way, thus promoting interoperability of data between application systems and facilitating data exchange.

This document defines the set of metadata elements specified for providing sensor model and other geopositioning data to users. For the case where a PSM is provided, it includes a location model and metadata relevant to all sensors; it also includes metadata specific to whiskbroom, pushbroom, frame, and SAR sensors. It also includes metadata for functional fit geopositioning, where the function is part of a CM or a TRM. This document also provides a schema for all of these metadata elements.