

# Guide to Coordinate Reference System (CRS) Resources

Joint ISO/TC 211, OGC, IOGP text; July 2022

## Intended Audience

Developers and others who need to know some of the detail about CRS registers

## Introduction

CRSs and transformations are defined by numerous stakeholders. These definitions are then provided to the user community via a variety of means, the most well-established being through the EPSG, ISO Geodetic and OGC CRS registries maintained by the International Oil and Gas Producers Association (IOGP), ISO / TC 211 - Geographic Information/Geomatics, and the Open Geospatial Consortium (OGC) respectively.

Each maintainer has a rigorous governance system in place to ensure that the CRS content meets the stakeholder requirements. IOGP, ISO / TC 211, and OGC cooperate very closely on the management of CRS and transformation definitions based on the specific parameters developed by the authority governing the data.

All three registers act as trustworthy repositories of authoritative information, while serving different purposes.

The three organizations have collaborated to write this short introduction intended to help our users decide when to use each register, and understand how we work together.

## Why three different CRS registers?

While there is significant overlap in the active participants in each of the IOGP, ISO / TC 211, and OGC programs, each organization is also organized to address the requirements of its stakeholder community. As a consequence, consumers of CRS content who work predominantly with only one organization will rely upon that organization to provide the content by a means most suitable for the user community.

These different drivers result in different kinds of content, functionality, and presentation. Entries in the ISO register are provided by the body responsible for that CRS; all these entries are also available via the EPSG register and the OGC's URI resolver. EPSG codes are the *lingua franca* of CRS descriptions

### Different owners and drivers

	OGC	ISO	EPSG
<b>Link</b>	<a href="http://www.opengis.net/def/crs">http://www.opengis.net/def/crs</a>	<a href="https://geodetic.isotc211.org/">https://geodetic.isotc211.org/</a>	<a href="https://epsg.org/">https://epsg.org/</a>
<b>Owner</b>	OGC	ISO/TC 211	IOGP
<b>Technical oversight</b>	CRS Domain Working Group (DWG) (spatial CRSs for the Earth), Planetary DWG (planetary CRSs), Temporal DWG (temporal CRSs).	ISO TC 211/AG 12 Control Body for the ISO Geodetic Register (convenors appointed by IAG)	IOGP Geodesy Subcommittee
<b>Main purpose</b>	concentrates on providing a machine-readable interface	geodetic reference systems and transformations of “international application”, which has been broadly interpreted by ISO/TC 211 in its support of the UN-GGIM’s Global Geodetic Reference Frame	Coordinate reference systems and coordinate transformations which may be global, regional, national or local in application.

### Different kinds of content

	OGC	ISO	EPSG
<b>Geodetic CRS</b>	✓	✓	✓
<b>Projected CRS</b>	✓	✓	✓
<b>Some local CRSs</b>	✓		✓
<b>CRSs defined in OGC Standards</b>	✓		
<b>IAU planetary body CRSs</b>	✓		

### Different presentation / functionality

<b>Human readable web page</b>		✓	✓
<b>Resolvable URI (uses CRS code shown)</b>	OGC, EPSG	ISO	EPSG
<b>GML definition</b>	✓	✓	✓
<b>WKT definition</b>		✓	✓

## IOGP's EPSG Geodetic Parameter Dataset

The IOGP's EPSG Geodetic Parameter Dataset is a collection of definitions of coordinate reference systems and coordinate transformations which may be global, regional, national or local in application. Data sources include the ISO GR, the EuroGeographics CRS-EU registry, and data submitted directly by national authorities. The EPSG Geodetic Parameter Dataset is maintained by the Geodesy Subcommittee of the IOGP Geomatics Committee.

## ISO Geodetic Registry (ISO/TC 211)

The ISO Geodetic Registry contains authoritative information on international coordinate reference systems and transformations. The main purpose of the Registry is to serve as the primary source of such information for end users as well as other registries, and to support the implementation of the UN-GGIM's Global Geodetic Reference Frame (GGRF). It is overseen by the ISO Technical Committee on geographic information/geomatics (ISO/TC 211) through a Control Body chaired by appointees of the International Association of Geodesy.

## OGC CRS register

The OGC CRS register concentrates on providing a machine readable interface. For the entries defined in the EPSG register, it serves as a URI resolver to those entries in their IOGP source registry. OGC also includes CRSs defined in its own Standards and CRSs that OGC Member organizations request OGC to manage. The OGC CRS register infrastructure is overseen by the OGC Naming Authority as part of the OGC Definitions Server. Specific Earth CRS content is managed by the CRS Domain Working Group (CRS DWG) and Planetary/astronomical CRSs by the Planetary DWG. Note that OGC-registered CRS content is recommended for inclusion by OGC Members: there are multiple sources for these definitions and the user needs to be aware of the suitability of each definition based on the authority of its source.

## Other CRS sources

There are other volunteer-run web-accessible CRS registers which do not have a controlled governance process and can therefore sometimes contain unverified information