EPSG Geodetic Parameter Registry

User manual

Version 6.2

Contents

1 Home page

GeoRepository is a cloud-based web application and API for storing, searching, and displaying geodetic parameters. The application is used for hosting the EPSG Geodetic Parameter Dataset, which is a collection of definitions of coordinate reference systems and coordinate operations which may be global, regional, national, or local in application.

This is the latest generation of the site which includes an enhanced data model compliant with the ISO 19111:2019 revision which replaces the ISO 19111:2007 version. The new data model includes the ability to describe dynamic coordinate reference systems, which are now differentiated from static coordinate reference systems. Furthermore, it includes the ability to describe geoid-based vertical coordinate reference systems, point motion models, derived coordinate reference systems and datum ensembles.

Exports of the dataset include the EPSG MS Access, Oracle SQL Scripts, MySQL Scripts, PostgreSQL Scripts and WKT compliant with the ISO 19162:2019 standard. Exports can only be made by registered users.

The EPSG Geodetic Parameter Dataset is maintained by the Geodesy Subcommittee of the IOGP Geomatics Committee. For more information about the Geomatics Committee please visit https://epsg.org and click on the Geomatic Home button shown in Figure 1.

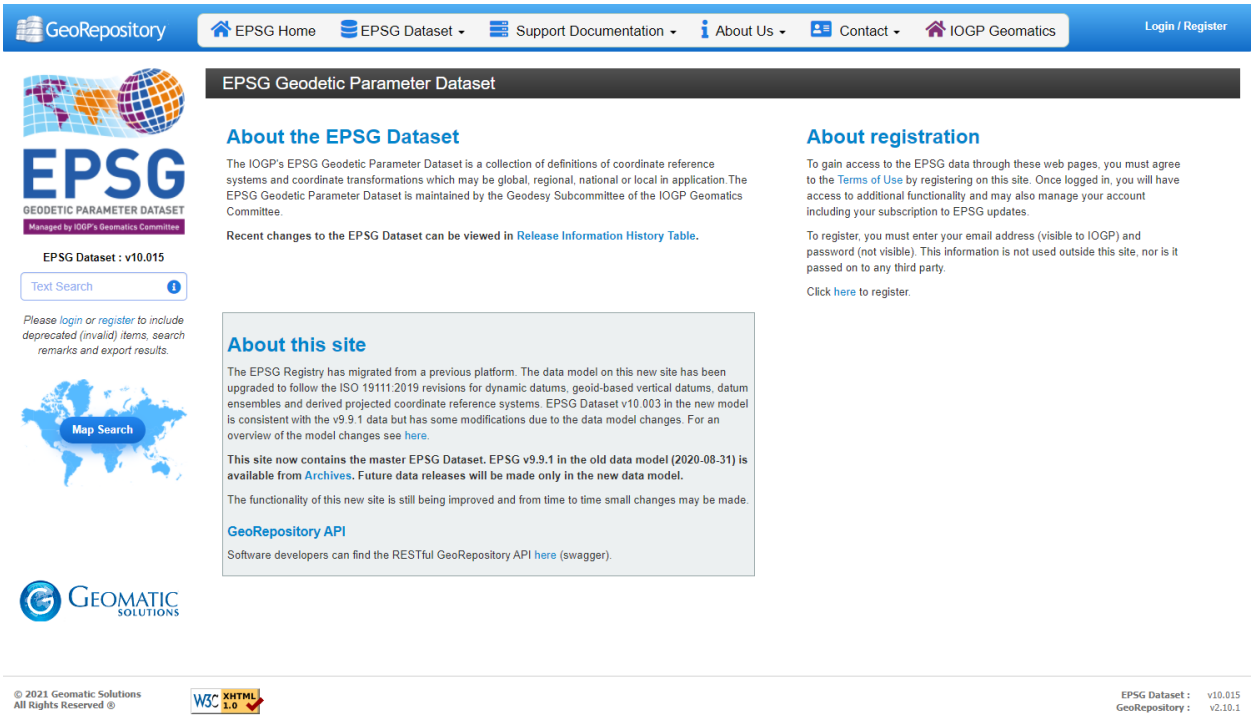


Figure 1: GeoRepository home page

The application can be used without registration, but with functionality limited to basic searching and reporting only. Registration gives the user access to export functions, once logged in.

This document can be downloaded from the site using the 'Support Documentation' menu option.

1.1 Online Registration

To gain full access to the EPSG Geodetic Parameter Dataset registry functionality through these web pages, you must register on this site. Once registered, you may also subscribe to updates and make change requests.

To register, click on the **Register** link shown in the upper right-hand corner of the home page (see Figure 1). Next, a registration form will appear like the one shown in Figure 2.

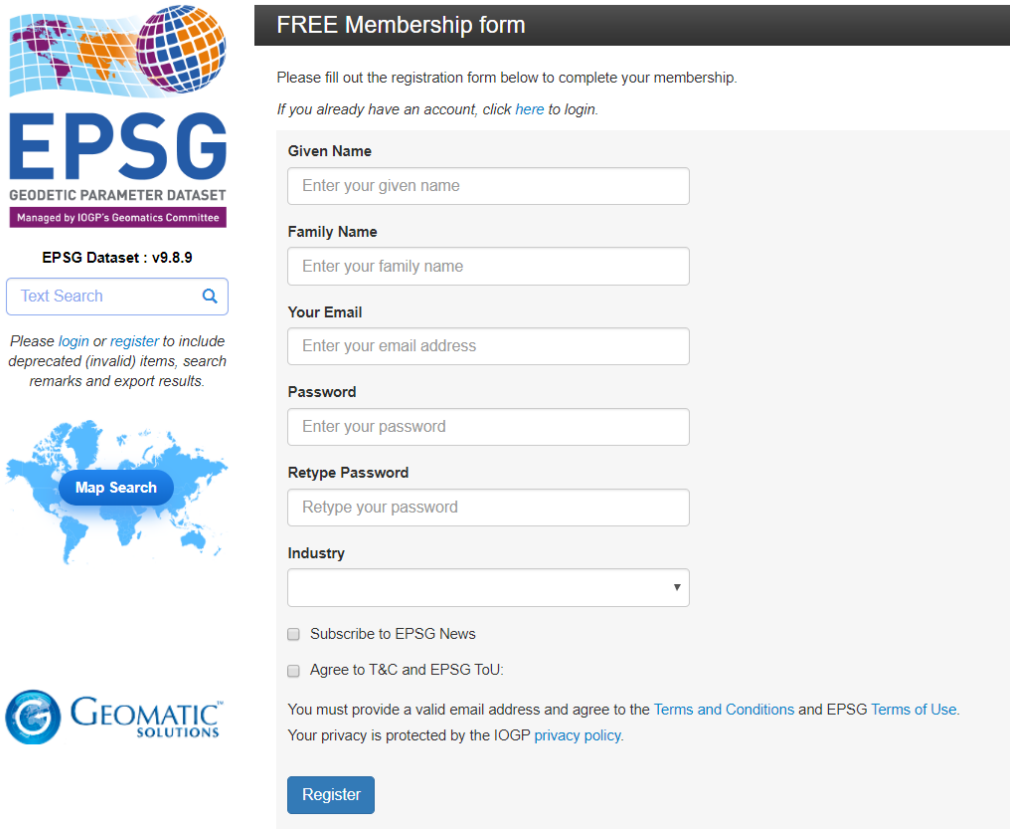


Figure 2: Membership registration form

Enter your details into the boxes shown. All boxes displayed are mandatory. Details provided (except for your password) will be visible only to IOGP and will be protected under the General Data Protection Regulations (EU) 2016/679 to which IOGP is fully compliant. This information is not used externally to this site, nor will it be passed on to any third parties.

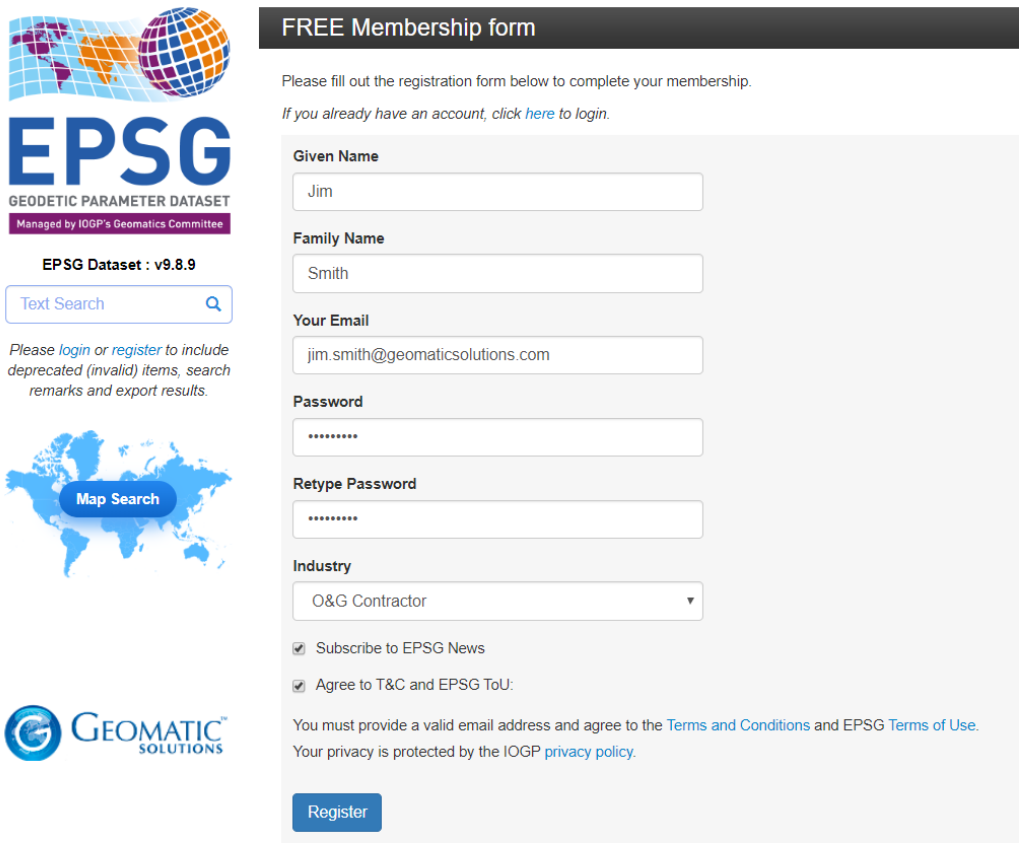


Figure 3: Populate the boxes indicated with an asterisk

Your password must be at least 8 characters long and must contain at least one upper case letter, one lower case letter, one number and one special character.

Once details have been entered, click on **Register** button at the bottom of the form and an email will be automatically sent to the email address you supply.

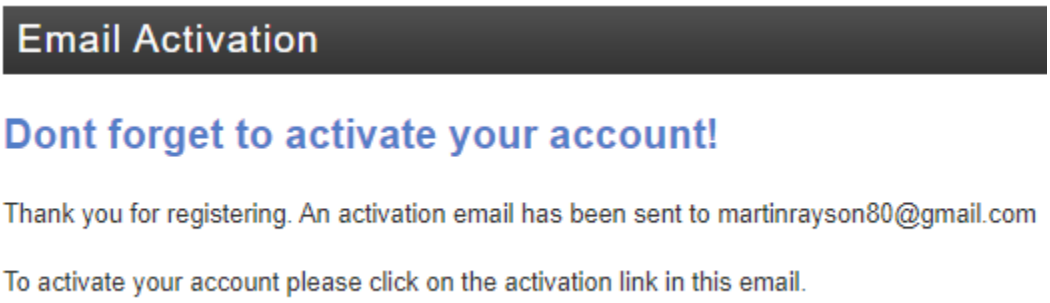
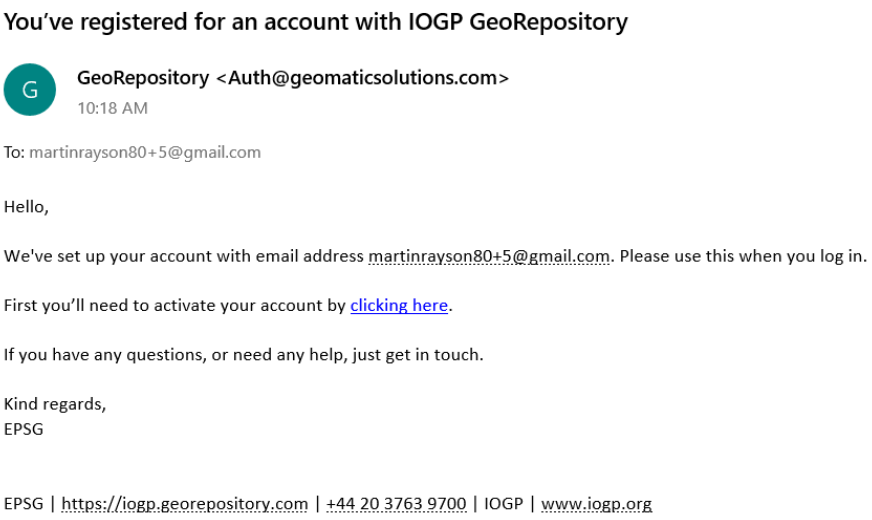


Figure 4: Activate the account

To activate your account, open the email sent and follow the instructions.


You've registered for an account with IOGP GeoRepository

G GeoRepository <Auth@geomaticsolutions.com>
10:18 AM

To: martinrayson80+5@gmail.com

Hello,

We've set up your account with email address martinrayson80+5@gmail.com. Please use this when you log in.

First you'll need to activate your account by clicking here.

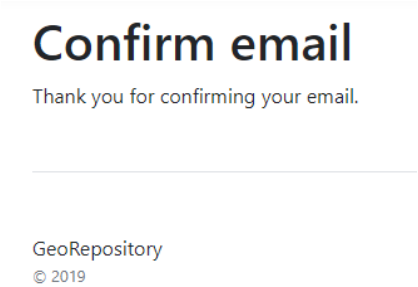
If you have any questions, or need any help, just get in touch.

Kind regards,
EPSG

EPSG | https://iogp.georepository.com | +44 20 3763 9700 | IOGP | www.iogp.org

Figure 5: Confirm account registration

If your account is successfully activated a message like the one shown in Figure 6 will appear.


Confirm email

Thank you for confirming your email.

GeoRepository
© 2019

Figure 6: Confirmation accepted; account live

1.2 User roles and privileges

Four categories of users are defined:

- Guest User
- Registry User
- Reviewer
- Registry Manager (Geo Admin, CMS Admin and User Admin)

Which have the following definitions and privileges:

- **Guest user** is the default setting. This constitutes any user who is accessing the registry without having logged into the application.
- **Registered user** is the role assigned to anyone that has created a user account on the registry and has logged into the application.

- **Reviewer** is assigned the role by the **Site Admin**. A Reviewer is part of the internal data QC process, and the role can be assigned to any registered user at the discretion of the Registry Manager.
- **Geo Admin** has access to all systems and functionality of the site excluding editing the static pages and accessing user accounts.
- **User Admin** has access to manage all existing user accounts and create a new user account.
- **CMS Admin** edit all existing static pages and create a new static pages.

This manual will address the privileges provided to **Registered Users and Guest Users**. Table 1 describes the functionality assigned to each category of user:

Table 1 : User group privileges

Functionality	Guest User	Registered User (logged in)	Geo Admin	Reviewer	User Admin	CMS Admin
Search / View / Report valid (including superseded) objects	✓	✓	✓	✓		
Submit proposals for change requests	✓	✓	✓	✓		
Search / View / Report invalid (including deprecated) objects		✓	✓	✓		
Use registry export functions		✓	✓	✓		
Create change requests, add new objects, amend existing objects			✓			
View objects in pending change requests			✓	✓		
QC and comment on pending change requests			✓	✓		
Approve change request for release			✓			
View and comment on approved change requests			✓	✓		
Make registry release (makes public all approved change requests)			✓			
Manage user accounts					✓	
Update static pages						✓

2 Registered user login

After completing online registration, follow this procedure to log into the application. Click on the **Login button** shown in the top right-hand corner of Figure 2. Next, a panel like the one shown in Figure 7 will appear.

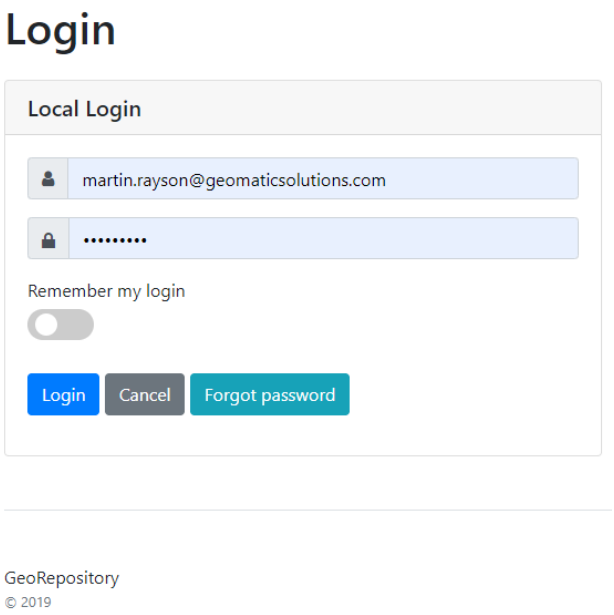


Figure 7: Login panel

Enter your username and password into the boxes provided and click the **blue Login button**. If all details are successfully recognized, you will be redirected to the main home page of the site. If your details are not recognized, you will be invited to re-enter your login details.

2.1 Forgot password

In the event you have forgotten your password click on the green '**Forgot password**' button and you will be re-directed to the following page:

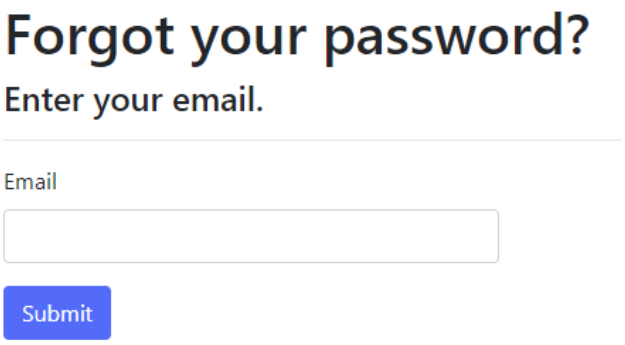


Figure 8: Forgot password panel

Enter your email into the text box provided and click **the Submit** button.

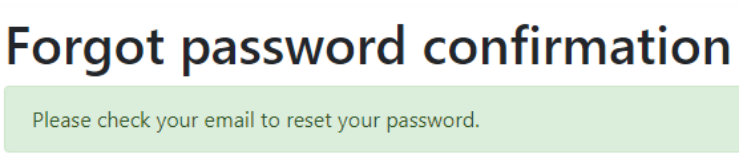


Figure 9: Reset password option

Follow the instructions; check your email *inbox,* and follow the link provided. A panel like the one shown in Figure 10 will appear. Enter the new password details into the boxes provided and click Reset button to confirm the new password.

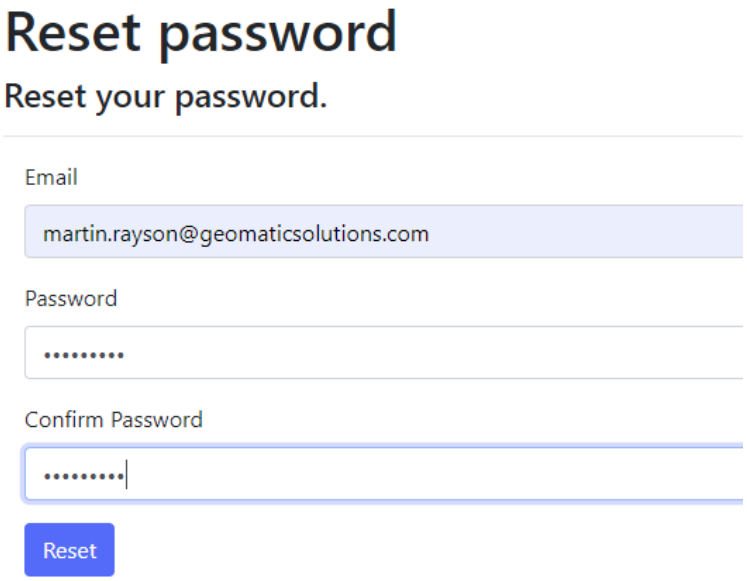


Figure 10: Confirm new password

2.2 Viewing user details

Users who have logged in can view their own account details by clicking on the **Menu** button shown in the top right-hand corner of Figure 11. The **Menu** option will only become available after you have successfully logged in to the application; it automatically replaces the Login/Register button (see previous Figure 2).

Figure 11: User menu option

Place the cursor over the menu option and click once with the left-hand mouse button. A sub-menu will automatically appear like the one shown in Figure 12.

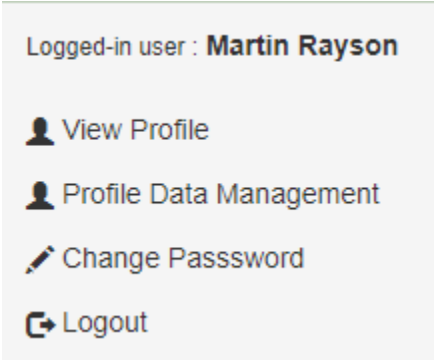


Figure 12: View user details menu

2.2.1 View profile

To view your own profile details, click on **View Profile** option and a panel like the one shown in Figure 13 will be displayed.

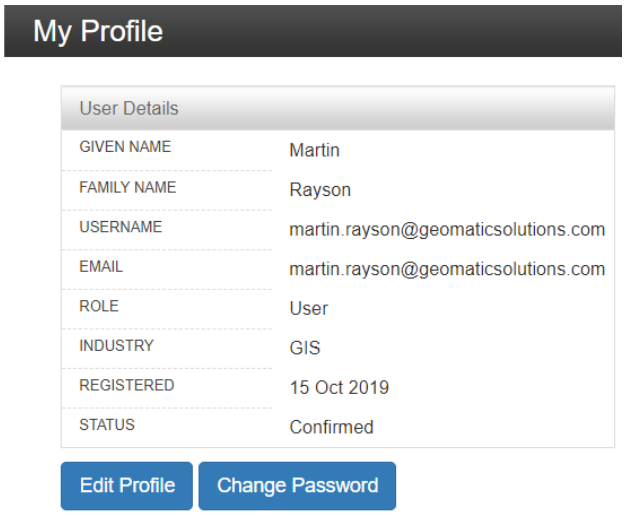


Figure 13: View own profile

To change your details, click on the **Edit Profile** button shown in Figure 13. As a Registered User you are permitted to change your Username and industry as shown in Figure 14. Once changes have been made click on **Save Changes** button.

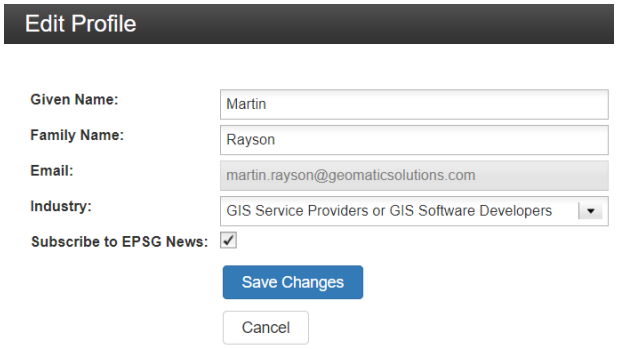


Figure 14: Edit profile

You will be unable to change any other details about your account such as your email address. If you require any details to be changed, you have two options:

1. Contact the system administrator
2. Set up a new account – in the event you want to change your email address.

2.2.2 Profile Data Management

The General Data Protection Regulations (GDPR) enable you to have access to what personal data is stored by this application. This allows such data to be either downloaded and viewed or deleted

permanently. Use either of the options on this panel to perform these operations. Should you delete your account you can create a new one with the same details.

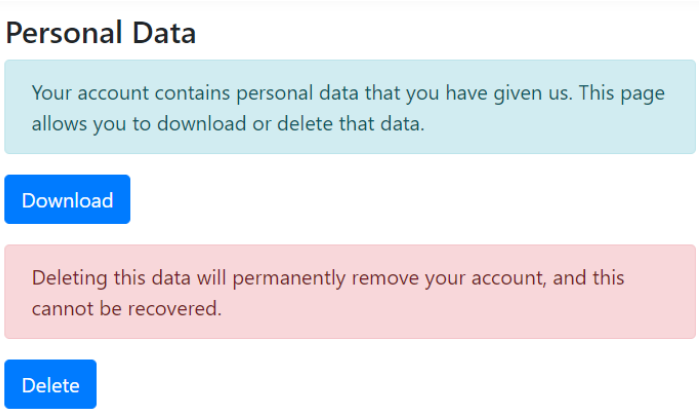


Figure 15: Personal Data

Select the required option from those illustrated in Figure 15. To return to the application click on the black back arrow in the upper left-hand corner.

2.2.3 Change Password

You do have the privilege to change your password without intervention of system administrator. To change your password, click on the **Change Password** button and a panel like to the one shown in Figure 16 will appear.

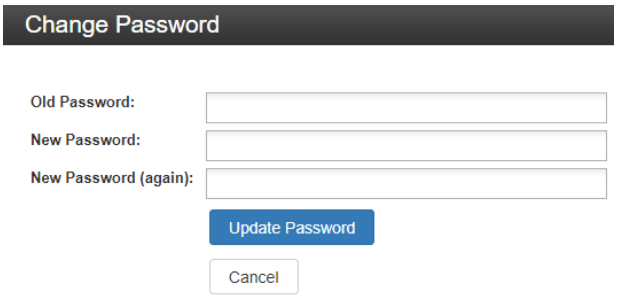


Figure 16: Change password

To change the password associated with your account enter the details into the panel shown in Figure 16. Enter your existing password in to 'Old Password' text box. Next, enter your new password into the box below. Confirm your new password in the lower box. Once completed click on the **Update Password** button to confirm your details. Click on the **Cancel** button to cancel all this action.

2.2.4 Logout

To log out of the application click on the Logout menu option. Confirmation that you have been successfully logged out will be shown by the screen shot captured in Figure 17.

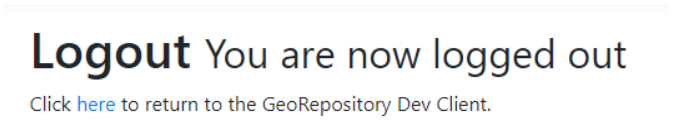


Figure 17: Confirm logout

3 Home page menu ribbon

From the home page the following menu options are provided.

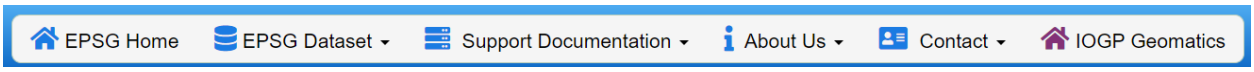


Figure 18: Menu ribbon options

3.1 EPSG Home

Click on the Home menu option to return to the home page of the site as shown in Figure 1. This can be activated from any page of the site.

3.2 EPSG Dataset

Click on this EPSG Dataset menu option and a sub-menu like the one shown in Figure 19 will appear.

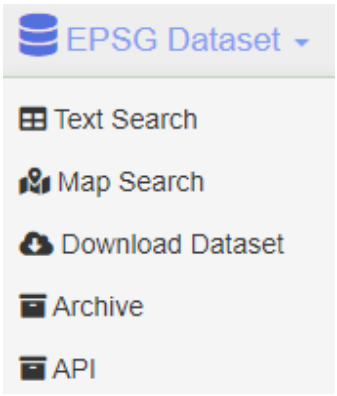


Figure 19: EPSG Dataset menu options

3.2.1 Text Search

The **Text Search** menu option enables you to initiate non-spatial textual searches. By default, when this is first selected the search text box will be displayed along with a 'results' panel which will show all objects contained within EPSG geodetic parameter dataset in a series of tabbed pages: e.g., CRSs, Transformations, Point Motion Operations, etc. Further details of this menu item are described in section 4.1.

3.2.2 Map Search

The **Map Search** menu option activates the map search utility enabling you to create a search query using the graphical user interface of the map. Pan and zoom functions are offered to help specify the geographic area of interest using either a single point, bounding box, or polygon area before selecting the query. Further details on how the map search function operates are described in section 4.2.

3.2.3 Download Dataset

The **Download Dataset** menu will provide you with a series of options to download the contents of the entire dataset or sub-sections of the dataset to an external data file: e.g. EPSG MS Access file, or Oracle

SQL scripts. Further details of all the file formats supported by the download option are described in section 6.

3.2.4 Archive

The archive menu enables all previous versions of the Dataset that are still publicly available to be downloaded in the following formats: MS Access database, MySQL, Oracle SQL, and PostgreSQL. The current version of the Dataset contains all significant changes and there should be no necessity to go back to the archive. It is maintained as an assurance to users that old data may be recovered.

3.2.5 API

The API menu option provides details of how developers and expert users can interface with the EPSG Dataset by interrogating objects it contains using the RESTful GeoRepository API swagger commands.

3.3 Support Documentation

This menu contains a series of documents that support / describe the functionality of the application database and web site. The options offered by this menu are shown in Figure 20.

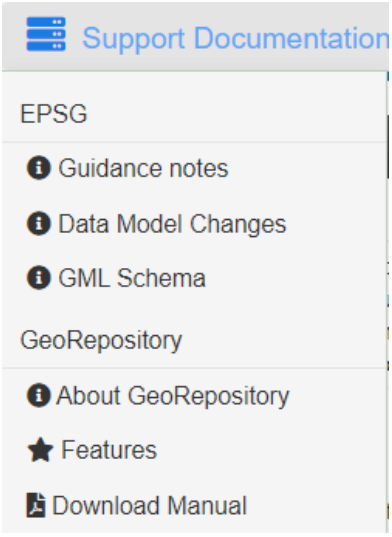


Figure 20: Support documentation menu

3.3.1 Guidance Notes

The **Guidance Notes** menu item provides you with a series of hyperlinks allowing additional IOGP EPSG support documentation to be downloaded by you. For example, these include Guidance Note 7-1 and Guidance Note 7-2 which describe the EPSG Geodetic Parameter Dataset and Conversions and Transformation formulas, respectively. Documents available from this page may change from time to time as decided by IOGP Geomatics Committee, geodesy subcommittee. Most IOGP Geomatics Guidance Notes are not solely supporting the EPSG Dataset, and these others are available through the Geomatics Home menu item (see 3.6).

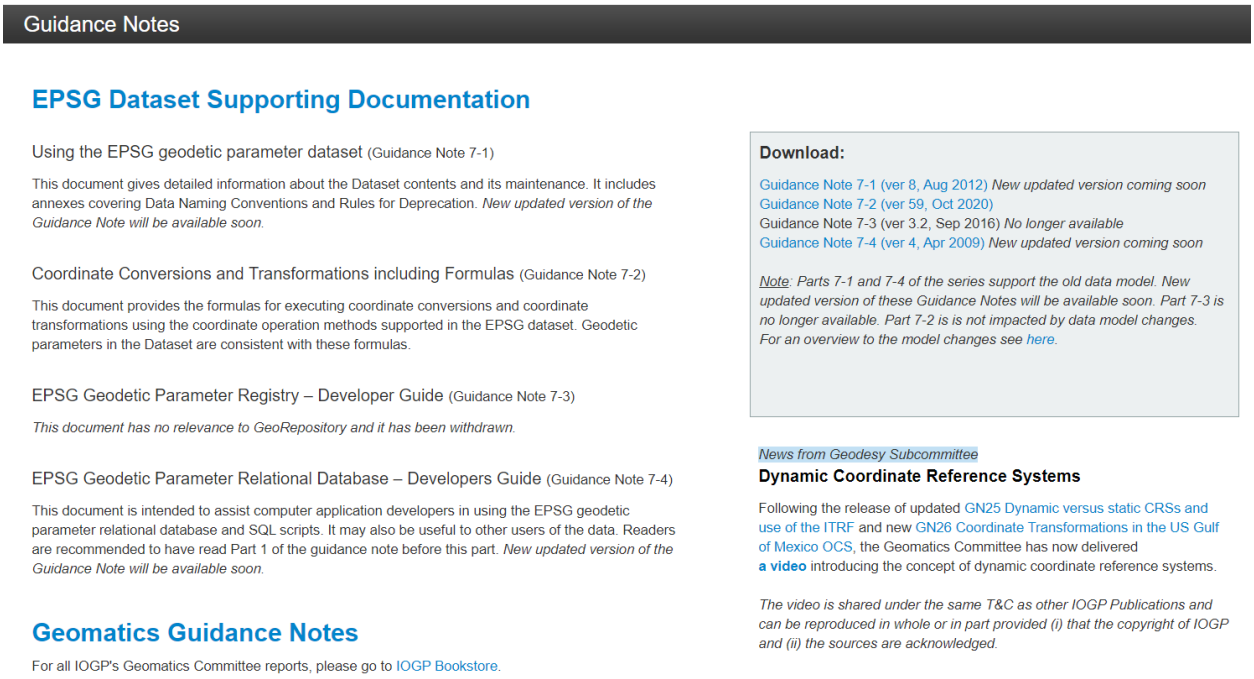


Figure 21: EPSG support documentation

3.3.2 GML Schema

This page gives access to the EPSG GML schema.

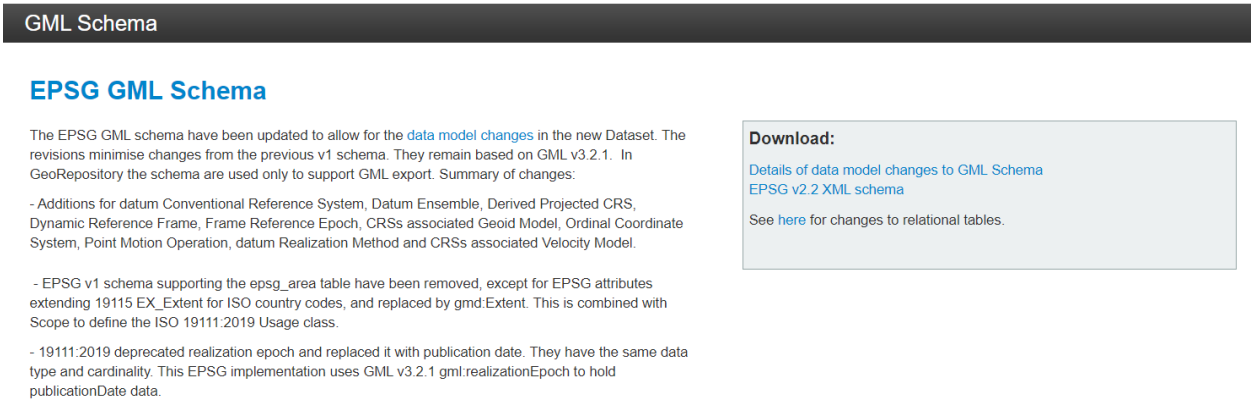


Figure 22: EPSG GML Schema

3.3.3 About GeoRepository

This panel provides some basic background details to the application and the development team. The team welcomes any constructive feedback on any functionality matters that may be encountered or requests for any new features that would be considered beneficial to the application. Use the feedback link provided.

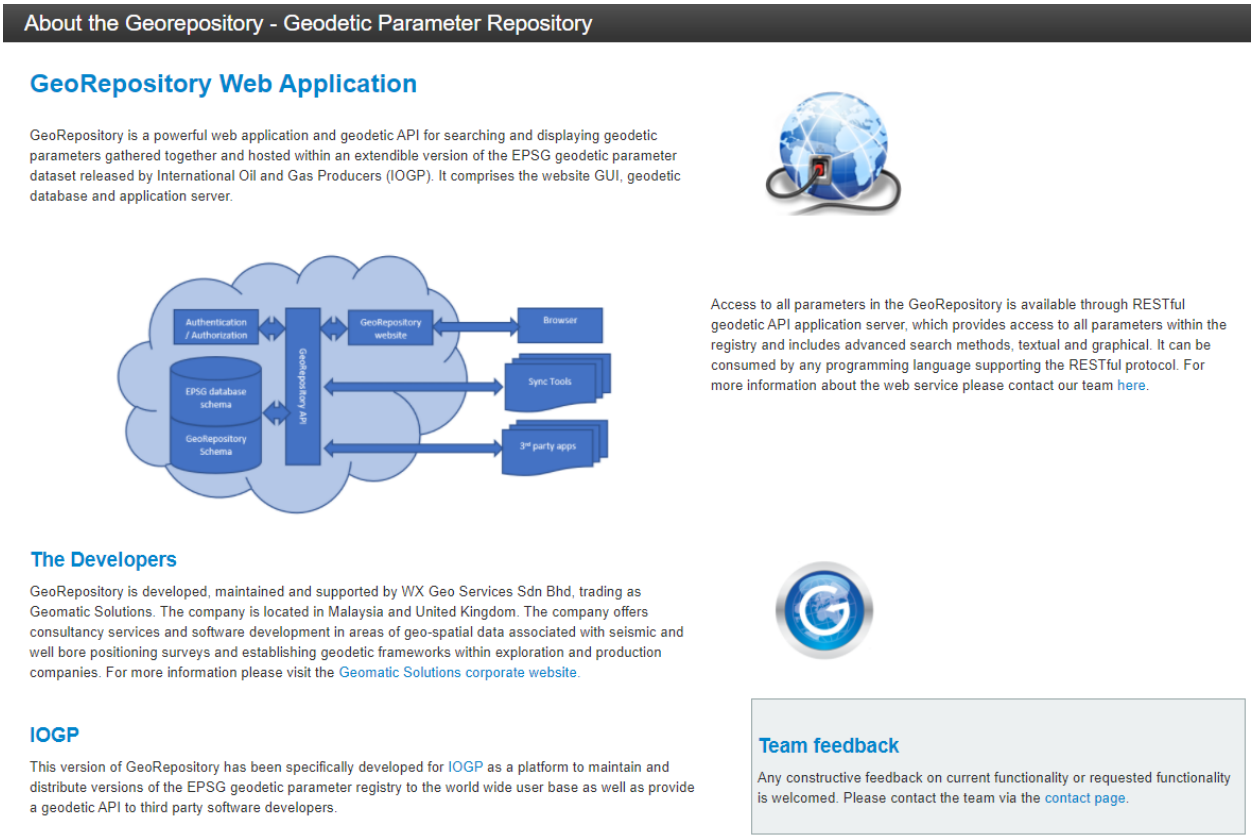


Figure 23: About GeoRepository

3.3.4 Features

This panel provides some high-level details of the application and its links to partners and other application providers.

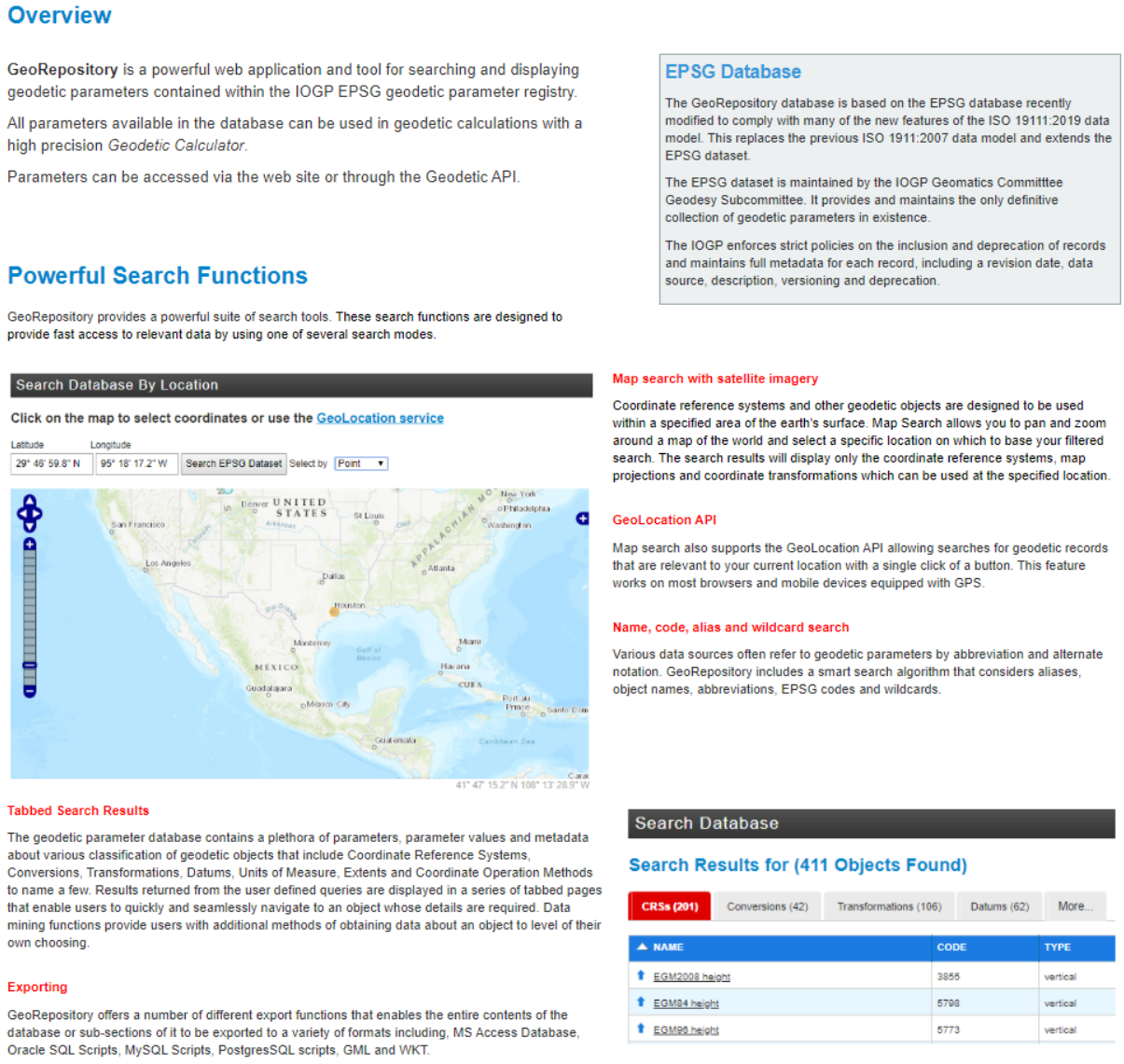


Figure 24: Features panel

3.3.5 Download manual

Select this option to download a pdf version of this user manual.

3.4 About Us

This menu option contains two links to further information about IOGP and Geomatic Solutions:

https://iogp.org/about-us/

https://geomaticsolutions.com/about-us

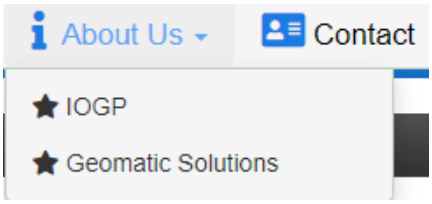


Figure 25: About Us menu

Click on either link to switch to the IOGP or Geomatic Solutions web sites, respectively.

3.5 Contact

The contact menu options are shown in Figure 26.

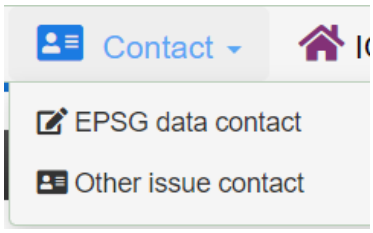


Figure 26: Contacts menu

3.5.1 EPSG data contact

The data submission template is available to all categories of users and can be accessed from the web site by selecting **Contact** menu option off the top home page menu ribbon.

Next, select **EPSG data contact** option and a page will appear titled EPSG Dataset Change Request Help. From this page you will find two places where hyperlinks are embedded to the '*Template for data submission*' and another two to the '*Example of data submission*'. Follow these links to access the Excel spreadsheets. The spreadsheet contains a series of tabbed pages for the submission of different categories of geodetic object. These currently include:

- Geodetic CRS
- Projected CRS
- Vertical CRS
- Compound CRS
- Transformation
- Point Motion

On each page there are both mandatory and non-mandatory fields that require population. Complete the form as required and email it to the address shown, i.e., feedback@epsg.org

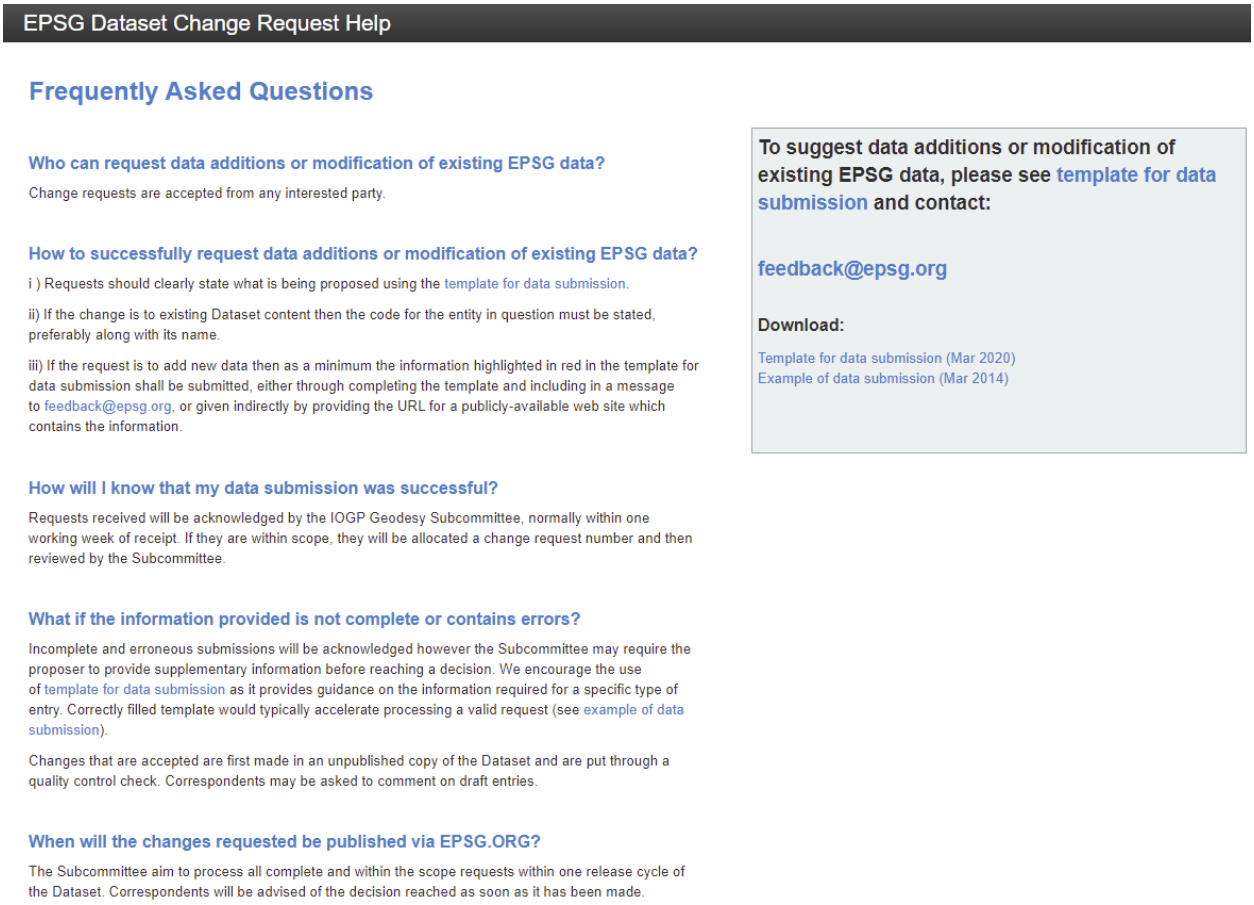


Figure 27: Change Request instructions

Requests can be made to modify existing database objects or for the creation of new objects. A template (Excel spreadsheet) showing the minimum information required in a submission may be accessed.

3.5.2 Other issue contact

To send a message to the GeoRepository Team about anything other than an EPSG data change request, fill in the contact form shown in Figure 28.

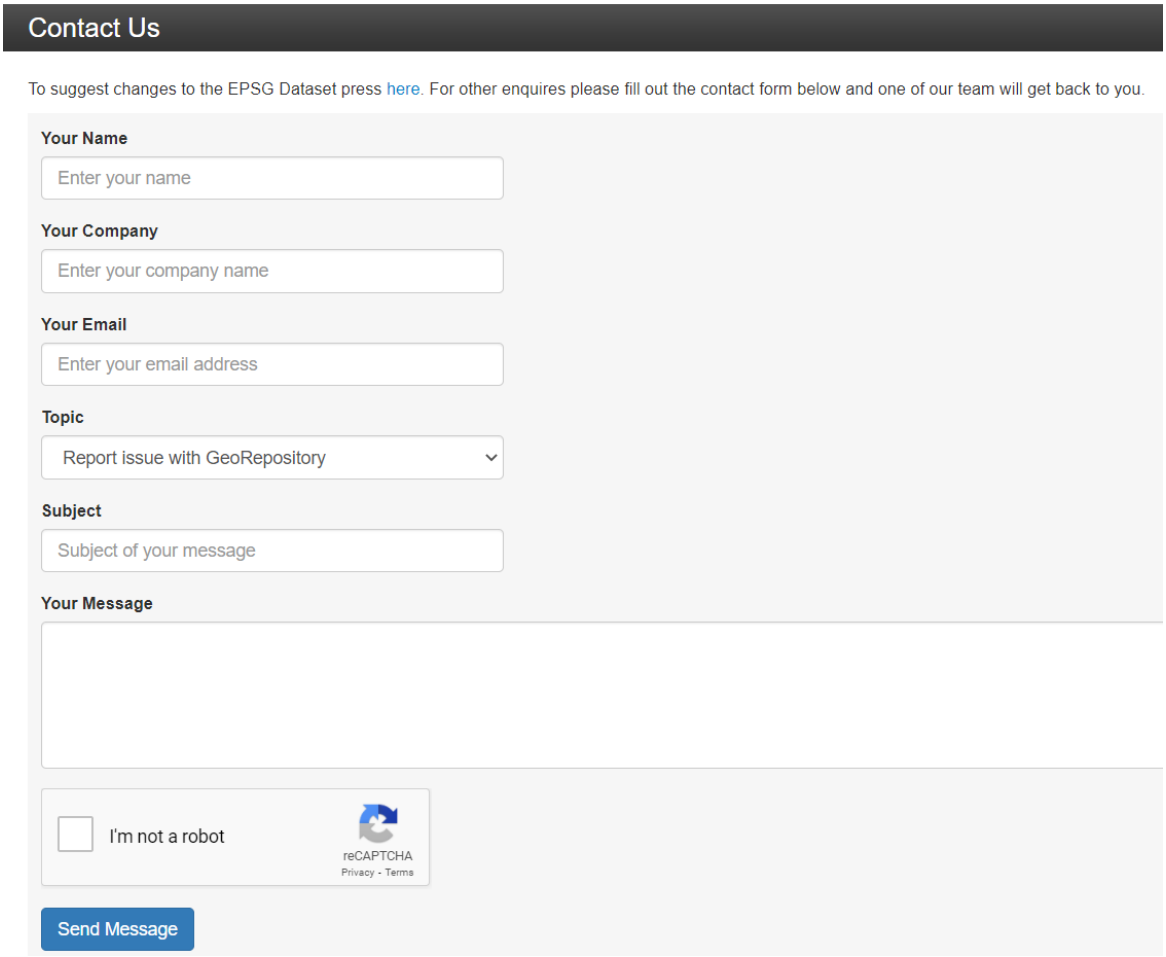


Figure 28: Contact panel

Fill in the details to the text boxes provided and select the appropriate option from the drop box. Once completed click on the tick box to confirm you are not a robot and click the **Send Message** button to submit the information.

3.6 IOGP Geomatics

Clicking this menu option will redirect you to the home page of the IOGP Geomatics Committee:

https://iogp.org/geomatics/

Follow any of the links on this page to access news, projects, and guidance documents.

4 Query Capabilities

Two main query capabilities are offered to perform searches (query) of the geodetic parameter database. The two modes offered are:

- Text search
- Map search

In either instance the search filter will return one or more objects based on the query submitted. This section describes how to generate the queries, which may be one mode or a nested combination of the two modes:

Either mode is accessible through the left panel of the main home page of the application as is indicated in Figure 29 (the check boxes are visible only after registered users have logged in).

Figure 29: Query functionality

4.1 Text Search (Non-spatial)

To invoke a text query (non-spatial query) use the text box as shown in the middle of Figure 29. Enter a text query into the box based upon one of the following search criteria:

- An EPSG object code, e.g., 4326
- An object name using a text string, e.g., Timbalai 1948
- Text from an extent description, e.g., Angola.

For all the above, wild cards are automatically prefixed and suffixed to the string entered, so Oman will return data for both Oman and Romania.

- An object type or sub-type e.g. [type]=geographic (see 4.1.4 below)

In each instance the text string(s) can be made more general by using wild cards in the text string syntax. Wild card details are described in 4.1.3 below. General rules applied to text searches include:

- Search expressions are not case-sensitive. They accept both upper- and lower-case letters in the search field.
- A search can be done for an entity name ending in 2 or more digits with or without the space in the name, for example SIRGAS 2000 or SIRGAS2000.
- Guest users can search for valid objects only. It precludes them from searching for deprecated objects and searching within object remarks. The option to exclude World items is also not available. However, a Registered user who has logged in can modify these filters:
- Referring to Figure 29, a registered users who is logged-in will see the tick boxes in Figure 29, which are labelled: Include Deprecated, Include World Items and Search Remarks.
    - Place a tick in the box to the left of the text label if you wish the search to retrieve objects that include deprecated items.
    - If you do not wish objects with an extent of world to be retrieved, uncheck the World Items tick box.
    - A further option is also provided to include searching through all the Remarks associated with each of the metadata fields for the database objects. For example:

Figure 30: Remarks field within geodetic object metadata

Selecting the **Search Remarks** (Figure 29) tick box option will increase the number of objects returned from the search function. For the remainder of this chapter the examples shown will be for the search option invoked from the EPSG database menu item.

4.1.1 Retrieve objects by specifying object codes

Enter an object code into the text box. The object code number must adhere to the following criteria:

- Object code must be strictly numerical
- Object code must be within the EPSG code range

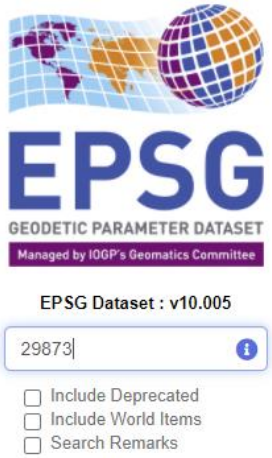


Figure 31: Enter EPSG code

Enter the object code into the text box provided and then press the **Enter** key.

4.1.2 Retrieve objects by specifying an object name

Enter a text string into the text box provided that describes the object name (see Figure 29). General rule is:

- Object name can be alphanumeric, e.g., ETRS89

Enter the object name into the text box provided and then either press the carriage return key or click on the blue GO button to commence object retrieval.

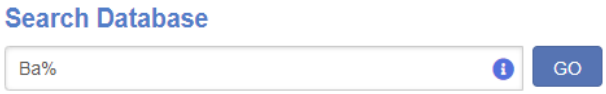
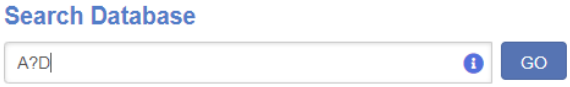
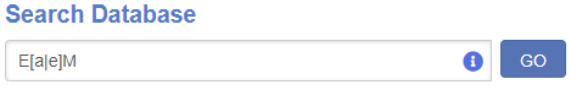
Note: Misspelling the object name will affect the objects retrieved from the query.

4.1.3 Using wildcards to retrieve objects

Wildcards are provided to enhance the text query created to retrieve objects. The wildcard options that are supported can be displayed by clicking on the blue information button shown to the right of the text box (Figure 31).

Descriptions of the wildcard options supported are shown in Table 2. Note, when wildcards are included within the search string it will invariably increase the number of objects retrieved from the database as the filter parameters are more general and less specific.

Table 2: Wildcard features

Wildcard	Example
% or *	 Using the % or * symbol as a postfix will return all objects that have text starting with 'ba', 'Ba' or 'BA' within the name or alias fields of the objects followed by any other multiple letters and numbers. Alternatively, the symbol can be used as a prefix as shown:  Using the symbol in this fashion will return all objects whose name or alias commences with any letters and numbers but will also end in 'ba', 'Ba' or 'BA'. Finally, the symbols can be used as prefix and postfix simultaneously to give a combined solution from the previous descriptions.
? or _	 Using either ? or _ symbol performs a search by assuming there is only one missing letter or number represented by the wildcard symbol. For example, in this instance the filter will return results with a text string containing any combination of alphanumeric strings that contains in part a sub-string that starts with A and ends with D, with other letter or number between. E.g., **AGD**84, Ain el **Abd**.
[-]	 Using the syntax provided: The search filter will return all geodetic objects that start with the letter 'N' or 'n' followed by any of the letters contained within the range within the square bracket, e.g., letters a, b and c.
|	 Using the syntax provided: The search filter will return all geodetic objects that start with the letter E(e), ends with the letter M(m) and also contain either the letter a or letter e.

Conditioning the search string

When the wildcard search has been created the text string is automatically prefixed and suffixed by the % wildcard. For example, ba* will become %ba*% (except when % is entered by the user).

4.1.4 Retrieving objects by specifying object type

A search string can be created to retrieve objects by specifying object type or sub-type, based on the following:

- Name
- Code
- Type

What follows are the syntax required for their use along with some examples of how they are expected to operate.

4.1.4.1 Name

An object type of **name** must be entered into the text box using the following syntax:

[name]=xxxxxxxxx…n

Where xxxxxxxx….n is a text string that will become the search parameter upon which objects are retrieved.

With this object type the following basic rules apply:

- The text string can be alphanumeric
- There is no limit to the length of the text string that can be submitted to the search
- The text string is not case sensitive

For example:

[name]=Hartebeesthoek94

4.1.4.2 Code

An object type of **code** can be used in three modes:

- = (equals)
- > (greater than)
- < (less than)

The syntax for each is as follows:

[code]=yyyyy

[code]<yyyyy

[code]>yyyyy

Where yyyyy is an integer number with a minimum length of one digit and a maximum length of five digits.

The following basic rules apply:

- The string must be numeric only
- The objects returned will only be for objects whose codes match the query and not a sub-section thereof
- Wildcards cannot be used

For example:

[code]=1024

[code]<23030

4.1.4.3 Type

An object type of **Type** is used to search and retrieve objects that matches one of the specific object types recognized within the EPSG geodetic parameter dataset. The object **types** recognized include:

- 3D
- 2D
- Geographic
- Geodetic
- Projected
- Geocentric
- Dynamic
- Concatenated
- Transformation
- Vertical
- Derived
- Engineering
- Compound

The following basic rules apply:

- The text is not case sensitive
- The type must be spelt correctly for the search to operate as expected

4.1.5 Combined searches

Combinations of wildcards and types can be used to create a more advanced text search.

For example:

[name]=NAD??

This will retrieve all objects that contain the name NAD with two additional characters added to the end of the text string. Any combination of types and wildcards can be submitted to generate a search. However, when wildcards are used the text string is automatically prefixed and suffixed by the % wildcard.

4.2 Graphical queries (Spatial searches)

Map Search retrieves database objects associated with a bounding box (BBOX). Only CRS, datum, and coordinate operations (transformations and conversions, including map projections) have this association. Other items, such as ellipsoids and units of measure cannot be found through the map search, although when they are included as part of a CRS, datum, or coordinate operation their descriptions will be provided. To activate the map search, two options are provided. First, click on the search button shown in Figure 32.

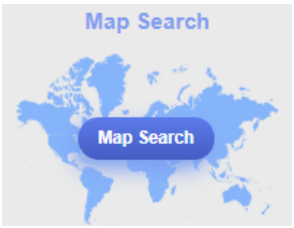


Figure 32: Activate map search

Second, click on the EPSG Dataset from the main menu and select **Map Search** from the sub-menu.

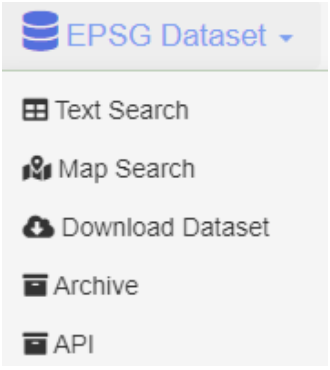


Figure 33: Active map search from main menu

In either case a user interface like the one shown in Figure 34 will be displayed.

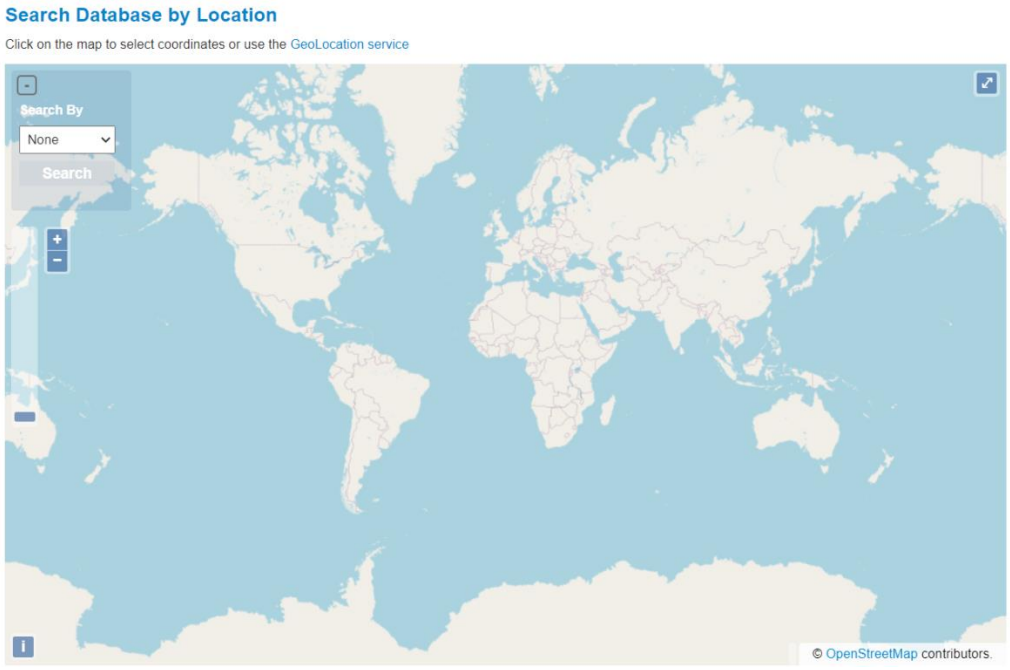
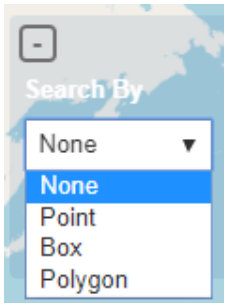


Figure 34: Map interface

The main features of the user interface are as follows:

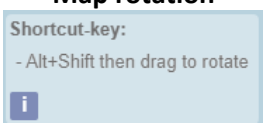


The map interface can be used to create three categories of spatial searches, namely: Point, Box or Polygon. To select a search mode, click on the down arrow within the drop box and a series of options will appear like the ones shown in box opposite. By default, **None** is the setting, which allows you to pan and zoom the map interface.

Pan and Zoom

Prior to conducting a spatial query, it is often more convenient to narrow the geographic window within the user interface to a more localized area, rather than showing a world view. The pan and zoom features enable these changes to be made.

Map rotation



By default, the map is orientated to geographic north. However, the map orientation can be modified to a reference other than north by using the map rotation option.

Reset rotation

If the map rotation has changed the default orientation of the map this icon will appear in the top right corner of the map interface. To return the orientation of the map to geographic north click on this icon.

Toggle full screen

Click on the icon shown on the left to change the map view to a full screen view. To return to the default view panel click on  icon in the top right corner.

4.2.1 Geo-spatial search by Box and Polygon

Spatial searches based upon the use of a rectangular box, or an irregular polygon form an integral part of the search criteria when using the map interface. Although the creation of these entities will be described in later sections some important aspects of their definitions and usage are addressed here.

Box is a simple geometric shape specified by **two** corner points: upper left-hand corner and lower right-hand corner (shown by the blue circle) to create the regular blue rectangle as shown in Figure 35.

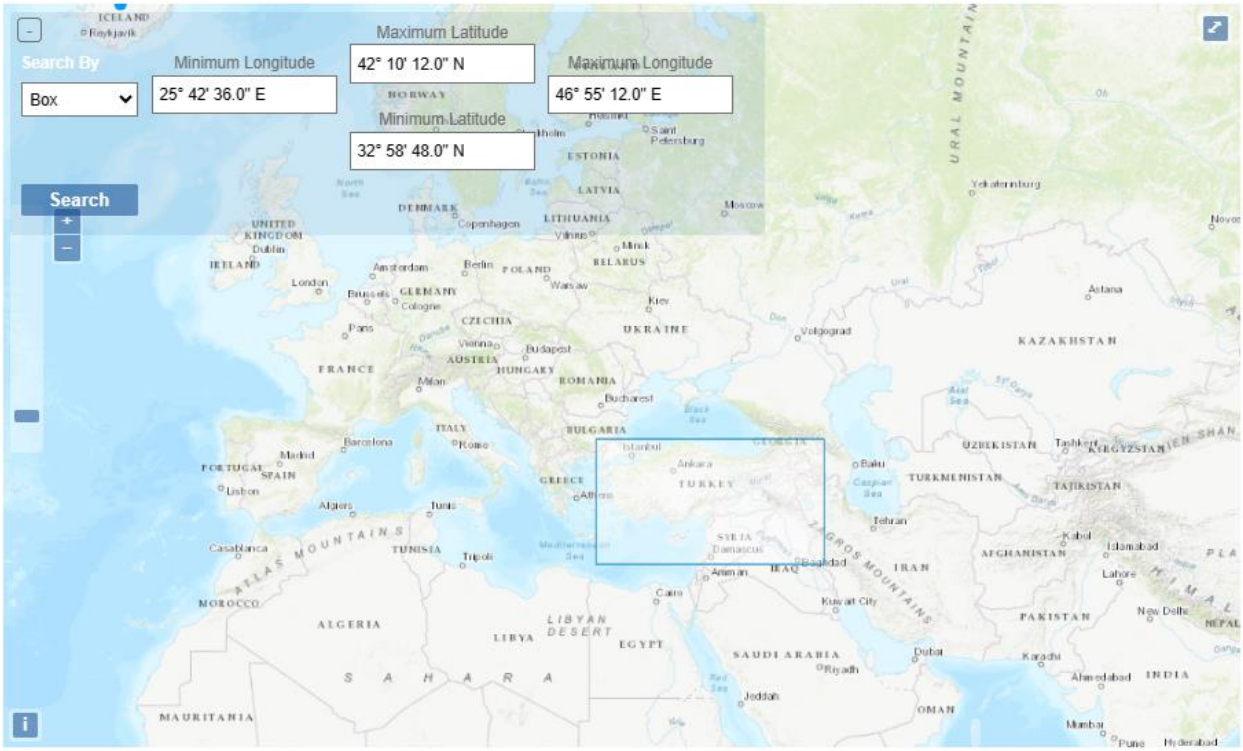


Figure 35: Bounding box and bounding polygon

The upper left-hand corner will always be labelled as Maximum Latitude and Minimum Longitude, and the coordinates of the lower right-hand corner will always be known as Minimum Latitude and Maximum Longitude. This will be regardless of whether the box is contained exclusively within one quadrant, or the box crosses the equator and / or the 180° meridian (see Figure 36 and Figure 37).

For the example shown in Figure 35 the upper left hand will be given by:

- Maximum Latitude 42° 10’ 12.0” N
- Minimum Longitude 25° 42’ 36.0” E

And the lower right-hand corner will be given by:

- Minimum Latitude 33° 58’ 48.0” N
- Maximum Longitude 46° 55’ 12.0” E

When specifying the coordinate of the box they will always be quoted to two decimal places in the decimal degree format.

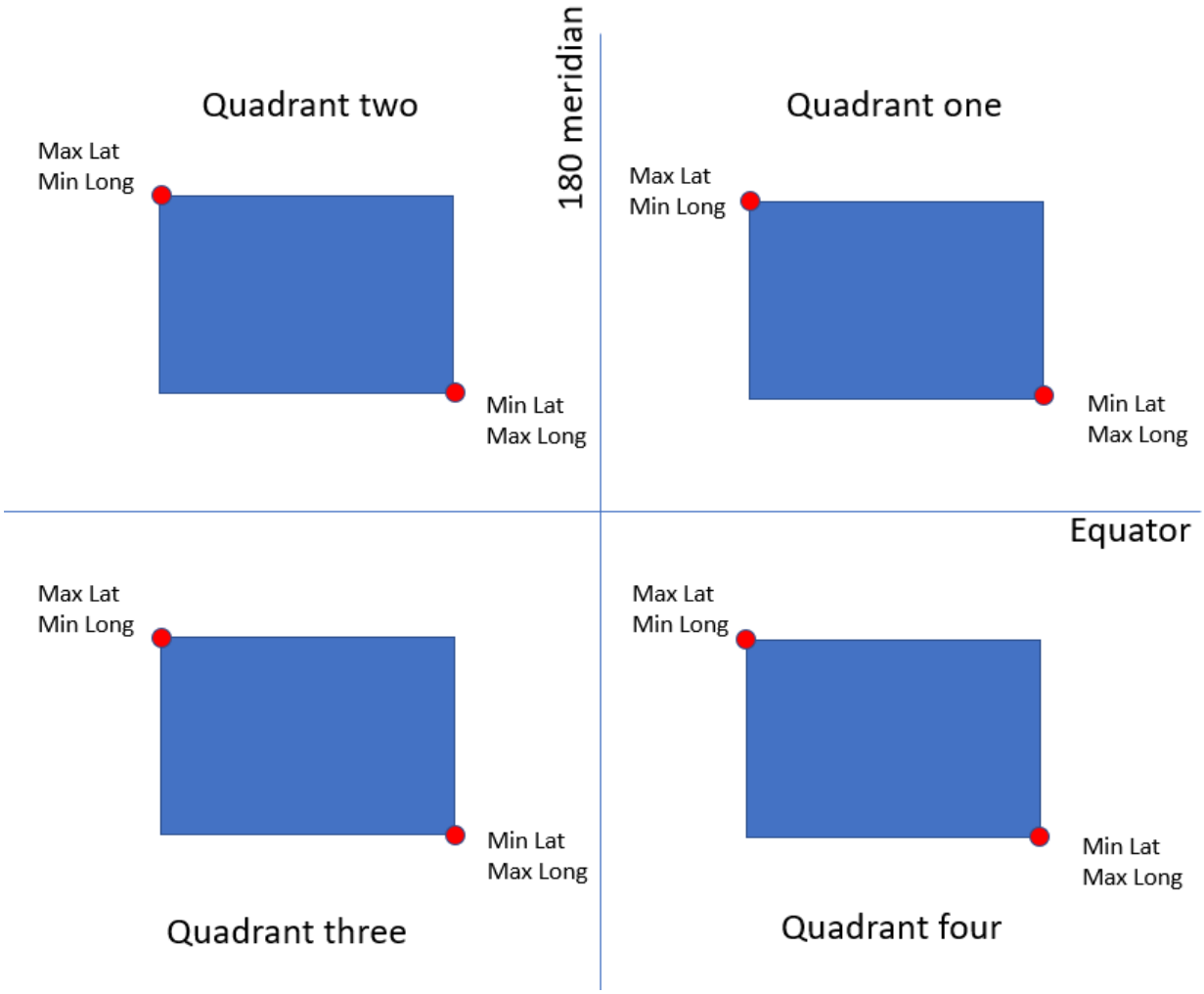


Figure 36: Box in different quadrants

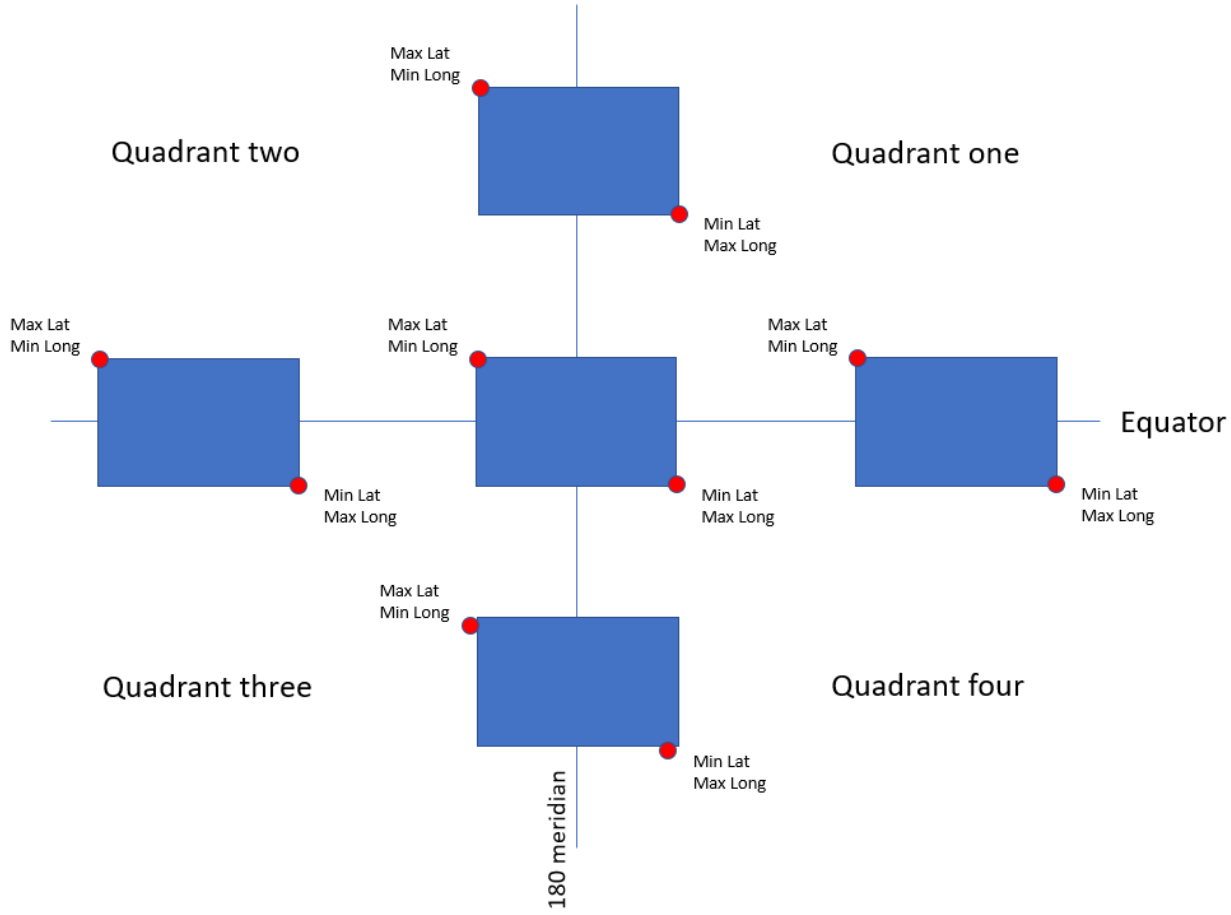


Figure 37: Box overlapping equator and 180 meridian

For each scenario shown in Figure 36 and Figure 37 the same relationship holds, whereby Max Lat > Min Lat and Max Long > Min Long.

Two other definitions required for geo-spatial queries include:

A **Point** is defined as an entity where the two corners of the BBOX are equivalent. Therefore, the search geometry acts as a single point.

A **Polygon** is a geometric shape comprising a minimum of three straight line segments (a triangle) connected to form a closed polygonal circuit. The bounding polygon can have any number of sides and can perform an irregular shape.

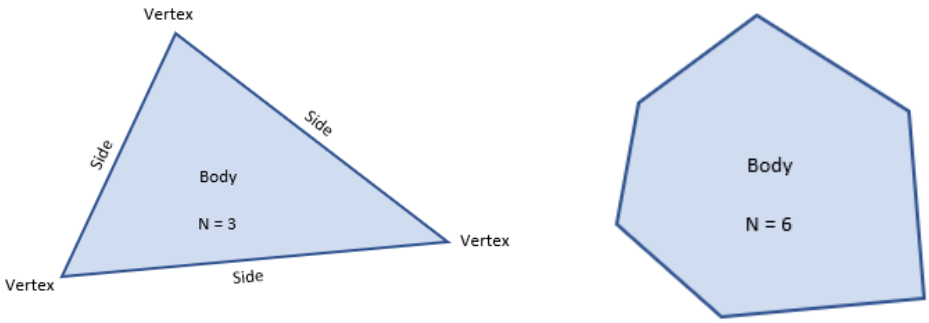


Figure 38: Bounding polygons

Intersecting polygons such as the one shown in Figure 39 will not be accepted as a search filter.

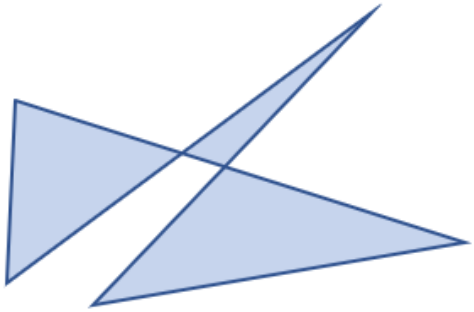


Figure 39: Intersecting polygons are not accepted

4.2.2 Zooming and panning

Before any zooming or panning can be applied to the map the Search mode must be set to **None** as shown within Figure 34. To change the scale of the map the following functions are provided:

- Use the scale bar displayed on the left-hand side of the map. To either increase or decrease the scale of the map place the cursor on + or – button and click once with the left-hand mouse button.
- Place the cursor over blue button on the scale bar. Click and hold down the left-hand mouse button. Move the cursor up the scale bar to decrease map scale and down the scale bar to increase map scale.
- Place the cursor over the map. If your mouse contains a wheel push the wheel forward to decrease the map scale or pull the wheel backwards to increase the map scale.

To pan around the map the following option is provided:

- Place the cursor over the map. Click the left-hand mouse button and keep it pressed down. Move the mouse up, down, right, and left to move the map north, south, east, and west respectively.

Once the map view has been modified to the geographic area required select one of the three search modes that are shown in Figure 34, e.g., Point, Box or Polygon.

The drop box can be hidden clicking the  icon shown above the menu box. To redisplay the menu box, click on the 

icon and it will reappear.

4.2.3 Query with a point

Querying with a Point will generate a database query comprising the coordinates of a single point (Latitude and Longitude) and it will retrieve all objects whose bounding boxes contain the user-defined point. Three methods are provided to select a single point coordinate:

- Placing the cursor on the map interface and click with the left-hand mouse button
- Enter coordinates in the text boxes provided
- Using the Geo Location service

4.2.3.1 Select single point from map

To select a single point from the map interface, place the cursor over the map and click once with the left-hand mouse button.

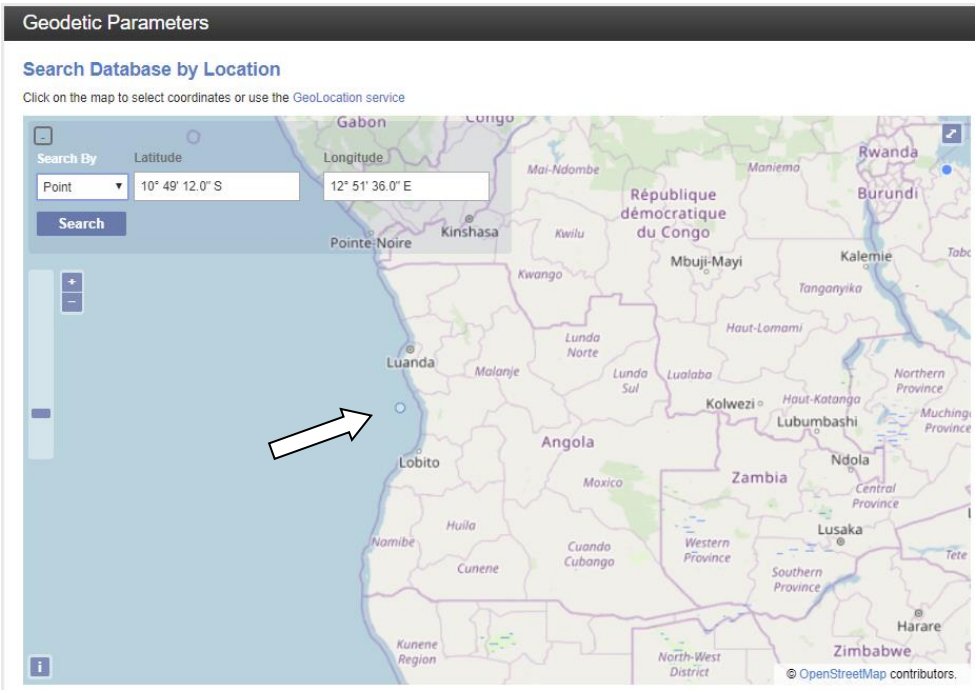


Figure 40: Single point selection from map

Next, a light blue circle will appear on the map interface where the point selection was made. The coordinates of that point will also be displayed in the latitude and longitude text boxes shown above the

map view. Using this option, the coordinates will be displayed in the degrees, minutes and seconds format with the seconds given in one decimal place. The coordinates can be manually edited before submitting the query and the number of decimal places for seconds is unlimited.

If the values of latitude and longitude are dramatically altered the modification will be reflected as a new search circle will be drawn on the map interface.

Click on the **Search** button to activate the query.

4.2.3.2 Enter coordinates in text box

Using the two text boxes provided type coordinates for latitude and longitude as shown in Figure 41. The format for the coordinates can be either:

- Decimal degrees
- Degrees, minutes, and seconds

Figure 41: Coordinates in text box

The format for **decimal degrees** must comply as follows:

- Latitudes north of equator will be assigned a positive number, e.g., 4.2376823
- Latitudes south of equator will be assigned a negative number, e.g., -34.2672345
- Longitudes east of Greenwich meridian will be assigned a positive number, e.g., 113.4672374
- Longitudes west of Greenwich meridian will be assigned a negative number, e.g., -93.4672341

The input format for decimal degrees does not permit the submission of a letter to designate the hemisphere. Therefore, E, W, N and S are not recognized. The format for **degrees, minutes and seconds** must comply as follows:

Figure 42: Degrees, Minutes and Seconds format

There must be a space between degrees and minutes, minutes and seconds, and seconds and hemisphere.

- Latitudes north of the equator must have the letter N after seconds
- Latitudes south of the equator must have the letter S after seconds
- Longitudes east of Greenwich meridian must have the letter E after seconds
- Longitudes west of Greenwich meridian must have the letter W after seconds

Figure 43: Invalid coordinates format

Where the entry of either format has been performed incorrectly a warning message will be displayed indicating the coordinates are invalid. When the coordinates are invalid the Search button will be disabled until the entries have been corrected.

The **precision** (number of decimal places) to which the coordinates are quoted is the decision of the user and the coordinate values will only be used within the query at the precision with which they were quoted. Once entered click on the Search button to activate the query. Alternatively, if the point was selected by first clicking on the map interface the latitude and longitude displayed within these two text boxes can be manually edited as shown in Figure 44.

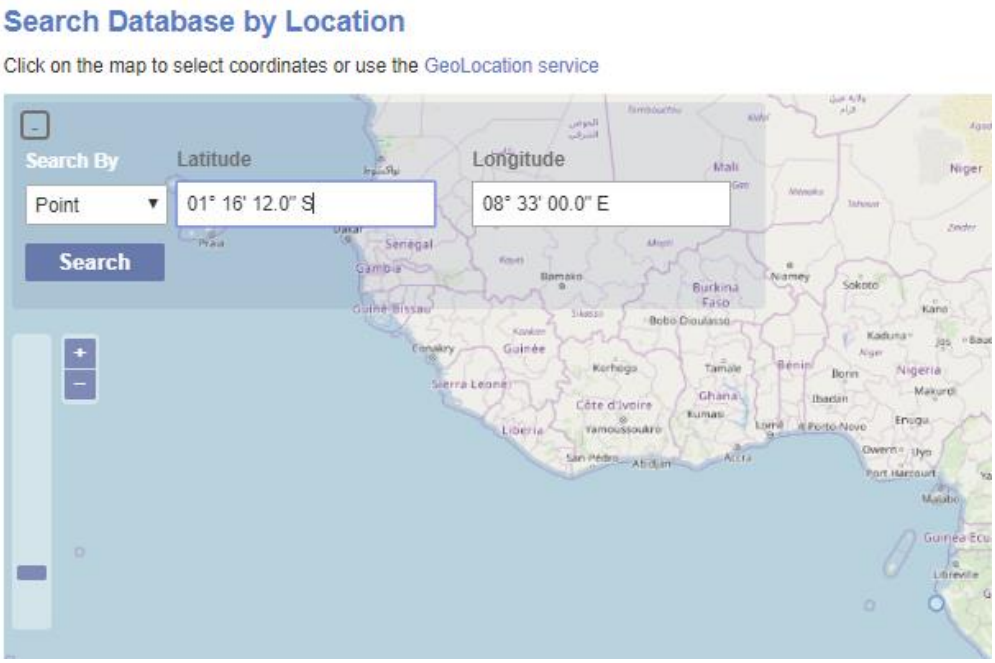


Figure 44: Edit the coordinates manually

4.2.3.3 GeoLocation Service

This option will only work if the location of the user can be identified. The Geo Location Services (controlled within the Windows environment) will automatically assign coordinates to the latitude and longitude text boxes based upon the current location of the user. The coordinates that appear on these boxes represent the central location of the map view shown (See Figure 45).

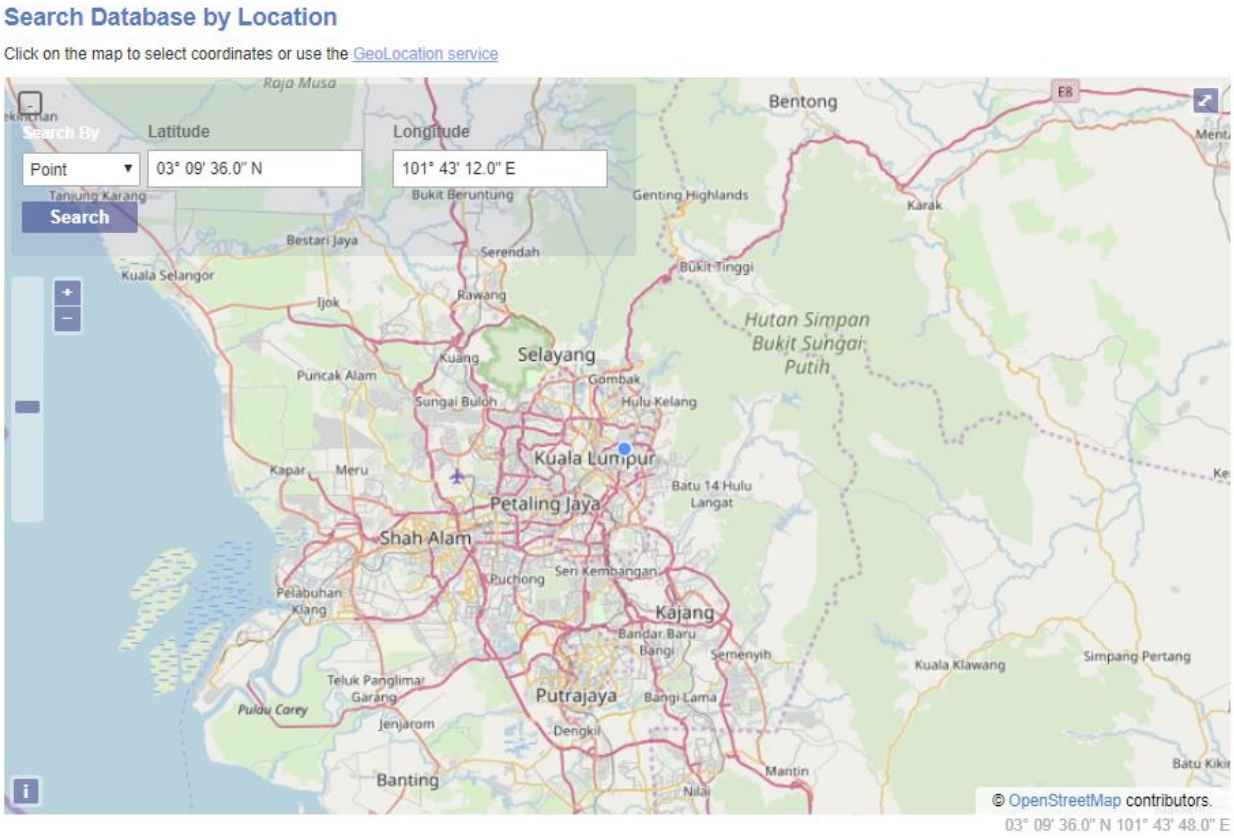


Figure 45: Geo Location Service

Note, the coordinates shown in the lower right side of the panel represent those of the cursor and will not necessarily coincide with the GeoLocation service. The coordinates taken from the GeoLocation Service will be shown in the two text boxes provided. The format of the coordinates will always be Degrees, Minutes and Seconds. To activate the search, click once on the blue Search button.

4.2.4 Query with a rectangular box

To create a query with a rectangular box, click on the drop-down menu shown in Figure 34 and click the Box option. This will allow you to draw a rectangular box directly on the map interface.

To create the box, place the cursor at the upper left corner of the required box and click once on the left-hand mouse button. Drag the cursor to the lower right-hand corner of the box and click once with the left-hand mouse button (do not keep the mouse button depressed whilst dragging). A rectangle like the one shown in Figure 46 will be superimposed on top of the map interface.

The coordinates for upper left and lower right points will be displayed in the latitude and longitude boxes in the top left of the user interface. If required, the coordinates shown within the text boxes can be manually edited to change the coordinate values.

Once completed, click on the **Search** button on map interface to search the registry for all objects whose bounding boxes and shape polygons fall within or intersect the box specified.

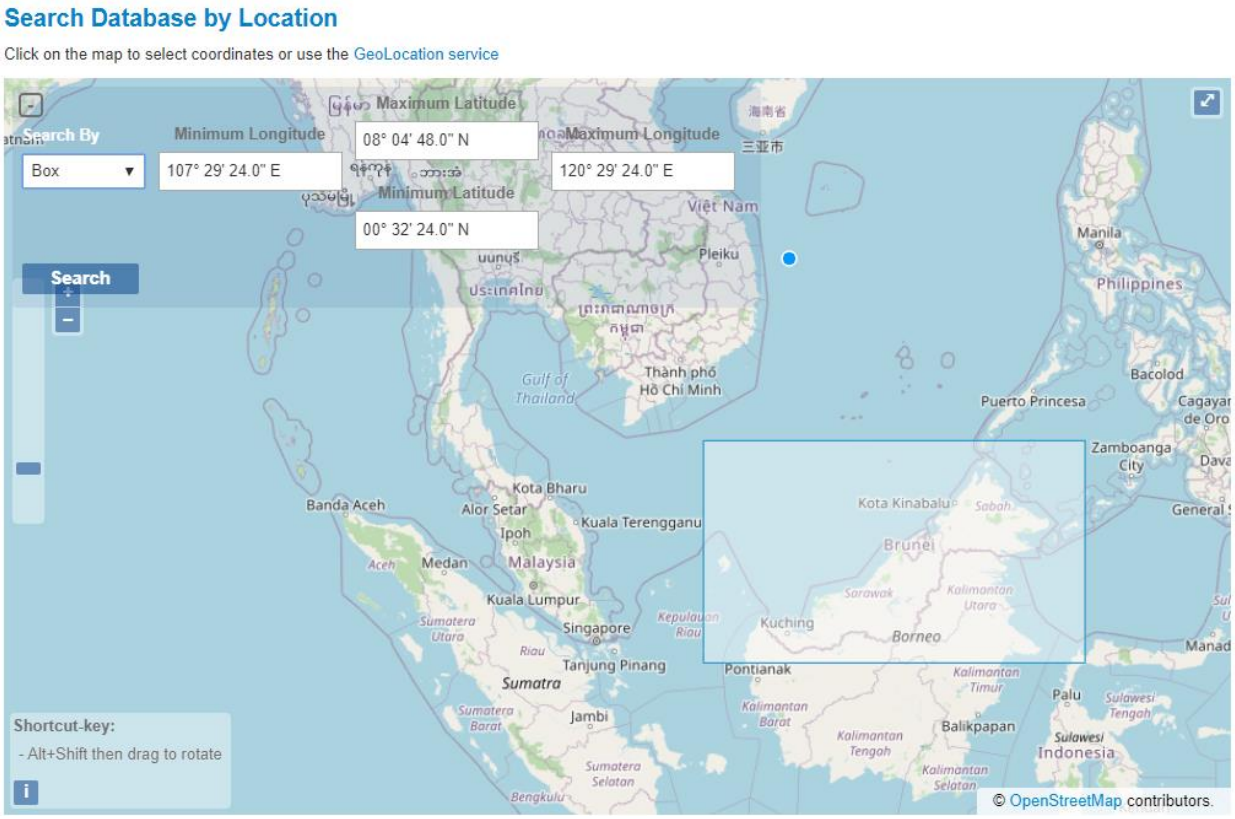


Figure 46: Query by box

4.2.5 Query with a polygon

To create a query with a polygon first click on the drop menu shown in Figure 34 and click polygon option from the menu. This will enable a multi-sided (multi-segmented) polygon to be drawn on the map interface.

To draw the bounding polygon, place the cursor at the first point (vertex) of the polygon and click once with the left-hand mouse button. Drag the cursor to the next point and repeat the left-hand mouse click. Repeat the process for all points that define the polygon. To complete the polygon, place the cursor back over the first point of the polygon and click once with the left-hand mouse button. These steps are shown graphically in Figure 47.

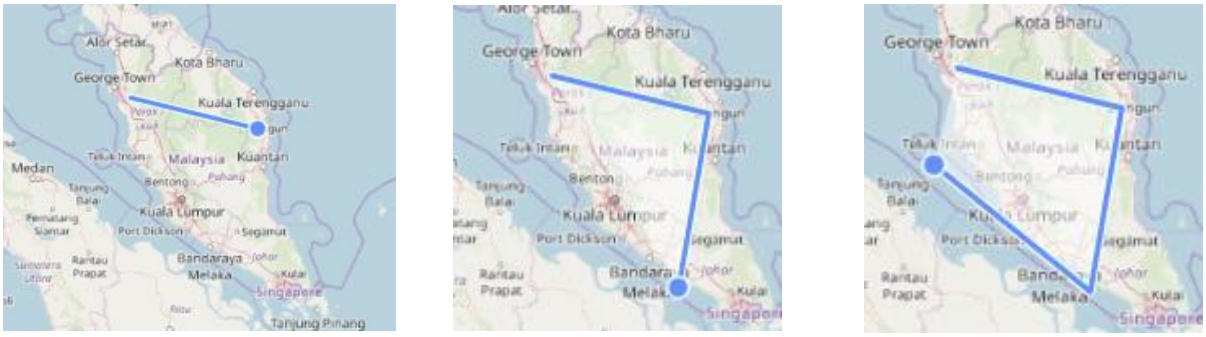


Figure 47: Creating the polygon search figure

The final polygon is shown in Figure 48. In this example, the polygon will comprise five points, where the first and the last point are repeated.

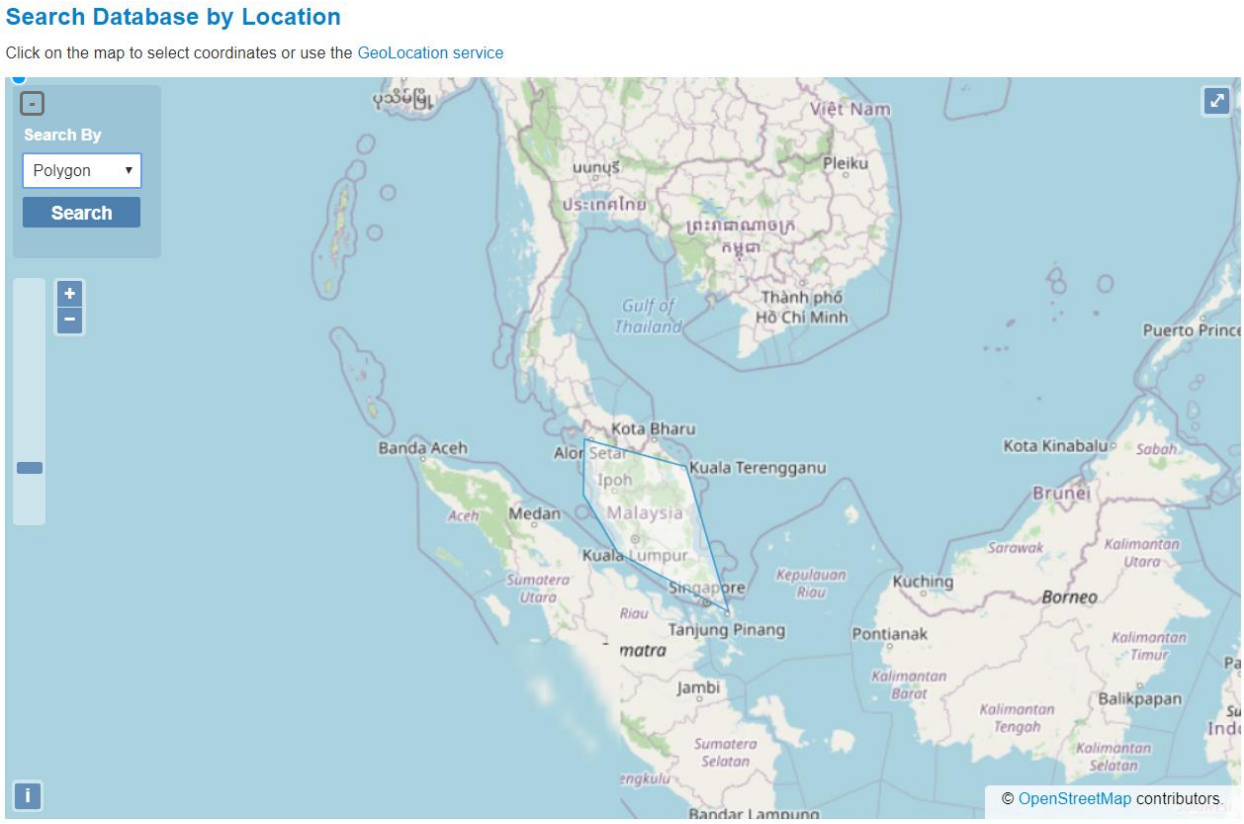


Figure 48: Completed polygon

Figure 49 shows another more complex example for a bounding polygon representing the approximate outline of the US State of Texas. During the construction, the vertices are selected to represent the key turning points defining the polygon, which again appears with a blue outline with a light blue fill colour.

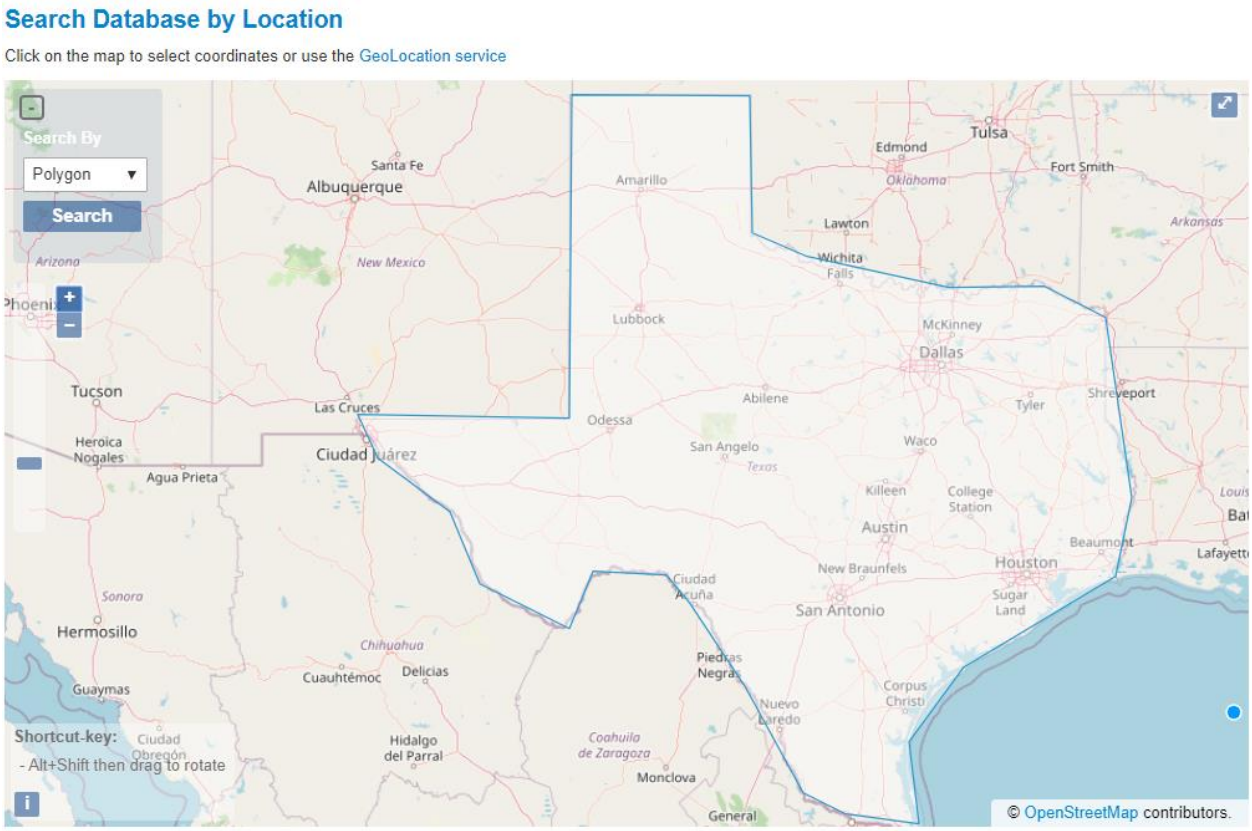


Figure 49: Specify the polygon on the map

To redraw the polygon, place the cursor at the new starting point of the polygon and click with left-hand mouse button. This will automatically delete the previous polygon from the screen. Once the polygon is drawn to your satisfaction the query can be performed. Click on the blue **Search** button to activate the search. What will be retrieved from the database will be all objects whose bounding boxes are contained within or overlap the user-defined polygon.

4.3 Nested Searches

Upon completing the first non-spatial (text) or spatial (map) search the results of the query will appear in the results panel (see Figure 50). The lower part of the panel shows the table of objects that were returned from the initial search query submitted. However, to add further power to the search function a search can be created that comprises multiple elements. These we refer to as nested searches, where nested searches comprise a group of search commands linked together in a chain. This creates a series of AND links, which can be a combination of both spatial and non-spatial entities, for example:

Here the search comprises two components. The first was text search using the name: Timbalai 1948 and the second was a non-spatial text string UTM. Each time another element is added the number of objects returned from the search will in theory get lesser and lesser, which helps target the desired object(s) which is being sought. The results of this query are shown within the lower panel of Figure 50 and comprise two objects returned from the database.

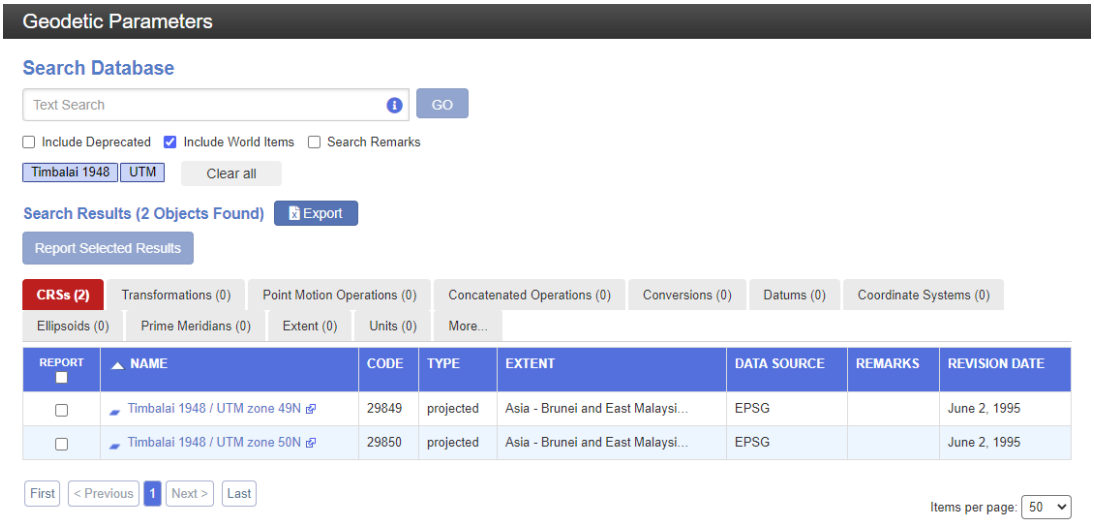


Figure 50: Nested searches

To clear any of the components of the nested search, place the cursor over that search object and click once with the left-handed mouse button. That item will be removed from the list, e.g., the UTM object was removed. Notice that the number of returned objects now increases from the previous list.

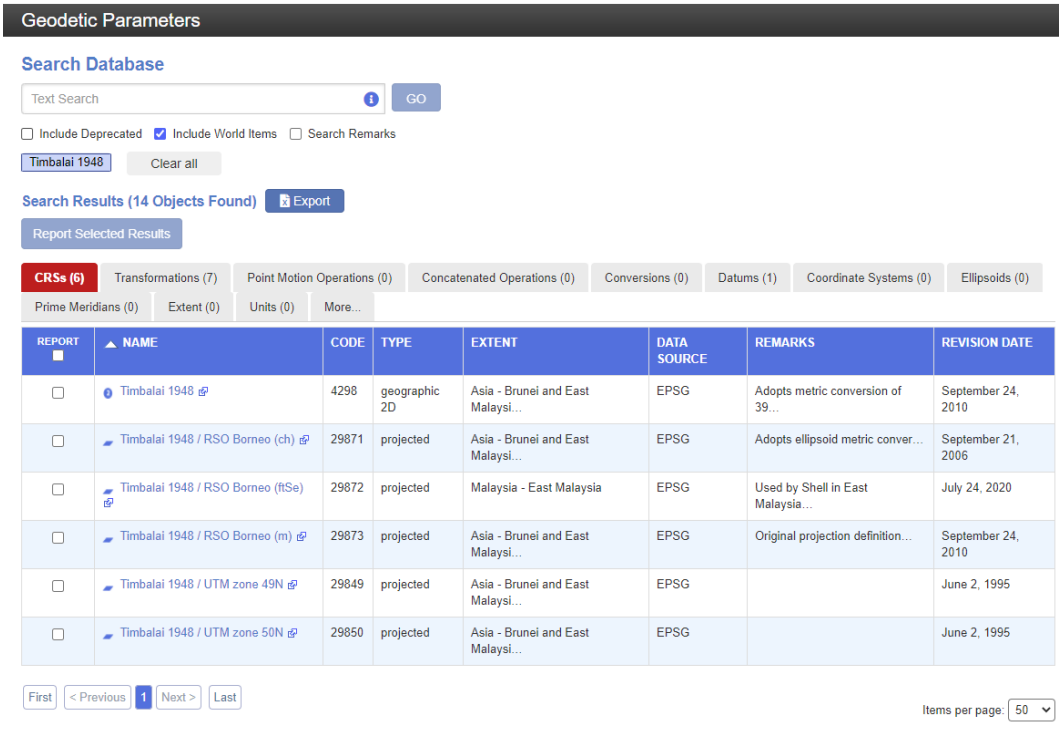


Figure 51: Removal of search component

To remove all components of the nested search, click on the **Clear All** button and all items will be deleted within the adjacent blue boxes.

4.3.1 Example One

The following example uses the text string search criteria only.

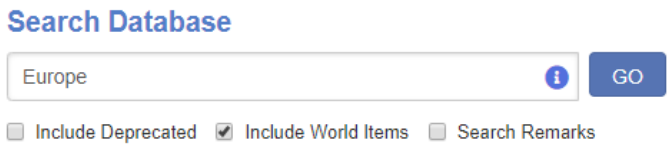


Figure 52: Enter the first search criteria

Enter the string into the box provided and click the **Go** button to commence the first part of the search. The first search request will appear in the blue box as shown in Figure 53.

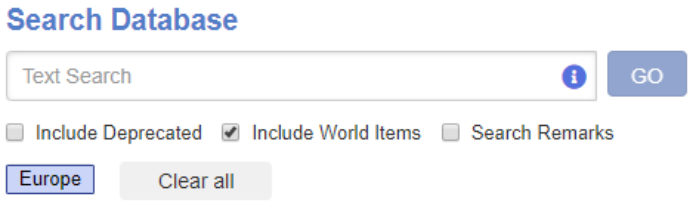


Figure 53: First search criteria shown in blue box

Enter a second text string into the box provided as is shown in Figure 54, e.g., UTM.

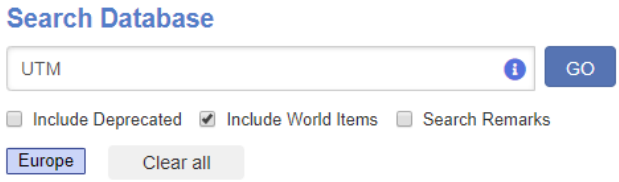


Figure 54: Second search criteria entered

After entering the second part of the search criteria click the **GO** button again and a search of the database will be conducted to find objects that match both parts of the search. Finally, the second search criteria will be added to the search list, e.g., Europe and UTM.

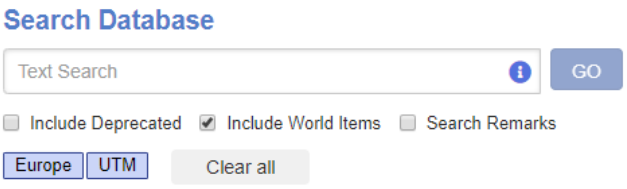


Figure 55: Second search criteria added to the list

If required a third search criterion can be added to complement the two existing parameters. The example shown here uses the [code] search option.

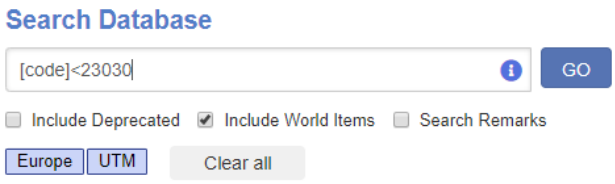


Figure 56: Third search criteria

In this instance EPSG codes that are less than 23030.

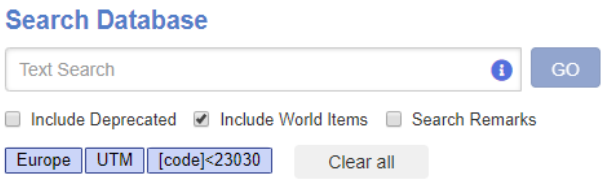
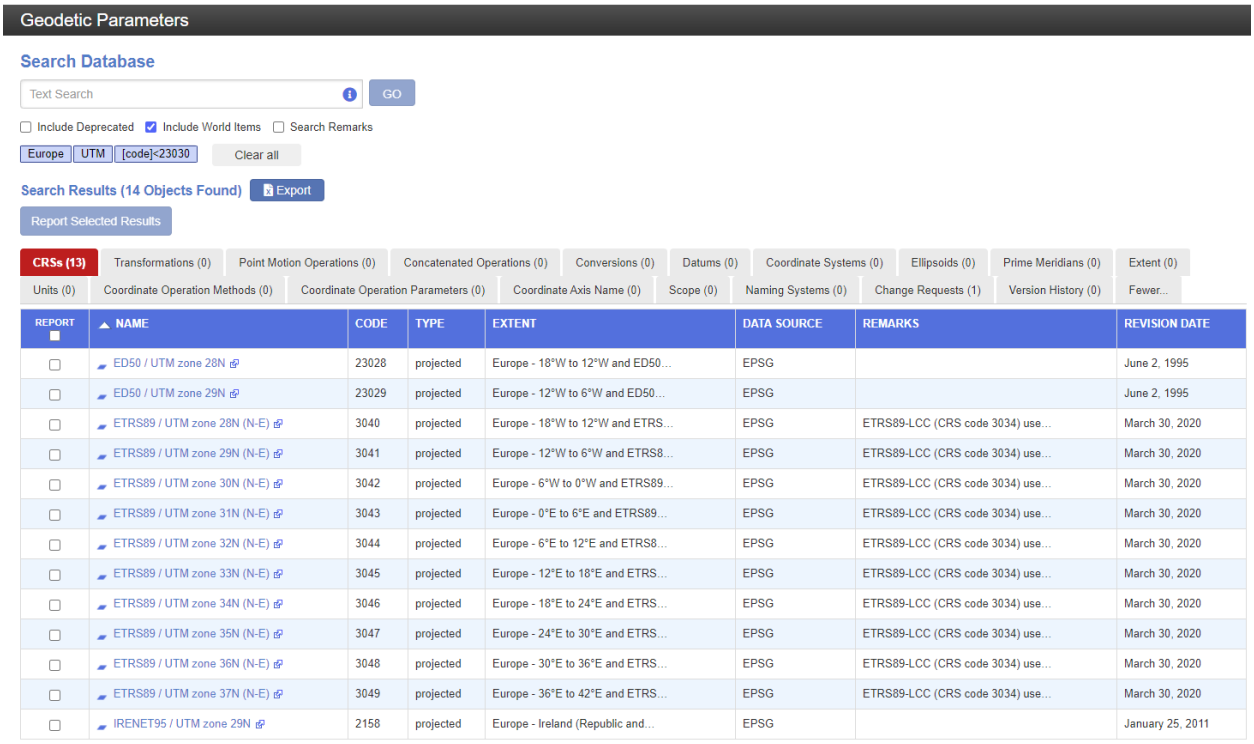


Figure 57: Three search criteria used simultaneously

In this example the geodetic objects returned from the search criteria are shown in Figure 58.



REPORT	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
☐	ED50 / UTM zone 28N	23028	projected	Europe - 18°W to 12°W and ED50...	EPSG		June 2, 1995
☐	ED50 / UTM zone 29N	23029	projected	Europe - 12°W to 6°W and ED50...	EPSG		June 2, 1995
☐	ETRS89 / UTM zone 28N (N-E)	3040	projected	Europe - 18°W to 12°W and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 29N (N-E)	3041	projected	Europe - 12°W to 6°W and ETRS8...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 30N (N-E)	3042	projected	Europe - 6°W to 0°W and ETRS89...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 31N (N-E)	3043	projected	Europe - 0°E to 6°E and ETRS89...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 32N (N-E)	3044	projected	Europe - 6°E to 12°E and ETRS8...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 33N (N-E)	3045	projected	Europe - 12°E to 18°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 34N (N-E)	3046	projected	Europe - 18°E to 24°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 35N (N-E)	3047	projected	Europe - 24°E to 30°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 36N (N-E)	3048	projected	Europe - 30°E to 36°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	ETRS89 / UTM zone 37N (N-E)	3049	projected	Europe - 36°E to 42°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 30, 2020
☐	IRENET95 / UTM zone 29N	2158	projected	Europe - Ireland (Republic and...	EPSG		January 25, 2011

Figure 58: Returned results

4.3.2 Example Two

This example will combine both the graphical search criteria and text criteria. First, select the **Map Search** function and then select from the point, box, or polygon search options. In this instance the polygon option is selected. Pan and zoom to the geographic area required and draw the polygon on to the background map as shown in Figure 59. When zooming and panning the search option must be set to None.

Figure 59: First criteria, select polygon using map interface

Once the polygon has been drawn click on the **Search** button shown in upper left had part of user interface. The results of the search will be shown and at the same time notice that the first search option (polygon) will be displayed within the nested search list as shown in Figure 60.

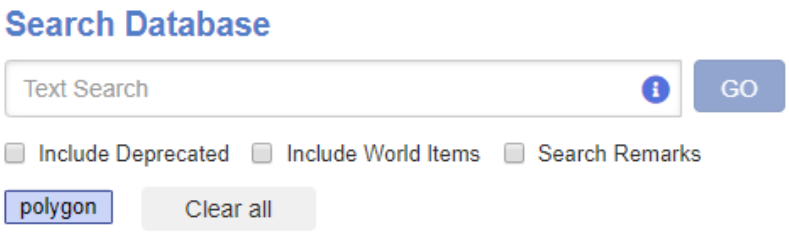


Figure 60: First criteria listed as polygon

Next, a text search will be added to the map search already defined. Into the text search box is added the second search criteria, e.g., India Zone.

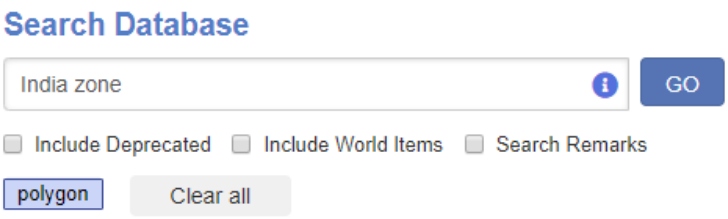


Figure 61: Enter second search criteria

To activate the search, click on the GO button once the text has been entered. The second search criteria will then be added to the search list as is shown in Figure 62.

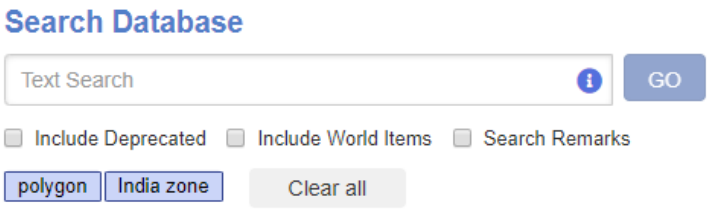


Figure 62: Search criteria list extended to two items

Finally, a third search criteria is added as is shown in Figure 63, e.g., IIIa.

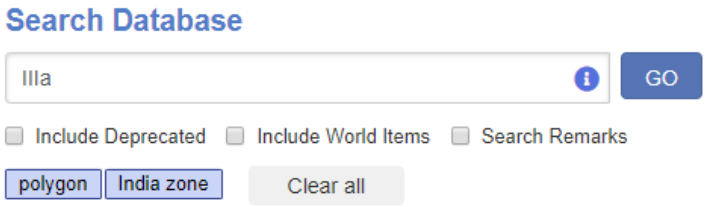


Figure 63: Enter third search criteria

As previously, click the GO button after entering the required text and the third search criteria will be added to the list as shown in Figure 64.

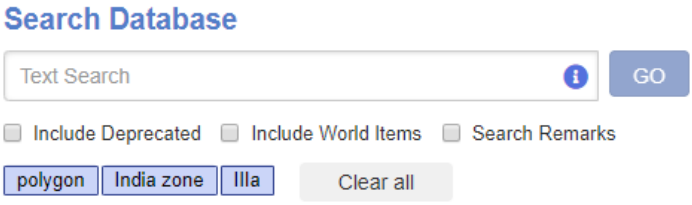


Figure 64: Third search criteria added to the list

Once the search criteria have been run with the three items submitted the following results will be displayed in this instance.

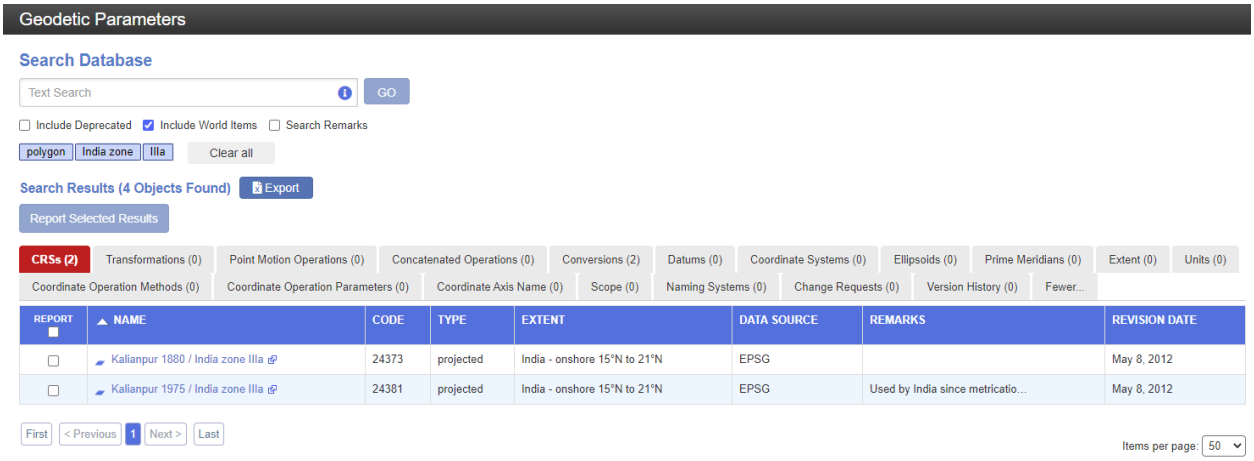


Figure 65: Result of the search

4.3.3 Reset search criteria

The search criteria shown within the search database list can be reset in two ways:

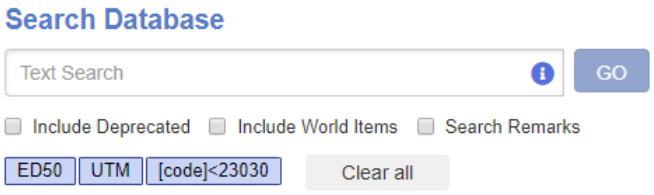


Figure 66: Deleting any search criteria

1. To clear any of the individual items, click on that item with left hand mouse button and it will be deleted from the list, leaving the other two remaining. When an item is deleted the search criteria will be re-run using just the items that remain.

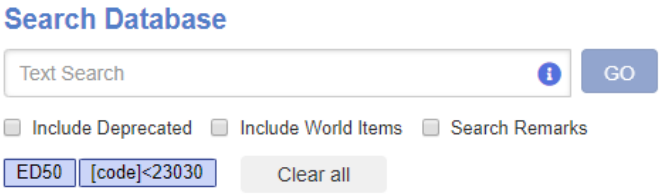


Figure 67: Search item deleted

2. To clear all items within the list, click on the **Clear all** button shown in any of the recent figures and the cookie list will be deleted leaving no items in the search criteria.

5 Query results panels

Once the query is performed all objects that match the criteria of the search query will be retrieved from the geodetic parameter database and displayed within the tables of the results panel. In a point search was performed, with the coordinates of the point shown in the text boxes provided.

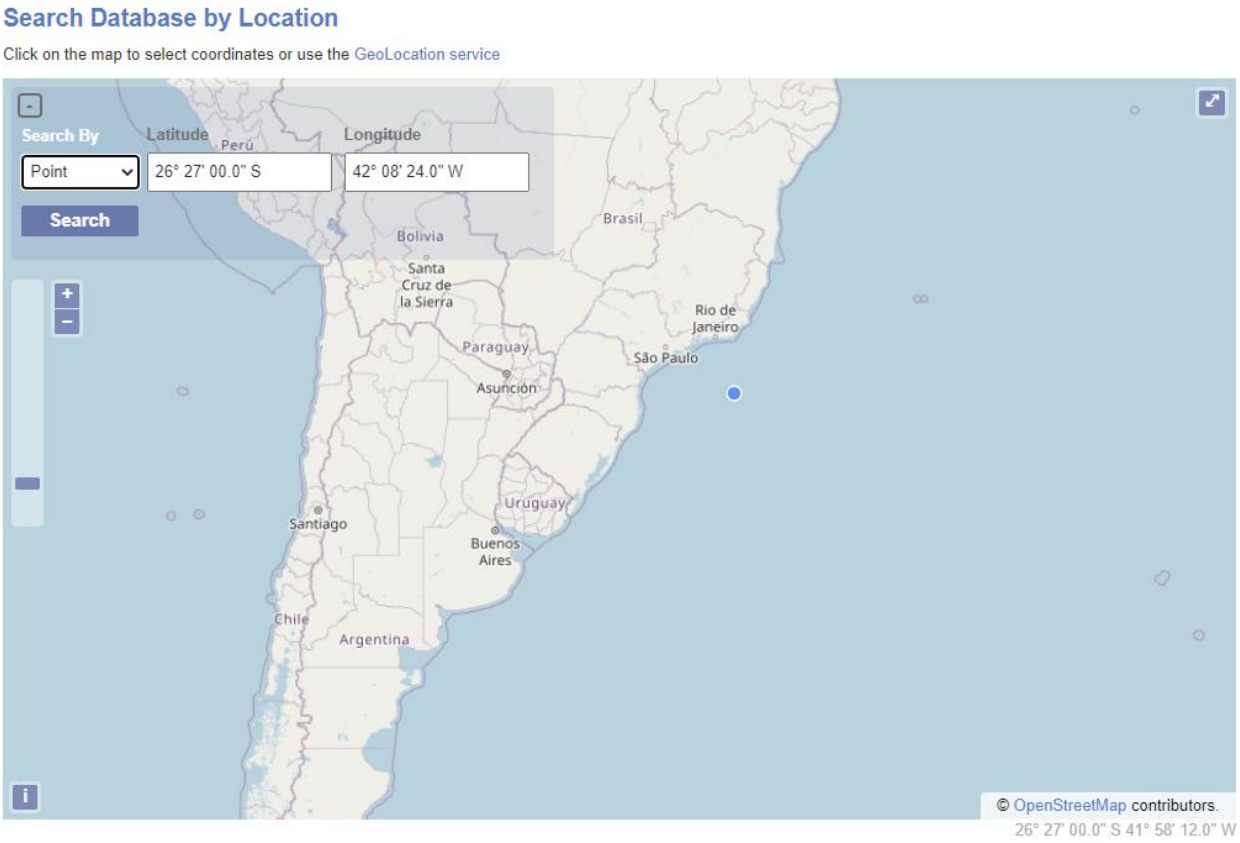


Figure 68: Conduct a point search

For this point query the results panel is shown on Figure 70. The basic layout of the results panel will comprise, from top to bottom and left to right, the following:

The top part of the panel will display the query that was made. In this instance a query of type = point. This is shown in Figure 69.

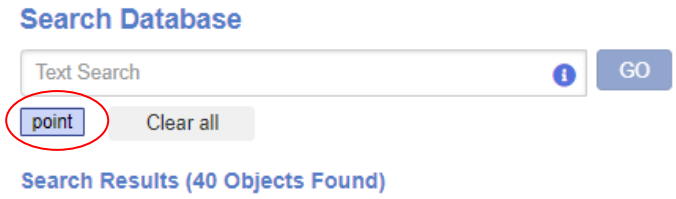


Figure 69: Search criteria

When nested searches are conducted the number of entries shown within the blue boxes under the Search Database text box will increase (see Figure 69). See section 5.4 for further details.

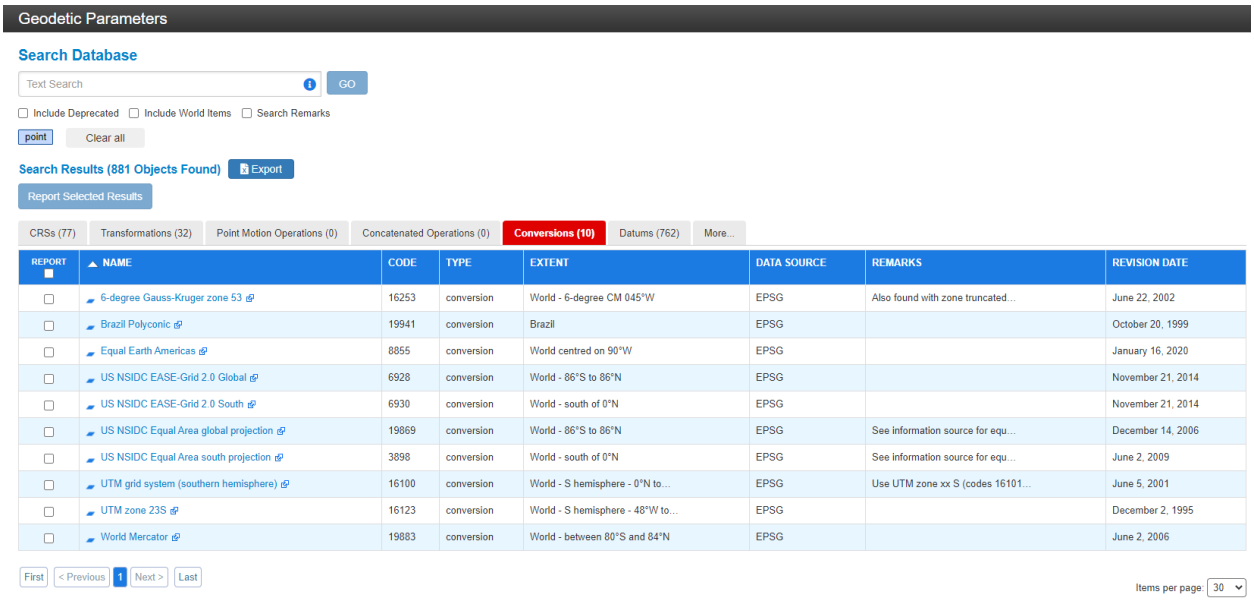


Figure 70: Results panel

The results panel will comprise a series of tabbed pages, which are shown above the main table. By default, the first six tabbed pages displayed will be:

- CRS
- Transformations
- Point Motion Operations
- Concatenated Operations
- Conversions
- Datums
- More…

Note that the tabbed page shown with a red background is the one currently displayed, in this instance the Conversions tabbed page. The number shown to the right of each tab label indicated the number of objects associated with each category, e.g., 10 objects returned for CRS category. The total number of objects returned for the six tabbed pages combined is shown by the number to the right of the label Search Results (881 objects found). This value excludes objects on other currently hidden tabs.

For each tabbed page, the following eight columns are displayed:

Report	Select an object(s) whose details will be presented within a report.
Name	The name of the CRS as stored in the registry.
Code	The EPSG code associated with the CRS specified in the name column.
Type	The list of 'Types' shown will vary depending upon which tabbed page is being viewed. For example, for the CRS tabbed page the following types are displayed: • Geodetic (Geocentric, Geographic 3D, Geographic 2D)

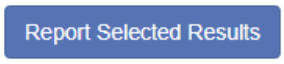
	• • Projected • Derived projected • Vertical • Engineering • Compound
Extent	Describes the geographic extent (area) of each object listed. Note: this is the extent name field which may be highly cryptic, not the extent description which gives a more complete text description of the geographic extent.
Data Source	Authority from where definition is derived (e.g., EPSG)
Remarks	Part of the metadata used to describe any general remarks which are associated with the object.
Revision Date	The date on which the definition was published or last revised.

To display additional geodetic object categories, click on the More tab and the following five tabbed pages will be displayed:

- Coordinate Systems
- Ellipsoids
- Prime Meridians
- Extent
- Units

This is further expanded, see section 5.3.

In summary, the user interface features on the Results panel include:

Feature	Description
	Total number of objects returned from the submitted query for those object tabs displayed. To the right of it is an Export option to export all the objects listed within the results panel to an Excel spreadsheet that replicates the tabbed pages as individual Sheets.
	In the left most column of each results page is a check box. If a tick is placed in a box it enables a report to be generated for these objects.
	The number in brackets within each tabbed page name refer to the number of objects found for each of these categories.
	This refers to the number of objects displayed on one page. To increase or decrease the number of objects included click on the drop box and select one of numbers listed. Where the number of objects exceeds the Item per page number the results will be spread over multiple pages. The following functions are used to navigate between these pages.
	Display objects on page 1 of the list.

< Previous	Display objects on the previous page, e.g., 2 to 1.
2	The current page number is highlighted blue with white number.
Next >	Advance to the next page in the list, e.g., 2 to 3.
Last	Display objects on the last page in the list.

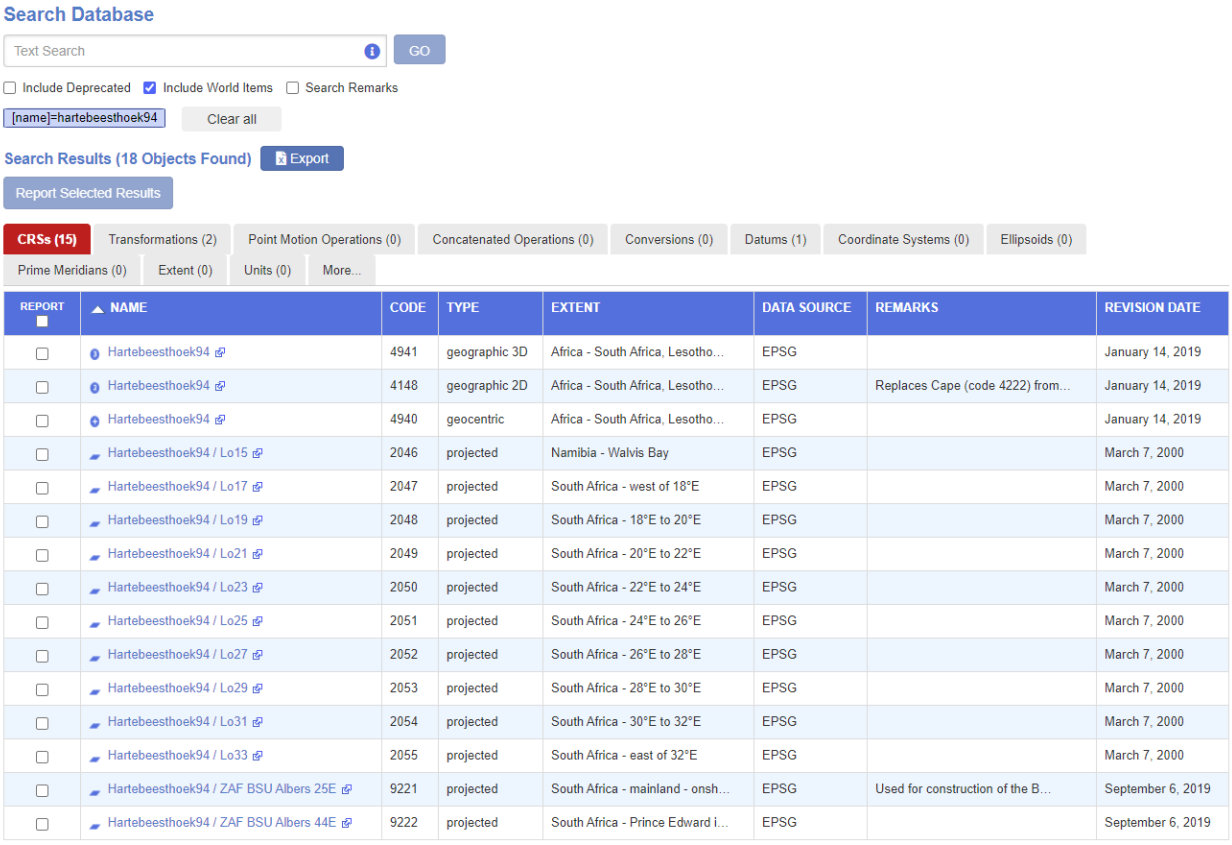
5.1 Search examples

Consider some of the examples shown in section 4, for searches by name, code, and type:

For example, submit the following search text string:

[name]=Hartebeesthoek94

This search should retrieve the following objects and display them in the results table as follows:



REPORT	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
	Hartebeesthoek94	4941	geographic 3D	Africa - South Africa, Lesotho...	EPSG		January 14, 2019
	Hartebeesthoek94	4148	geographic 2D	Africa - South Africa, Lesotho...	EPSG	Replaces Cape (code 4222) from...	January 14, 2019
	Hartebeesthoek94	4940	geocentric	Africa - South Africa, Lesotho...	EPSG		January 14, 2019
	Hartebeesthoek94 / Lo15	2046	projected	Namibia - Walvis Bay	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo17	2047	projected	South Africa - west of 18°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo19	2048	projected	South Africa - 18°E to 20°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo21	2049	projected	South Africa - 20°E to 22°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo23	2050	projected	South Africa - 22°E to 24°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo25	2051	projected	South Africa - 24°E to 26°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo27	2052	projected	South Africa - 26°E to 28°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo29	2053	projected	South Africa - 28°E to 30°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo31	2054	projected	South Africa - 30°E to 32°E	EPSG		March 7, 2000
	Hartebeesthoek94 / Lo33	2055	projected	South Africa - east of 32°E	EPSG		March 7, 2000
	Hartebeesthoek94 / ZAF BSU Albers 25E	9221	projected	South Africa - mainland - onsh...	EPSG	Used for construction of the B...	September 6, 2019
	Hartebeesthoek94 / ZAF BSU Albers 44E	9222	projected	South Africa - Prince Edward i...	EPSG		September 6, 2019

Figure 71: Search results for [name]=

The results panel shows all objects that met the query criteria by categorized objects. The one coloured red is the one currently being viewed. Click on any of the other tabbed pages to show details of other retrieved object types listed.

For example, enter code 1024 as the search string:

[code]=1024

This search should retrieve the following results pages:

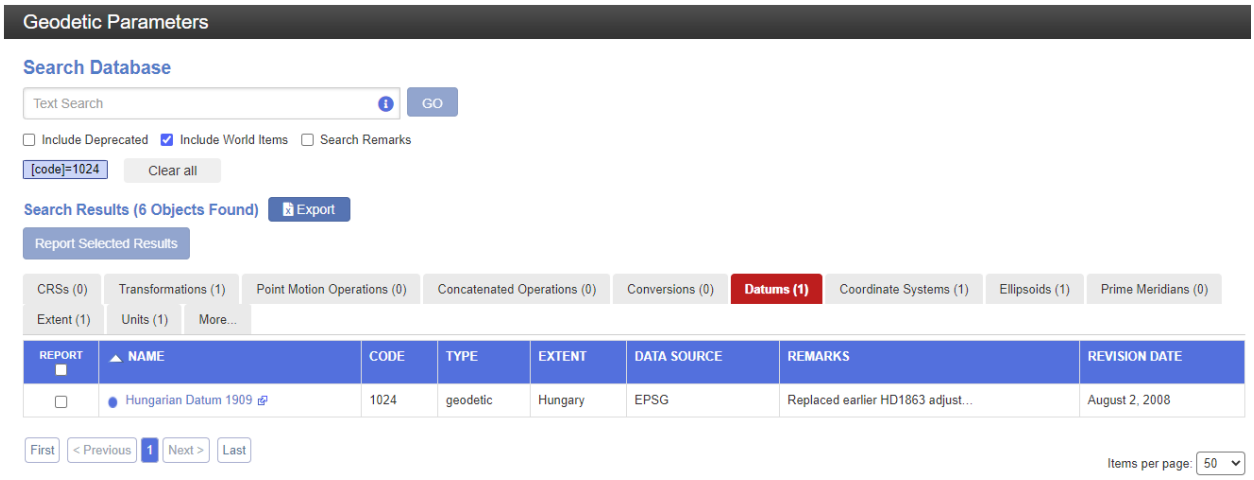


Figure 72: Search results for [code]=

Likewise, if a search is made as follows:

[code]<5000

This search filter will retrieve the following objects to populate the results pages:

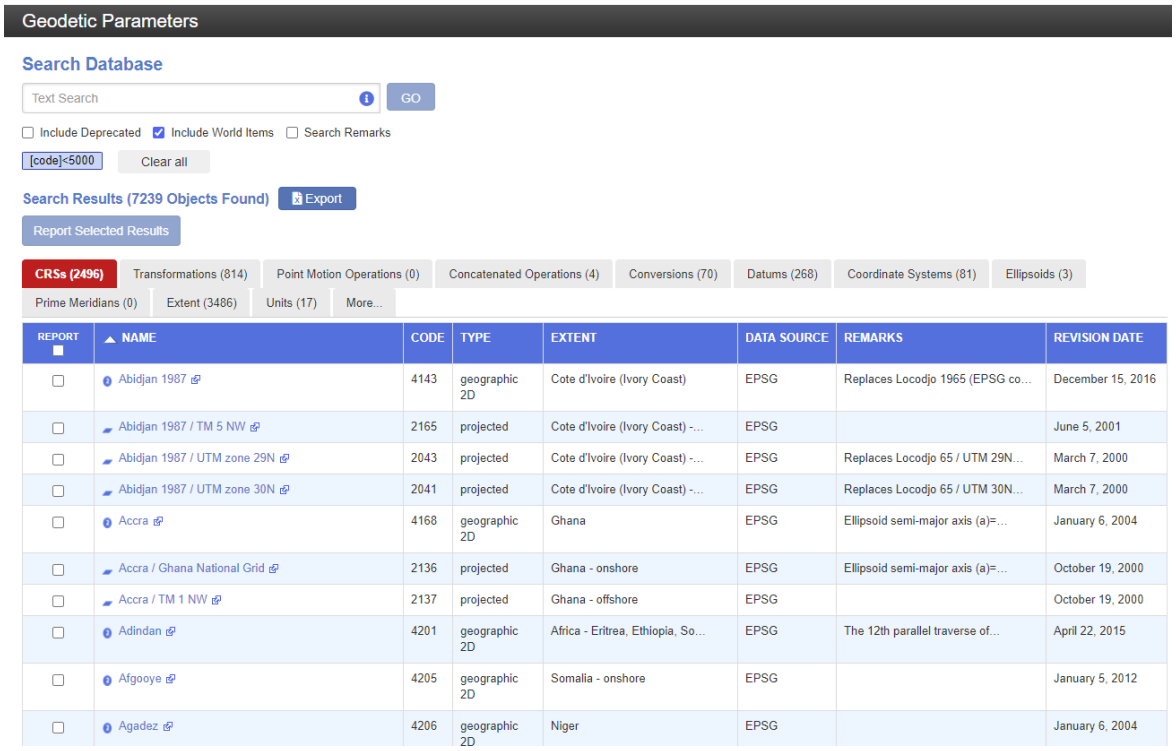
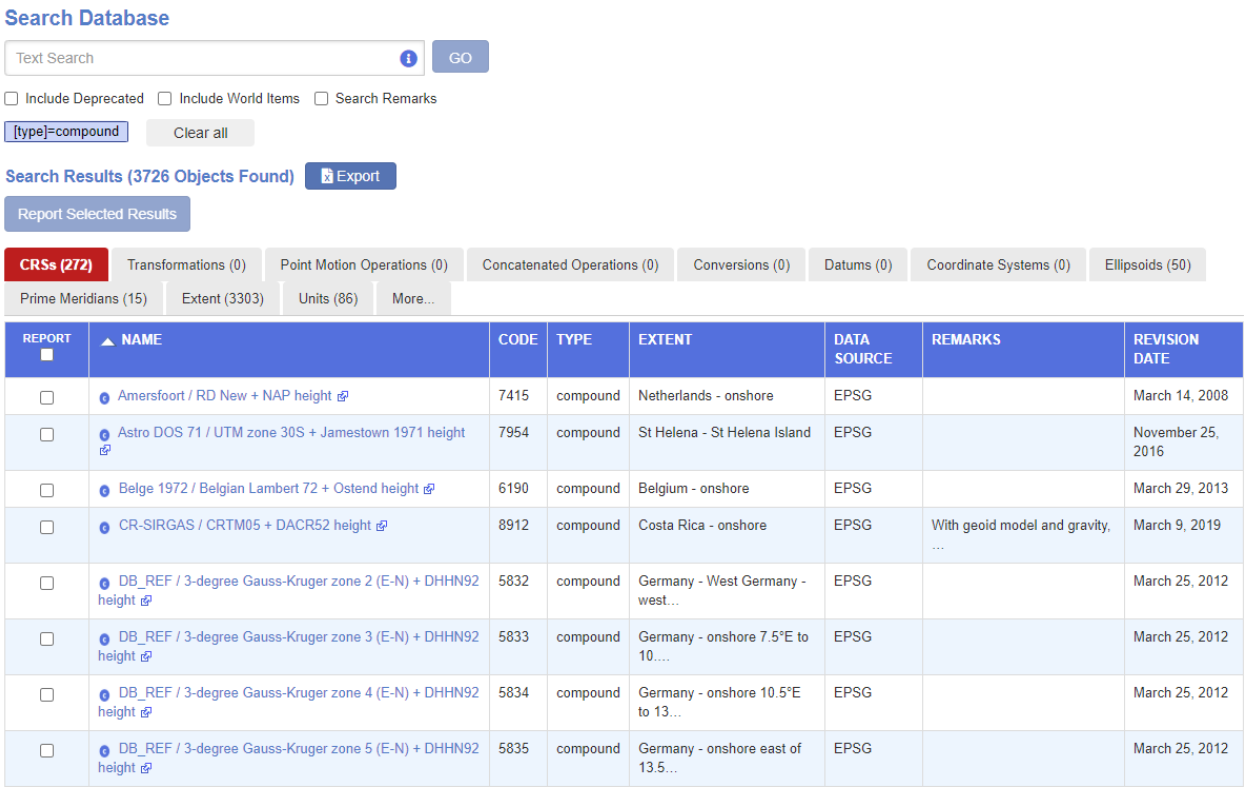


Figure 73: Search result for [code]<

For example, submit a query using type equals' compound:

[type]=compound

This search should retrieve the following results pages:



REPORT	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
☐	Amersfoort / RD New + NAP height	7415	compound	Netherlands - onshore	EPSG		March 14, 2008
☐	Astro DOS 71 / UTM zone 30S + Jamestown 1971 height	7954	compound	St Helena - St Helena Island	EPSG		November 25, 2016
☐	Belge 1972 / Belgian Lambert 72 + Ostend height	6190	compound	Belgium - onshore	EPSG		March 29, 2013
☐	CR-SIRGAS / CRTM05 + DACR52 height	8912	compound	Costa Rica - onshore	EPSG	With geoid model and gravity, ...	March 9, 2019
☐	DB_REF / 3-degree Gauss-Kruger zone 2 (E-N) + DHHN92 height	5832	compound	Germany - West Germany - west...	EPSG		March 25, 2012
☐	DB_REF / 3-degree Gauss-Kruger zone 3 (E-N) + DHHN92 height	5833	compound	Germany - onshore 7.5°E to 10....	EPSG		March 25, 2012
☐	DB_REF / 3-degree Gauss-Kruger zone 4 (E-N) + DHHN92 height	5834	compound	Germany - onshore 10.5°E to 13...	EPSG		March 25, 2012
☐	DB_REF / 3-degree Gauss-Kruger zone 5 (E-N) + DHHN92 height	5835	compound	Germany - onshore east of 13.5...	EPSG		March 25, 2012

Figure 74: Search results for [type]=

5.2 Objects display ordering

The order in which the objects on each tabbed page are shown are (by default) alphabetical based upon the Name column.

5.2.1 Sort by Name

Modifications to the object ordering can be made by clicking on the column labels shown in the blue bar of Figure 75. For example:

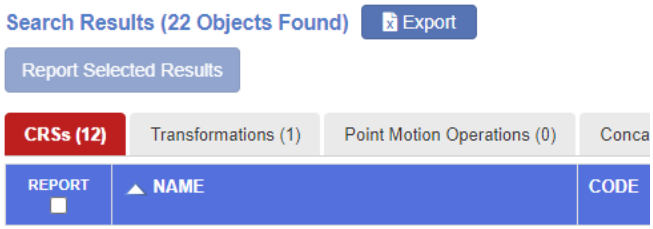


Figure 75: Change object ordering

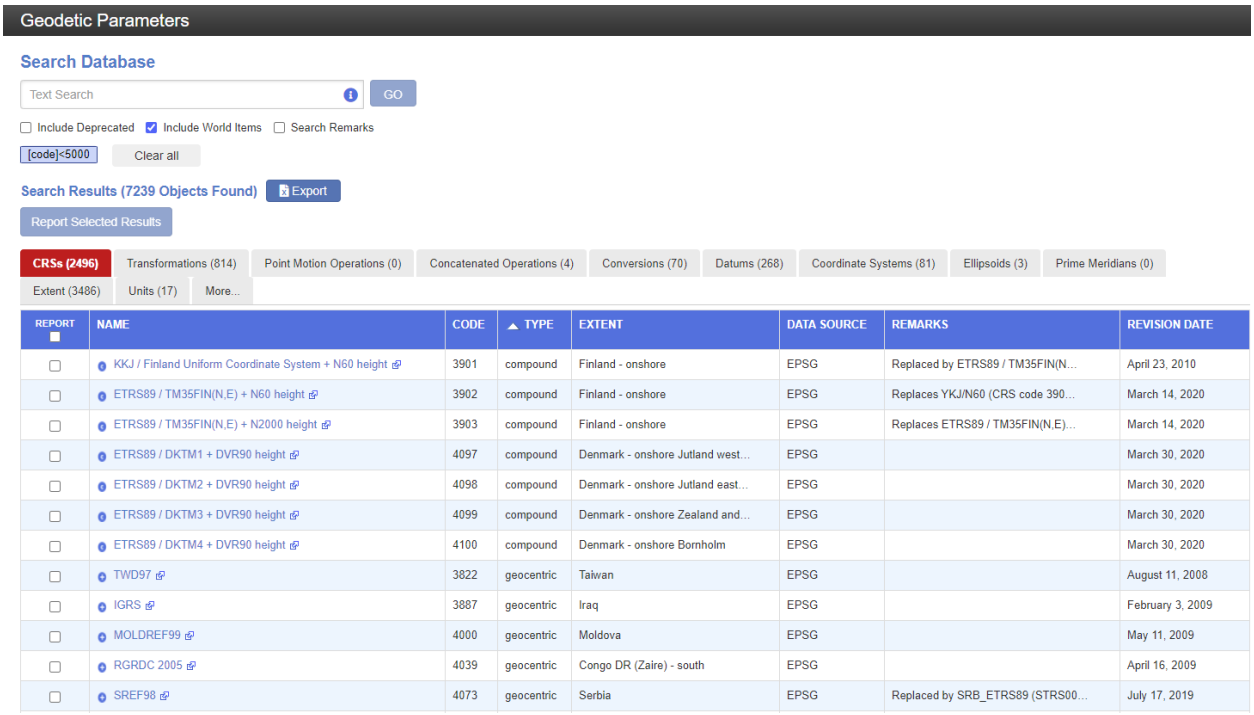
To re-order the CRS names place the cursor over the **Name** column label and a label will be underlined. Click once with the left-hand mouse button and the CRS names will be re-ordered reverse alphabetically.

5.2.2 Sort by Code

Similar modifications can be made to the other column header labels. For example, click on the Code header label. This will re-order all the entries from smallest EPSG code to largest EPSG code. Clicking on the Code header label a second time will reverse the order from largest EPSG code to smallest EPSG code.

5.2.3 Sort by Type

Likewise, to re-order the objects based upon Type place the cursor over Type column label and click once with the left-hand mouse button.



REPORT	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
	KKJ / Finland Uniform Coordinate System + N60 height	3901	compound	Finland - onshore	EPSG	Replaced by ETRS89 / TM35FIN(N...	April 23, 2010
	ETRS89 / TM35FIN(N,E) + N60 height	3902	compound	Finland - onshore	EPSG	Replaces YKJ/N60 (CRS code 390...	March 14, 2020
	ETRS89 / TM35FIN(N,E) + N2000 height	3903	compound	Finland - onshore	EPSG	Replaces ETRS89 / TM35FIN(N,E)...	March 14, 2020
	ETRS89 / DKTM1 + DVR90 height	4097	compound	Denmark - onshore Jutland west...	EPSG		March 30, 2020
	ETRS89 / DKTM2 + DVR90 height	4098	compound	Denmark - onshore Jutland east...	EPSG		March 30, 2020
	ETRS89 / DKTM3 + DVR90 height	4099	compound	Denmark - onshore Zealand and...	EPSG		March 30, 2020
	ETRS89 / DKTM4 + DVR90 height	4100	compound	Denmark - onshore Bornholm	EPSG		March 30, 2020
	TWD97	3822	geocentric	Taiwan	EPSG		August 11, 2008
	IGRS	3887	geocentric	Iraq	EPSG		February 3, 2009
	MOLDREF99	4000	geocentric	Moldova	EPSG		May 11, 2009
	RGRDC 2005	4039	geocentric	Congo DR (Zaire) - south	EPSG		April 16, 2009
	SREF98	4073	geocentric	Serbia	EPSG	Replaced by SRB_ETRS89 (STRS00...	July 17, 2019

Figure 76: Re-ordering based on Type

The re-ordering is also nested in its approach. In the example shown in Figure 76, the objects were first re-ordered by **Code** and then by **Type**. Hence, within the Type column each object is grouped by CRS type (e.g., geocentric, geographic 2D, geographic 3D and projected), but also within each type the ordering is also determined by their EPSG Codes, with the smallest EPSG code number first within each group. In this example, those of type = compound are clearly ordered according to EPSG code number from smallest to largest.

5.2.4 Sort by Extents

This re-orders the objects alphabetically or reverse alphabetically if clicked again.

5.2.5 Sort by Data Source

To re-order the objects based upon Data Source place the cursor over the Data Source column header and click once with the left-hand mouse button. The objects will be listed by the data authority in alphabetical order, e.g., IOGP and then OGP. At the same time, the order in which the objects are listed within each 'group' will be based upon EPSG Code number, ranging from smallest code to largest code.

5.2.6 Sort by Revision Date

To re-order the objects based upon Revision Date place the cursor over the Revision Date column header and click once with the left-hand mouse button. The objects will be listed by their release date or revision date from oldest to newest. At the same time, the order in which the objects are listed also takes into account the EPSG code, being written from smallest to largest on the date of their release / revision.

5.3 Displaying 'more' tabbed pages

A twelfth tab label – '**More**' is also shown in Figure 77. Clicking on this tab will expand the number of tabbed pages available for viewing to that shown in Figure 77. These additional pages include:

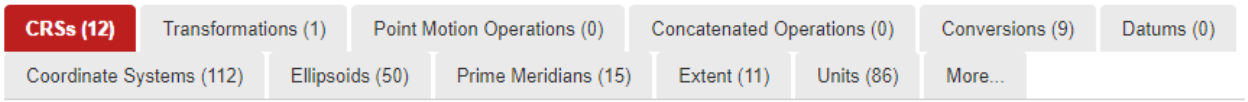


Figure 77: Additional tabbed pages

- Coordinate Operation Methods
- Coordinate Operation Parameters
- Coordinate Axis Name
- Scope
- Naming System
- Change Requests
- Version History

To view the contents of any of the additional tabbed pages click on the text of the tabbed page. It will turn red, and the contents will be displayed within the table below (see Figure 78).

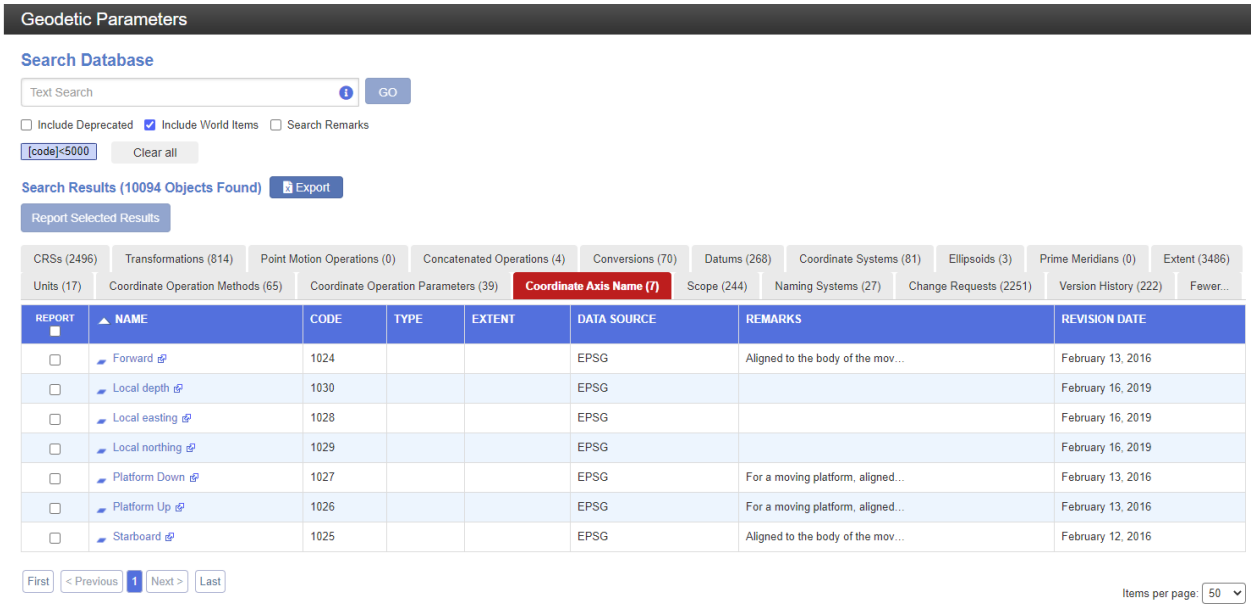


Figure 78: Coordinate Axis Name tabbed page

The order in which the objects are displayed is initially shown alphabetically, from A to Z. This is against the trend applied to many of the other pages where the initial object ordering is given alphabetically. The special case of the ordering in this instance is because of the number of objects within the category is less than one reporting page (e.g., items per page <50).

5.3.1 Fewer tabbed pages

To reduce the number of tabbed pages displayed click on the 'Fewer' button and the tabs displayed will be reduced back to the original six.

5.4 Data mining

All the objects listed in the name column of the results panel act as hyperlinks and can be expanded to reveal further details of any of the retrieved objects in the table. An example is given for CRS Kalianpur 1880 / India zone IIIa. The details can be viewed in one of two ways:

1. In Figure 65 there is the following icon to the right of the object name: - if you click on this icon it will open the details of that object in a new window.
2. Alternatively, clicking on the object name the details of the object will be displayed in the current window,

In both cases further details are displayed as shown in Figure 79.

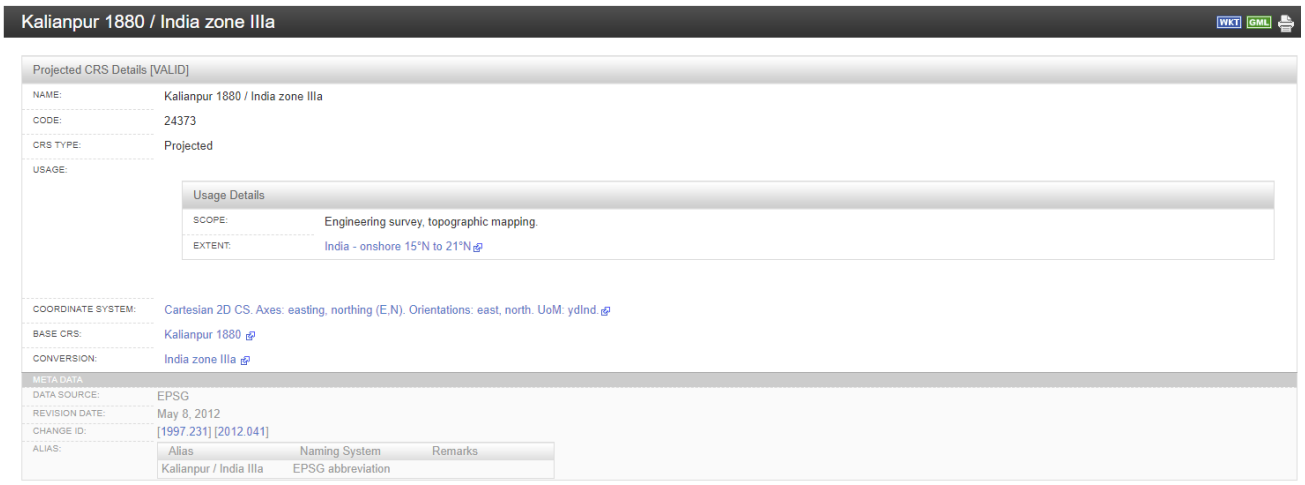


Figure 79: Open the object to view parameters and metadata

The viewing panel has several key features:

- All text shown in blue can be further expanded to display additional parameters and parameter values associated with the sub-objects, e.g., Extent, Coordinate System, etc.
- Direct access to Change Request ID used to create or modify the object.
- Metadata including Alias details.
- The provision of an on-line calculator, not available to Guest users (temporarily disabled).
- Export options to WKT and GML (see section 7 for further details).
- Print a summary report (see 6.6 for further report options)

To expand any of the data links place cursor over the blue underlined text and click once with the left-hand mouse key. For example, select the Base Geographic CRS, Kalianpur 1880.

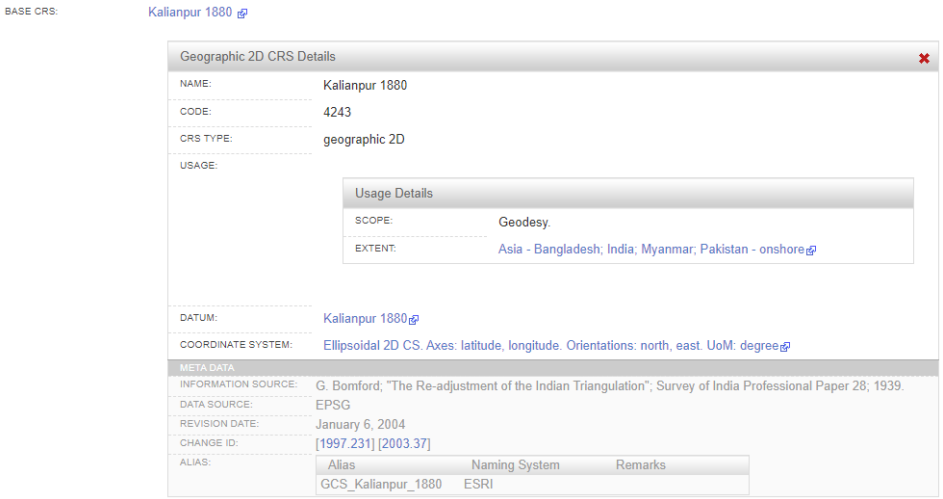


Figure 80: Base Geographic CRS

As is shown in Figure 80 the expansion process with the various sub-objects can be continued as desired. Figure 81 displays the expanded details for the geodetic datum.

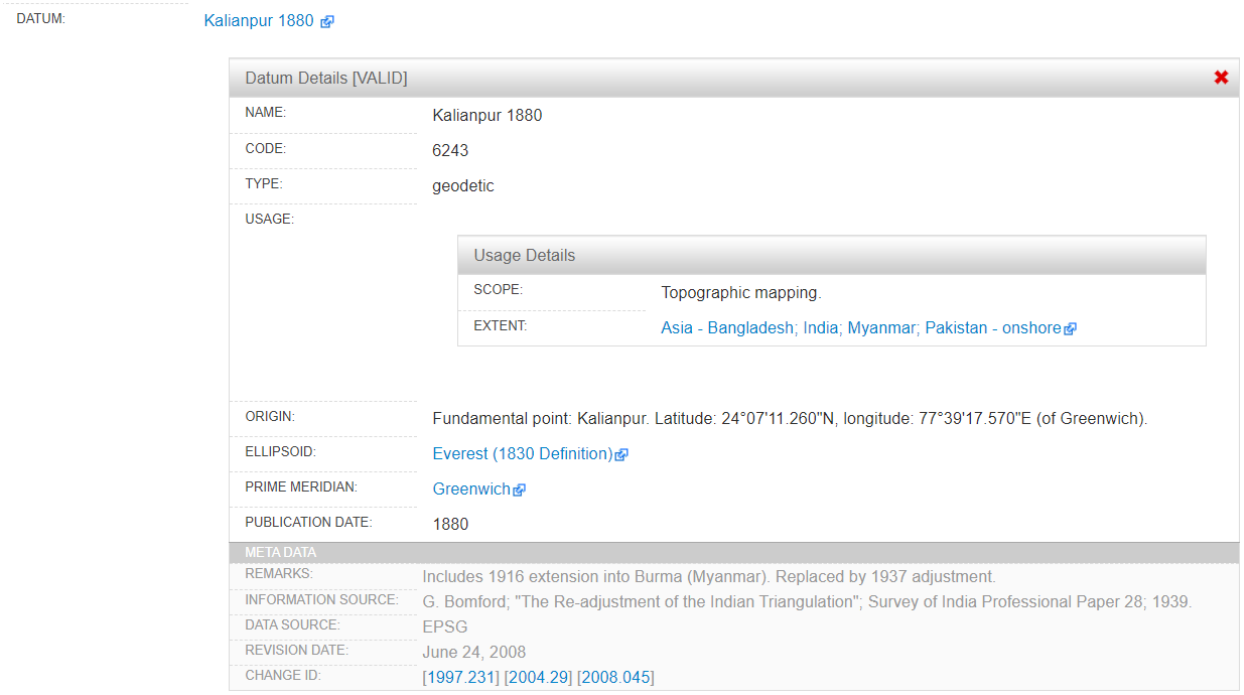


Figure 81: Geodetic datum parameters

The Usage link is the new term introduced within the ISO 19111:2019 data model which now combines scope and extent. Scope is used to describe the expected usage of CRS. In this instance, it is Topographic mapping. Extent (formerly Area) is displayed using two polygons. The first, shown in dark blue in Figure 82, is known as the geographic bounding box and is simply a four-point arc-rectangle. Its latitude and longitude coordinates are displayed around the borders of the map in decimal degrees, latitude positive north and longitude positive east. The second is a more complex polygon shown by the orange area. Each extent contained within the database is given an EPSG code which is shown adjacent to the code label: 1307.

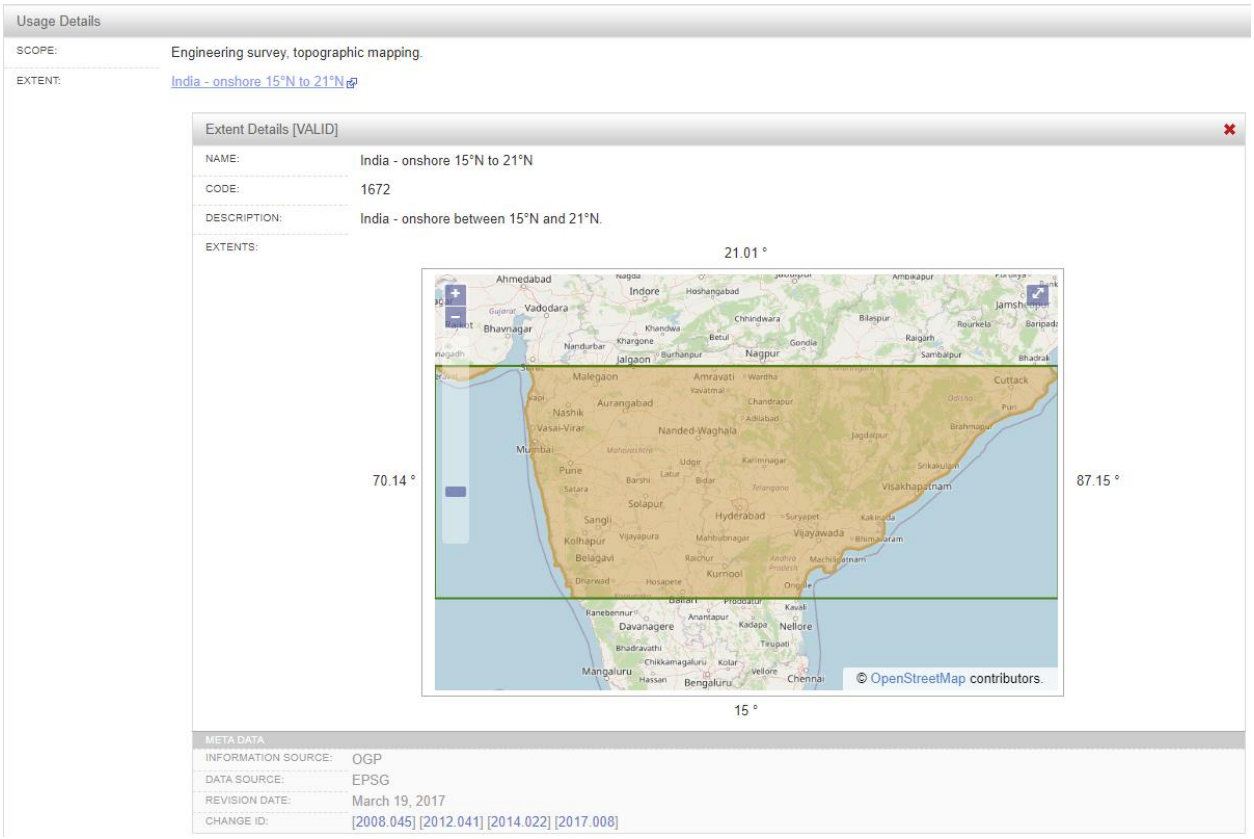
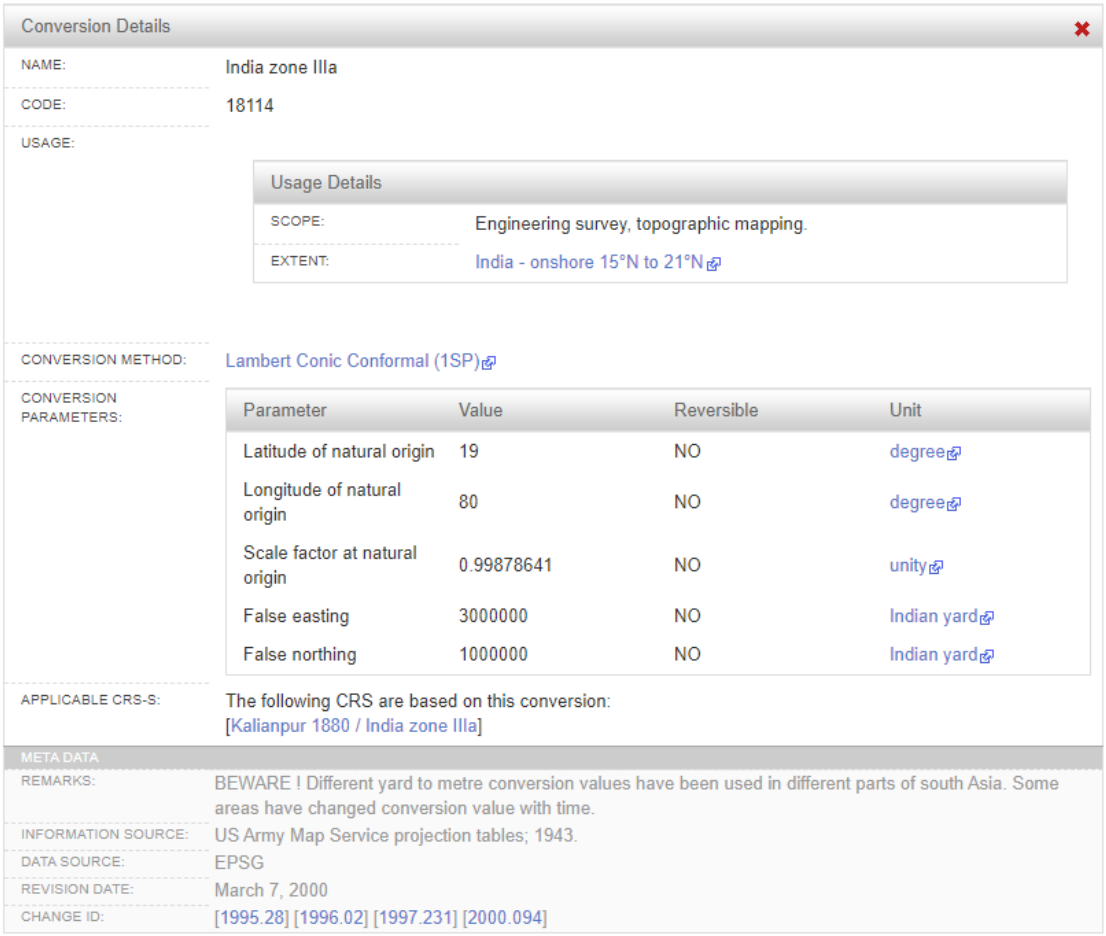


Figure 82: Usage: scope and extent

Finally, expand the Ellipsoid definition to show the parameters of the ellipsoid, as shown in Figure 83.

Figure 83: Ellipsoid parameters

- To hide / collapse any of the sub-object definitions click on the red cross in the right-hand corner of the expanded panel.
- Also note that the metadata that accompanies each data level is displayed at the base of each of the panels.



Conversion Details

NAME:	India zone IIIa
CODE:	18114
USAGE:	

Usage Details

SCOPE:	Engineering survey, topographic mapping.
EXTENT:	India - onshore 15°N to 21°N

CONVERSION METHOD:	Lambert Conic Conformal (1SP)

CONVERSION PARAMETERS:

Parameter	Value	Reversible	Unit
Latitude of natural origin	19	NO	degree
Longitude of natural origin	80	NO	degree
Scale factor at natural origin	0.99878641	NO	unity
False easting	3000000	NO	Indian yard
False northing	1000000	NO	Indian yard

APPLICABLE CRS-S:	The following CRS are based on this conversion: [Kalianpur 1880 / India zone IIIa]

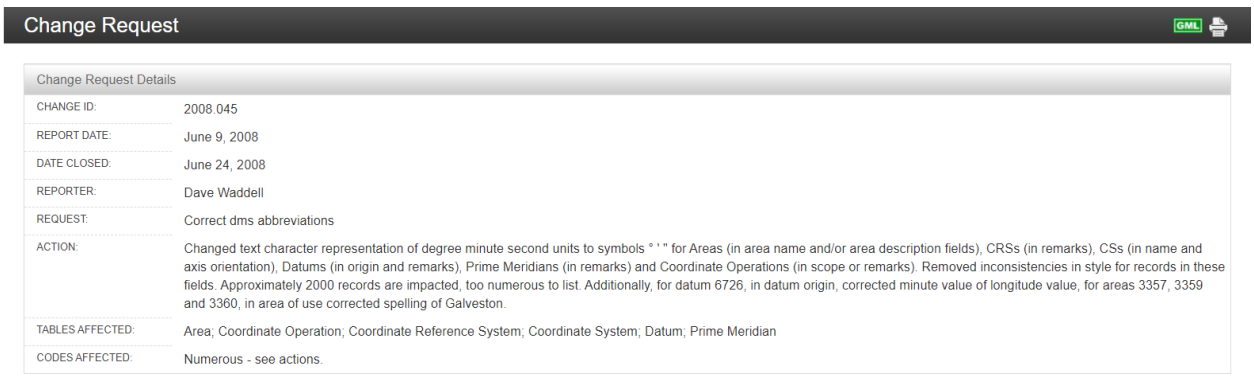
META DATA

REMARKS:	BEWARE ! Different yard to metre conversion values have been used in different parts of south Asia. Some areas have changed conversion value with time.
INFORMATION SOURCE:	US Army Map Service projection tables; 1943.
DATA SOURCE:	EPSG
REVISION DATE:	March 7, 2000
CHANGE ID:	[1995.28] [1996.02] [1997.231] [2000.094]

Figure 84: Projection parameter definition, India zone IIIa

One further example is given for the projection parameters associated with this projected 2D CRS. To view these parameters and parameter values click on the conversion link shown in Figure 84.

Likewise, the details can be expanded to show information concerning the conversion method and units of measure associated with the parameter values. The Change ID link describes details of the changes of modifications made to the objects contained within the geodetic parameter registry.



Change Request

Change Request Details

CHANGE ID:	2008.045
REPORT DATE:	June 9, 2008
DATE CLOSED:	June 24, 2008
REPORTER:	Dave Waddell
REQUEST:	Correct dms abbreviations
ACTION:	Changed text character representation of degree minute second units to symbols ° ' " for Areas (in area name and/or area description fields), CRSs (in remarks), CSs (in name and axis orientation), Datums (in origin and remarks), Prime Meridians (in remarks) and Coordinate Operations (in scope or remarks). Removed inconsistencies in style for records in these fields. Approximately 2000 records are impacted, too numerous to list. Additionally, for datum 6726, in datum origin, corrected minute value of longitude value, for areas 3357, 3359 and 3360, in area of use corrected spelling of Galveston.
TABLES AFFECTED:	Area; Coordinate Operation; Coordinate Reference System; Coordinate System; Datum; Prime Meridian
CODES AFFECTED:	Numerous - see actions.

Figure 85: Change ID details

The details within the Change Request are defined as follows:

Parameter	Parameter details
Change ID	Unique identification given to the Change Request. Syntax is year number followed by the sequential Change Request made that calendar year. Therefore, this is the 18th request made in 2019.
Report Date	Date the request was made
Date Closed	Date the Change Request was completed
Reporter	Which person or entity reported the request
Request	Details of the request – what needs to be done in this Change Request
Action	What actions were conducted as part of the Change Request
Tables Affected	EPSG table names given as semi-colon separated list for those objects in the Codes Affected field
Codes Affected	The EPSG codes of previously-existing objects modified through the Change Request. (New objects are not listed here). Codes are given as semi-colon separated blocks by table. The blocks are identified through the order of entries in the Tables Affected field

6 Export functionality

Export functions are available for both individual objects and collection of objects.

6.1 Individual objects

To export data at an individual object level two file formats can be used,

- WKT adhering to the ISO 19162:2019 specification
- GML v3.2.1 using the EPSG schema extensions (see section 3.3).

WKT export is available only for CRSs, Transformations, Point Motion Operations and Concatenated Operations. GML export is available for all object types.

In Figure 86 there are three icons in the upper right-hand corner.

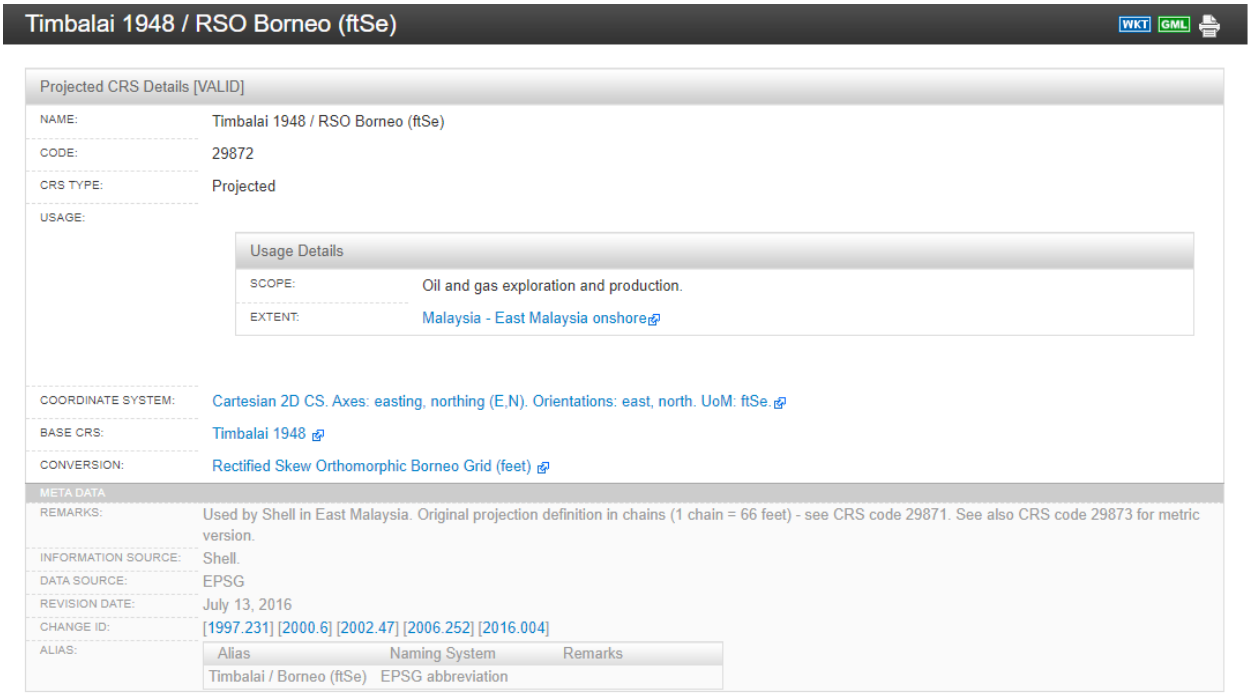


Figure 86: Export for individual objects

Select the appropriate icon to export either the WKT or GML file formats. Examples of these file formats are given in Figure 87 and Figure 82, respectively.

WKT Version 2

```
PROJCRS["Timbalai 1948 / RSO Borneo (ftSe)",BASEGEOGCRS["Timbalai 1948",DATUM["Timbalai 1948",ELLIPSOID["Everest 1830 (1967
Definition)",6377298.556,300.8017,LENGTHUNIT["metre",1,ID["EPSG",9001]],ID["EPSG",7016]],ID["EPSG",6298]],PRIMEM["Greenwich",0,ANGLEUNIT["radian",1,ID["EPSG",9101]],ID["EPSG",890
1]],ID["EPSG",4298]],CONVERSION["Rectified Skew Orthomorphic Borneo Grid (feet)",METHOD["Hotine Oblique Mercator (variant B)",ID["EPSG",9815]],PARAMETER["Latitude of projection
centre",4,ANGLEUNIT["degree",0.0174532925199433,ID["EPSG",9102]]],PARAMETER["Longitude of projection
centre",115,ANGLEUNIT["degree",0.0174532925199433,ID["EPSG",9102]]],PARAMETER["Azimuth of initial
line",53.315820472,ANGLEUNIT["degree",0.0174532925199433,ID["EPSG",9102]]],PARAMETER["Angle from Rectified to Skew
Grid",53.130102361,ANGLEUNIT["degree",0.0174532925199433,ID["EPSG",9102]]],PARAMETER["Scale factor on initial
line",0.99984,SCALEUNIT["unity",1,ID["EPSG",9201]]],PARAMETER["Easting at projection centre",1937263.44,LENGTHUNIT["British foot (Sears
1922)",0.304799471538676,ID["EPSG",9041]]],PARAMETER["Northing at projection centre",1452947.58,LENGTHUNIT["British foot (Sears
1922)",0.304799471538676,ID["EPSG",9041]]],ID["EPSG",19957]],CS[Cartesian,2,ID["EPSG",4405]],AXIS["Easting (E)",east],AXIS["Northing (N)",north],LENGTHUNIT["British foot (Sears
1922)",0.304799471538676,ID["EPSG",9041]],USAGE[SCOPE["Oil and gas exploration and production."],AREA["Malaysia - East Malaysia (Sabah; Sarawak), onshore and
offshore."],BBOX[0.85,109.31,7.67,119.61]],ID["EPSG",29872]]
```

Figure 87: WKT version 2

GML Document

```
<?xml version="1.0" encoding="utf-8"?>
<gml:ProjectedCRS xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:epsg="urn:x-ogp:spec:schema-xsd:EPSG:2.2:dataset" gml:id="epsg-crs-29872" xmlns:gml="http://www.opengis.net/gml/3.2">
  <gml:metaDataProperty>
    <epsg:CommonMetaData>
      <epsg:type>projected</epsg:type>
      <epsg:alias code="1087" codeSpace="7302" alias="Timbalai / Borneo (ftSe)" />
      <epsg:informationSource>Shell.</epsg:informationSource>
      <epsg:revisionDate>2020-07-24</epsg:revisionDate>
      <epsg:changes>
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/1997.231/export?format=gml" />
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/2000.600/export?format=gml" />
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/2002.470/export?format=gml" />
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/2006.252/export?format=gml" />
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/2016.004/export?format=gml" />
        <epsg:changeID xlink:href="https://apps.epsg.org/api/v1/Change/2020.069/export?format=gml" />
      </epsg:changes>
      <epsg:show>true</epsg:show>
      <epsg:isDeprecated>false</epsg:isDeprecated>
      <epsg:Usage>
        <epsg:extent xlink:href="https://apps.epsg.org/api/v1/Extent/3977/export?format=gml" />
        <gml:scope>Oil and gas exploration and production.</gml:scope>
      </epsg:Usage>
    </epsg:CommonMetaData>
  </gml:metaDataProperty>
  <gml:identifier codeSpace="EPSG">29872</gml:identifier>
  <gml:name>Timbalai 1948 / RSO Borneo (ftSe)</gml:name>
  <gml:remarks>Used by Shell in East Malaysia. Original projection definition in chains (1 chain = 66 feet) - see CRS code 29871. See also CRS code 29873 for metric version.</gml:remarks>
  <gml:scope />
  <gml:conversion xlink:href="https://apps.epsg.org/api/v1/Conversion/19957/export?format=gml" />
  <gml:baseGeodeticCRS xlink:href="https://apps.epsg.org/api/v1/CoordRefSystem/4298/export?format=gml" />
  <gml:cartesianCS xlink:href="https://apps.epsg.org/api/v1/CoordSystem/4405/export?format=gml" />
</gml:ProjectedCRS>
```

Figure 88: GML file format

6.2 Multiple objects

Data can be exported from the database by Registered Users who have logged in from the following location:

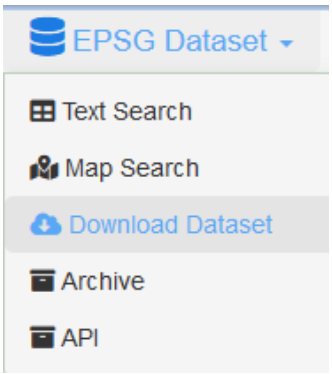


Figure 89: Download Datasets

Select the Download Dataset option from the menu shown in Figure 89.

6.3 Download Dataset

Currently, the entire database can be exported to the following formats. Having clicked on the Export Database button a panel like the one shown in Figure 90 will appear.

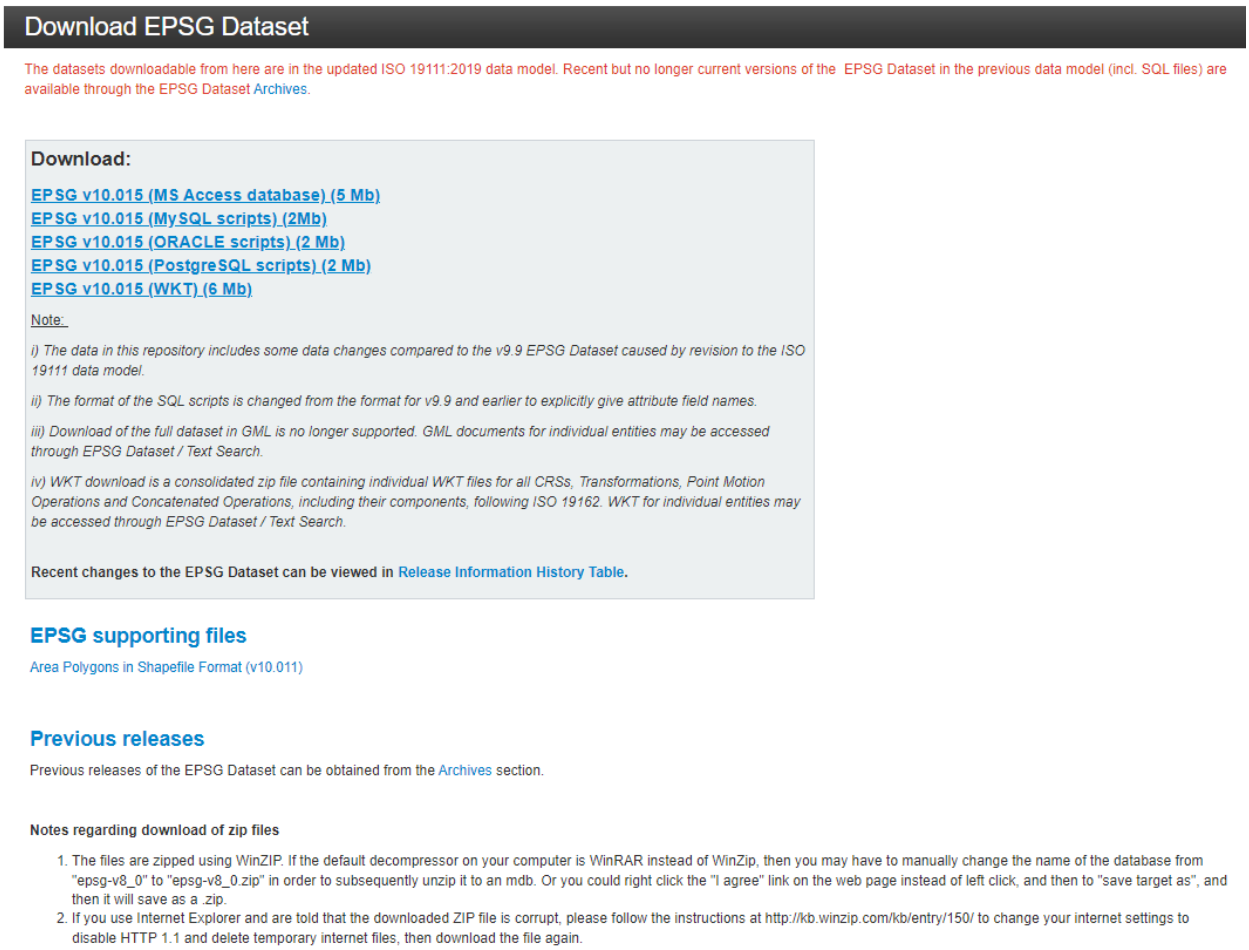


Figure 90: Export the database

In each instance the exported file will be compressed into a zipped format.

6.3.1 EPSG MS Access

This download will allow users to work with the EPSG Microsoft Access database. Simply download and open the zipped file to access the database file.

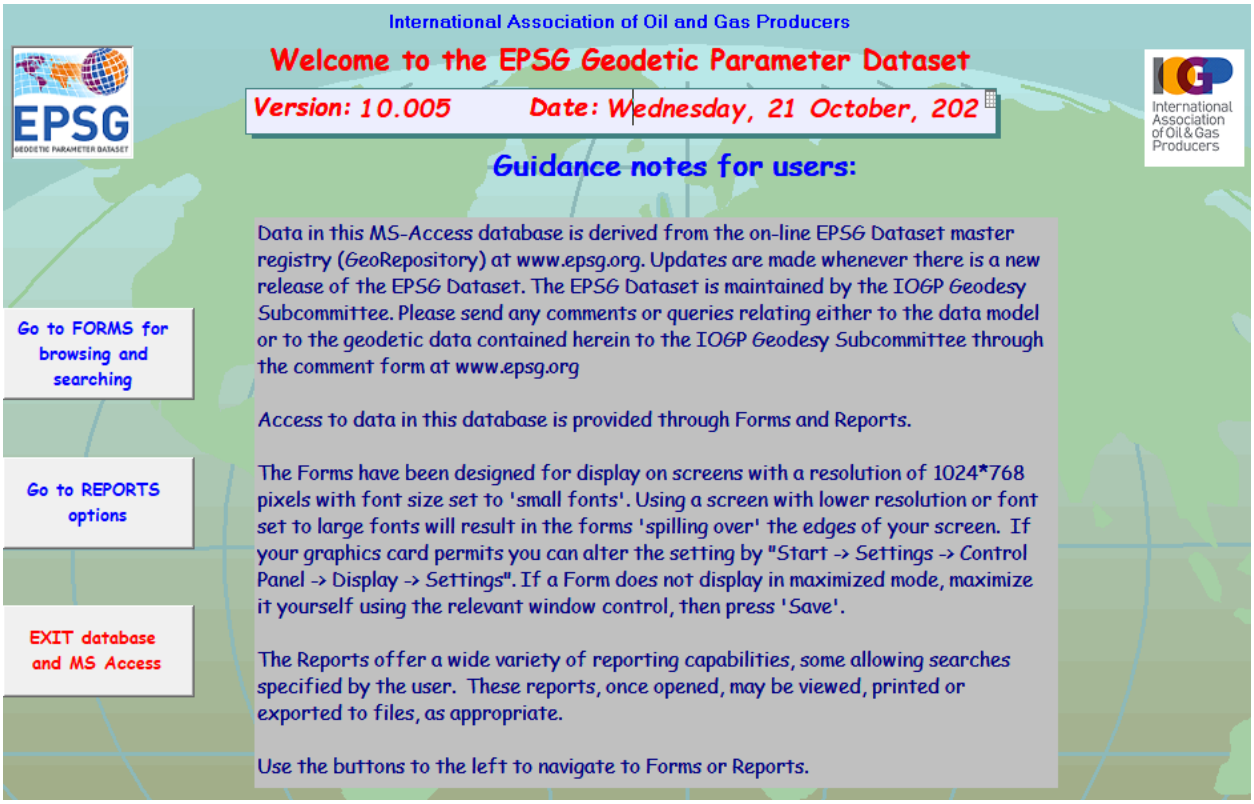


Figure 91: EPSG MS Access database file - example

6.3.2 Oracle export

From the menu provided select the Oracle option (Figure 90). The application will return a zipped file, which when completed will show an icon like the one in Figure 92.

Figure 92: Oracle database zipped file

The downloaded file must be unzipped using one of the standard zipper applications. Once unzipped the following four files should automatically appear within the selected sub-directory. Instructions for installing the data in an Oracle database are given in the Readme file.

Name	Type	Compressed size
Oracle_Data_Script	SQL File	1,638 KB
Oracle_FKey_Script	SQL File	1 KB
Oracle_Readme	Text Document	1 KB
Oracle_Table_Script	SQL File	3 KB

Figure 93: Oracle database files

6.3.3 MySQL Scripts

From the menu provided select the MySQL Scripts option. The application will return a zipped file to the directory selected. When the zipped file is opened the following four files should be available. Instructions for installing the data in a MySQL database are given in the Readme file.

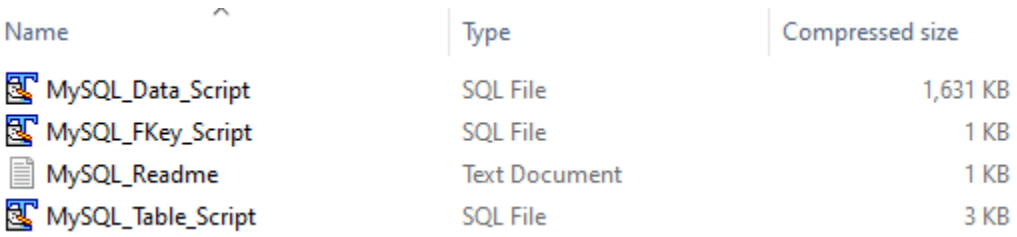


Figure 94: MySQL script files

An example from the top SQL file is shown in Figure 95.

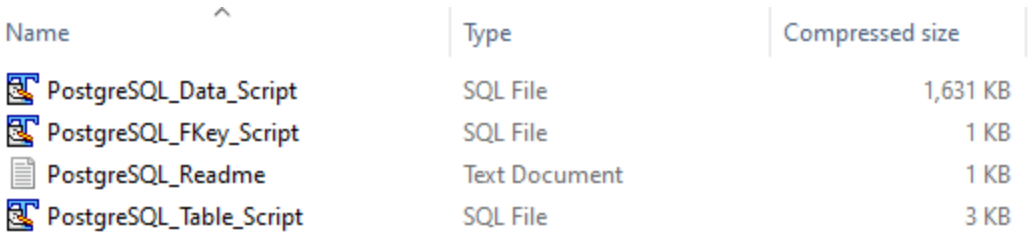
```
INSERT INTO epsg_area VALUES ( 3554,
'New Zealand - Snares and Auckland Islands',

'New Zealand - Snares Island, Auckland Island - onshore.',
-51.13,
        -47.8,
        165.55,
        166.93,
    'urn:ogc:def:extent-polygon:EPSG::3554',
'',
'',
Null,
'',
'LINZ',
'OGP',
'2014-05-01',
'2012.027 2014.015',
0);
```

Figure 95: MySQL script example

6.3.4 PostgreSQL scripts

From the menu provided select the PostgreSQL Scripts option. The application will return a zipped file to the directory selected. When the zipped file is opened the following four files should be available. Instructions for installing the data in a PostgreSQL database are given in the Readme file.



Name	Type	Compressed size
PostgreSQL_Data_Script	SQL File	1,631 KB
PostgreSQL_FKey_Script	SQL File	1 KB
PostgreSQL_Readme	Text Document	1 KB
PostgreSQL_Table_Script	SQL File	3 KB

Figure 96: PostgreSQL script export

An example of the data file is shown in Figure 97.

```
INSERT INTO epsg_coordoperation VALUES ( 1171,
'NAD27 to WGS 84 (2)',
'transformation',
4267,
4326,
'DMA-Cen Am',
2,
2419,
'For military purposes only. Accuracy 8m, 3m and 5m in X, Y and Z axes.',
10,
9603,
Null,
Null,
'Derived at 19 stations.',
'U.S. Defense Mapping Agency TR8350.2 September 1987.',
'OGP',
'2014-11-19',
'2005.200 2014.058',
1,
0 );
```

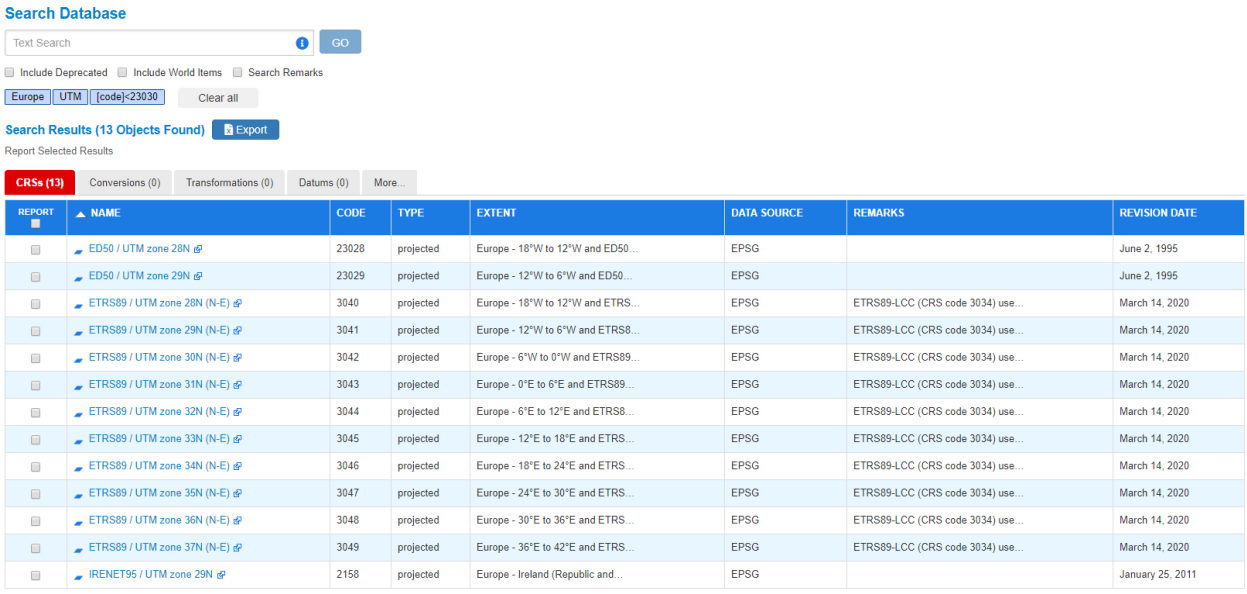
Figure 97: PostgreSQL script data file

6.3.5 WKT

From the menu provided select the WKT option. The application will return to the directory selected a zipped file containing well-known text (WKT) compliant with ISO 19162:2019 for all valid CRS, transformations, point motion operations and concatenated operations.

6.3.6 Export to spreadsheet

The results panel provides another export function where the objects returned from searches and shown on the tabbed pages (see section 5) can be exported to an Excel spreadsheet. Click on the **Export** button to the right of Search Results (xx objects found).



REPORT	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
	ED50 / UTM zone 28N	23028	projected	Europe - 18°W to 12°W and ED50...	EPSG		June 2, 1995
	ED50 / UTM zone 29N	23029	projected	Europe - 12°W to 6°W and ED50...	EPSG		June 2, 1995
	ETRS89 / UTM zone 28N (N-E)	3040	projected	Europe - 18°W to 12°W and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 29N (N-E)	3041	projected	Europe - 12°W to 6°W and ETRS8...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 30N (N-E)	3042	projected	Europe - 6°W to 0°W and ETRS89...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 31N (N-E)	3043	projected	Europe - 0°E to 6°E and ETRS89...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 32N (N-E)	3044	projected	Europe - 6°E to 12°E and ETRS8...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 33N (N-E)	3045	projected	Europe - 12°E to 18°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 34N (N-E)	3046	projected	Europe - 18°E to 24°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 35N (N-E)	3047	projected	Europe - 24°E to 30°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 36N (N-E)	3048	projected	Europe - 30°E to 36°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	ETRS89 / UTM zone 37N (N-E)	3049	projected	Europe - 36°E to 42°E and ETRS...	EPSG	ETRS89-LCC (CRS code 3034) use...	March 14, 2020
	IRENET95 / UTM zone 29N	2158	projected	Europe - Ireland (Republic and...	EPSG		January 25, 2011

Figure 98: Export results to Excel Spreadsheet

An example of an exported spreadsheet is given in Figure 99. The columns shown in the spreadsheet are identical to those within the application.

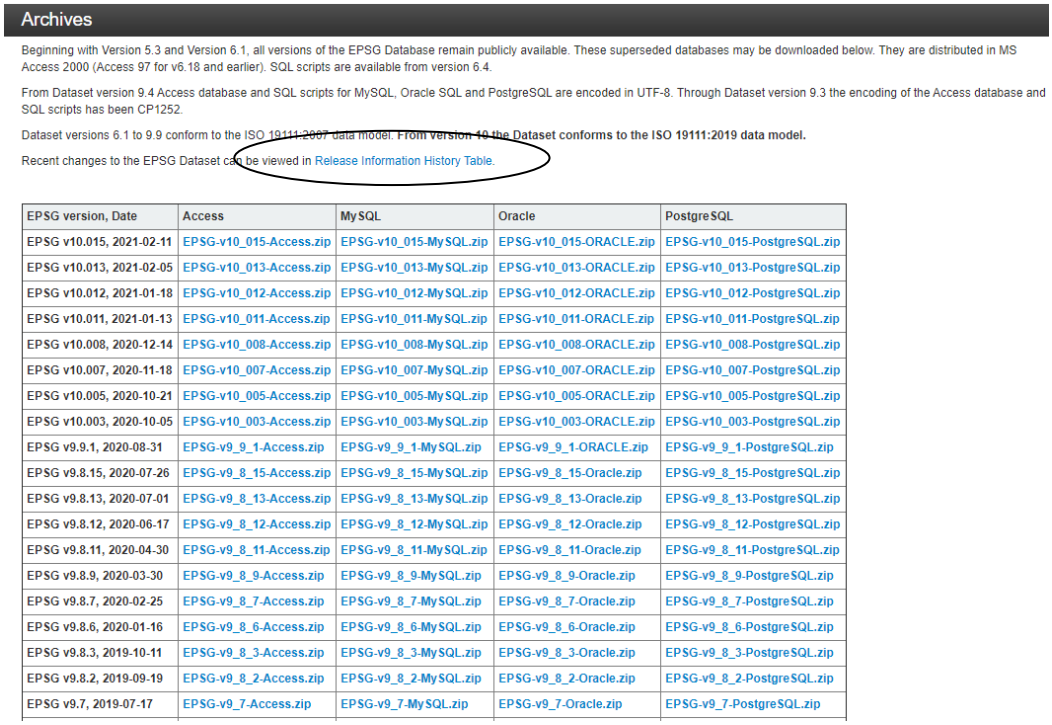
	A	B	C	D	E	F	G
1	NAME	CODE	TYPE	EXTENT	DATA SOURCE	REMARKS	REVISION DATE
2	GDM2000	4742	geographic 2D	Malaysia	OGP	Replaces all earlier Malaysian geogra	August 27, 2007
3	GDM2000	4920	geocentric	Malaysia	OGP		March 16, 2006
4	GDM2000	4921	geographic 3D	Malaysia	OGP		August 27, 2007
5	GDM2000 / East Malaysia BRSO	3376	projected	Malaysia - East Malaysia	OGP	Replaces Timbalai 1948 / RSO Borneo	January 21, 2012
6	IGS08	6934	geocentric	World (by country)	IOGP	Used for products from International (	May 17, 2019
7	ITRF2014	7789	geocentric	World (by country)	IOGP	Replaces ITRF2008 (CRS code 5332).	May 17, 2019
8	NSIDC EASE-Grid Global	3410	projected	World - 86°S to 86°N	OGP	Used as basis for Equal-Area Scalable	November 21, 2014
9	NSIDC EASE-Grid North	3408	projected	World - north of 0°N	OGP	Used as basis for Equal-Area Scalable	November 21, 2014
10	Timbalai 1948	4298	geographic 2D	Asia - Brunei and East Malaysia	OGP	Adopts metric conversion of 39.37014	September 24, 2010
11	Timbalai 1948 / RSO Borneo (ch)	29871	projected	Asia - Brunei and East Malaysia	OGP	Adopts ellipsoid metric conversion of	September 21, 2006
12	Timbalai 1948 / RSO Borneo (m)	29873	projected	Asia - Brunei and East Malaysia	OGP	Original projection definition in chain	September 24, 2010
13	Timbalai 1948 / UTM zone 49N	29849	projected	Asia - Brunei and East Malaysia - 108°E to 114°E	OGP		June 2, 1995
14	WGS 72 / UTM zone 49N	32249	projected	World - N hemisphere - 108°E to 114°E	OGP		June 2, 1995
15	WGS 72BE / UTM zone 49N	32449	projected	World - N hemisphere - 108°E to 114°E - by country and WGS 72BE	OGP		June 2, 1995
16	WGS 84	4979	geographic 3D	World (by country)	OGP		August 27, 2007
17	WGS 84 / NSIDC EASE-Grid 2.0 Global	6933	projected	World - 86°S to 86°N	OGP	Supersedes NSIDC EASE-Grid Global, (	November 21, 2014
18	WGS 84 / NSIDC EASE-Grid 2.0 North	6931	projected	World - north of 0°N	OGP	Supersedes NSIDC EASE-Grid North, C	November 21, 2014
19	WGS 84 / Pseudo-Mercator	3857	projected	World - 85°S to 85°N	IOGP	Not a recognised geodetic system. Us	November 25, 2015
20	WGS 84 / UTM grid system (northern hemisphere)	32600	projected	World - N hemisphere - 0°N to 84°N	OGP	Use WGS 84 / UTM zone xx N (codes 3	June 5, 2001
21	WGS 84 / UTM zone 49N	32649	projected	World - N hemisphere - 108°E to 114°E - by country	OGP		August 25, 2006
22	WGS 84 / World Mercator	3395	projected	World - between 80°S and 84°N	OGP	Euro-centric view of world excluding	June 2, 2006

Figure 99: Exported spreadsheet

6.4 Archive

Previous versions of the EPSG Dataset remain publicly available in the four different formats indicated. MS Access versions are available from EPSG v5.3, My SQL versions from EPSG v6.4, and Oracle and PostgreSQL versions from EPSG v6.7. To download an archived version, click on its link.

Note: there were data model changes beginning with Dataset versions 6 and 10.



Archives

Beginning with Version 5.3 and Version 6.1, all versions of the EPSG Database remain publicly available. These superseded databases may be downloaded below. They are distributed in MS Access 2000 (Access 97 for v6.18 and earlier). SQL scripts are available from version 6.4.

From Dataset version 9.4 Access database and SQL scripts for MySQL, Oracle SQL and PostgreSQL are encoded in UTF-8. Through Dataset version 9.3 the encoding of the Access database and SQL scripts has been CP1252.

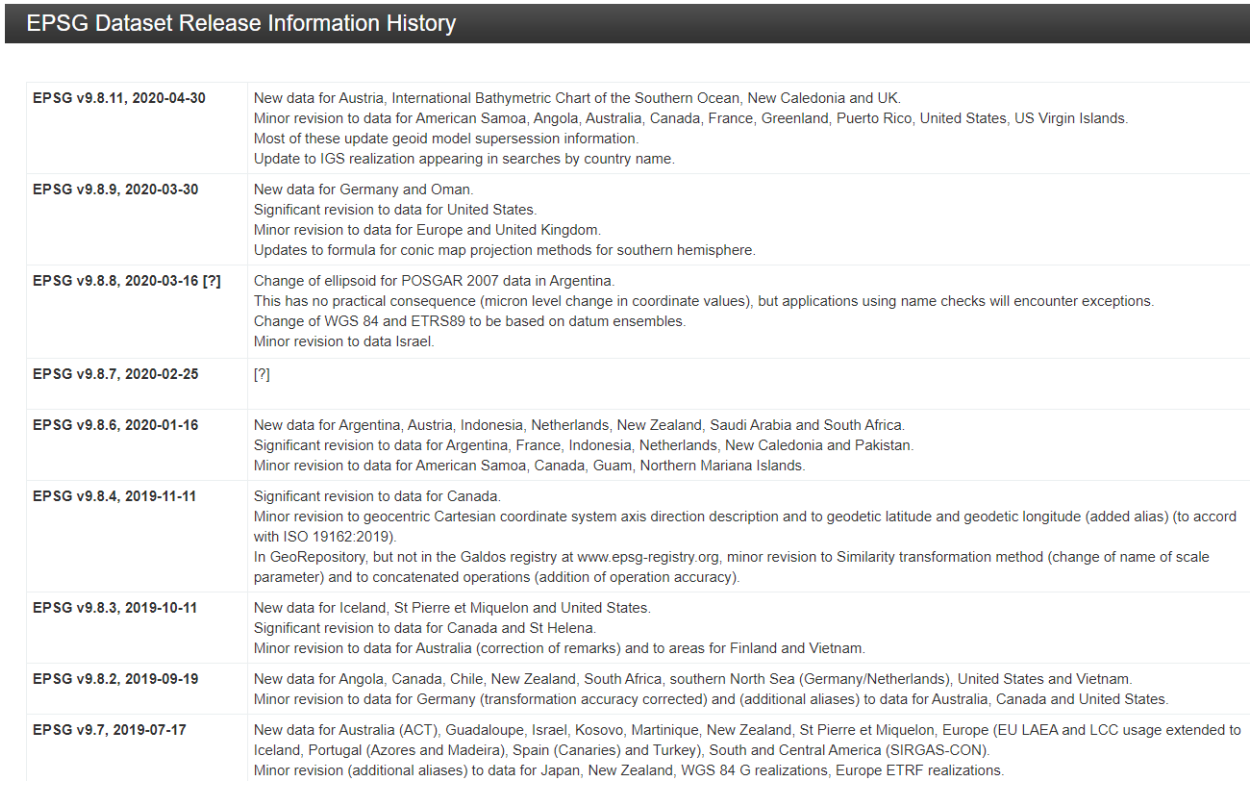
Dataset versions 6.1 to 9.9 conform to the ISO 19111:2007 data model. **From version 10 the Dataset conforms to the ISO 19111:2019 data model.**

Recent changes to the EPSG Dataset can be viewed in Release Information History Table.

EPSG version, Date	Access	MySQL	Oracle	PostgreSQL
EPSG v10.015, 2021-02-11	EPSG-v10_015-Access.zip	EPSG-v10_015-MySQL.zip	EPSG-v10_015-ORACLE.zip	EPSG-v10_015-PostgreSQL.zip
EPSG v10.013, 2021-02-05	EPSG-v10_013-Access.zip	EPSG-v10_013-MySQL.zip	EPSG-v10_013-ORACLE.zip	EPSG-v10_013-PostgreSQL.zip
EPSG v10.012, 2021-01-18	EPSG-v10_012-Access.zip	EPSG-v10_012-MySQL.zip	EPSG-v10_012-ORACLE.zip	EPSG-v10_012-PostgreSQL.zip
EPSG v10.011, 2021-01-13	EPSG-v10_011-Access.zip	EPSG-v10_011-MySQL.zip	EPSG-v10_011-ORACLE.zip	EPSG-v10_011-PostgreSQL.zip
EPSG v10.008, 2020-12-14	EPSG-v10_008-Access.zip	EPSG-v10_008-MySQL.zip	EPSG-v10_008-ORACLE.zip	EPSG-v10_008-PostgreSQL.zip
EPSG v10.007, 2020-11-18	EPSG-v10_007-Access.zip	EPSG-v10_007-MySQL.zip	EPSG-v10_007-ORACLE.zip	EPSG-v10_007-PostgreSQL.zip
EPSG v10.005, 2020-10-21	EPSG-v10_005-Access.zip	EPSG-v10_005-MySQL.zip	EPSG-v10_005-ORACLE.zip	EPSG-v10_005-PostgreSQL.zip
EPSG v10.003, 2020-10-05	EPSG-v10_003-Access.zip	EPSG-v10_003-MySQL.zip	EPSG-v10_003-ORACLE.zip	EPSG-v10_003-PostgreSQL.zip
EPSG v9.9.1, 2020-08-31	EPSG-v9_9_1-Access.zip	EPSG-v9_9_1-MySQL.zip	EPSG-v9_9_1-ORACLE.zip	EPSG-v9_9_1-PostgreSQL.zip
EPSG v9.8.15, 2020-07-26	EPSG-v9_8_15-Access.zip	EPSG-v9_8_15-MySQL.zip	EPSG-v9_8_15-Oracle.zip	EPSG-v9_8_15-PostgreSQL.zip
EPSG v9.8.13, 2020-07-01	EPSG-v9_8_13-Access.zip	EPSG-v9_8_13-MySQL.zip	EPSG-v9_8_13-Oracle.zip	EPSG-v9_8_13-PostgreSQL.zip
EPSG v9.8.12, 2020-06-17	EPSG-v9_8_12-Access.zip	EPSG-v9_8_12-MySQL.zip	EPSG-v9_8_12-Oracle.zip	EPSG-v9_8_12-PostgreSQL.zip
EPSG v9.8.11, 2020-04-30	EPSG-v9_8_11-Access.zip	EPSG-v9_8_11-MySQL.zip	EPSG-v9_8_11-Oracle.zip	EPSG-v9_8_11-PostgreSQL.zip
EPSG v9.8.9, 2020-03-30	EPSG-v9_8_9-Access.zip	EPSG-v9_8_9-MySQL.zip	EPSG-v9_8_9-Oracle.zip	EPSG-v9_8_9-PostgreSQL.zip
EPSG v9.8.7, 2020-02-25	EPSG-v9_8_7-Access.zip	EPSG-v9_8_7-MySQL.zip	EPSG-v9_8_7-Oracle.zip	EPSG-v9_8_7-PostgreSQL.zip
EPSG v9.8.6, 2020-01-16	EPSG-v9_8_6-Access.zip	EPSG-v9_8_6-MySQL.zip	EPSG-v9_8_6-Oracle.zip	EPSG-v9_8_6-PostgreSQL.zip
EPSG v9.8.3, 2019-10-11	EPSG-v9_8_3-Access.zip	EPSG-v9_8_3-MySQL.zip	EPSG-v9_8_3-Oracle.zip	EPSG-v9_8_3-PostgreSQL.zip
EPSG v9.8.2, 2019-09-19	EPSG-v9_8_2-Access.zip	EPSG-v9_8_2-MySQL.zip	EPSG-v9_8_2-Oracle.zip	EPSG-v9_8_2-PostgreSQL.zip
EPSG v9.7, 2019-07-17	EPSG-v9_7-Access.zip	EPSG-v9_7-MySQL.zip	EPSG-v9_7-Oracle.zip	EPSG-v9_7-PostgreSQL.zip

Figure 100: Archive file available

Each release has associated release notes. To view these, click on the link shown within Figure 100.



EPSG Dataset Release Information History

EPSG v9.8.11, 2020-04-30	New data for Austria, International Bathymetric Chart of the Southern Ocean, New Caledonia and UK. Minor revision to data for American Samoa, Angola, Australia, Canada, France, Greenland, Puerto Rico, United States, US Virgin Islands. Most of these update geoid model supersession information. Update to IGS realization appearing in searches by country name.
EPSG v9.8.9, 2020-03-30	New data for Germany and Oman. Significant revision to data for United States. Minor revision to data for Europe and United Kingdom. Updates to formula for conic map projection methods for southern hemisphere.
EPSG v9.8.8, 2020-03-16 [?]	Change of ellipsoid for POSGAR 2007 data in Argentina. This has no practical consequence (micron level change in coordinate values), but applications using name checks will encounter exceptions. Change of WGS 84 and ETRS89 to be based on datum ensembles. Minor revision to data Israel.
EPSG v9.8.7, 2020-02-25	[?]
EPSG v9.8.6, 2020-01-16	New data for Argentina, Austria, Indonesia, Netherlands, New Zealand, Saudi Arabia and South Africa. Significant revision to data for Argentina, France, Indonesia, Netherlands, New Caledonia and Pakistan. Minor revision to data for American Samoa, Canada, Guam, Northern Mariana Islands.
EPSG v9.8.4, 2019-11-11	Significant revision to data for Canada. Minor revision to geocentric Cartesian coordinate system axis direction description and to geodetic latitude and geodetic longitude (added alias) (to accord with ISO 19162:2019). In GeoRepository, but not in the Galdos registry at www.epsg-registry.org, minor revision to Similarity transformation method (change of name of scale parameter) and to concatenated operations (addition of operation accuracy).
EPSG v9.8.3, 2019-10-11	New data for Iceland, St Pierre et Miquelon and United States. Significant revision to data for Canada and St Helena. Minor revision to data for Australia (correction of remarks) and to areas for Finland and Vietnam.
EPSG v9.8.2, 2019-09-19	New data for Angola, Canada, Chile, New Zealand, South Africa, southern North Sea (Germany/Netherlands), United States and Vietnam. Minor revision to data for Germany (transformation accuracy corrected) and (additional aliases) to data for Australia, Canada and United States.
EPSG v9.7, 2019-07-17	New data for Australia (ACT), Guadaloupe, Israel, Kosovo, Martinique, New Zealand, St Pierre et Miquelon, Europe (EU LAEA and LCC usage extended to Iceland, Portugal (Azores and Madeira), Spain (Canaries) and Turkey), South and Central America (SIRGAS-CON). Minor revision (additional aliases) to data for Japan, New Zealand, WGS 84 G realizations, Europe ETRF realizations.

Figure 101: Release Information History

6.5 API

The GeoRepository API acts as the interface between the user and the database. Commands issued by the user and sent to the database to retrieve parameters and parameter values matching the query submitted. Typically, these commands are automatically generated by selections made using the web site. However, for developers and expert users who wish to interrogate the EPSG Dataset they can do so without using the web site, but instead issue their own scripts that adhere to the syntax required by the Swagger commands. Details of the swagger commands are provided by clicking on the

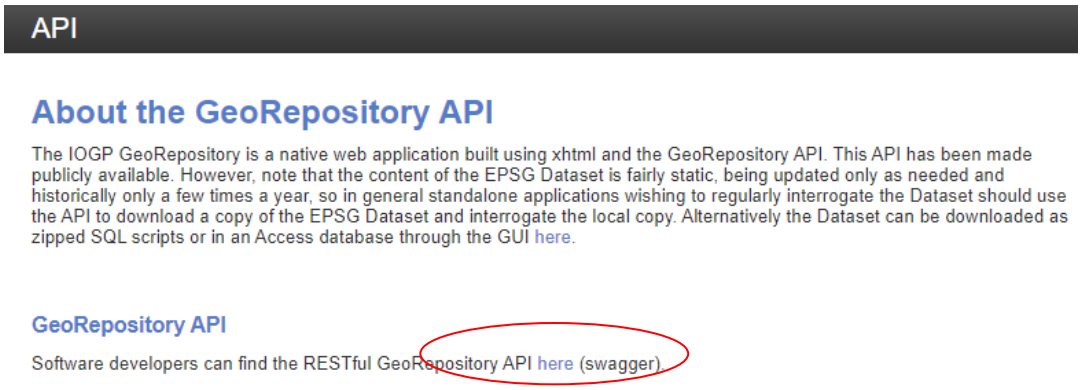


Figure 102: Access the swagger commands page

Clicking on the link will direct you to the following page. A list of all commands is provided to interrogate the EPSG Dataset and retrieve the parameters and parameter values from the geodetic objects.

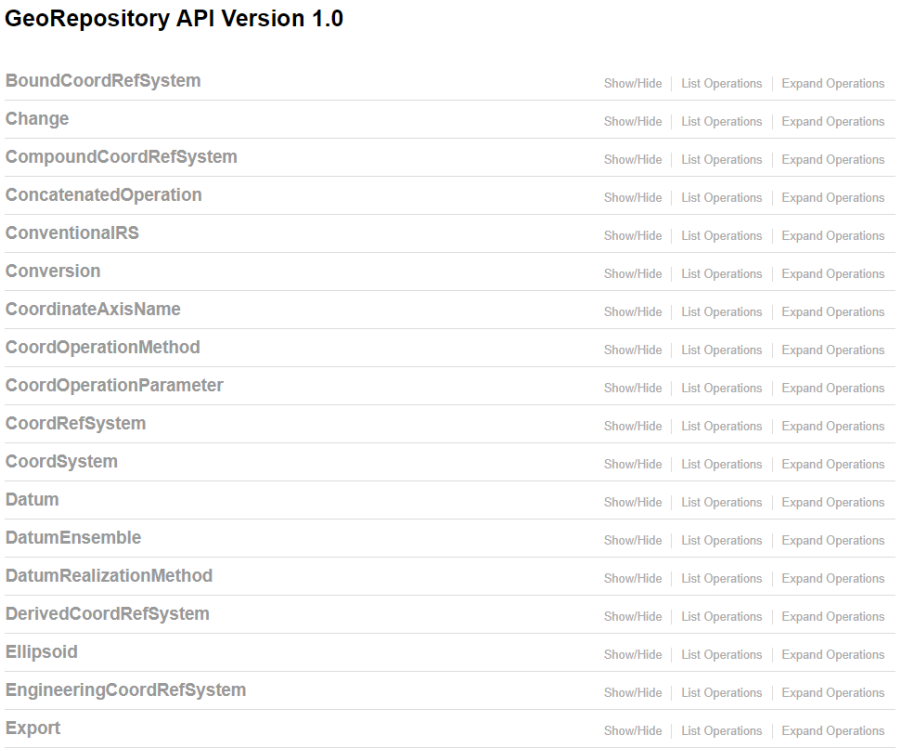


Figure 103: Swagger command for GeoRepository API

For any of the commands shown click on the 'List Operations' option shown on the right-hand side of the page and the GET operations will be displayed.

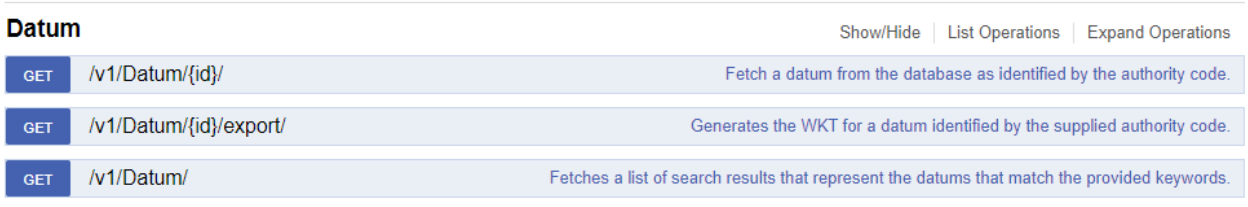


Figure 104: GET operations for Datum command

Click on any of the GET operations listed to display expanded details of the entry requirements. Users are directed towards a separate manual which describes further details of the API commands.

6.6 Printing reports

To print reports for specific objects shown within the search results panel, place a tick in the box to the left of the object name(s). Next, click on the **Report Selected Results** button (shown in the red ellipse).

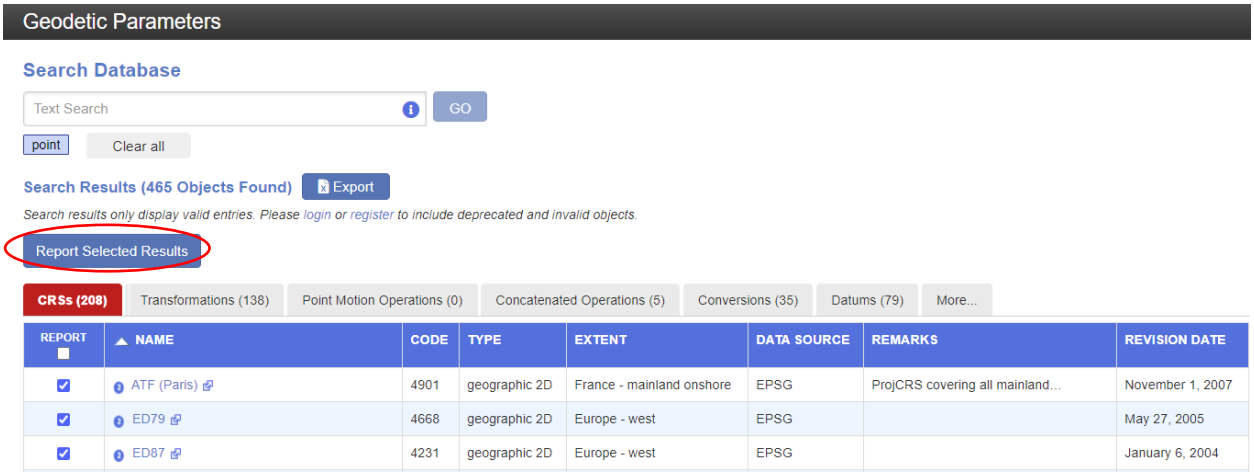


Figure 105: Print report for specific object

When completed a panel like the one in Figure 106 will appear.

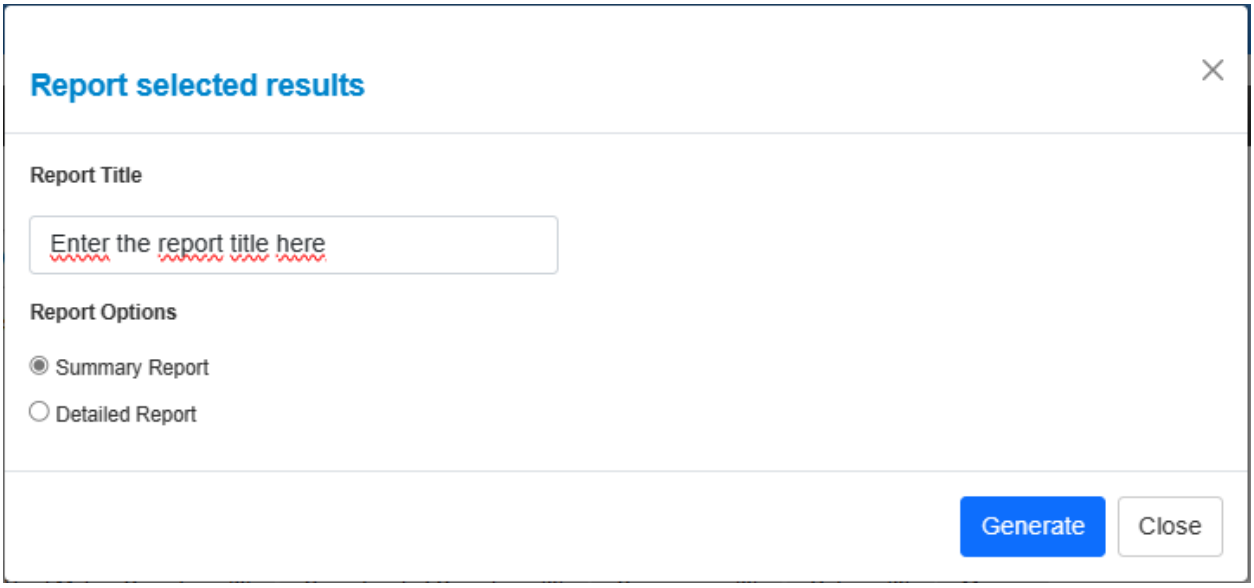


Figure 106: Report panel

Two options are provided to create either a summary report or a detailed report. The summary report omits aliases and metadata. Click on the appropriate radial button, e.g., Summary Report. Next, enter a title into the text box provided (an entry is required). Finally click on the **Generate** button to create the report. The report is generated within a separate window to the website.

EPSG Geodetic Parameter Dataset **Report Title** **EPSG Geodetic Parameter Registry**

Version 10.084

Report Type: summary
Parameter Count: 1

** You use the information in this report as agreed to by the terms of use.

NAD27 / Texas South Central [VALID]

Type:	Projected Coordinate Reference System				**Code:** EPSG::32040
Usage:	**Scope:**	Engineering survey, topographic mapping.			
	Extent:	United States (USA) - Texas - counties of Aransas; Atascosa; Austin; Bandera; Bee; Bexar; Brazoria; Brewster; Caldwell; Calhoun; Chambers; Colorado; Comal; De Witt; Dimmit; Edwards; Fayette; Fort Bend; Frio; Galveston; Goliad; Gonzales; Guadalupe; Harris; Hays; Jackson; Jefferson; Karnes; Kendall; Kerr; Kinney; La Salle; Lavaca; Live Oak; Matagorda; Maverick; McMullen; Medina; Presidio; Real; Refugio; Terrell; Uvalde; Val Verde; Victoria; Waller; Wharton; Wilson; Zavala. Gulf of Mexico outer continental shelf (GoM OCS) protraction areas: Matagorda Island; Brazos; Galveston; High Island, Sabine Pass (TX).			
Base CRS:	**Name:**	NAD27			
	Type:	Geographic 2D Coordinate Reference System			
Datum:	**Name:**	North American Datum 1927			
	Prime Meridian:	**Name:**	Greenwich		
	Ellipsoid:	**Name:**	Clarke 1866		
		Semi-Major Axis:	6378206.4 metre = 20925832.164 US survey foot [calculated]		
		Semi-Minor Axis:	6356583.8 metre = 20854892.017 US survey foot [calculated]		
		Inverse Flattening [calculated]:	294.9786982		
Conversion:	**Name:**	Texas CS27 South Central zone			
	Conversion Method:	**Name:**	Lambert Conic Conformal (2SP)		

Conversion Parameters:	Parameter Name	Parameter Value or Parameter File	Unit of Measure	Sign Reversal
	Latitude of false origin	27° 50' 00" N	sexagesimal DMS	No
	Longitude of false origin	99° W	sexagesimal DMS	No
	Latitude of 1st standard parallel	28° 23' 00" N	sexagesimal DMS	No
	Latitude of 2nd standard parallel	30° 17' 00" N	sexagesimal DMS	No
	Easting at false origin	2000000	US survey foot	No
	Northing at false origin	0	US survey foot	No

Coordinate System:	Coordinate Axes:	Order	Axis Name	Abbrev	Unit of Measure	Orientation
		1	Easting	X	US survey foot	east
		2	Northing	Y	US survey foot	north

Figure 107: Summary Report Example

Use the standard Windows options to either Save or Print the report. To access this menu right click within the page area.

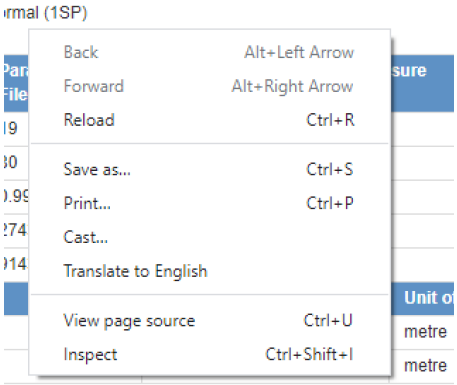


Figure 108: Save and print options

Repeat the process to generate the Detailed Report as required.

EPSG Geodetic Parameter Dataset **Enter the report title here** **EPSG Geodetic Parameter Registry**

Version 10.084

Report Type: detailed
Parameter Count: 1

** You use the information in this report as agreed to by the terms of use.

NAD27 / Texas South Central [VALID]

Type:	Projected Coordinate Reference System				**Code:** EPSG::32040
Aliases:	**Alias**		**Naming System**	**Remarks**	
	NAD27 / Texas South Cen.		EPSG abbreviation		
	NAD_1927_StatePlane_Texas_South_Central_FIPS_4204		ESRI		
Usage:	**Scope:**	Engineering survey, topographic mapping.			**Code:** EPSG::1142
	Extent:	**Description:**	United States (USA) - Texas - counties of Aransas; Atascosa; Austin; Bandera; Bee; Bexar; Brazoria; Brewster; Caldwell; Calhoun; Chambers; Colorado; Comal; De Witt; Dimmit; Edwards; Fayette; Fort Bend; Frio; Galveston; Goliad; Gonzales; Guadalupe; Harris; Hays; Jackson; Jefferson; Karnes; Kendall; Kerr; Kinney; La Salle; Lavaca; Live Oak; Matagorda; Maverick; McMullen; Medina; Presidio; Real; Refugio; Terrell; Uvalde; Val Verde; Victoria; Waller; Wharton; Wilson; Zavala. Gulf of Mexico outer continental shelf (GoM OCS) protraction areas: Matagorda Island; Brazos; Galveston; High Island, Sabine Pass (TX).		**Code:** EPSG::2256
Base CRS:	**Name:**	NAD27			**Code:** EPSG::4267
	Type:	Geographic 2D Coordinate Reference System			
	Aliases:	**Alias**	**Naming System**	**Remarks**	
		246	ISO Geodetic Register code		
		NAD27 - Latlon	ISO Geodetic Register name		
		GCS_North_American_1927	ESRI		
Datum:	**Name:**	North American Datum 1927			**Code:** EPSG::6267
	Aliases:	**Alias**	**Naming System**	**Remarks**	
		NAD27	EPSG abbreviation		
		D_North_American_1927	ESRI		
	Usage:	**Scope:**	Topographic mapping.		
		Extent:	**Description:**	North and central America: Antigua and Barbuda - onshore. Bahamas - onshore plus offshore over internal continental shelf only. Belize - onshore. British Virgin Islands - onshore. Canada onshore - Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Saskatchewan and Yukon - plus offshore east coast. Cuba - onshore and offshore. El Salvador - onshore. Guatemala - onshore. Honduras - onshore. Panama - onshore. Puerto Rico - onshore. Mexico - onshore plus offshore east coast. Nicaragua - onshore. United States (USA) onshore and offshore - Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin and Wyoming - plus offshore . US Virgin Islands - onshore.	**Code:** EPSG::1349
	Prime Meridian:	**Name:**	Greenwich		**Code:** EPSG::8901
		Greenwich Longitude:	0 degree		**Code:** EPSG::9102
	Ellipsoid:	**Name:**	Clarke 1866		**Code:** EPSG::7008
		Semi-Major Axis:	6378206.4 metre = 20925832.164 US survey foot [calculated]		**Code:** EPSG::9001
		Semi-Minor Axis:	6356583.8 metre = 20854892.017 US survey foot [calculated]		**Code:** EPSG::9001
		Inverse Flattening [calculated]:	294.9786982		
	Datum Origin:	Fundamental point: Meade's Ranch. Latitude: 39°13'26.686"N, longitude: 98°32'30.506"W (of Greenwich).			
Conversion:	**Name:**	Texas CS27 South Central zone			**Code:** EPSG::14204
	Conversion Method:	**Name:**	Lambert Conic Conformal (2SP)		**Code:** EPSG::9802
		Aliases:	**Alias**	**Naming System**	**Remarks**
			Lambert_Conformal_Conic_2SP	ESRI	
		Is method reversible?:	Yes		
	Conversion Parameters:	**Parameter Name**	**Parameter Code**	**Parameter Value or Parameter File**	**Unit of Measure**	**Uom Code**	**Sign Reversal**
		Latitude of false origin	EPSG::8821	27° 50' 00" N	sexagesimal DMS	9110	No
		Longitude of false origin	EPSG::8822	99° W	sexagesimal DMS	9110	No
		Latitude of 1st standard parallel	EPSG::8823	28° 23' 00" N	sexagesimal DMS	9110	No
		Latitude of 2nd standard parallel	EPSG::8824	30° 17' 00" N	sexagesimal DMS	9110	No
		Easting at false origin	EPSG::8826	2000000	US survey foot	9003	No
		Northing at false origin	EPSG::8827	0	US survey foot	9003	No
Coordinate System:	**Name:**	Cartesian 2D CS. Axes: easting, northing (X,Y). Orientations: east, north. UoM: ftUS.					**Code:** EPSG::4497
	Coordinate Axes:	**Order**	**Axis Name**	**Abbrev**	**Unit of Measure**	**Uom Code**	**Orientation**
		1	Easting	X	US survey foot	9003	east
		2	Northing	Y	US survey foot	9003	north
Life Cycle Status:	**Is Valid?** Yes						
	Superseded? No						
	Deprecated? No						
Data Source:	EPSG						
Revision Date:	2 juni 1995						

Figure 109: Detailed Report Example

6.6.1 Printing from object view

When viewing the object panel from the results table (e.g. Figure 86) there is another print option shown within the upper right-hand corner of that panel (Figure 110).

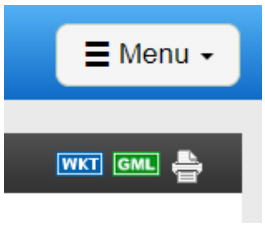


Figure 110: Print from object view

Click on the print icon on the right side and a new panel will appear with the Summary Report being displayed.

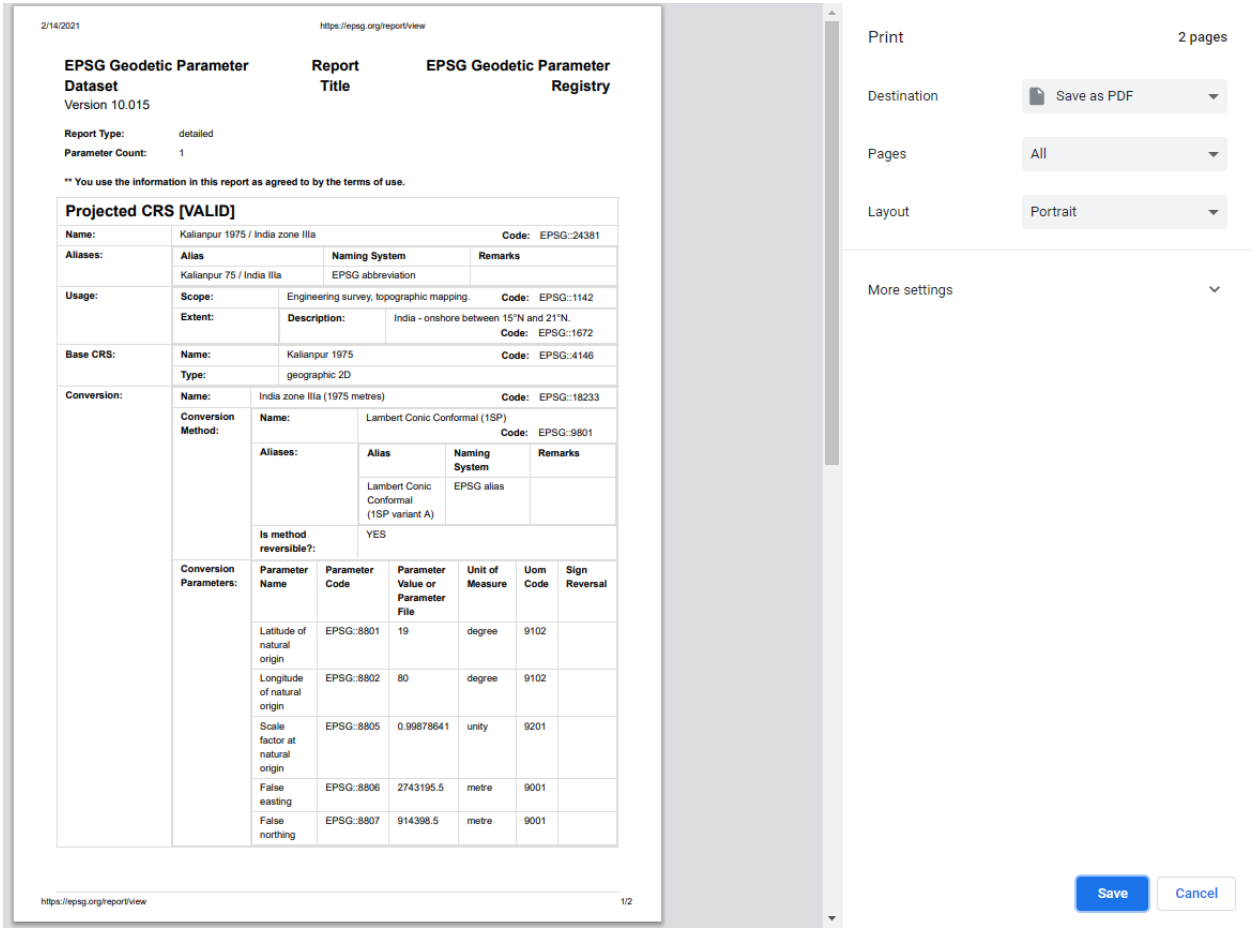


Figure 111: Printing summary report

On the right-hand side of the panel select the parameters required to print the report. This inclues file type (e.g. PDF), pages, page lay-out, page size etc.

7 Amendements

Manual version	Software version	Description
6.2	2.35.74	The reporting capability has been altered for projected CRS such that the datum information (semi-major and when applicable, semi-minor axis) as also calculated and given in the coordinate system units used by the CRS. This can be seen in the two examples: Figure 107 and Figure 109. The provider of the background map service used by the application has been switched to ESRI to ensure that labels are always in English and not localised as they were in previous versions of the software. This can be seen in figures: Figure 35 and Figure 59.

END OF DOCUMENT