



## Help text MACHU-GIS

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## 1 Introduction to MACHU-GIS

MACHU-GIS 2.4 has been developed within the framework of the EU Culture 2000 project MACHU (Managing Cultural Heritage Underwater). The main purpose of MACHU is to open up the information of the cultural underwater heritage to scientists, decision makers and the general public. The MACHU-GIS is to address scientists as well as policy makers. The public will be addressed through the MACHU website. For information on the MACHU project and the specific place of the GIS system within the project see: [www.machuproject.eu](http://www.machuproject.eu).

The MACHU-GIS has been developed on MapViewer internet version 2.4, the standard web-GIS application of Rijkswaterstaat, the executive arm of the Dutch Ministry of Infrastructure and Environment. The MapViewer is a web application enabling users to compose maps, for example for presentations or reports. Carrying out simple (spatial) analyses is also possible. A large number of geographic files can be used to compose the maps, in the course of which any combination is possible. For additional information on backgrounds, related applications and current projects in connection with the MapViewer, please contact Rijkswaterstaat at <https://www.rijkswaterstaat.nl/en/contact>.

Within MACHU-GIS it is possible to combine relevant data for managing the cultural underwater heritage from different sources. MACHU-GIS is originally developed to combine archaeological and historical data of several EU partners with the information of the surroundings (such as geophysical, chemical, sedimentation and oceanographic information), possible threats in the short term (such as erosion, works significantly developing the infrastructure, exploitation of the sea bottom, fishery) and possible threats in the long term (such as the increasing erosion due to the climate variation and chemical deterioration), as well as relevant legislation.

Map layers in the MACHU-GIS are presented through web services (WMS), some of which have standard data formats as defined during the MACHU-project. The web services are combined and grouped in to themes and layers by the administrator using an Administration Module. Each layer contains one or more sub layers, representing data from a specific source (Web Map Service), e.g. country representative. Users can access the information related to these map layers or create their own custom selection of map layers.

The application contains information in English. Information is based upon INSPIRE formats and OCG standards to the greatest possible extent.

## 2 Zooming in on the map

### *Description*

Zooming in on the map can be done in various ways. With each way of zooming a new map is fetched with visible map layers in conformity with scale dependency as laid down in the definition file on which the map is based.

### *Actions*

*Zooming in by means of clicking:*



- Activate the displayed button and click in the map to zoom in.

The point of clicking becomes the centre from which zooming occurs.

*Zooming in by means of drawing a frame:*



- 1 Activate the displayed button.
- 2 Drag a frame in the map keeping the left mouse button pressed in.

The selection becomes the point from which zooming occurs.

*Zooming in by means of the slider in the map:*



- Move the displayed slider up to zoom in.

*Zooming in by means of the plus (+) button above the slider:*



- Click the displayed button to zoom in..

*Zooming in by means of scrolling with the mouse:*

- Position the mouse in the map and scroll up.

The position of the mouse becomes the centre from which zooming occurs.

### 3 Zooming out on the map

#### *Description*

Zooming out on the map can be done in various ways. With each way of zooming a new map is fetched with visible map layers in conformity with scale dependency as laid down in the definition file on which the map is based.

#### *Actions*

*Zooming out by means of clicking:*



- Activate the displayed button and click in the map to zoom out.

The point of clicking becomes the centre from which zooming occurs.

*Zooming out by means of drawing a frame:*



- 1 Activate the displayed button.
- 2 Then drag a frame in the map keeping the left mouse button pressed in.

The selection becomes the point from which zooming occurs.

*Zooming out by means of the slider in the map:*



- Move the slider down to zoom out.

*Zooming out by means of the minus (-) button beneath the slider:*



- Move the slider down to zoom out.

*Zooming out by means of scrolling with the mouse:*

- Position the mouse in the map and scroll down.

The position of the mouse becomes the centre from which zooming occurs.

## 4 Zooming to the starting map extent

### *Description*

The starting map extent is stored in a map settings file. When login has occurred, the start map settings are loaded and zooming to the starting map extent occurs. This function is intended to return to the starting map extent (after the map extent has been adapted).

It is possible to [open a different map-settings file](#). When a different file is opened, zooming occurs to this map extent.

### *Actions*



- Click the displayed button to zoom to the starting map extent.

The starting map extent is displayed.

*Also view:*

[Opening map settings](#)

## 5 Previous and next map extent

### *Description*

Each zoom or move action to the map is stored as a map extent. The previous and next buttons enable a step forward or a step back in these map extents. This is comparable with the 'undo' and 'redo' functionalities.

### *Actions*



- Click the arrow to the left to view the previous map extent.



- Click the arrow to the right to view the next map extent.

This functionality applies only when a previous map extent has been viewed first.

## 6 Moving the map (panning)

### *Description*

It is possible to move (or pan) the map in various ways. The map can be picked up or moved by means of buttons with a fixed value. Besides, there is a navigation map representing the large map. The navigation map contains a red frame (the size of the frame depends on the scale level) which can be dragged to the desired position in the map.

### *Actions*

*Moving by means of grabbing and dragging the map:*



- 1 Activate the displayed button.
- 2 Click in the map and keep the left mouse button pressed (the map is 'picked up' by the mouse now).
- 3 Set the mouse in motion and the map is moved in the direction indicated.
- 4 Release the left mouse button to confirm the new position.

The map can only be moved within the limits of the frame.

*Moving by means of the panning buttons in the map:*



- The display contains four buttons enabling the map to be moved.

The button indicates the direction into which the map will move.

*Also view:*

- [Overview or navigation map](#)

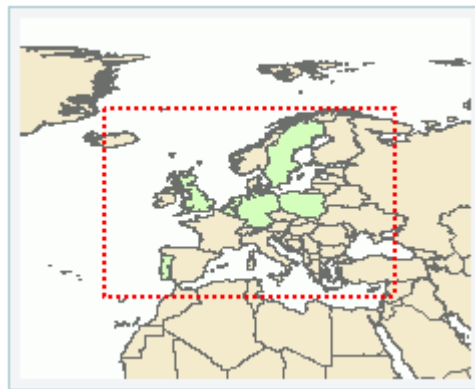


## 7 Overview or navigation map

### *Description*

The overview or navigation map represents the total map at a larger extent. The position of the map can be determined with the use of the red dotted frame or the red cross. The red frame changes into a red cross when zooming in far into the map has occurred. The overview or navigation map can be folded away by clicking the arrow (pointing down) on the bottom right. The map can be unfolded again by clicking the arrow (pointing up) on the bottom right.

In MACHU-GIS the maximum extent is set to global. The extent will increase when zooming in to the map, but will continue to represent the total map on a larger scale.



### *Action*

The overview or navigation map contains a red dotted frame or red cross.

- Drag the red dotted frame or the red cross to the desired position.

The map immediately moves along when the frame is dragged.

## 8 Measuring and displaying distance

### *Description*

The distance between 2 or more points can be measured within the map.

### *Action*



- 1 Click the displayed button to activate the measuring function.
- 2 Then place at least 2 points by clicking the desired positions in the map.

A line appears between the points applied.



The entire distance between the points and the distance of the latest segment are displayed as demonstrated in the illustration.

- Double-click in the map to stop the measuring session.

Clicking in the map again starts a new measuring session. The measuring function remains active as long as no other button is activated.

*Also view:*

[Measuring and displaying area](#)

## 9 Measuring and displaying area

### *Description*

A polygon can be drawn in the map. The area of this polygon is displayed.

### *Action*



- 1 Click the displayed button to activate the measuring function.
- 2 Then place at least 2 points by clicking the desired positions in the map.

A polygon appears between the points applied.

Measure: 115982.19 km<sup>2</sup>

The area of the polygon drawn is displayed as demonstrated in the illustration.

- Double-click in the map to stop the measuring session.

Clicking in the map again starts a new measuring session. The measuring function remains active as long as no other button is activated.

*Also view:*

[Measuring and displaying distance](#)

## 10 Displaying map information

### *Description*

Each map contains map layers which in their turn usually contain feature information. This function enables the feature information to be retrieved.

In MACHU-GIS the function acts on all visible map layers or on a single activated theme, layer or sub layer. Retrieved information is displayed on sub layer level.

### *Action*



- 1 Click the displayed button to activate the Identify function.
- 2 Optionally activate a theme, layer or sub layer to narrow the list of results.
- 3 Then click an object in the map whose information must be retrieved.

In MACHU-GIS a picture of a pin indicates the location of the click.

A window pops up containing the information available on the indicated objects of the active map layer or, if no map layer is active, of all visible map layers. The information is displayed in the shape of a table with the attribute names as column headings followed by the corresponding attribute values of the result.

*Also view:*

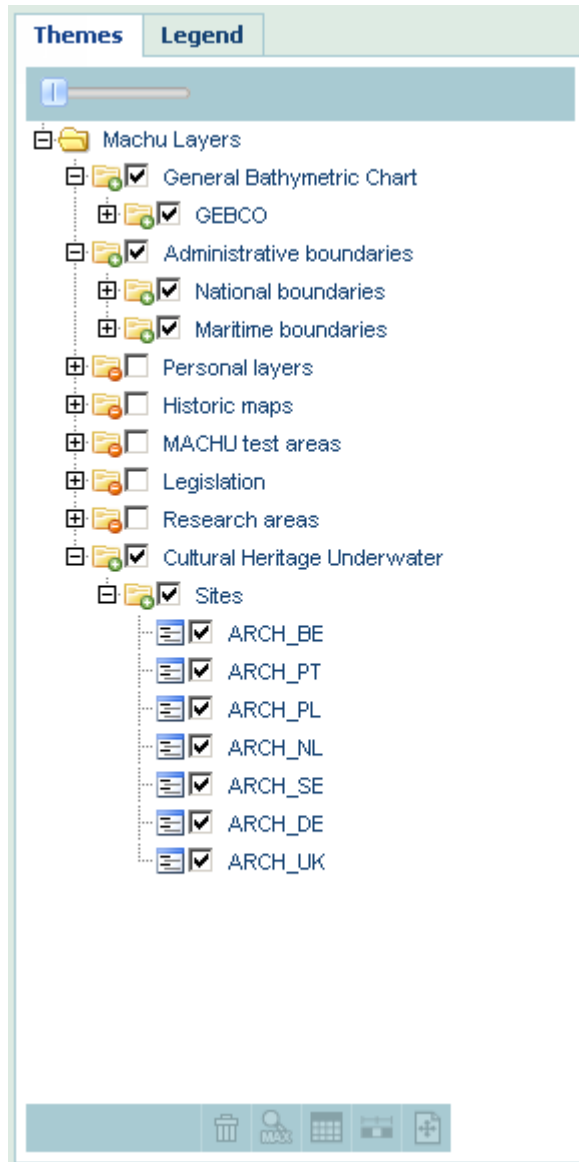
[Retrieving meta information](#)

[Activating a map layer](#)

[Introduction to MACHU-GIS](#)

## 11 Switching themes, layers en sub layers on and off

### Description



The table of contents (left of the map) contains all map layers that can be made visible within the map.

Clicking a plus-symbol in front of a theme or layer will unfold the hidden list of layers or sub layers below. Clicking a minus-symbol will hide them again.

Switching the visibility of themes, layers or sub layers on or off is done by ticking the checkboxes present in the table of contents. Ticking a theme on makes all the

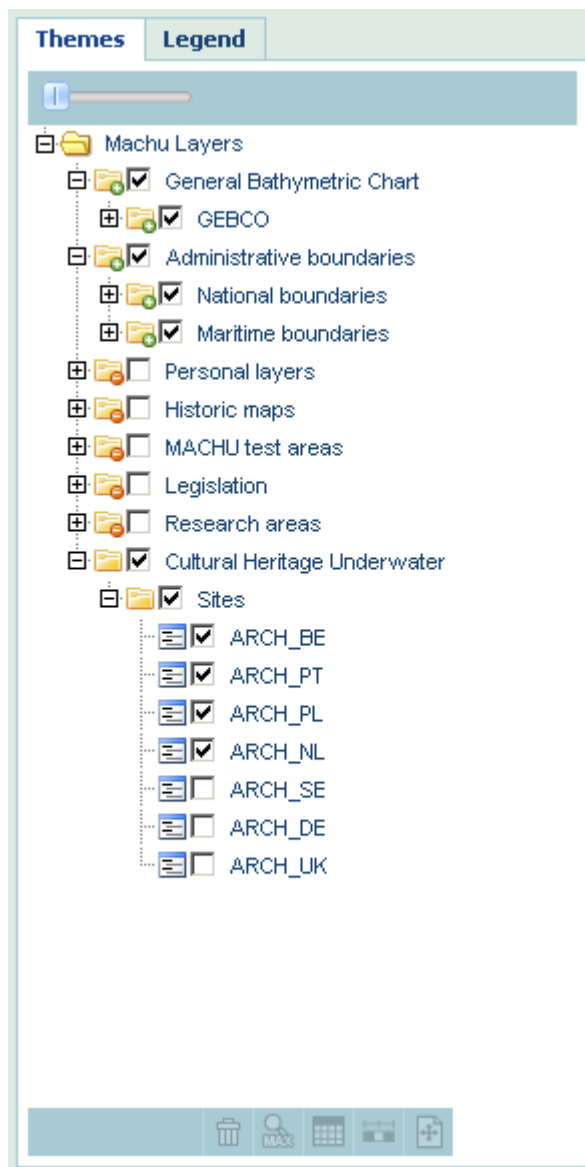
underlying layers and their sub layers visible. Ticking a layer on makes all underlying sub layers visible. And vice versa.

## 12 Indication of visibility of sub layers in layers and themes

The theme shows whether or not underlying layers and sub layers are visible:  
 Theme with a small folder and red icon means: underlying layers are not visible.  
 Green icon: all the layers and sub layers are visible.

Theme without icon added to the small folder: some layers or sub layers are visible, others are not.

The same applies on the level of the map layers.



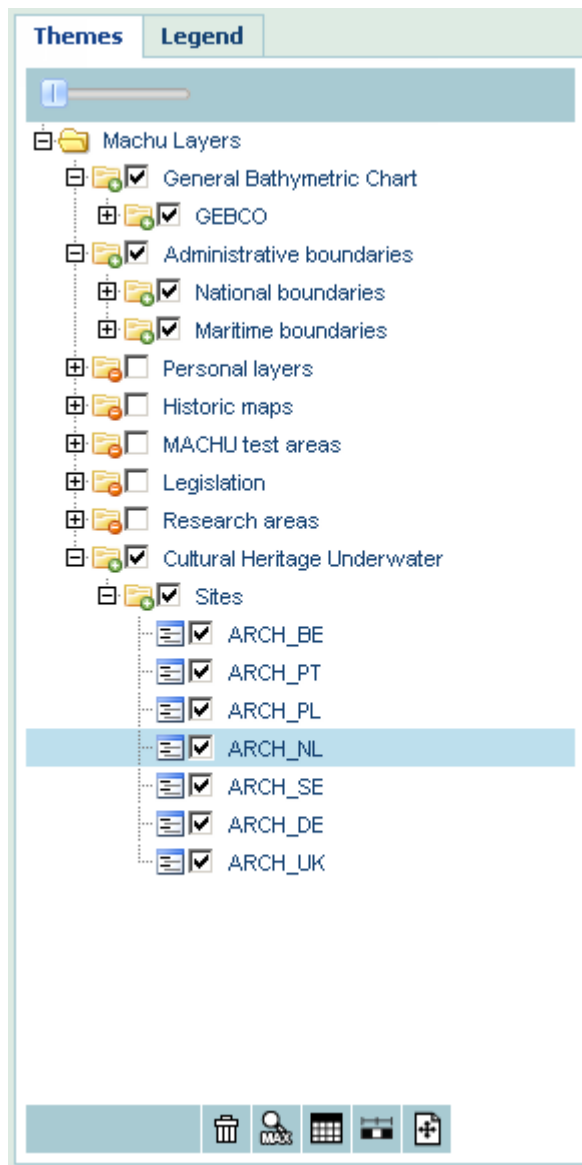
*Action*

- Tick the name of sub layer, map layer or theme to switch all the underlying layers off or on respectively.



## 13 Activating a map layer

### Description



Activating a map layer makes it possible to carry out actions related to the map layer in question.

It is possible to activate one single sub layer, a complete layer or an entire theme. Its background lightening blue indicates that a map layer is active. The activation is switched off again by clicking the map layer once more.

The possibility of using an activated sub layer, layer or theme depends upon the function that is carried out.

*Action*

- Activate a layer, sub layer or theme from the list by clicking a layer.

The following functionalities can be carried out on an active layer.

*Also view:*

- [Selecting by means of clicking](#)
- [Cancelling a selection](#)
- [Selecting with the use of a rectangle](#)
- [Selecting by drawing a line](#)
- [Selecting by drawing a polygon](#)
- [Selecting inside another geographical feature](#)
- [Query builder](#)
- [Using the selection table](#)
- [Editing labels](#)
- [Deleting labels](#)

## 14 Map layer visible in the legend

### *Description*

The elements of a **sub layer** are always displayed in the legend.

### *Action*

- Click the Legend tab to display the legends of the visible sub layers.

### *Also view:*

- Displaying active elements of the legend

## 15 Notification of visibility of scale-dependent sub map layer

### *Description*

Map layers have been digitalized with a particular scale (accuracy), as a result of which they have a corresponding application scale. Consequently in most cases it is unadvisable to use for example a topographic map 1: 25,000 on a scale of 1: 60,000. Making use of a topographic map 1: 50,000 is better in this case. Against this background, in combination with performance reasons, a minimum and/or a maximum scale has been defined for some files. The map layer concerned is not visible outside the defined scale. In the table of contents, this is indicated by the name of this map layer in red and the exclamation mark depicted with the map layer name.

In MACHU-GIS spatial resolution is defined in the sub layer.

### *Action*

No action

### *Also view:*

- Retrieving scale information on a map layer
- Zooming to the maximum scale

## 16 Adjusting the transparency of a map layer

### *Description*

A map is composed of map layers. These map layers are frequently positioned on top of one another. The sequence of the map layers is shown in the table of contents. A map layer 'X' will be placed above another layer 'Y' in the map, when the map layer 'X' is placed below map layer 'Y' in the table of contents. A map layer may be invisible because of another map layer on top of it. The transparency can be adjusted for each map layer by means of a slider.

In MACHU-GIS transparency can be adjusted on the layer level.



### *Action*

- 1 Activate a layer.
- 2 Use the displayed slider to adjust the transparency of the map.

The map layer transparency changes immediately, which is visible in the map.

*Also view:*

[Activating a map layer](#)

## 17 Adding a new theme, layer or sub layer

### *Description*

All layers added by the administrator, can be found in the table of contents when logging in to MACHU. It is possible to customize the table of contents by creating new themes and layers and adding sub layers. Sub layers, derived from a Web Map Service (WMS) can be selected from the administrator's layer list or derived from an external Web Map Service by entering its Uniform Resource Locator (URL).

### *Actions*

#### *Adding a new theme:*

- 1 Press the right mouse button and click on Machu Layers in top of the table of contents.
- 2 Select the Add theme option that will appear to open the 'Add Theme'- popup window.
- 3 Add a new theme name in the text box after 'Theme:'.
- 4 Click the Add button.
- 5 Click on the new added theme in the table of contents to move it to a desired location within the table of contents.

#### *Adding a new layer:*

- 1 Add the layer directly when creating a new theme by adding a layer name after 'Layer' in the 'Add theme' popup window.
- 2 Click on the new added layer in the table of contents to move it to a desired location within the theme.

Or

- 1 Press the right mouse button and click on the theme in the table of contents where the layer is to be added
- 2 Select the 'Add layer' option that will appear to open the 'Add (favourite)' popup window
- 3 Add a new layer name in the text box after 'Layer:'
- 4 Click the Add button.
- 5 To view the new added layer in the table of contents, press the minus symbol in front of the theme to unfold the list of layers.
- 6 Click on the new added layer in the table of contents to move it to a desired location within the table of contents.

#### *Adding a new sub layer from the administrator's layer list:*

- 1 Press the right mouse button and click on the layer in the table of contents where the sub layer is to be added
- 2 Select the 'Add sub layer' option that will appear to open the 'Add (favourite) map layer' popup window

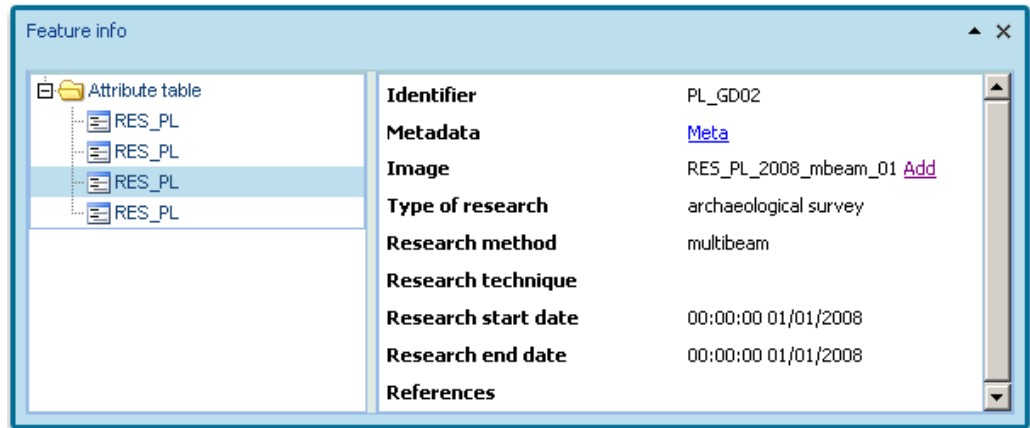
- 3 Select the 'Select' tab. A list of available web map services provided by the administrator is presented here. Each service contains one or more sub layers that can be add to, or are already present in, the table of contents.
- 4 Click the map of the desired service. The list with available sub layers unfolds
- 5 Click one sub layer. A preview of the file appears in the right window of the pop-up
- 6 Click the Add button to add the sub layer to the map layer.
- 7 Repeat previous steps to add more sub layers or click the Close button to close the pop-up and to return to the map.
- 8 To view the new added sub layer in the table of contents, press the minus symbol in front of the layer to unfold the list of sub layers.
- 9 Click on the new added sub layer in the table of contents to move it to a desired location within the layer.

*Adding a sub layer from an external web map service:*

- 1 Press the right mouse button and click on the layer in the table of contents where the sub layer is to be added.
- 2 Select the 'External' tab.
- 3 Enter the URL of the web map service in the text box, after 'URL:'.
- 4 Click the Connect button. A preview of the file appears in the right window of the pop-up
- 5 Click the Add button to add the sub layer to the layer.
- 6 Click the Close button to close the pop-up and to return to the map.
- 7 Repeat previous steps to add more sub layers or click the Close button to close the pop-up and to return to the map.
- 8 To view the new added sub layer in the table of contents, press the minus symbol in front of the layer to unfold the list of sub layers.
- 9 Click on the new added sub layer in the table of contents to move it to a desired location within the layer

*Adding Research Images*

In MACHU-GIS it is also possible to add images from an individual research represented by the features in the Research Area layer. To do this, open the attribute table of a Research Area sub layer and click on the 'Add'-button displayed in the 'Image' column. This button will only be displayed if an image is available. After clicking the 'add'-button, the image will be added into a Theme/layer called 'Research Images'. This Theme/layer will be created if the first image is added this way to the table of contents.



*Also view:*

[Displaying map information](#)

[Switching themes, layers and sub layers on and off](#)

[Changing the sequence of a map layer](#)



## 18 Deleting a theme, layer or sub layer

### *Description*

A **theme, layer or sub layer** can be deleted from the list of map layers. As a result the layer is no longer visible in the map.

### *Action*



- 1 Press the right mouse button and click on the theme, layer or sub layer in the table of contents
- 2 Select Delete.

### *Also view:*

- [Activating a map layer](#)

## 19 Zooming to the maximum scale

### *Description*

Map layers have been digitalized with a particular scale (accuracy), as a result of which they have a corresponding application scale. Consequently in most cases it is unadvisable to use for example a topographic map 1: 25,000 on a scale of 1: 60,000. Making use of a topographic map 1: 50,000 is better in this case. Against this background, in combination with performance reasons, a minimum and/or a maximum scale has been defined for some files. The map layer concerned is not visible outside the defined scale. In the table of contents this is indicated by the display of the name of this map layer in red and the exclamation mark depicted with the layer name.

The scales defined can be retrieved using the [scale information button](#).

When a map layer has a defined maximum scale, 'Zooming to maximum scale' zooms to this maximum scale and the map layer becomes visible. In the table of contents this is indicated by the name of the layer displayed in black. It may occur that the map layer, after zooming, is not displayed on screen yet. In this case the map layer is a large-scale map layer (for example: 1:10,000). In this case zooming occurred to a location where the map layer does not contain information. The map can be moved to a different area using the [panning functions](#). The minimum and the maximum scales are fixed and cannot be adapted.

In MACHU-GIS this functionality is active only on a sub layer level.

### *Action*



- Click the displayed button to zoom to the active map layer.

If a maximum map scale has been defined for the active map layer, zooming occurs to the maximum scale.

In MACHU-GIS this functionality is active only on a sublayer level.

### *Also view:*

- Retrieving scale information on an active map layer
- Notification of the visibility of a scale-dependent map layer
- Moving the map (panning)

## 20 Using the attribute table

### *Description*

The attribute table contains attribute information of the active map layer. Additional functionalities are available which are related to the attribute table. These functionalities become available as soon as the attribute table is opened.

In MACHU-GIS this functionality is active only on a sub layer level.

NOTE: If a selection is performed on the map layer, the attribute table will still show all features available in the sub layer, but the additional function will be performed on the selected set of features! Use the remove selection button at the select tab to delete the selection.

### *Actions*



- 1 Activate a sub layer.
- 2 Click the displayed button at the bottom of the table of contents.

A window pops up containing the attribute information (in table shape) of all features within the active sub layer.

### *Highlighting object(s)*



- 1 Select one or more rows (simultaneously press the 'Shift' or 'Ctrl' key when clicking more rows) to create a sub selection.
- 1 Click the displayed button.

The selected features are highlighted in the map.

### *Zooming to a selection*



- 1 Click the displayed button.

Zooming occurs to all features. However if a sub selection is created, zooming will occur only to the selected set of features.

### *Exporting to an Excel file*



1. Click the displayed button.
2. Click 'Save' or 'Open' when the request appears to download the Excel file.

The Excel file contains the same values as the attribute table. If a sub selection is created, only the rows of the sub selection will be exported.

Deleting a sub selection



If a sub selection is present, it can be deleted.

- 1 Click the displayed button.

The sub selection is removed from the table. The selection remains unchanged.

Sorting records

It is possible to sort the records of the selection table.

- 1 Select an attribute header. Once a header is selected, an arrow is displayed after the attribute name and a dropdown list with additional options is added.
- 1 Click on the arrows after the attribute name to order the record ascending or descending or
- 1 Click the dropdown list and select the option Sort Ascending or Sort descending

Determine the visibility of attributes

It is possible to determine which attributes in the table are visible.

- 1 Select an attribute header. Once a header is selected, an arrow is displayed after the attribute name and a dropdown list with additional options is added.
- 1 Click the dropdown list and select the option Columns to open a list of available attributes.
- 1 Switching the visibility of attributes on or off is done by ticking the checkboxes in front of each attribute

*Also view:*

- [Using the selection table](#)
- [Cancelling a selection](#)
- [Activating a map layer](#)

## 21 Retrieving scale information on an active map layer

### *Description*

Each map layer has a minimum and a maximum scale level. The map layer is only visible when the scale of the map is between the minimum en the maximum scale level of the map layer.

In MACHU-GIS this functionality is active only on an active sub layer level.

### *Action*



- 1 Activate a sub layer.
- 2 Click the displayed button at the bottom of the table of contents or the legend.

A window pops up containing the scale information of the selected map layer.

*Also view:*

[Notification of visibility of scale-dependent sub map layer](#)

[Activating a map layer](#)

## 22 Retrieving meta information

### Description

All map layers contain [meta information](#).

In MACHU meta information can only be retrieved on a sub layer level.

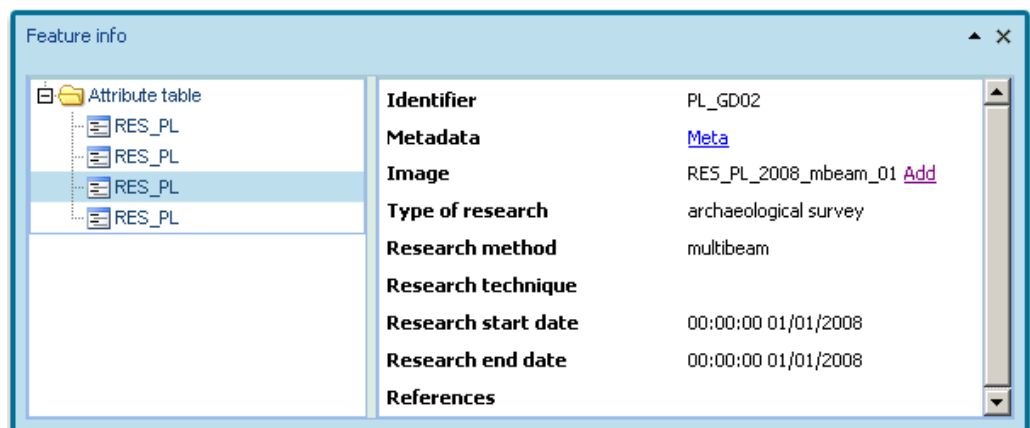
### Action



- 1 Activate a **SUB** layer.
- 2 Click the displayed button at the bottom of the table of contents or the legend.

A window pops up containing the meta information of the selected **SUB** layer.

In MACHU-GIS it is also possible to retrieve meta information from individual research datasets represented by the features in the Research Area layer. To do this, open the attribute table of the Research Area sub layer and click on the metadata-button of a research.



Also view:

- [Activating a map layer](#)
- [Displaying map information](#)
- [Meta data](#)

## 23 Changing the sequence of map layers

### *Description*

The sequence of the map layers in the table of contents is related to the visibility in the map. The upper map layer in the list is the upper the map layer in the map as well. Consequently certain map layers may occur in the map although they are not visible because another map layer is on top of them. Adapting the sequence of the map layers makes underlying layers visible again. The [transparency](#) of a map layer can also be adapted to make underlying map layers visible.

Because of the layered arrangement of the maps in this application, above-mentioned procedure applies only for sub layers within their own layer, layers within their own theme and complete themes within the table of contents. So sub layers cannot be moved to other layers or other themes and layers cannot be moved outside their themes.

### *Action*

- 1 Select a theme, layer or sub layer from the table of contents and hold on to it using the left mouse button.
- 2 Drag the theme, layer or sub layer to the desired position in the table of contents.
- 3 Release the theme, layer or sub layer in the desired position.

The map is adapted on the basis of the position of the map layer.

*Also view:*

[Adjusting the transparency of a map layer](#)

## 24 Displaying active elements of a legend

### *Description*

A map layer contains elements which are symbolized in the map. The description of the symbols is displayed in the legend when a map layer is marked 'visible' in the table of contents.

### *Action*

- To view the legend, click the 'Legend' tab next to the 'Themes' tab at the table of contents.

### *Also view:*

[Map layer visible in the legend](#)



## 25 Adapting the scale

### *Description*

The scale level can be adapted by means of zooming in and out. Zooming occurs step-by-step. The steps were set in advance and cannot be adapted. The scale level is visible at the bottom of the map in an entry box. This value can be adapted manually by entering a different number. The map is adapted in conformity with the scale number entered.

### *Action*



- 1 Click in the entry box at the bottom of the map as shown in the illustration.
- 2 Enter a new scale number.
- 3 Press 'Enter' to confirm the scale number.

The map is adapted in conformity with the new scale number.

### *Also view:*

- [Zooming in on the map](#)
- [Zooming out on the map](#)
- [Retrieving scale information on an active map layer](#)
- [Notification of the visibility of a scale-dependent map layer](#)

## 26 Displaying cursor coordinates

### *Description*

The X and Y coordinates of the cursor (when the cursor is in the map) are visible at the bottom of the map in entry boxes. These boxes cannot be adapted manually. The X and Y coordinates are adapted when the mouse moves the cursor in the map. The coordinates are displayed in latitude en longitude according to the WGS84 coordinate system.

### *Action*

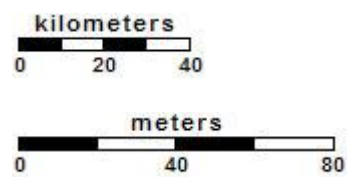
No action.

lon:  lat:

## 27 Scale ruler

### *Description*

The scale ruler is to be found at the bottom left of the map. It represents the scale in relation to the map. The scale rule is represented in kilometres in case of extensive zooming out, the scale rule is represented in metres in case of extensive zooming in.



### *Action*

No action.

### *Also view:*

- [Zooming in on the map](#)
- [Zooming out on the map](#)
- [Retrieving scale information on an active map layer](#)
- [Notification of the visibility of a scale-dependent map layer](#)

## 28 Maximizing a map window

### *Description*

A defined space has been reserved for the map window. It is possible to enlarge the displayed map window and to return it to its original size.

### *Action*



- 1 Click the displayed buttons.

The map window is enlarged when panels of the application are folded in. These panels can be folded out again through the buttons, so all the functions are usable again.

## 29 Opening map settings

### *Description*

A file of map settings may contain the following: labels, selections, map layers, red-lining and the zoom level. Several map settings can be stored. This file is loaded when logging in. A file of map settings can be opened from a location on a hard disk or network station.

Opening a map setting from a location on a hard disk or a network station:

- 1 Select the 'This computer' tab.
- 2 Click 'Browse' to find the desired map-settings file (xml).
- 3 Click 'Open'.
- 4 A pop-up window appears in which the user can choose if the layers are to be synchronized with the current layer-settings of the administrator.
- 5 If 'no' is selected, the window is closed and the settings of the opened file are loaded.
- 6 If 'yes' is selected, a new pop-up window appears in which the user is informed on which map layers, present in the settings file, will be added but are (no longer) part of the administrators settings. Also, the user is informed on which map layers are present in the administrator's settings but missing in the selected settings file. If desired, the user can select these map files to be added as well when the map layers are loaded.
- 7 Select 'Add' to add the map layers.

*Also view:*

[Saving map settings](#)

## 30 Saving map settings

### *Description*

A map-settings file (xml) may contain the following: labels, selections, map layers, red-lining and the zoom level. Several map settings can be stored.

### *Action*



- 1 Go to the 'File' tab.
- 2 Click the displayed button (a window pops up).
- 3 Select an existing folder or enter the name of a new folder.
- 4 Click 'Save'.
- 5 Click 'Close'.

The window is closed and the settings are stored in a new xml file.

### Overwrite an existing file.

- 1 Select an existing file in the list.
- 1 Click 'Save'.
- 1 Confirm this action by selecting 'Yes'.
- 1 Click 'Close'.

The window is closed and the settings are stored in the selected xml file.

*Also view:*

[Opening map settings](#)

## 31 Printing maps



### *Description*

A map can be printed or saved to a file (pdf).

When printing the map, a legend, title and north arrow will be added tot the map.

### *Action*



- 1 Select the 'File' tab.
- 2 Click the 'print' button to open up the 'print' pop up window
- 3 Add or select the following information from a dropdown list:
  - Title: Title of the map (optional)
  - Layout: Select a map layout
  - Scale: Select a print scale
  - Rotation: Rotation (degrees) to the map (default = 0°)
- 1 To reset the extent (and scale) of the map, select the reset position (reset pos.) button. A transparent square will appear in the map. Click on the square to move it to another position or rescale the map extent.
- 2 Click the Print button to create a pdf file of the map
- 3 A new window appears with a link to open the pdf file
- 4 Click on the link an open the pdf file in a new window using Adobe Acrobat
- 5 Print or save the pdf file using the Adobe Acrobat tools.

## 32 Selecting by means of clicking

### *Description*

This selection tool makes it possible to select features in the map by means of clicking objects in the map. When a selection has been created, it can be used. The selection table, for example, shows what was selected. Only features from [active map layers](#) can be selected.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button.
- 3 Select an object in the map by clicking it.

The selected object (based on the active sub layer(s)) are marked.

### *Also view:*

- Selecting with the use of a rectangle
- Selecting by drawing a line
- Selecting by drawing a polygon
- Using the selection table
- Cancelling a selection
- Activating a map layer



## 33 Cancelling a selection

### *Description*

A previously created selection of features can be cancelled by means of this functionality. This function deletes all current selections at any map layer.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button.

The selected features are deselected.

### *Also view:*

- [Selecting by means of clicking](#)
- [Selecting with the use of a rectangle](#)
- [Selecting by drawing a line](#)
- [Selecting by drawing a polygon](#)
- [Using the selection table](#)
- [Activating a map layer](#)

## 34 Selecting with the use of a rectangle

### *Description*

This selection tool makes it possible to select features in the map by means of drawing a rectangle. When a selection has been created, it can be used. The selection table, for example, shows what was selected. Only features from an [active map layer](#) can be selected.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button.
- 3 Keep the left mouse button pressed in and draw a rectangle around the features to be selected.

The selected objects (based on the active **SUB** layers) are marked.

### *Also view:*

- [Selecting by means of clicking](#)
- [Selecting by drawing a line](#)
- [Selecting by drawing a polygon](#)
- [Using the selection table](#)
- [Cancelling a selection](#)
- [Activating a map layer](#)

## 35 Selecting by drawing a line

### *Description*

This selection tool makes it possible to features in the map by drawing a line. When a selection has been created, it can be used. The selection table, for example, shows what was selected. Only features from an [active map layer](#) can be selected.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button.
- 3 Draw a line by placing dots in the map.
- 4 Double-click in the map to finish drawing the line.

The features touched (based on the active **sub**layers) are marked.

### *Also view:*

- [Selecting by means of clicking](#)
- [Selecting with the use of a rectangle](#)
- [Selecting by drawing a polygon](#)
- [Using the selection table](#)
- [Cancelling a selection](#)
- [Activating a map layer](#)

## 36 Selecting by drawing a polygon

### *Description*

This selection tool makes it possible to select features in the map by drawing a polygon. When a selection has been created, it can be used. The selection table, for example, shows what was selected. Only features from an [active map layer](#) can be selected.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button.
- 3 Draw a polygon by placing dots in the map.
- 4 Double-click in the map to finish the drawing of a polygon.

The features touched (based on the active **sub** layer(s)) are marked.

### *Also view:*

- [Selecting by means of clicking](#)
- [Selecting with the use of a rectangle](#)
- [Selecting by drawing a line](#)
- [Using the selection table](#)
- [Cancelling a selection](#)
- [Activating a map layer](#)

## 37 Selecting inside another geographical feature

### *Description*

This selection tool makes it possible to select features within a map layer 'Y' using a selected feature from another map layer 'X'. Map layer 'X' should contain polygon features.

### *Action*



- 1 Activate map layer 'X'
- 2 Go to the 'Select' tab.
- 3 Select a feature from map layer 'X' in the map by clicking it.
- 4 Click the displayed button to open the selection pop up window.
- 5 Select a sub layer from map layer 'Y' from the map layer dropdown list.
- 6 Choose a selection colour, used to identify the selected features in the map (optional).
- 7 Click the OK button to perform the selection
- 8 Click the Close button to close the selection window

Selected features (based on the active sub layers) are marked.

### *Also view:*

- [Selecting by means of clicking](#)
- [Selecting with the use of a rectangle](#)
- [Selecting by drawing a line](#)
- [Selecting by drawing a polygon](#)
- [Using the selection table](#)
- [Cancelling a selection](#)
- [Activating a map layer](#)

## 38 Query builder

### *Description*

The query builder enables the selection of geographic features on the basis of a query consisting of one or more expressions that can be combined. An expression comprises an attribute, an operator and a value. Attributes are the non-spatial features of a geographic object, for example the name of the object. The operator indicates what the value of the attribute has to comply with. The operators available are: equals (=), does not equal (!=), is smaller than (<), is smaller than or equals (<=), is larger than (>), is larger than or equals (>=), or contains (LIKE).


An example: all the objects dating back to before the year 1500 can be retrieved with the query First Year Dated < 1500.

The query builder can only be used after [activating the map layer](#) to be queried has occurred.

In MACHU-GIS all sub layers of an activated layer will be included in the query. To query a single sub layer, activate only this sub layer in the table of contents.

### *Action*



- 1 Go to the 'Select' tab.
- 2 Click the displayed button to open the 'Query builder' window.
- 3 Select an attribute from the attribute dropdown list.
- 4 Select an operator from the operator dropdown list.
- 5 Enter a selection value. By using the '..' button, a limited number of example values will be selected from the active map layer. To add an example value, select it from the example values dropdown list.
- 6 Click the Add button to combine the selected components of the query to a query expression.
- 7 Repeat previous steps to add another expression to the query (optional)  
Click  to delete an expression.

The expression appears in a table. If the entire expression must be denied, this is indicated by ticking in the 'Not' column of this table. The 'And/or' column of this table offers the opportunity to indicate how the expression must be combined with the next expression. This is done by clicking in the cell of the 'And/or' column. Attribute, operator and value can be changed here by clicking it and changing its content.

The complete query appears in the text box below the table, where the expressions are displayed.

- 8 Choose a selection colour, used to identify the selected features in the map (optional).

- 9 Select 'Execute query' to carry out the query, *OR*
- 10 Select 'Clear' to delete the entire query.

After executing the query one can

- 1 Use the Zoom to selection button to zoom to the selected features in the map *OR*
- 2 Open the selection table button to view the attribute information of the selected features in the selection table.

## 39 Using the selection table

### *Description*

The selection table contains attribute information of the active map layer.

If no selection has been performed on the active map layer, the table will contain attribute information on all available features within this map layer. If a selection is performed on the active map layer, the table will contain only attribute information on the selected set of features. Use the remove selection button at the select tab to delete any selection.

Additional functionalities are available which are related to the selection table. These functionalities become available as soon as the selection table is opened:

: When using the Open Attribute Table button at the bottom of the table of contents instead, this will open the attribute table showing all available features within a sub layer, regardless of any selection! The result of the additional functions within this table however, will still be performed on the selected set of features (if present).

### *Action*



The selection table can be opened if a selection has been created in an active sublayer.

- 1 Go to the 'Select' tab.
- 2 Click the displayed button.

A window pops up containing attribute information of the selected features in the shape of a table (or all features if no selection is performed). Within the table, the following functions are available:

#### Highlighting object(s)



1. Select one or more rows (simultaneously press the 'Shift' or 'Ctrl' key when clicking more rows) to create a sub selection.
- 1 Click the displayed button.

The selected features are highlighted in the map.

#### Zooming to a selection





- 1 Click the displayed button.

Zooming occurs to all features. However if a sub selection is created, zooming will occur only to the selected set of features.

### Exporting to an Excel file



- 1 Click the displayed button.
- 1 Click 'Save' or 'Open' when the request appears to download the Excel file.

The Excel file contains the same values as the attribute table. If a sub selection is created, only the rows of the sub selection will be exported.

### Deleting a sub-selection



If a sub-selection is present, it can be deleted.

- 1 Click the displayed button.

The sub-selection is removed from the table. The selection remains unchanged.

### Sorting records

It is possible to sort the records of the selection table.

- 1 Select an attribute header. Once a header is selected, an arrow is displayed after the attribute name and a dropdown list with additional options is added.
- 1 Click on the arrows after the attribute name to order the record ascending or descending *OR*
- 1 Click the dropdown list and select the option Sort Ascending or Sort descending.

### Determine the visibility of attributes

It is possible to determine which attributes in the table are visible.

- 1 Select an attribute header. Once a header is selected, an arrow is displayed after the attribute name and a dropdown list with additional options is added.

- 1 Click the dropdown list and select the option Columns to open a list of available attributes.
- 1 Switching the visibility of attributes on or off is done by ticking the checkboxes in front of each attribute

Also view

[Using the attribute table](#)

[Cancelling a selection](#)

[Activating a map layer](#)

## 40 Editing labels

### *Description*

A label is a tag showing information on an object in the map. These labels can be added to the map. Labels can be edited with respect to colour and font, deleted again and stored in a [map settings file](#).

### *Action*



- 1 Go to the 'Label' tab.
- 2 Click the displayed button (a window pops up).
- 3 Select an attribute.
- 4 Select a colour.
- 5 Select the character size.
- 6 Click 'OK' to confirm.

The window is closed and the edited labels appear in the map.

### *Also view:*

- [Deleting labels](#)

## 41 Deleting labels

### *Description*

If a map layer possesses [edited labels](#), they can be deleted.

### *Action*



- 1 Activate the layer possessing the labels to be deleted.
- 2 Click the displayed button.

The labels disappear from the map.

*Also view:*

[Editing labels](#)

# Settings

## *Description*

A User can determine the visibility of available functions within MACHU during a session.

## *Action*



- 1 Go to the Setting tab.
  - 2 Click the displayed button (a window pops up).
  - 3 Switching the visibility of functions done by:
    - Switching function on or off by ticking the checkboxes in front of each individual function
    - Switching all functions on by clicking the 'restore default functions' button or the 'show all functions.' button
- 1 Click the Close button to close the window. The functions will be visible according to the settings.

# Report

## *Description*

This function is added to MACHU GIS to create a possibility to report new cultural heritage features for MACHU according to the MACHU data formats. This function opens up a link to a website, managed by the Dutch MACHU partner, the Cultural Heritage Agency (Rijksdienst voor het Cultureel Erfgoed).

## *Action*



- 1 Go to the Report tab.
- 2 Click the displayed button to open up the website.
- 3 Follow the instructions on the website.

# Contact information

## *Description*

Questions or remarks on the MACHU GIS viewer can be posted tot the administrator.

## *Action*

- 1 Click 'Contact' in the top right header of the application.

# Help

## *Description*

Find help on the functionality of MACHU GIS.

## *Action*



- 1 Click Help in the top right header of the application or click the displayed button.



## 42 Adapting the character size

### *Description*

It is possible to adapt the font size of the application in the table of content, button information and the content of pop up windows.

### *Action*

- Select the desired font size by clicking the 'a' of the relevant size in the top right header of the application. The bold letter indicates which character size is active. The size of the first one is 11pt, the second is 13pt and the third 16pt.

## 43 ISO 19115:2003

In accordance with INSPIRE guidelines, the MACHU-GIS uses the ISO19915:2003 metadata standard for geography. Because of the development and maintenance of MACHU-GIS by Rijkswaterstaat, the metadata in MACHU is displayed according to the Dutch profile on ISO19915:2003, which contains the core set of the European profile set by INSPIRE.

You will find more information on European metadata standards for geography and web services on the website of [INSPIRE](#). For information on the Dutch meta data profile, visit the website of [Geonovum](#).

## 44 Explanation of the fields

Explanation of the meta data fields according to meta data standard ISO 19115:2003.

## 45 Metadata file identifier

Unique ID for the meta-data file. It is created with the use of the Global Unique Identifier.

## 46 Metadata language

What language is used to describe the meta data? Entering the correct language occurs with abbreviations. 'dut' is the standard indication for Dutch. Other examples: English 'eng', German 'gem', French 'fre'. For a complete list of abbreviations please go to: [http://www.loc.gov/standards/iso639-2/php/code\\_list.php](http://www.loc.gov/standards/iso639-2/php/code_list.php)

## 47 Metadata character set

Full name of the character encoding standard to describe the meta-data set. The encoding standard tells a computer which characters (letters, numbers, punctuation marks, etc.) a document is composed of: the bytes are translated into the correct characters and vice versa. This is a conditionally compulsory box: it is compulsory if the value of the character set is not in compliance with the ISO/IEC 10646-1. The standard is 'utf8', which stands for '8-bit variable size UCS Transfer Format, based on ISO/IEC 10646'. Because this code complies with ISO/IEC 10646, this box becomes optional.

## 48 Parent Id

Unique ID for the meta data of which these meta data are a subset. It is created by the use of the Global Unique Identifier and is generated automatically.

## 49 Metadata hierarchy level

On which data level is the meta data applicable (from low to high)? 4 data levels are to be distinguished:

- Attribute; is applicable to one feature, examples are: meta data with respect to the position, meta data with respect to the elevation data, meta data with respect to the concentration (as an attribute is never described on its own, this data level cannot be selected).
- Data set; is applicable to one collection of data which are connected in a certain way, examples are: topographic map 1:10,000 vector edition of December 2006, aerial photograph of a province included in the first quarter of 2005, depth gauging data of a harbour included in January 2007.
- Series; is applicable to a number of data sets, examples are: topographic map 1:10,000 vector editions of 1990 up to and including 2006, aerial photographs of provinces, included in 2000, 2002, 2005, 2007, depth gauging data of harbours, included in 1990, 1994, 1998, 2003, 2007.
- Service; is applicable to a (web)service with one or more data sets or series (a different ISO standard is used for the meta-data description of a service).



## 50 Hierarchy level description

If the metadata are not applicable to (one complete) data set, but a series is, this constitutes a deviating situation and this is an element to be entered compulsorily. In case of a data-set series an adequate description must be entered to which the meta data are applicable.

Examples are:

- Is applicable to all grid data sets within the (map-page) top25grid series.
- Is applicable to all polygon data sets of the digital topographic map 1:10,000 vector edition of 2006.
- Is applicable to all grid data sets within the aerial photograph 2006 15 cm resolution series.

## 51 Contact responsible party metadata

Name/address data in meta data of contact point

## 52 Responsible party meta data

Name of the organization or person responsible for the correctness of the contents of these meta data. Taking the 'Role of the organization' box into account is important in this respect, for this box indicates that the organization is also a contact point. When entering this item, use the full name of the (department within the) organization and, if applicable, followed by the official abbreviations of the department or organization (between brackets).

Examples are:

- Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) Data-ICT-Department (DID).
- Topografische Dienst Kadaster (Ordnance Survey).

## 53 URL of metadata organization

Website address of the organization or person responsible for the contents of these meta data.

Examples are:

<http://www.rijkswaterstaat.nl>

<http://www.kadaster.nl>

<http://www.zeeland.nl>.

## 54 Metadata date

This date indicates the up-to-date ness of these meta data. The date is entered automatically at the moment of creation of these meta data. When the meta data are changed afterwards, the date is automatically adjusted, so the up-to-date ness of these meta data remains correct. The date is displayed like this: YYYY-MM-DD (2007-12-31).

## 55 Metadata standard name

Name of the meta-data standard used. This box is automatically filled with the current international ISO standard for meta data: 'ISO 19115:2003'.

## 56 Metadata standard version

Name of a selection profile of the 'ISO 19115:2003' meta-data elements. Within The Netherlands this profile is called 'Nederlandse meta data standaard voor geografie 1.1' (abbreviated to 'NL profile') and it is binding for the Dutch national government. This profile is used to display meta information in MACHU GIS.

## 57 Dataset title

A unique and identifying name for the data set or data-set series.

Examples are:

- Address Coordinates The Netherlands (ACN) edition 2007.
- Depth gauging data Vlake van de Raan period 1 up to and incl. 15 January 2007.
- Dredging and pouring sections Westerschelde 2007 as per 1-01-2007.
- Kerngis road areas The Netherlands survey date 1-03-2007.



## 58 Alternative title

Translation of the data set into a different language or an addition to the data-set title (sub-title). In most cases a title is meant here indicating how the file is known in popular speech or else the official abbreviation of the file (e.g.. AHN5\*5, TOP10, DTB, NWB and the like).

## 59 Dataset reference date

This concerns the reference date of the related data set. The format of the date is YYYY-MM-DD (hyphenated). The type of event the date refers to is indicated in the linked 'Date of creation, publication or modification' box (related data-set reference date) (ISO no. 395). The information to be entered in this field must indicate whether the creation, a publication or a modification of this related data set is concerned.

## 60 Date of creation, publication or modification

Event to which the date is related. Possible events are: Date of completion (Creation), Date of publication and Date of latest modification (Revision). The choices have the following definitions:

Creation = Date on which the data set or data-set series was created.

Publication = Date on which the data set or data-set series was published.

Revision = Date on which the data set or data-set series was checked, corrected or modified.

## 61 Version

### Version number or version name

In a number of cases files which are kept up to date on a regular basis are indicated with a year in their data-set name, e.g. 'Aerial photograph 2007'. In most cases the version is not indicated in the data-set title. In all cases the version number or version name must be submitted here, so also including an additional specification when for instance a half-yearly or quarterly delivery is concerned, e.g. '2007 2nd quarter' or '2008 1st half year'. It is less common to indicate a GIS file used organization-wide or within several organizations by a version number such as '1.1' or '35' (as is usual with Word and Excel files (and the like)), although it may be advisable for specific file types, such as a depth-gauging file (grid file) of a (part of a) river branch or sea channel which is updated on a weekly basis (in this case the meaning of the version number must have been documented). In case of depth-gauging files it is also customary to submit a date (and time, if applicable) as a version number, e.g. '18aug07'.

## 62 Citation identifier code

Unique value to describe data, so each meta-data file is unique. Code is generated automatically.

## 63 Series name/number

Name of the series or derived data set, of which the data set is a part. A data set has a name for the main theme, e.g. 'DTB' (Digital Topographic Dataset). Usually this main theme is divided into one or more sub-themes or series, e.g. 'DTBwet' and 'DTBdry'. The moment when a correction or renewal is implemented in the data structure, the serial name and/or serial number is usually changed as well. E.g. 'DTBwet' and 'DTBdry', which are joined into a new serial name 'DTB2000' by means of an adjustment in the file structure. Another example is topographic files of the Topografische Dienst Kadaster (Ordnance Survey). The main theme is the common topographic files ('TOP'), the various serial names consist of e.g. 'TOP250grid', 'TOP50grid', 'TOP50vector', 'TOP10vector'(old), 'TOP10NL' (new).

## 64 Abstract

Enter an extensive description of the contents and meaning of the data set, this may deal with the geographic component as well as the attribute values, with the creation of the data set (series as well as with the (tips for the) use of the data set now and in the future.

Examples are:

- Address Coordinates The Netherlands comprises every known Dutch postal address, provided with an x- and a y-coordinate, measured in the National Triangulation System.
- The soil map contains information on the composition of the soil up to a depth of approximately 1 metre. Groundwater steps (Gts) provide information on the depth of on average the highest (GHG) and on average the lowest groundwater level (GLG)

The summary is also intended to incorporate each form of description that cannot be described in any other box. An example of this is a description of the period when obtaining data for the production of the data set was started and finished (such as the period of flying to take aerial photographs for or the production of the end product or an end product derived from this), with the period of obtaining those data being outside (before) the time frame of the temporal coverage of the data set. A second example is an indication of the box(es) which can be used to display labels and legend(s). A third example is a description of the number of records (number of polygons, lines or points) occurring in the data set, an indication whether the features are single-part or multi-part, an indication of the modifications, i.e. how many and which, if applicable, have been changed in comparison with a previous version of the file. Furthermore, the summary is important to indicate which data/objects may be incorrect, for example because data were obtained whose quality is (partly) doubtful.

## 65 Purpose of the creation

Purpose for which the data were originally created or intended. This may be, for example, 'topographic reference image scale 1: 25,000', 'aerial-photo reference image up to scale 1:1,000', 'reference image up to scale 1: 500 as basis for digitalization of management objects', 'depth gauging to determine the Nederrijn channel depth', 'file serves as Dredging Reference Plane for the Waal from 01-01-2008', 'to determine main routes in The Netherlands', etc. If the data set was specifically created for a project, it is advisable to describe this clearly here including the project name, project number (and other relevant file numbers, if any), description of the project (or a description of the location where information on the project is to be found) and the specific relation between data set and project.



## 66 Status

Status of editing or revision and use of data set or data-set series. Options:

- Update required. (Data are still to be updated/created).
- Planned. (Data are planned for update or creation).
- Under development. (Data are being created).
- Completed. (Data are ready, production is concluded).
- Continuously updated. (Data are constantly revised to keep them up to date).
- Historical Archive. (Data are stored in records which are not immediately accessible).
- Not relevant (Data are no longer relevant and consequently unusable).

## 67 Example

File name of a figure showing a sample image of the data set. Various extensions (file types) are possible, it is advisable to display the entire route (internet link) to the server, so it can be opened by clicking the button.

## 68 Responsible party dataset

Name of the organization or person responsible for the correctness of the contents of this data set or data-set series. It is of importance to take the following box into account: 'Role of the organization', for this box indicates that the organization is also a contact point. Please enter the full name of the (department within the) organization, followed, if applicable, by the official abbreviations of the department or organization (between brackets). Examples are: Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) Data-ICT-Department (DID) and Topografische Dienst Kadaster (Ordnance Survey).

## 69 Role of the responsible party

As a rule 'Contact point' is entered here, or 'The organization or person to be contacted to gather know-how on or supply of the data set(s)'.

Roles are:

- Supplier - Organization supplying the data.
- Manager – Party that accepted responsibility for and takes care of the management of the data.
- Proprietor – Party that owns the data.
- User – Party that uses the data.
- Distributor – Party involved with the delivery of the data set.
- Maker – Party that created the data.
- Contact point – Party that can be contacted to gather know-how or to supply the data.
- Obtainer – Key party responsible for gathering data and performing research.
- Editor – Party that edited the data, in such a way that the data have changed.
- Publisher – Party that publishes the data.
- Author – Party that is the author of the data.

## 70 URL of responsible party dataset

Website address of the organization or person responsible for the contents of this data set or data-set series.

Examples are:

<http://www.Rijkswaterstaat.nl>,

<http://www.kadaster.nl>,

<http://www.zeeland.nl>.

## 71 Keywords

Keywords are words which are commonly used and give a quick indication of the contents of a data set. Besides, keywords are used as search terms to find data sets within a digital databank.

Examples are:

Archaeology, Address coordinates, Postal addresses, Soil map, Geology, Depth data, Fauna, Flora, Boundaries administrative, Boundaries cadastral, Boundaries nature, Groundwater, Elevation data, Infrastructure, Aerial photography, Environmental data, Planning, Spatial use, Satellite images, Topography general, Topography organization-specific, Permits, Traffic data.

## 72 Thesaurus of keywords

Reference to a domain (thesaurus) which uses particular keywords and gives them meaning. E.g. GEMET - GEneral Multilingual Environmental Thesaurus, (European Environment Agency) at <http://www.eionet.europa.eu/gemet/>.

## 73 Spatial resolution

The scale to which the file may be truthfully used. Using a larger scale (more detail) than the applicable scale furnishes information which may seem correct, but contains a (light or strong degree of) inaccuracy that is usually not visible. A scale is as truthful as the scale to which the data in the data set were obtained, with the exception of data sets the same accurately obtained data of which have been generalized to a less detailed scale level. In this exceptional case the degree of generalization also determines the scale level of the data set.

Example: Where policy assistants want to be reasonably sure of the locations of houses and buildings in relation to the distance of a motorway route, they can make use of a large-scale file (e.g. scale 1:1,000) such as the GBKN (large-scale standard map of The Netherlands), the Land Registry Office or the DTB (Digital Topographic File). A consultant looking for a mapped overall survey of buildings on a national level makes use of a small-scale file displaying merely a generalized outline of a village or urban buildings (e.g. a topographic file on scale 1: 250,000). Note: so scale 1:1,000 is larger than a scale 1: 250,000.

Exclusively positive numeric numbers must be entered, examples are:

1000 = 1 in 1,000 (1 cm = 10 m)

10000 = 1 in 10,000 (1 cm = 100 m)

25000 = 1 in 25,000 (1 cm = 250 m)



## 74 Dataset language

What language is used to describe the data set? This concerns the texts in the boxes and the definitions of the attribute table. Entering the correct language occurs using abbreviations. 'Dut' has been entered for Dutch. Other examples are: English 'eng', German 'gem', French 'fre'. For a complete list of abbreviations please go to: [http://www.loc.gov/standards/iso639-2/php/code\\_list.php](http://www.loc.gov/standards/iso639-2/php/code_list.php)

## 75 Dataset character set

Full name of the character encoding standard used to describe the data set. The encoding standard tells a computer which characters (letters, numbers, punctuation marks, etc.) a document is composed of: the bytes are translated into the correct characters and vice versa. This is a conditionally compulsory box; it is compulsory if the value of the character set is not in compliance with ISO/IEC 10646-1.

The standard is 'utf8', which stands for '8-bit variable size UCS Transfer Format, based on ISO/IEC 10646'. As this code complies with ISO/IEC 10646, this box is optional.

## 76 Topic categories

Main theme(s) of the data set. For example: 'elevation' for General Elevation File The Netherlands (AHN) or 'location' for Address Coordinates The Netherlands (ACN). Select from the options below:

Agriculture and cattle breeding	Livestock farming or growing plants. For example: agriculture, irrigation, diseases affecting crops.
Biota	Flora and fauna in their natural environments. For example: habitats, ecology.
Boundaries	Area descriptions with legal status. For example: habitat guideline for areas, Flora & Fauna Act for areas, political and administrative boundaries.
Climatology, meteorology, atmosphere	Processes and phenomena in the atmosphere. For example: cloud cover, weather, climate change.
Elevation	Elevation information, both on land and under water. For example: laser altimetry, depth gauging, elevation map, DEM, slopes.
Nature and environment	Natural sources, protection and management. For example: environmental pollution, countryside, water quality, waste storage.
Geoscientific data	Data belonging to an earth science. For example: geology, minerals, structure of the earth, gravity map, raw materials, erosion.
Health	Health (care), human ecology and security. For example: diseases, hygiene, health care.
Reference material on earth coverage	Basic maps. For example: land coverage, topographic maps, (aerial) photographs, unclassified maps.
Military	Sensitive military information such as bases, structures and activities. For example: barracks, warehouses, drill grounds, military transports.
Location	Positional information and services. For example: addresses, geodetic network, postcodes and postcode areas, place names, checkpoints.
Oceans	Information on areas with salt-water bodies (not in-land). For example: tides, coastal information.
Planning land register	Information used for planning activities. For example: land use, cadastral information.
Society	Characteristics of society and cultures. For example: anthropology, archaeology, crime, customary practices, settlements, education.
(Civil) structures	Structures made by humans. For example: dams, bridges, sluices, museums, churches, shops, towers.

Transport	Means of transport of goods and/or persons. For example: waterways, railways, roads, airports, tunnels.
Utility companies and communication	Infrastructure and facilities. For example: power cables, water mains, gas mains, water purification, telecommunication, radio, TV.

## 77 Supplemental information

Additional information with respect to the data, for example documentation. One or more references to documentation can be included here (e.g. an ISBN number), maybe as an internet link, describing additional information on the data set.

Examples are:

MER A50/A73 rapport, isbn :..

<http://www.ahn.nl>

<https://vergunningen.rws.nl/vergunningen>

## 78 Name of related data set

Group of connected data sets which have not been defined as a 'data-set series'. This usually concerns project and planning studies and implementation projects. Examples of linked (related) data sets are: 'PKB Space for the River (Key Planning Decision Space)', 'Framework Directive Water', 'Planning Study A28', 'Dredge project ..', 'KernGIS', 'Spatial Policy'.

## 79 Reference date of related data set

The reference date of the related data set is concerned here. The format of the date is YYYY-MM-DD (hyphenated). The type of event the date refers to is displayed in the box linked to it: 'Date of creation, publication or modification (Reference date of related data set) (ISO no. 395)'. The entry in this box must indicate whether the creation, a publication or a modification of this related data set is concerned here.

## 80 Type of relation

Type of relation between the data sets. This relation is always indicated by the term 'Cross-reference' and is also the only option to be used in this ISO standard. The user is not required to enter anything here.



81 Data set of contact point

Name/address data of a contact point.

## 82 Usage

Brief description of the possibilities for use. Besides 'Purpose of the creation' there are often several options for use of the data set. An example is a boundaries file serving as an official administrative boundary (with a rather high degree of accuracy of 1:10,000), while at the same time, in an A3 map with the entire Netherlands, this file may also serve as a small-scale reference file or survey map.

## 83 Organization using the data

Identification or means to get into contact with other users of the data. Contact data of users other than meta data and those responsible for the data.

## 84 Constraints

Applications for which the data are not suitable in a GIS-technically specific sense and/or for which use of the data is not even allowed. It is not the intention to mention all the applications for which the data are not suitable in a general sense. Examples are:

- Not to be used with a scale larger (more detailed) than 1: 50,000.
- To be used for rural area, not suitable for existing urban area.
- Using data for Navigation is not allowed.

## 85 (Legal) access constraints

Access requirements intended to ensure that the privacy or intellectual property of an external party remains safeguarded and all the other restrictions with respect to obtaining both the meta data and the data. If data and meta data are freely accessible, the notification 'Not applicable' is compulsory. Select an option from the list with the following access restrictions:

Not applicable	Freely accessible, there are no legal restrictions on use.
Copyright	Legally not freely accessible, the rights for publication, production and sale of rights is vested in an external party. Written consent for use is required by definition. However, conditions are usually made public stating the way in which it is permitted to publish the data set without written consent.
Patent pending	Legally not freely accessible, concerns produced or sold information waiting for a patent. Written consent prior to use is required.
Patent	Legally not freely accessible, produced or sold information is patented by the authorities. Written consent prior to use is required.
Brand name	Legally not freely accessible. Is officially registered and its use is strictly reserved to its proprietor or manufacturer.
Licence	Legally not freely accessible. Under certain conditions the authorities have a licence. Written consent prior to use is usually required.
Intellectual property	Legally not freely accessible. Is the property of an external party, comparable with copyrights. Written consent prior to use is required.
Other restrictions	Deviating restrictions exist. Contact the organization concerned prior to use.
Not accessible	Total prohibition on distribution and use.

## 86 Legal use constraints

Requirements for use safeguarding privacy or intellectual property and any other special restrictions with respect to obtaining the meta data or data. The options have the following definitions:

Copyright	Exclusive right to publication, production or sale of rights to a literary, theatre, musical or artistic work, or to the use of a commercial edition or label, granted by law for a specific period of time to an author, composer, artist or distributor.
Patent	Authorities have granted an exclusive right to create, sell, use or license an invention.
Patent pending	Information produced or sold and waiting for a patent.
Brand name	A name, symbol or other object to identify a product, which has been officially registered and the use of which is legally reserved to its proprietor or manufacturer.
Licence	Formal consent to do something.
Intellectual property	Right to financial benefit of and having control over the distribution of an intangible property which is the result of creativity.
Not accessible	Prohibition on distribution and use.
Otherwise	Restriction not included in the list (use the 'Other restrictions (ISO no. 72)' box to explain this option in more depth).

A 'Copyright' usually applies for GIS files obtained from another organization, and the option 'Otherwise' usually applies for files from one's own organization.

## 87 Other constraints

Other restrictions or limitations which cannot be entered in other boxes, for example compulsory acknowledgement of the source or the name of the copyright holder. Furthermore, if the option 'Otherwise' has been selected with the '(Legal) restrictions preventing use (ISO no. 71)' box, this option must be explained in more detail here. A possible definition may be 'No legal restrictions preventing use'.

## 88 Security constraints

Restriction imposed because in principle the information is confidential. The options have the following definitions:

Freely accessible	Available for general disclosure.
Not accessible	Not suitable for general disclosure.
Confidential	Available to persons capable of dealing with the information in a confidential manner.
Secret	Must be kept secret and concealed to everyone except a selected group of persons.
Top secret	Strictest secrecy mandatory.



## 89 User note

Explanation referring to the security restrictions. Also view the explanation 'Security restrictions (ISO no. 74)'. In order to create a better understanding of the reasons why files are 'Confidential' or 'Not accessible' (or ('Top) 'Secret'), this is the place to enter specifically whether 'Private property protection' or 'news-sensitive information' and the like is concerned.

## 90 Lineage level description

The level referred to by the data-quality description. Options are:

- Data set: refers to one data set.
- Series: refers to several data sets consequently constituting a series.
- Service: refers to a service rather than to a data set/series.

## 91 Completeness value unit

Entry of the unit of the numeric value entered in the 'Completeness (ISO no. 137)' box, for example: per cent, mm, cm, m. If a textual description instead of a numeric value is entered with quantitative value, the value 'text' must be entered in this box.

## 92 Completeness

Indication whether the data set is complete. This concerns both the completeness of the geometry and the attribute data of the geometry. A numeric indication with a measuring unit in percentages is sufficient here, for example: 10, 90, 100. But it can also be done in another textual manner, this is by far the clearest way to describe completeness, for example: 11 provinces completed, 10 out of 90 map pages are completed, southern provinces are lacking, attribute data for municipal roads are lacking.

## 93 Positional accuracy value unit

Entry of the unit of the numeric value entered in the 'Geometric accuracy (ISO no. 137)' box, for example: mm, cm, m, hm, km. Within GIS cm (large-scale, accurate files) or m (small-scale files) are usually taken as the unit. If a textual description instead of a numeric value is entered with quantitative value, the value 'text' must be entered in this box.

## 94 Positional accuracy

Maximum numeric value of the deviation of the x and y coordinates in the data set in relation to the actual place on earth. If the deviation is in a range (for example 0 to 5 cm), the highest deviation must be entered (5 cm). If necessary, the deviation can be entered textually too. Accuracy is also indicated using the term systematic error. This in contrast to the term accidental error which is used for precision. Among other things accuracy is dependent on the manner of obtaining the data. Data obtained terrestrially (by means of land surveying) are of a higher accuracy than data obtained photogrammetrically (based on aerial photographs). Furthermore the equipment used (e.g. kind of GPS receiver) and the reference files used (e.g. quality of aerial photographs on which digitalizing occurs) play a significant role with respect to accuracy. Point of departure is an accuracy of 0.2 mm, related to the original map scale [Source: Object catalogue GBKN (large-scale standard map of The Netherlands). A description of the minimum contents of the GBKN, National Partnership GBKN, Apeldoorn, September 1998]. When digitalizing at a map scale of 1:10,000 this results in a maximum deviation of 2 m.

- E.g. 'TOP10Vector' > maximum deviation 4 m.
- E.g. 'GBKN' Photogrammetrically obtained > maximum deviation for urban area (scale 1:1,000) 20 cm, and maximum deviation for rural area (scale 1: 2,000) 40 cm.
- E.g. 'GBKN' Terrestrially obtained > maximum deviation for urban area (scale 1:1,000) 10 cm, and maximum deviation for rural area (scale 1: 2,000) 30 cm.

If the deviation is unknown or cannot be determined, this could be referred as 'Not doable'.

## 95 Source description

General description of or comments on the history of a data set if they do not fit the other meta-data boxes. This may also be descriptions of or comments on the source data and/or the production process. Descriptions may be extensive. Examples are:

- Postcode table linked to building and plot coordinates on the basis of cadastral maps.
- Land Registry Office supplies a text file which is converted into a GIS polygon shape file by the Public Works and Water Management Geo-Information and ICT Department.
- The National Road File (NWB) is composed from the most current and accurate source files, such as the Digilanguage Site File 2000 file (DTB2000), and missing parts are supplemented by the Topographic map 1:10,000 vector (TOP10 Vector) file of the Topografische Dienst Kadaster (Ordnance Survey).

## 96 Process steps description

The method used to obtain the source data. Also enter applicable regulations, if any. This offers additional information on the data set.

Examples of methods:

- Multibeam acoustic soundings in accordance with regulations by the Directorate -General for Public Works and Water Management (RWS) of January 2007.
- Laser altimetry height measurements in accordance with regulations by the Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) of February 2007.
- Visual observations in the field.

- Method of obtaining 1 Levelled points
- Method of obtaining 2 Remote sensing
- Method of obtaining 3 Aerial photographs
- Method of obtaining 4 Aerial photographs false colour
- Method of obtaining 5 Multibeam
- Method of obtaining 6 Laser altimetry
- Method of obtaining 7 High points from aerial photographs
- Method of obtaining 8 Ground radar
- Method of obtaining 9 Single-beam echo sounder
- Method of obtaining 10 Terrestrially measured points
- Method of obtaining 11 Contour lines from aerial photographs
- Method of obtaining 12 Sub-bottom profiler
- Method of obtaining 13 GIS edits



97 Date of processing

Date on or period during which the source data were obtained. If several activities took place, the period lasts up to the date of the next activity.

98 Processing organization

Name/address data of the organization that performed the edits to the data set.

## 99 Data source description

Description of the background history of a data set: the origin of the data in the data set, the organization that created it. In many cases a description of the full name of the source data and the up-to-date ness of the source data suffice to supply the desired information: 'Cadastral plots version supply January 2007'.

## 100 Data collection description

The method used to obtain the source data. Also enter the applicable regulations, if any. This offers additional information on the data set.

Examples of methods:

- Multibeam acoustic soundings in accordance with regulations by the Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) of January 2007.
- Laser altimetry height measurements in accordance with regulations by the Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) of February 2007.
- Visual observations in the field.

Method of obtaining 1 Levelled points  
Method of obtaining 2 Remote sensing  
Method of obtaining 3 Aerial photographs  
Method of obtaining 4 Aerial photographs false colour  
Method of obtaining 5 Multibeam  
Method of obtaining 6 Laser altimetry  
Method of obtaining 7 High points from aerial photographs  
Method of obtaining 8 Ground radar  
Method of obtaining 9 Single-beam echo sounder  
Method of obtaining 10 Terrestrially measured points  
Method of obtaining 11 Contour lines from aerial photographs  
Method of obtaining 12 Sub-bottom profiler  
Method of obtaining 13 GIS edits

## 101 Time/period of data collection

Date on or period during which the source data were obtained. If several activities took place, the period lasts up to the date of the next activity.

## 102 Responsible party dataset

Name of the organization that obtained the source data. Taking the 'Role of the organization' (next box) into account is of importance in this respect. Don't use abbreviations only. Make use of the options list. Examples are: Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) Data-ICT-Dienst (DID), Topografische Dienst Kadaster (Ordnance Survey).

## 103 Revision frequency

Frequency of revising the data. In case of small data sets the entire set is usually revised at this frequency, in case of large area-, land-covering data sets only those map pages (different arrangement, if applicable) in which the data have changed are revised and supplied with this frequency. Options:

Continuously	Data are updated repeatedly and frequently.
Daily	Data are updated each day.
Weekly	Data are updated each week.
Biweekly	Data are updated every 2 weeks.
Monthly	Data are updated each month.
1 x quarterly	Data are updated once each three months.
1 x semi-annually	Data are updated every six months.
Annually	Data are updated each year.
2-,3-,4-,5-,6-,7-,8-,9-yearly	Data are updated once every .. years.
10-yearly	Data are not updated within 10 years.
Over 10-yearly	Data are updated once in more than 10 years.
If required	Data are updated if necessary.
Irregularly	Data are updated at intervals of different lengths.
Not planned	There are no plans to update the data.
Unknown	Revision frequency is not known.

104 Date of next revision

Planned date of next revision of the data. The planned date must be in accordance with the 'Revision frequency' (box 143).



## 105 Spatial representation type

Method used to present the geographic information spatially.

- Vector Data consist of vectors used to create geometric elements such as points, lines and polygons.
- Grid Data consist of a collection of cells of the same size and shape, with each cell having a value applying to the area of the entire cell.
- Text Data in the shape of a text or table.
- TIN Data in this Triangulated Irregular Network consist of nodes and lines describing a surface as a collection of irregular triangles with an x-, y- and z-coordinate on each point (node) of the triangles. The TIN is a 3-dimensional model.
- Stereo Data providing a 3D overview with the aid of two overlapping images.
- model
- Video Data consisting of video images.

## 106 Reference system code

The (alphanumeric) encoding for the reference system (coordinate system) applying to the position data (x, y) in the data set. A code from the EPSG (European Petroleum Survey Group) standard must be used to name the reference system. A horizontal and vertical reference system combination is also possible, i.e. 7415, the combination of RD New and NAP (provided the vertical reference system actually is NAP).

In MACHU GIS, datasets are preferably provided in the WGS84.

Examples and features of this and other systems are:

EPSG Reference system	Feature
28992 RD New	(projection)
7415 RD New / NAP	(composition)
4937 ETRS 89	(geographic 3D)
25831 ETRS 89 / UTM zone 31N	(projection)
3447 ETRS 89 / Lambert 2005	(projection)
4326 WGS 84	(geographic 2D)
4979 WGS 84	(geographic 3D)
4230 ED 50	(geographic 2D)
23095 ED 50 / TM 5 NE	(projection)
23031 ED 50 / UTM zone 31N	(projection)
23032 ED 50 / UTM zone 32N	(projection)

## 107 Responsible party namespace referenceschema

Name of the organization responsible for the codes of reference systems. E.g. 'European Petroleum Survey Group (EPSG)' which is responsible for the EPSG codes.

108      Name of object catalogue

Name of the object catalogue. In an object catalogue the definitions are given of all kinds of objects (object classes) and the attributes explained. If the object catalogue has not been stored with the data set, a URL can be entered here as well.

## 109 Object catalogue reference date

The reference date of the object catalogue is concerned here. The format of the date is YYYY-MM-DD (hyphenated). The type of event referred to by the date is 'Creation, publication, or modification date (Data on Object catalogue) (ISO no. 395)'. It must indicate whether the creation, a publication or a modification of this related data set is concerned here.

## 110 Distribution format

Name of the file format with which the data are distributed. Examples are: Shape, Feature Class, File System Grid (ESRI Grid), GML, DWG, DXF, Ascii, DBF.

## 111 Version of distribution format

Version number or version name of the distribution format. To be able to determine whether data can be used in an application, it is necessary to know the version of the file format in which the data are supplied. Examples are: DGN\_V8, DXF\_R14, DXF\_R2000, DXF\_R2004, DXF\_R2006, DXF\_R2007, DWG\_R14, DWG\_R2000, DWG\_R2004, DWG\_R2006, DWG\_R2007.

Comment: GIS file types do not possess versions in distribution format.

112 Contact distributor

Contact information, provide by the distributor of a dataset.



## 113 Name of distributing organization

Name of the organization or person responsible for the distribution of this data set or data-set series. Please enter the full name of the (department within the) organization, followed, if applicable, by the official abbreviations of the department or organization (between brackets). Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) Data-ICT-Dienst (DID) is the standard entry as most of the data supplies for the Rijkswaterstaat, Ministry of Transport, Public Works and Water Management (RWS) are issued by them.

## 114 Role of distributing organization

The role or function of the organization here is always 'Distributor', in accordance with the ISO standard defined as 'The organization or person taking care of the supply of the data set'.

## 115 URL of distributing organization

Website of the organization or person taking care of the supplies of the data set or data set series (distribution). Examples are: <http://www.Rijkswaterstaat.nl>, <http://www.kadaster.nl>, <http://www.zeeland.nl>.

## 116 Distribution order process fees

Amount required to obtain the data, including the currency unit. Please enter the amount first, followed by the correct currency. Abbreviations for the currency are the standard three-letter codes in accordance with ISO 4217. For example: 100 EUR or 145 USD.

## 117 Distribution order ordering instructions

General instructions and conditions applied by the organization with the supply of data.

## 118 Distribution order process turnaround

The time required for the supply of data, from the moment of commencement by the client. For example: 5 working days or 3 weeks.

119 Distribution/usage unit

Manner in which the data are supplied, for example: supply per map page, supply per province, supply per year, supply per country, per boundary to be indicated individually in digital form in RD projection.

120 File size

The file size is the size of the file of data to be expected in Megabyte(s), of one unit as specified in the box 'Supply/utility unit'. The size must exceed 0 (zero). The abbreviation for Megabyte is MB.



## 121 URL of dataset

The location of the data set including the name of the server, for example:  
`\\servernaam\gisdata\bodem\bodemtype.shp`.

122 Name of medium

Name of the kind of medium on which the data can be supplied, or the kind of direct connection through which the data are available.

For example: CD-ROM, DVD, Memory card, Hard disk, the Internet, Satellite. More than one option is possible.

## 123 Name of application schema

The name of an application diagram or information model if the data set has been composed according to that diagram. Examples are: IMRO2005, TOP10NL, IMWA. A diagram entered here must be in conformity with ISO 19109.

## 124 Application schema reference date

Reference date of the application diagram. The format of the date is YYYY-MM-DD (hyphenated). The type of event referred to by the date is displayed in the box linked to it 'Date of creation, publication or modification (date of application diagram) (ISO no. 395)'. It must indicate that the creation, a publication or a modification of this related data set is concerned here.

## 125 Application schema language

Identification of the computer language in which the definition of the diagram has been drawn up.

Example: GML, UML, NEN3610, IMRO2005.

## 126 Application schema constraint language

Identification of the computer language used to describe the application diagram.  
Example: OCL.

## 127 Extent description

Textual description of the period referred to by the data of the data set, in other words the period during which the data are valid. This element applies if a data set is not continuous and the data or objects in the data set may vary per period. In that case the data or objects in the data set represent a moment in time. For example a water boundary during a flood, or area boundaries with legal validity for a particular period only. In principle each data set has a temporal coverage which is valid up to the next revision of the data set. Examples are:

- 01-01-2007 up to and incl. 31-12 2007
- Period 1999-2001, during working days (Monday up to and incl. Friday).
- Weeks 30, 31, 35, 36 in 2007, during the time of 02:00 and 05:00 (p.m.).
- Maximum flood boundary 29 up to and incl. 31 January 1995.

## 128 Geografic area description

Name of the geographic area covered by the data. Several area categories are to be distinguished, such as the name of the whole or part of the country, province, municipality, region, water board, water area, water body, coastal strip, beach, dune area, polder, river foreland, dyke body, brook-valley area, wildlife area, national park, (national) countryside, sand-drift area, peat area, lateral-moraine area, economic region, agricultural region, urban area, border area, industrial area, military area, airport, (sea)port area, recreational area, ruined area.



129 West bound longitude

Extremely western coordinate (left side of surrounding rectangle) in the horizontal coverage of the data set. Coordinate according to the reference system WGS 84. (If possible) the value for this box is automatically calculated and entered from the data set. Manner of entering and display is degrees with decimals: 51.80 (N) or 3.70 (E).

130 East bound longitude

Extremely eastern coordinate (right side of surrounding rectangle) of the horizontal coverage of the data set. Coordinate according to the reference system WGS 84. (If possible) the value for this box is automatically calculated and entered from the data set. Manner of entering and display is degrees with decimals: 51.80 (N) or 3.70 (E).

## 131 South bound longitude

Extremely southern coordinate (bottom of surrounding rectangle) of the horizontal coverage of the data set. Coordinate according to the reference system WGS 84. (If possible) the value for this box is automatically calculated and entered from the data set. Manner of entering and display is degrees with decimals: 51.80 (N) or 3.70 (E).

## 132 North bound longitude

Extremely northern coordinate (top of surrounding rectangle) of the horizontal coverage of the data set. Coordinate according to the reference system WGS 84. (If possible) the value for this box is automatically calculated and entered from the data set. Manner of entering and display is degrees with decimals: 51.80 (N) or 3.70 (E).

## 133 Temporal extent

Validity of the contents of the data in a data set or data-set series specified by an end date. If the data apply during a specific period of time, the starting and final dates of this period should be entered here. Manner of entering and display is: YYYY-MM-DD -YYYY-MM-DD (2007-01-01 -2007-12-31).

134 Minimum value

Lowest vertical value in the data set, e.g. in LAT (Lowest Astronomical Tide) and in a unit of metres

135 Maximum value

Highest vertical value in the data set , e.g.in LAT (Lowest Astronomical Tide) and in a unit of metres