

User Manual

GST Desktop

Contents

1	DB Config	4
1.1	Change Password	6
1.2	Spatial Reference Systems.....	7
	Create SRS.....	8
	Delete SRS.....	9
1.3	User Management	10
	Quick User/Group creation	10
	Manage Users and Groups	11
	Add / Delete User	13
	Add / Delete Group	14
	Assign User to Group.....	15
	Unassign Group from User	16
1.4	User Data Overview	17
	Context Menu	17
	Search Bar	18
2	Tab: Feature Selection	19
2.1	Managing of Features and Feature Classes	19
2.2	Context Menu in Feature Class list.....	21
	Browsing Features and changing Object Property Values	22
2.3	Add a new Feature Class.....	24
	Add custom Feature and Simplex Properties to a Feature Class.....	26
	Add a normal property	27
	Add a constrained property	28
2.4	Property Aliases	31
2.5	Edit a Feature Class	32
	Rename a Feature Class	33
	Change Feature Class Spatial Reference System.....	33
2.6	Import and export Feature Classes (fcdxml files).....	36
3	Tab: Feature Selection - Uploading data	41
3.1	Upload data (browse files)	41
3.2	Upload data (Drag'n'Drop)	42
4	Upload Wizard	44
4.1	Section: Commit Message	46
4.2	Section: Overview	47
	Lock a Feature in the Upload Wizard.....	49
	Link a Geometry to a Unresolved Item	50

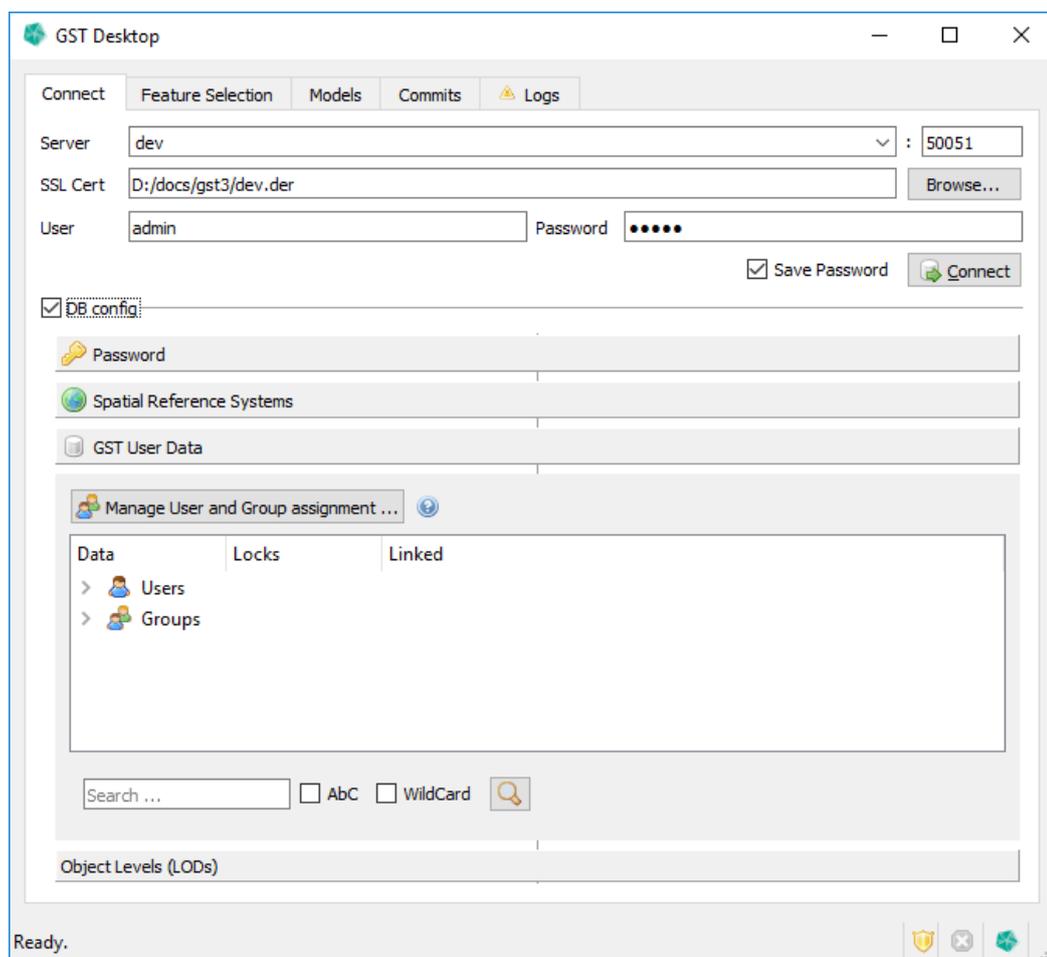
	Specify an Object SRS	53
4.3	Section: Object Properties.....	55
	Multi Selection / Set Property Values in bulk.....	57
4.4	Section: Simplex Properties.....	58
4.5	Section: Theme Preview	60
5	Tab: Feature Selection - Downloading data	63
5.1	Locking – Download data for modification	64
	Downloaded files.....	66
6	Tab: Feature Selection - Unlocking.....	68
6.1	Unlock: Updating a Feature	68
6.2	Unlock a Feature without Updating	70
6.3	Unlock a Feature without a GST archive file	73
7	Tab: Commits	76
7.1	Active Commit	77
8	Tab: Models (Model Management).....	78
8.1	Explanation of the Models Tab.....	80
8.2	Element Creation, Deletion and Assignment	81
	Create a new MoMa Tree Element	81
	Delete an Element.....	82
	Assign Element or Feature to the tree.....	85
	Unassign Element or Feature from the tree	87
9	Tab: Models (GST Sections)	89
9.1	Initiate a Section	89
9.2	Section Image Designer	90
10	Section Template File	102
	Template Structure and Area Placeholders	103
	Text placeholders.....	107
	JSON parameters.....	108
10.1	Deploying Sections/Boreholes as a Service	109
11	Manage Themes	113
11.1	Motivation and concept of Themes	113
	Match pattern	114
	Theme visibility on GST Web / Access Levels	114
	Theme types.....	115
	No Data handling	115

11.2	Define Themes	117
	Definition of a Continuous Theme	118
	Definition of a Discrete Theme	120
12	Manage Simplex Property Color Maps	122
12.1	Create or edit a Color Map	123
12.2	Manage or Remove Color Maps	124
13	Member Properties	125
13.1	Textured Lines	125
	Add a Textured Line to GST	126
	Special Member Properties for Textured Lines	127
	Crop image with offset JSON	128
13.2	Linked Files	129
14	File Formats	130
14.1	ISATIS ASCII Format [Grids]	131
	How to Create the ISATIS ASCII File	131
	Supported ISATIS parts	132
	Example ISATIS ASCII File	133
A	Intersection Template detailed information	134
A.1	Overview	134
A.2	Image details	135
A.3	Legend details	136
A.4	Additional JSON Parameters	138
	General JSON Parameters	138
	Borhole JSON Parameters	142
	Cross section JSON Parameters	146
	Map section JSON Parameters	148
	Legend JSON Parameters	149
	Shape JSON Parameters	151
A.5	URL Parameters	154

1 DB Config

To get to the DB config menu, first connect to the database with your user credentials. Within the **Connect** tab the database configuration can be found when the **DB config** is checked.

Figure 1.1
Within the **Connect** tab the database configuration can be found when the **DB config** is checked.



The database configuration panel is separated in the following panels.

- Password** page 6
 - * Change the password of the currently connected user
- Spatial Reference** page 7
 - * Create SRS: enter a new Spatial Reference System.
 - * Delete selected SRS: delete the selected Spatial Reference System.
- GST User Data**

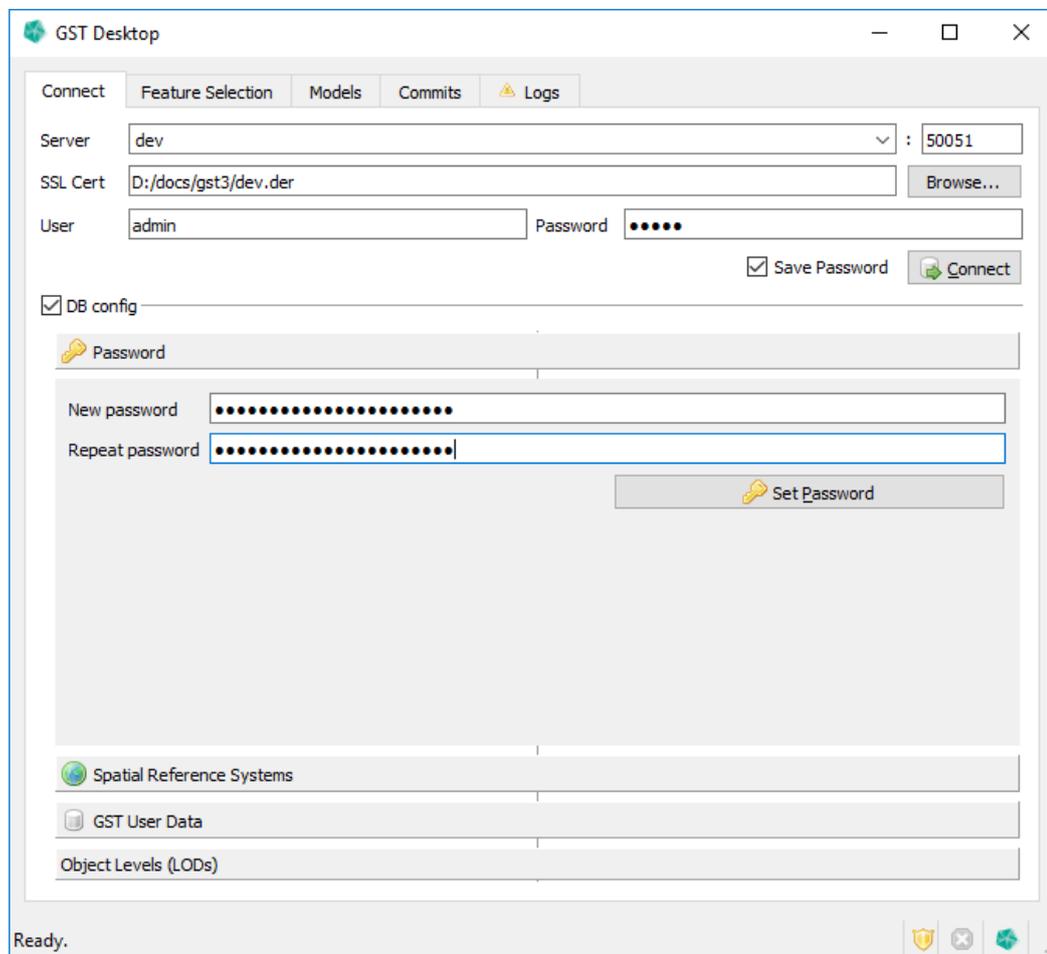
1. DB Config

- * Add, delete users and groups and manage the user assignment to groups page [10](#)
- * Show data of all users page [17](#)

1.1 Change Password

Click the  Password field to get to the **Change Password** dialog seen below.

Figure 1.2
"Change Password"
dialog



1. Type in the new password in the first field.
2. Repeat it in the second field.
3. Press the **Set Password** button

Note

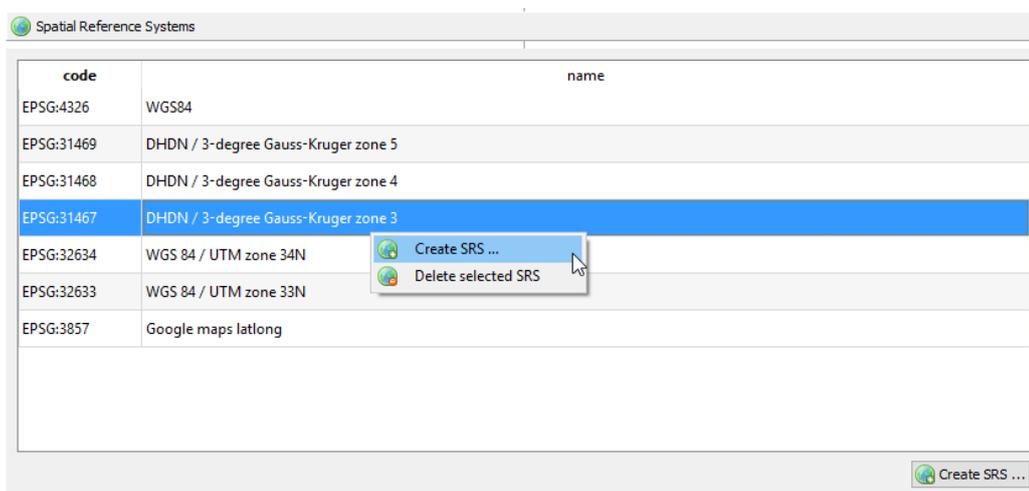
Changing the password requires you to login again with your new user credentials.

1.2 Spatial Reference Systems

Click the  Spatial Reference Systems field to get to the **Spatial Reference Systems** panel.

Figure 1.3

The context menu offers functions to manage the SRS in the GST Storage instance.



Now you can see a list of all available SRS in the database. Click on the list with the RMB to open the context menu with the SRS functions [see [Figure 1.3](#)].

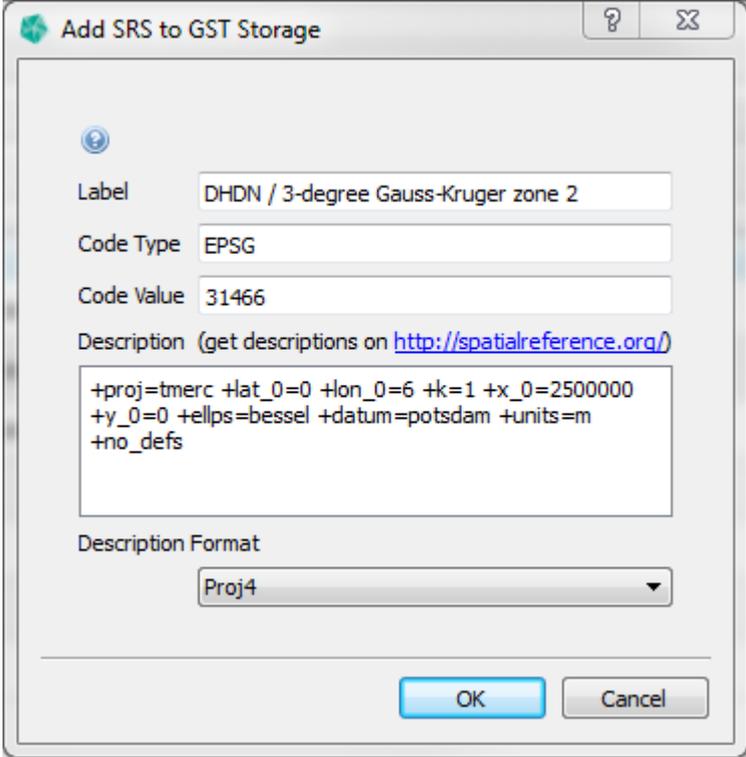
You can

- *  Create SRS page 8
- *  Delete SRS page 9

Create SRS

In the context menu select  **Create SRS** to open the **Create SRS** dialog.

Figure 1.4
"Create SRS" dialog



Add SRS to GST Storage

Label: DHDN / 3-degree Gauss-Kruger zone 2

Code Type: EPSG

Code Value: 31466

Description: (get descriptions on <http://spatialreference.org/>)

```
+proj=tmerc +lat_0=0 +lon_0=6 +k=1 +x_0=2500000
+y_0=0 +ellps=bessel +datum=potsdam +units=m
+no_defs
```

Description Format: Proj4

OK Cancel

1. **Label:** Enter a descriptive identifier for the new SRS.
2. **Code Type:** Enter the system from where the code is from. Most of the time this will be EPSG.
3. **Code Value:** The value of the SRS code from the system mentioned before.
4. **Description:** Enter the description of the SRS in the format you selected in the **Description Format** dropdown list.
5. **Description Format:** Select the format of the description entered above. You can choose between Proj4 and OGC-WKT.

Note

You can get the description and code value from a website like <http://epsg.io>. Prefer the Proj4 format, if you have the option.

6. After you are done, press

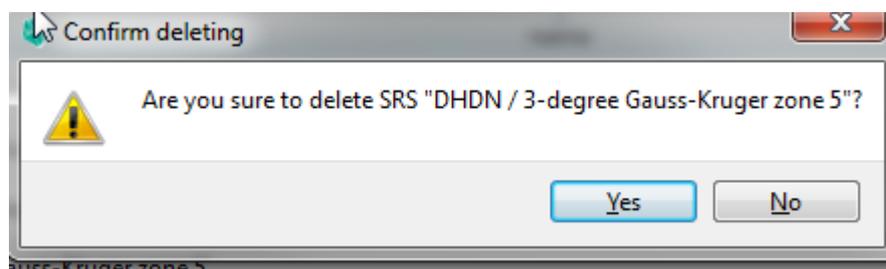
1. DB Config

- a) **OK** to add the new SRS.
- b) **Cancel** to abort.

Delete SRS

1. Right click the SRS you want to delete.
2. Choose  **Delete selected SRS** from the context menu.
3. The **Confirm SRS deleting** dialog will appear.

Figure 1.5
Confirm deleting
dialog

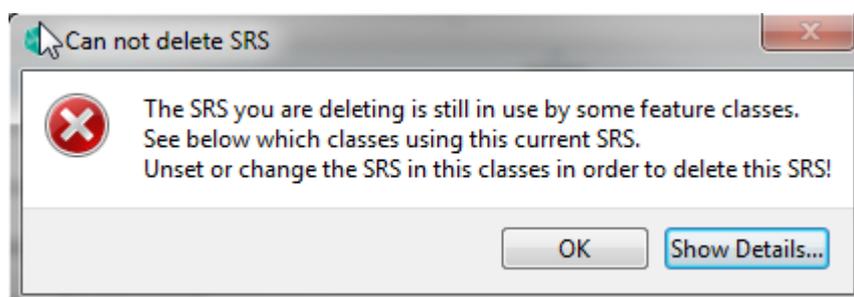


4. Press
 - a) **Yes** to confirm the deletion of the selected element.
 - b) **No** to abort the deletion.

Note

You can only delete a SRS if it is not referenced by any feature classes anymore. Trying to delete a still referenced SRS will cause an error.

Figure 1.6
SRS still referenced
dialog



Click **Show Details...** to see which feature classes reference the SRS you wanted to delete.

1.3 User Management

The user management in GST consists of users and groups. One user can be a member in multiple groups. A member of a group can see all published data of that group. Uploaded objects that are not specifically made public for a group are set to private and are only visible for the user that uploaded the objects.

Example:

User Gabi, member of group Reviewers uploads the feature Keuper publicly to group Reviewers. User Heinz, also member of group Reviewers, can now see and use the feature Keuper with his account. User Bernd, not member of group Reviewers, however, cannot see or use the feature Keuper with his account.

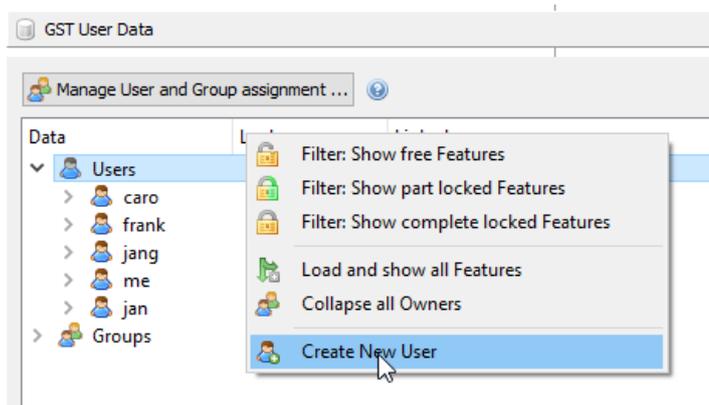
Note

Please note that User and Group management is an administrator task. In order to manage Users and Groups login as GST database administrator to enabled the functions. [They are disabled and non-functional for regular GST users.]

Quick User/Group creation

Creating users is very simple. Right click on  **User** to display the GST Data Tree context menu and choose  **Create New User** [see figure 1.7].

Figure 1.7
Use the context menu to quick create users

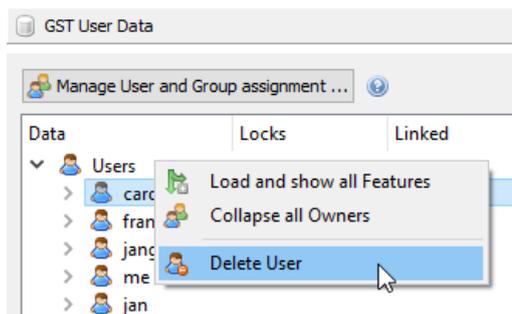


To delete users right click on the user that should be deleted. In the GST Data Tree context menu choose  **Delete User** [see figure 1.8].

Creating and Removing groups works in the same way. As an alternative users and groups can be created in the **Assign Groups to Users** Dialog. See section [User Management](#) on page 11.

1. DB Config

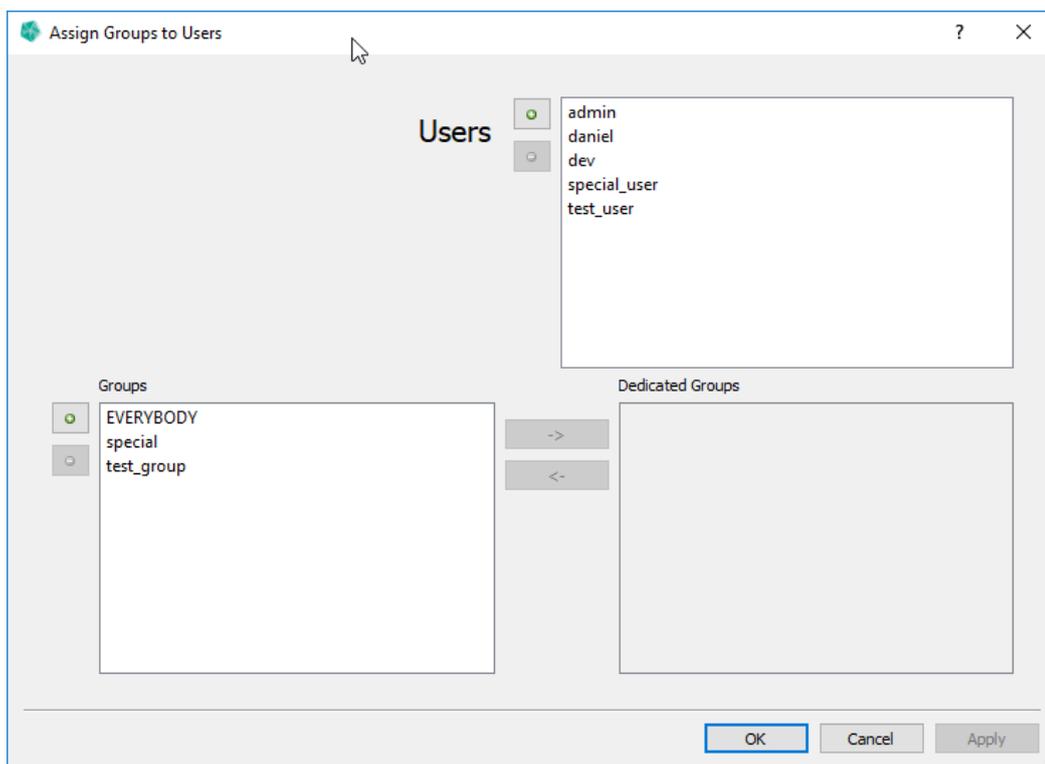
Figure 1.8
Assign Groups to
Users dialog



Manage Users and Groups

To manage the User and Group assignment (referring the example above), click on the button **Manage User and Group assignment** in the **GST User Data** panel (see figure 1.1). Then the **Assign Groups to Users** Dialog will be shown (see figure 1.9)

Figure 1.9
Assign Groups to
Users dialog



In this dialog you can

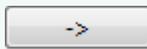
- * Add and Delete users page 13
- * Add and Delete groups page 14
- * Assign groups to specific users. page 16

Dialog Setup

In the top right corner you can see **Users**, a list of all GST users. In the bottom left corner is the **Groups** list where all GST groups are shown. Selecting a user from **Users** will show their assigned groups in the **Dedicated Group** list.



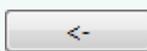
Create button



Assign button



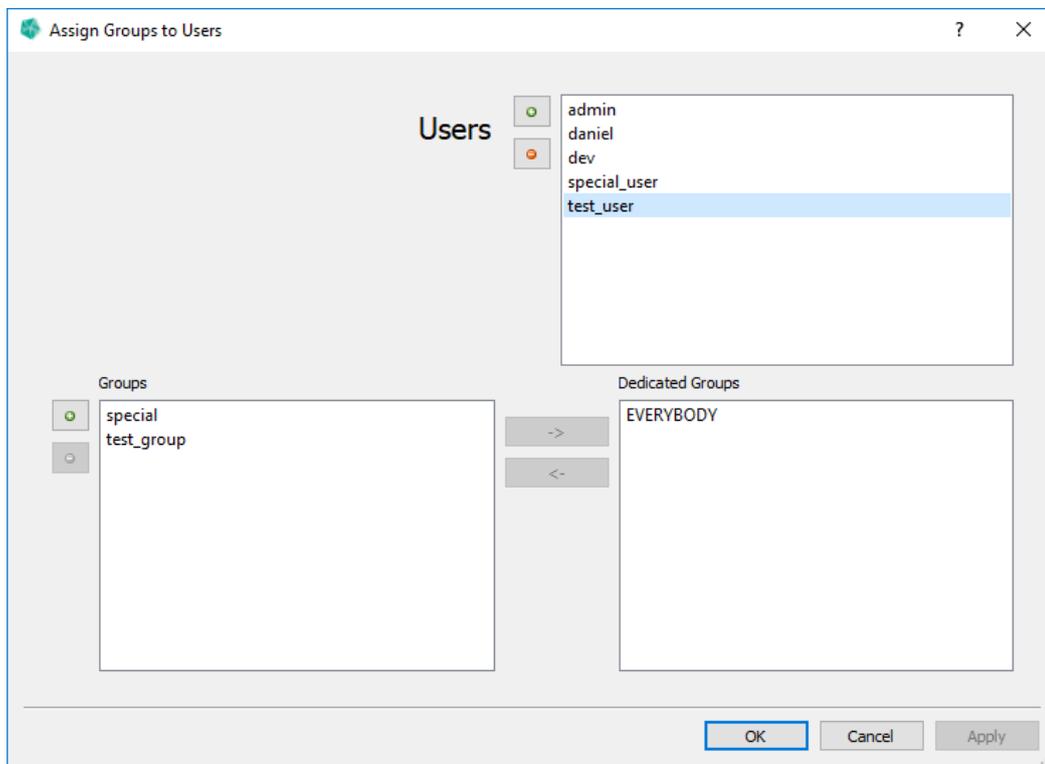
Delete button



Unassign button

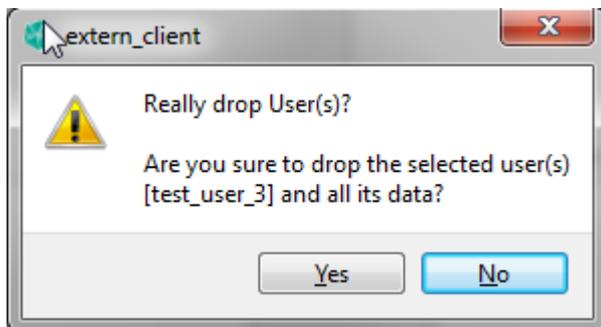
Add / Delete User

Figure 1.10
Assign Groups to
Users dialog



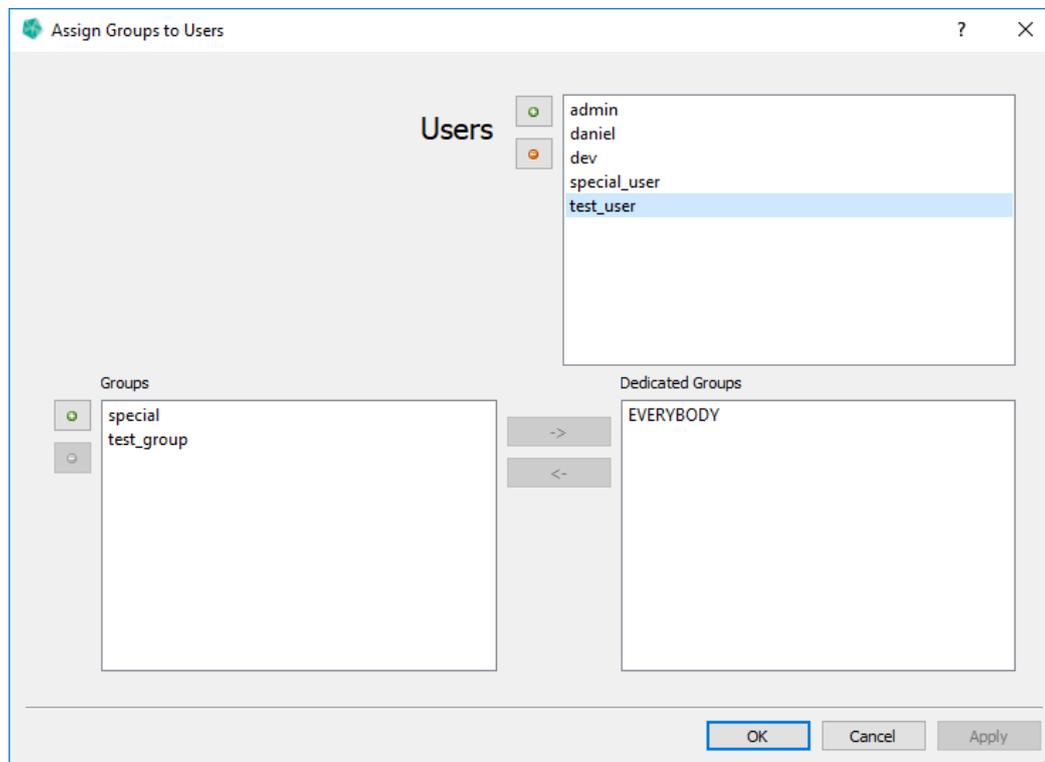
1. Select the user to delete in the **Users** list.
2. Use the **add** and **delete** buttons to Add / Delete user.
3. Deleting a user has to be confirmed.

Figure 1.11
Confirmation dialog



Add / Delete Group

Figure 1.12
Assign Groups to
Users dialog



1. Select any user from the **Users** list.
2. Select the group to delete in the **Groups** list
3. Press the  button.

For creating a group use the  create button and specify the group name in the Dialog that pops up. Continue with assigning users to the created group [see next section].

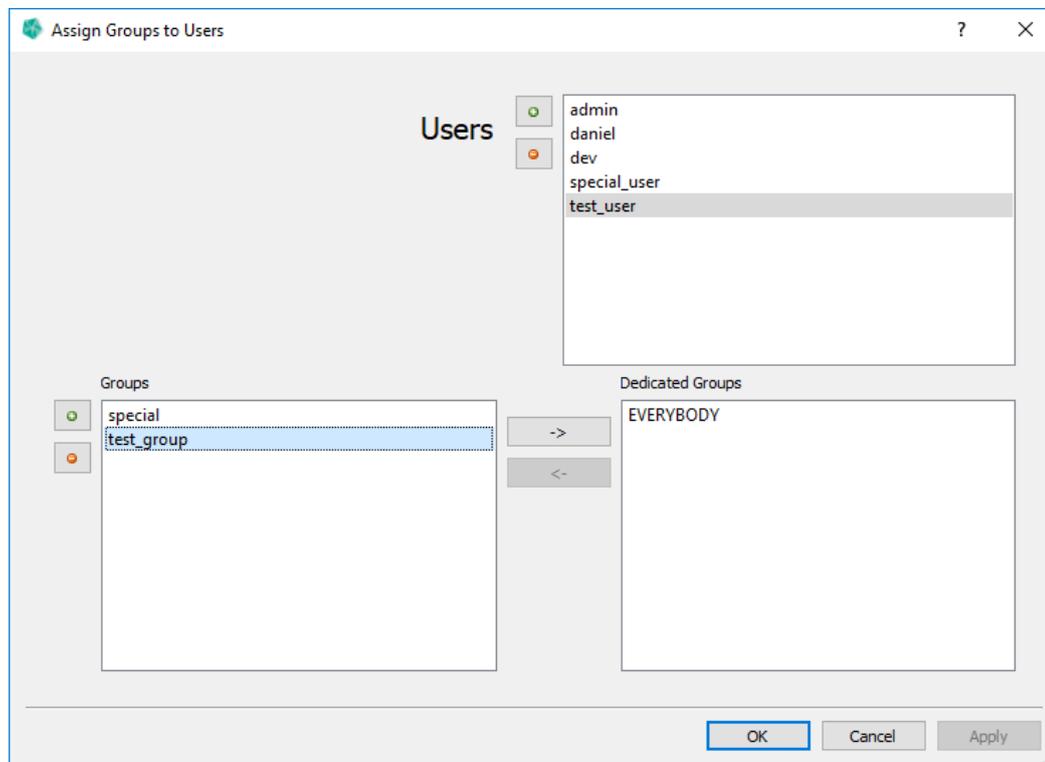
Note when deleting groups

To delete a group, it has to be unassigned from the currently selected user first. If the group to delete is listed on the right **Dedicated Group** list unassign it by clicking the  unassign button.

All users being assigned to the group will be automatically unassigned when the group is deleted.

Assign User to Group

Figure 1.13
Assign Groups to
Users dialog



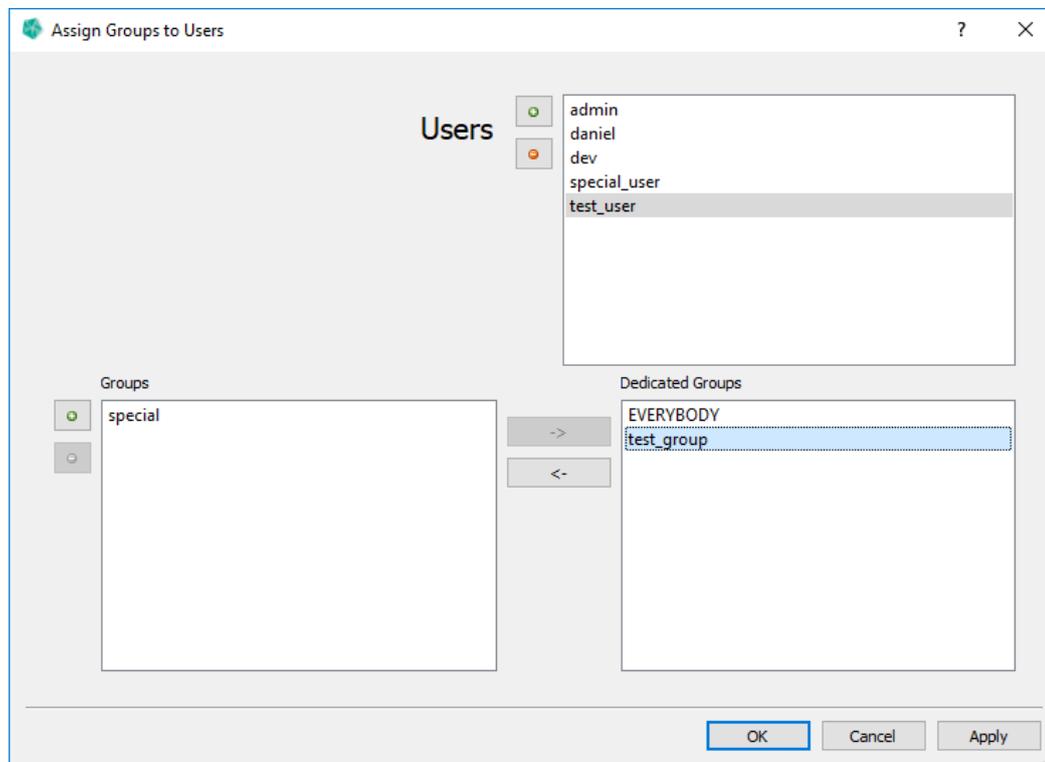
1. Select a user from the **Users** list.
2. Select the group you want to assign to the user from the **Groups** list.
3. Press the button.
4. Now you should see the selected group in the **Dedicated Groups** list.
5. Press
 - a) **Apply** to confirm your assignment.
 - b) **Cancel** to abort your assignment.

Note

Do not forget to press the dialogs **Apply** button in order to apply changes in assignment! Selecting a different user will notify you about unapplied changes and ask you to confirm or discard them.

Unassign Group from User

Figure 1.14
Assign Groups to
Users dialog



1. Select a user from the **Users** lists.
2. Select the group you want to unassign from the user from the **Dedicated Groups** list.
3. Press the button.
4. Now you should see the selected group in the **Groups** list.
5. Press
 - a) **Apply** to confirm your assignment.
 - b) **Cancel** to abort your assignment.

Note

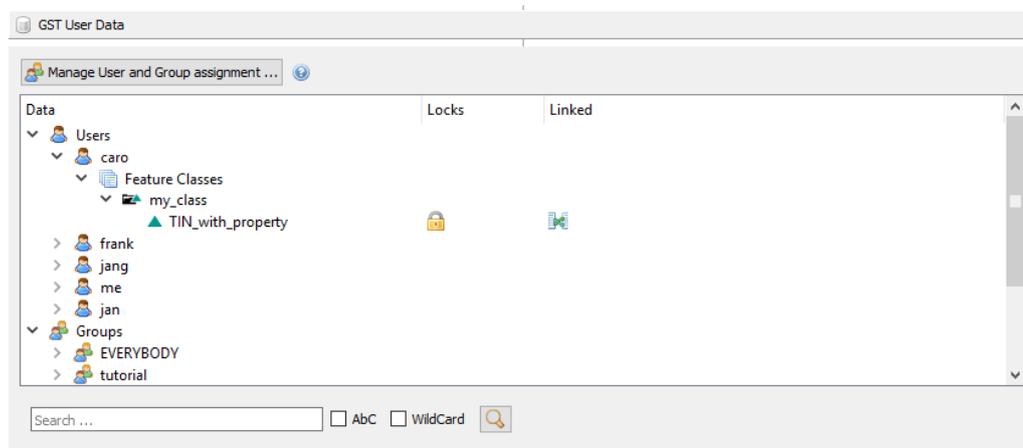
Do not forget to press the dialogs **Apply** button in order to apply changes in assignment! Selecting a different user will notify you about unapplied changes and ask you to confirm or discard them.

1.4 User Data Overview

Note

If you login as GST database admin the GST User Data tree displays all data, all users and all groups. [Also it allows user and group management controls.] If you login as regular GST user the GST User Data tree displays only the data of groups the current user is assigned.

Figure 1.15
The GST User Data tree is located in the **GST User Data** panel in the **Connect** tab.

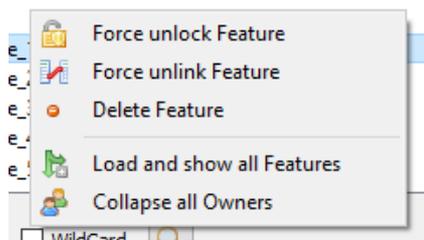


The GST User Data tree (or short GST Data tree) is located in the **GST User Data** panel in the **Connect** tab. Use this widget to browse the data that is assigned to each user. The column **Locks** shows icons for Features that are **locked** or **partly locked**. The column **Linked** shows icons for Features that are **linked** in the Model Management.

Context Menu

Use right click on a Feature to open the context menu to reach the **main actions** in the GST Data tree (figure 1.16).

Figure 1.16
GST Data tree context menu



Force unlock Feature Returns the lock from a Feature without a key file. Only an GST database admin can do this.

 **Force unlink Feature** Removes all Model Management links to that Feature.

- **Delete Feature** If a Feature is not locked and not linked it can be removed with this action. ATTENTION: This operation is not available on GST for Oracle for technical reasons.

 **Load and show all Features** Pre-load all Feature Class in order to easily browse or to use the search function.

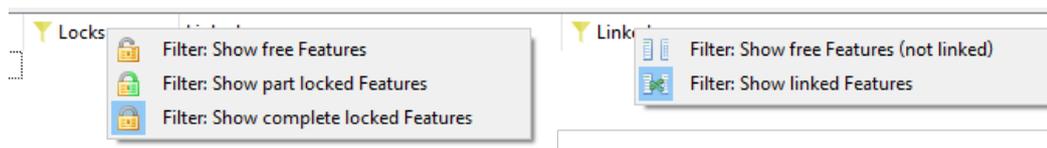
 **Collapse all Owners** Minimize all nodes of the tree and keep only Users and Groups open.

There are more actions supported by the GST Data tree context menu.

By right clicking on the column **Locks** a **filter action** can be activated displaying only items with the given index (see figure 1.17).

A filter icon  on the column header indicates that a filter is active. Filters can be combined.

Figure 1.17
GST Data tree lock filter context menu



By right clicking on a User or a Group **user management actions** become available in the context menu. (see section [User Management](#) on page 10).

Search Bar

Figure 1.18
Below the GST Data tree a search bar can be used to search content by text.



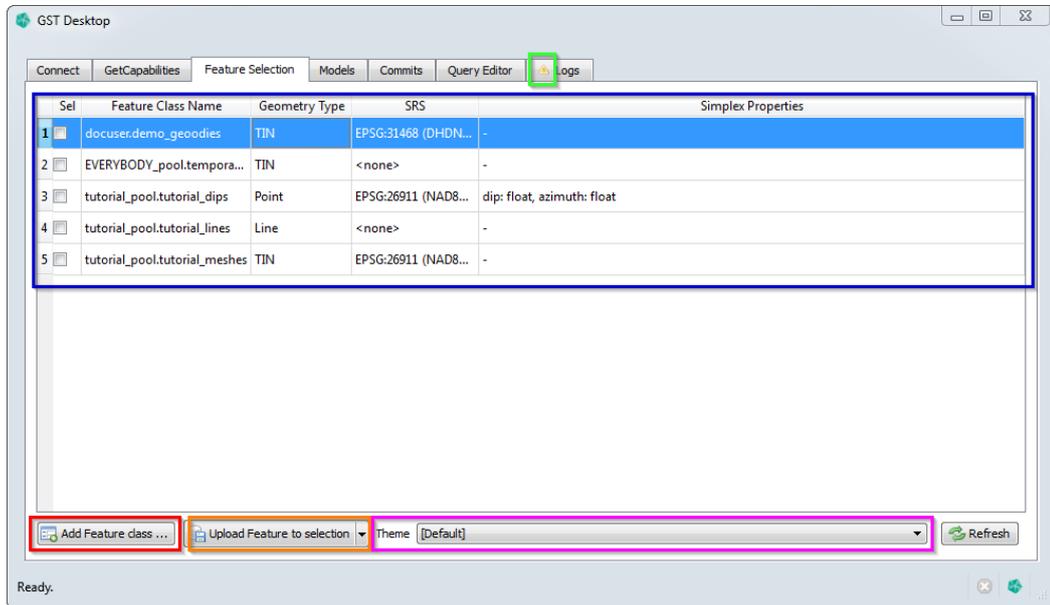
Below the GST Data tree a search bar can be used to search content by text. The search will be done down from the selected item in the tree until the end. If no item matches the search string a message box will pop up. The following options are available.

AbC If activated the search will be performed case sensitive

WildCard If activated the search string can include the wild card characters *, ? or [] a sets of character, e.g. [0-9] for a number between 0 and 9

2 Tab: Feature Selection

Figure 2.1
"Feature Selection"
tab

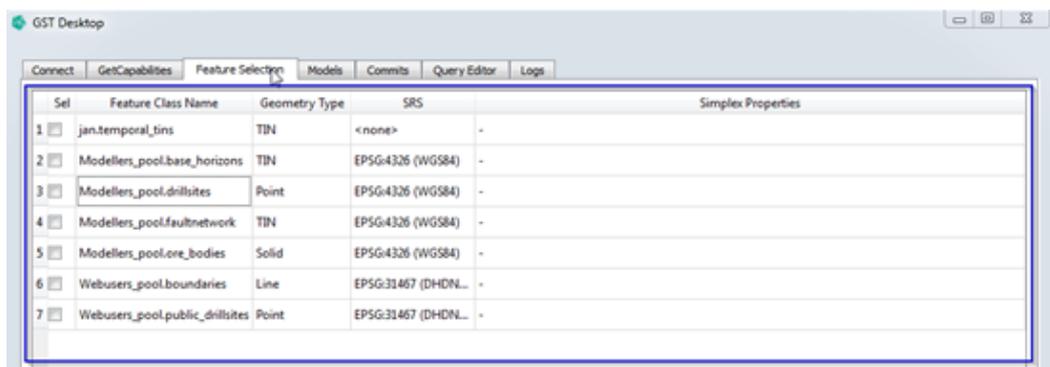


In the **Feature Selection** tab all feature classes are listed (blue). In this tab you have a set of functionality listed below. Each item in the following list refers to a paragraph for more information about the function.

- * Manage the Features and Feature Classes page 19
- * Open context menu for feature classes (RMB on blue Feature Class list) . page 21
- * Add new Feature Classes (red) page 24
- * Upload data (orange) page 41
- * Manage Themes (pink) page 113

2.1 Managing of Features and Feature Classes

Figure 2.2
Feature Class list



2. Tab: Feature Selection

The Feature Class list ([blue](#)) shows all classes that are available for the currently logged on user. The available classes can be distinguished by name in

- * Private classes – [<user>.<classname>]
- * Public classes – [<grouname>_pool.<classname>]

Private classes are visible for the currently logged on user only. Public classes are visible for all users that are assigned to the current group. [See section [User Management](#) on page [11](#) how to setup users and groups].

Note

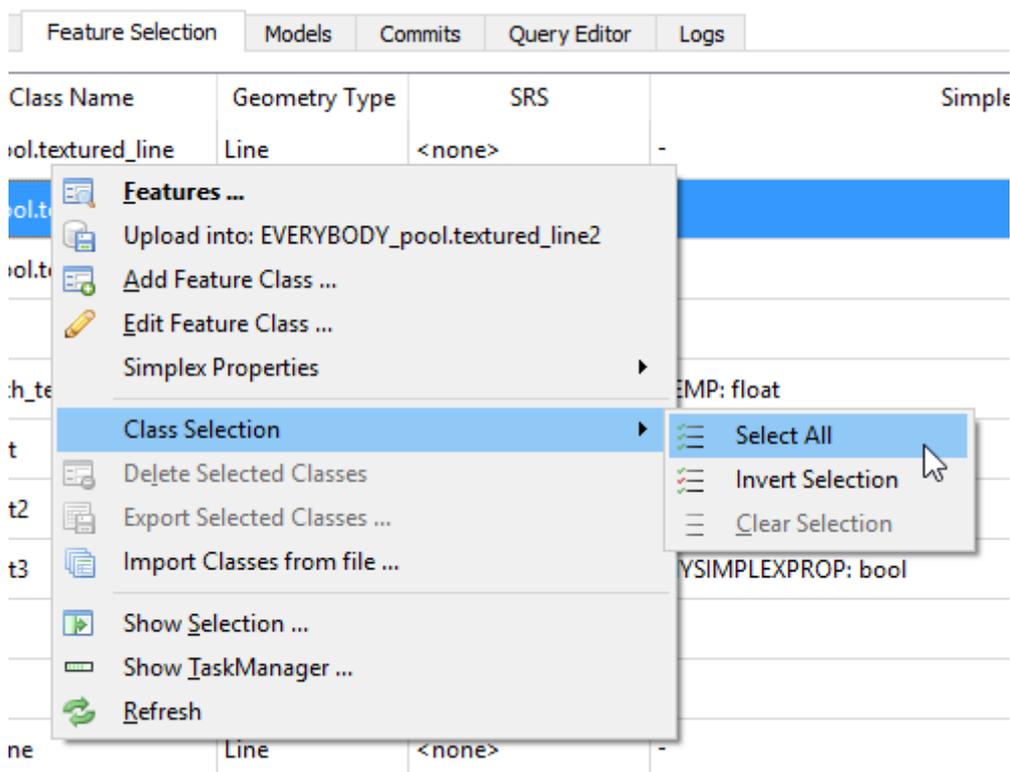
The checkboxes in the Feature Class list ([blue](#)) allow to define a selection.

- Indicates a selection of the whole class [all features of the class are selected]
- Indicates a selection of a subset of the class [some features of the class are selected]]

2.2 Context Menu in Feature Class list

The Feature Class list has a context menu that provides a central list of commands.

Figure 2.3
Context menu in
Feature Class list



Features ... Show the Features within this class to edit Object Properties, delete Features and more. page [22](#)

Upload into: <classname> Upload data into the current class. page [41](#)

Add Feature Class ... Add a new Feature Class page [24](#)

Edit Feature Class ... Edit the current Feature Class. Editing operations can be changing Feature Class name, adding new Properties, Rename Properties, changing the Spatial Reference System of the Class and more. page [32](#)

Submenu: **Simplex Properties** Change appearance of Simplex Properties and control visibility for GST Web page [122](#)

Submenu: **Class Selection**

Select All Selects all Feature Classes and their Features. [Select all data that is available for the current user.]

Invert Selection Selects all Feature Classes [and their Features], that were unselected, and unselect all Feature Classes [and their Features] that were selected before.

☰ **Clear Selection** Unselect every Feature Class.

🗑️ **Delete Selected Classes** Delete all selected classes. [Activates when at least one Feature Class is selected.]

Remark when deleting Feature Classes

Deleting Features Classes will delete all Features within this class.

📄 **Export Selected Classes ...** Write all checked classes into a fcdxml files. [Activates when at least one Feature Class is selected.] page 36

📄 **Import Classes from file ...** Restore Feature Classes from fcdxml files. page 36

📄 **Show Selection ...** Open the Selection Widget showing all the selected Features that will be processed, e.g. selected for Download page 63

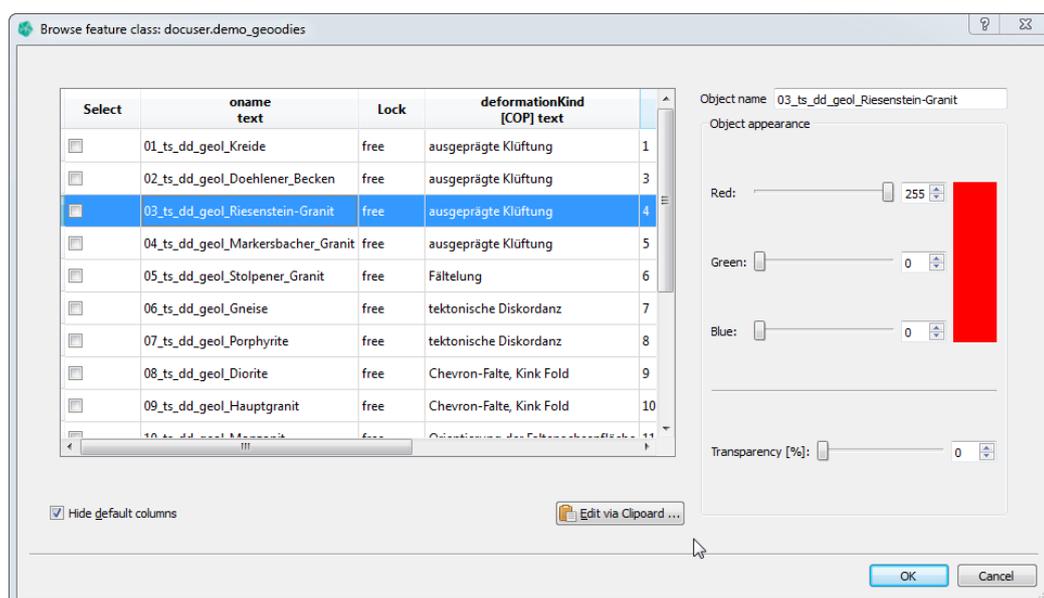
📄 **Show TaskManager** Shows/Hides the TaskManager. The TaskManager lists all active threaded tasks that are running in background. Within the TaskManager tasks can be supervised or even canceled.

🔄 **Refresh** Reloads the Feature Classes.
 This can be useful if changes in the database were done by an other instance and the current instance of GST Desktop is not up to date.

Browsing Features and changing Object Property Values

You can browse the features of the class when double click on the Feature Class or simply choose the context menu item 📄 **Features**

Figure 2.4
 "Browsing features of the class" dialog



2. Tab: Feature Selection

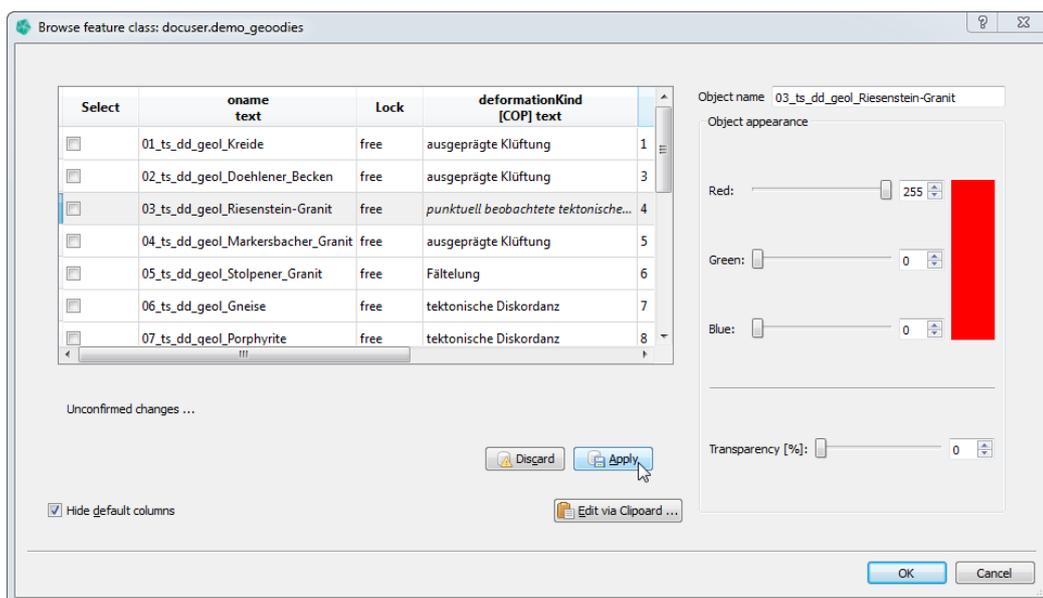
1. To edit a property double click onto the value
 - a) Regular object properties can be edited in free text.
 - b) Constrained properties will show a dropdown element with possible values (see Figure 2.5)

Figure 2.5
Edit constrained properties

	Lock	deformationKind [COP] text	
	free	ausgeprägte Klüftung	1
ken	free	ausgeprägte Klüftung	3
anit	free	beobachtete tektonische Brekzie	4
_Granit	free	<NULL>	5
it	free	<i>punktuell beobac...tonische Brekzie</i>	6
	free	ausgeprägte Klüftung	7
	free	tektonische Diskordanz	8
	free	Orientierung der...ltenachsenfläche	
	free	Fältelung	
	free	Darstellung der ...ner Achsenfläche	
	free	Chevron-Falte, Kink Fold	

3. Unsaved changes are marked in italic text. Press the **Apply** button to write changes to the GST Storage instance.

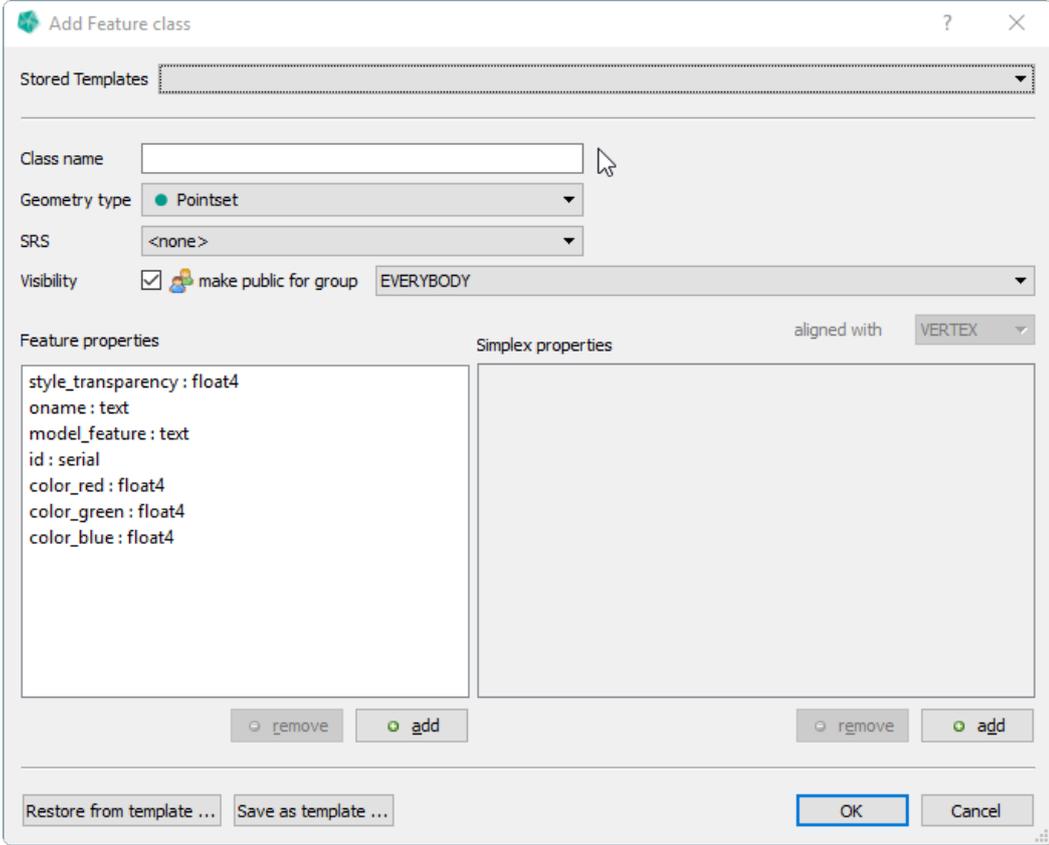
Figure 2.6
Unsaved changes are italic.



2.3 Add a new Feature Class

When you click on the button  **Add Feature Class** (using the button or the context menu in the Feature Class List see [Figure 2.3](#) on page 21) the **Add Feature Class** dialog appears.

Figure 2.7
Add Feature Class
dialog



Within this dialog you can define a new Feature Class.

Examples: What is the difference of Feature Properties and Simplex Properties?:

- * **Feature Properties** (often also called Object Properties) are properties with **one value per object**. Thus an "object name", a "color", an editor etc. are some examples.
- * **Simplex Properties** are properties with **multiple values per object** that are stored in the geometry internally (e.g. per triangle or per vertex). Thus "temperature", "copper content", "rock property" etc. are some examples.

A Feature Class is a named database table that can store geometries. A Feature Class

resides in a user schema (either a group schema or the current user schema) and stores geometries of a given type and within a specified Spatial Reference System (SRS). For geometries stored in a Feature Class a set of Properties can be defined. Each geometry that is later uploaded to that Feature Class shall provide these Properties. If a property is not provided a **No Data** or a **NULL** indicates a missing or not assigned value. The **Add Feature Class** dialog shows on the left side the defined Feature Property and on the right side the Simplex Properties. A set of default [Feature] properties are available for every Feature Class.

- * **oname** ... Object name of the Feature
- * **color_red**, ..., **style_transparency** ... Object [native] color representation
- * **id** ... Tables primary key
- * **model_feature** ... Free text object assignment [see Infobox]

Infobox: Property Model_Feature

With GST 2.11 Themes have gotten a more prominent role. One Theme called **Geology** will be pre installed matching on property **model_feature**. This property is used to control the assignment of a Feature to a geological setting via a property value. The property value can be matched by a Theme value to change the Feature's appearance (name and color represented in the legend) in GST Web. For more information about Themes please consult chapter [Manage Themes](#) on page 113!

- * Reading data from Gocad ASCII files the **Gocad Geological_Feature** will be stored into that Property.

Often used property definitions can be stored in Feature Class template files (fcdxml file extension) using the buttons **Save as template ...** resp. **Restore from template ...**. Template files that are stored in the GST Desktop Setup dir are called **Stored Templates**. They are pre installed with GST Desktop installer. By adding fcdxml files into the **templates** folder of your GST Desktop setup directory you can extend the list of stored templates.

Use the buttons  **add** and  **remove** to define custom Feature and Simplex Properties for your Feature Class.

Add custom Feature and Simplex Properties to a Feature Class

Feature Classes can be extended with custom properties via the **Add Feature Class** Dialog [shown in the chapter above] or via [Edit a Feature Class](#) on page 32.

Figure 2.8
The Add Property
Dialog

The following options are supported by the Add Property Dialog.

- * Add a normal Propertypage 27
- * Add a constrained Property page 28
- * Define an Alias with an Access Level restriction page 31

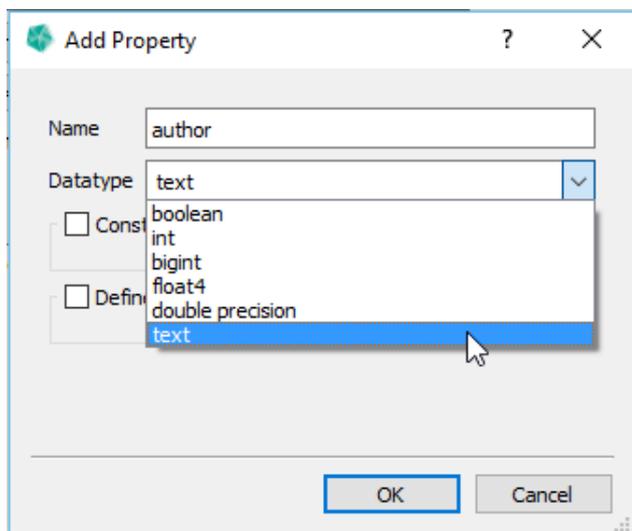
Definition

Normal Properties are free text or numerical. The user is allowed to set them to any appropriate value.

Constrained Properties are foreign key controlled properties. This allows to link values from a column of a third party table to a Property of the Feature Class. The user has the choice to select a value from the list of values of the third party table's column.

Add a normal property

Figure 2.9
"Add Property" dialog
where **Constrained
property** checkbox is
unchecked to setup
a normal property.



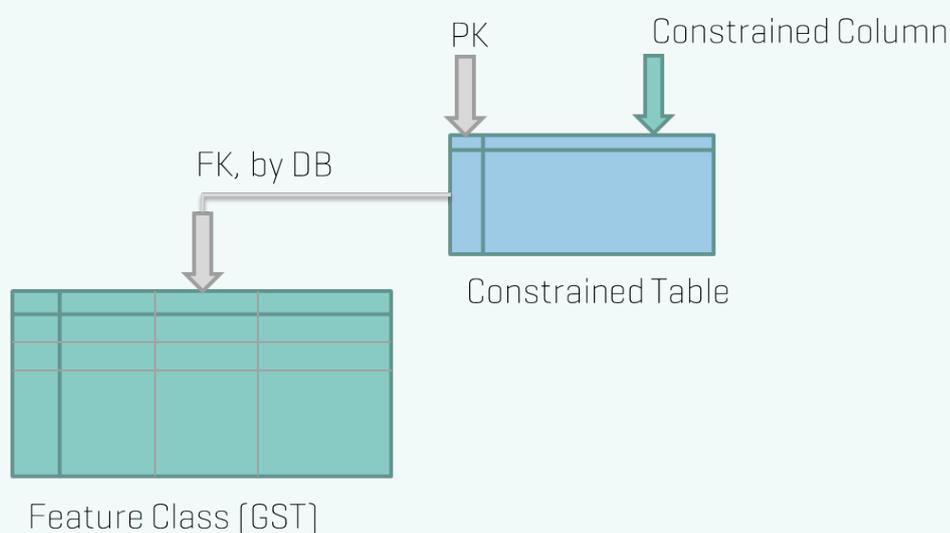
Simply specify a **property name** and a **property data type** to generate a normal property.

Add a constrained property

Concept for Constrained Properties

Constrained Properties can be useful if you have your own schema including object types. Create a Constrained Property to this table that includes the object type and specify the constrained column in the table so the user can choose one value from the list later on [e.g. see [Figure 2.5](#)].

The constrained column is one column in the linked table that is used to label the values. Within your Feature Class the Primary Key values of the linked table are stored. [Please refer to https://en.wikipedia.org/wiki/Foreign_key for more information about foreign keys.]



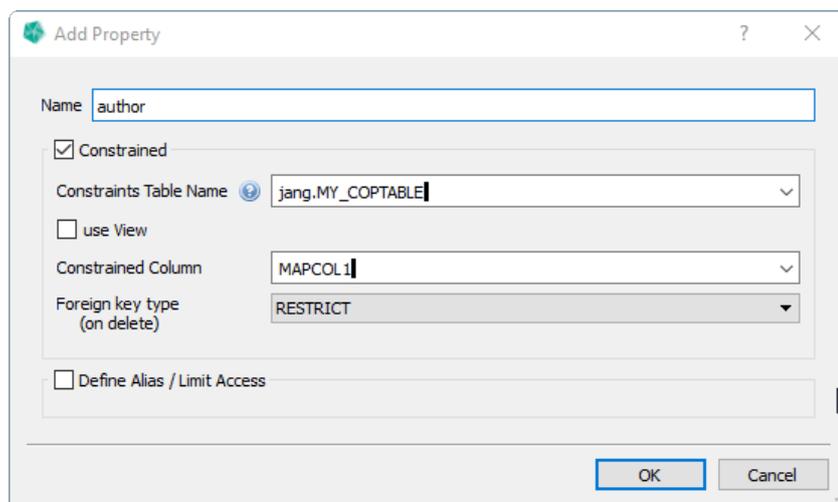
Requirements for Constrained Properties:

- * Tables must have a primary key
- * Users must have reference permission on the primary key column and the constrained column of the constrained table.

To create a constrained property, check the **Constrained property** check box in the **Add Property** dialog. The dialog will change to the **Add Constrained Property** dialog like below

2. Tab: Feature Selection

Figure 2.10
"Constrained feature
Property" dialog



A Constrained Property connects a Feature Class with a column of a foreign table or view by using a database foreign key. This makes it possible to link values that are stored in third party tables in the database, with Features of a Feature Class.

1. Choose the constraints table by using the **Constraints Table Name** drop down box or by typing in the name in the text field. Typing will be assisted by narrowing auto-complete suggestions.
2. Optional: Choose a view corresponding to a table by checking the **use View** check box. [see text box **Advanced in Constrained Properties** below]
3. Select the constrained column via the **Constrained Column** textbox or drop down menu.
4. Choose the on delete action.

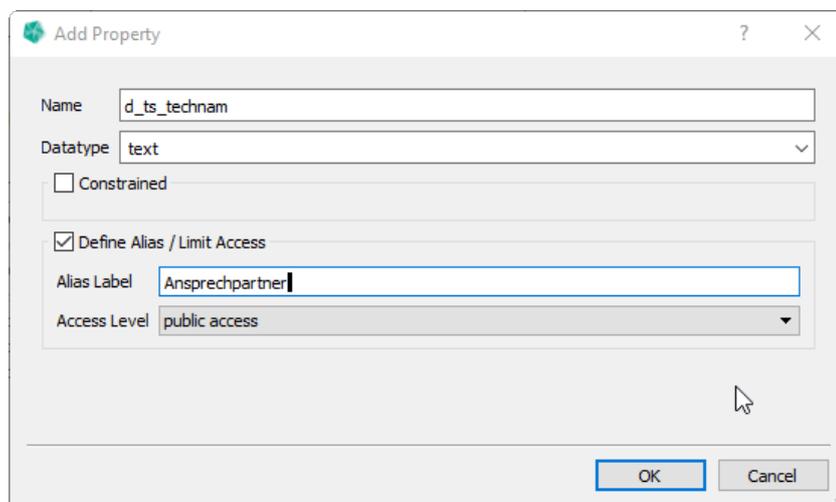
Note

Since the values of a constrained property are physically in a foreign table, we offer two options to handle what happens, if the data gets changed or deleted in the foreign table.

- **RESTRICT**: The value in the constrained table cannot be deleted as long as there is a reference to it from a feature class table.
- **SET NULL**: The value in the feature class table is set to NULL when a value in the constrained table is deleted

2.4 Property Aliases

Figure 2.11
Define an alias



By activating the checkbox **Define Alias / Limit Access** in the **Add Property** Dialog (see figure 2.11) a Property Alias can be attached to a property.

Property Aliases are used to

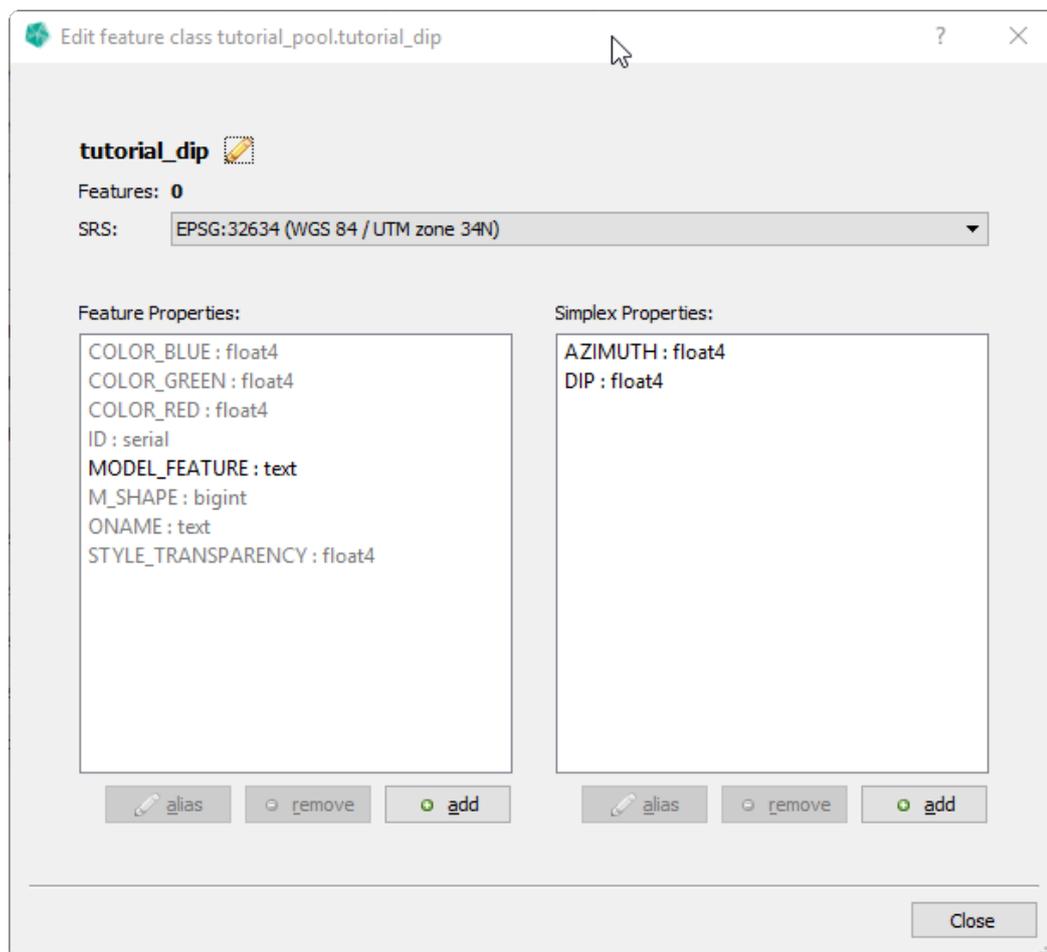
- * change the way properties are represented in GST Web.
- * hide and replace the (maybe technical) property names with are more meaning full name for users that are not involved in the modeling process.
- * limit the visibility of properties.

By defining an **Access Level** the visibility of a curtain property can be restricted for groups of Web users. Please refer to chapter [Motivation and concept of Themes](#) on page 114 for an explanation about Access Levels.

2.5 Edit a Feature Class

To open the **Edit Feature Class Dialog** use the context menu of the Feature Class list [see Figure 2.3 on page 21].

Figure 2.12
The Edit Feature
Class dialog



This dialog has the capability to

- * Change Feature Class name page 33
- * Change Class SRS page 33
 - * Set/Unset SRS [no transformation]
 - * Change SRS [persistent coordinate transformation]
- * Add/Remove Object and Simplex Properties or Alias definitions [see previous chapter] page 26

Note

When adding Properties to a Feature Class that already is filled with Features, the created Property Values will be assigned with **NULL** values.

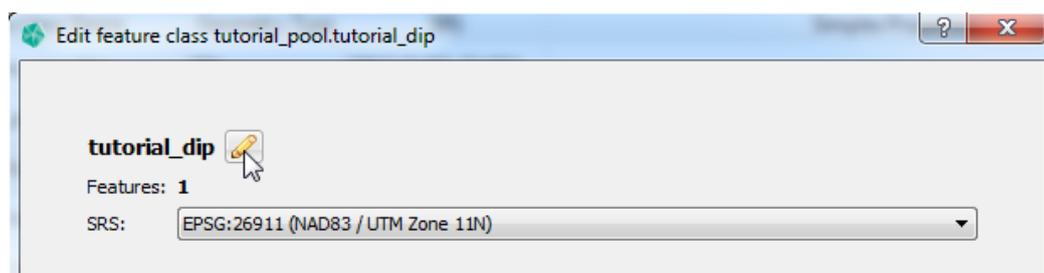
Browse feature class: docuser.demo_geodides

Select	oname text	Lock	id [PK] long	newproperty float
<input type="checkbox"/>	01_ts_dd_geol_Kreide	free	1	(NULL)
<input type="checkbox"/>	02_ts_dd_geol_Doehleener_Becken	free	3	(NULL)
<input type="checkbox"/>	03_ts_dd_geol_Riesenstein-Granit	free	4	(NULL)

Rename a Feature Class

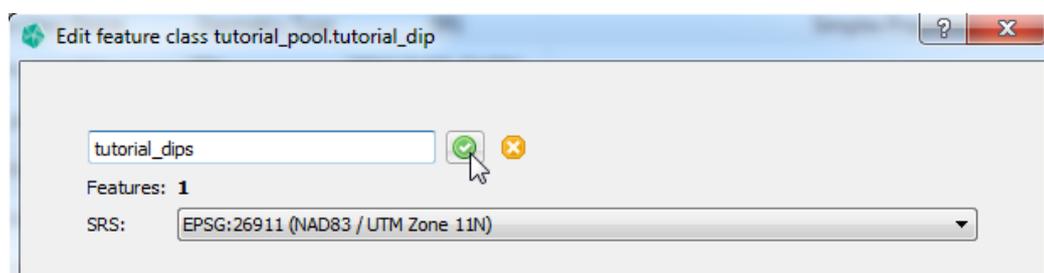
Renaming a Feature Class is very simple. In the **Edit Feature Class Dialog** use the  edit button to start the editing process.

Figure 2.13
The edit button is right behind the Feature Class Name



You can make your changes and  confirm your changes. This will make the changes persistent.  cancel your changes [or simply press ESC key] to discard the edit process.

Figure 2.14
Confirming your changes will write the new name persistent to the database

**Change Feature Class Spatial Reference System**

There are basically two ways of changing the Spatial Reference System [SRS] of your class:

- * **Without SRS Transformation**, simply unset the SRS first and then set a SRS. [No

2. Tab: Feature Selection

data will be transformed, just metadata will be changed.)

- * **With SRS Transformation**, which will cause a Transformation of your data in the Feature Class.

Both variants are equivalent if the Feature Class is empty. [The label **Features:** indicates the number of Features within the current class. In this example there is one Feature in the class `tutorial_dips`].

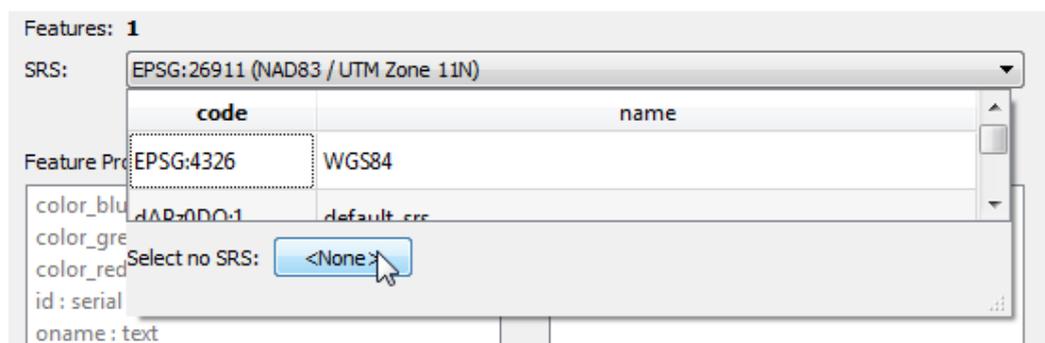
Without SRS Transformation

If the Feature Class has no SRS information simply specify one by choosing a SRS from the **SRS** dropdown element and press  **Apply**. Continue with step [2]! [No SRS information is indicated by a `<none>`.]

If the Feature Class has a SRS [SRS is different `<none>`, like in [Figure 2.14](#)], but you want to change the SRS to a different one without transforming your data, first unset the SRS and then set it. This could be useful if you have specified the wrong SRS while creating the Feature Class but already uploaded data.

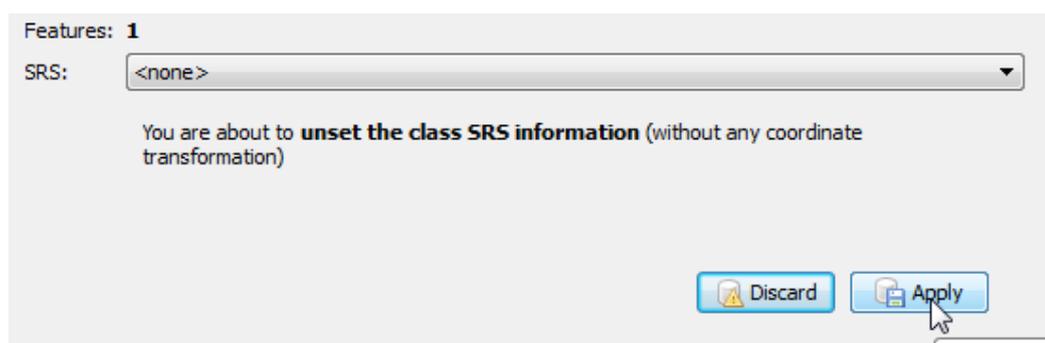
[1.1] To unset the SRS, use the `<None>` button on the bottom of the SRS list.

Figure 2.15
Use the `<None>` button on the bottom of the SRS list to unset the SRS.



[1.2]  **Apply** the unset operation with the buttons that appear direct below the **SRS** dropdown element. [You can do this without care. It can be undone anytime. Therefore simply select the last chosen SRS again.]

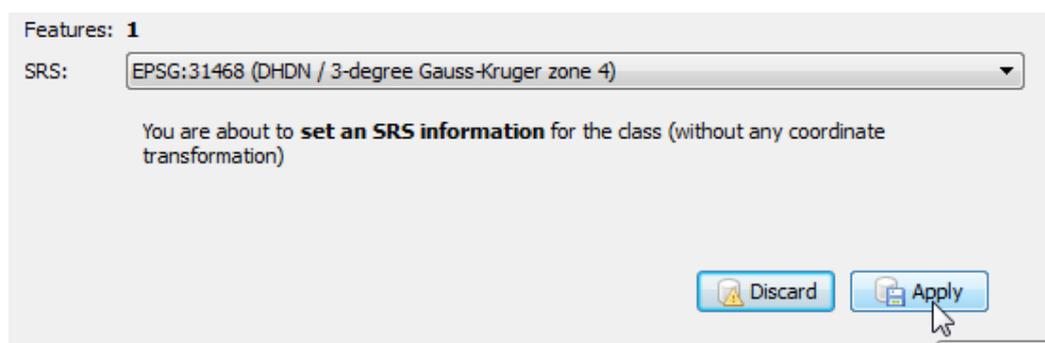
Figure 2.16
Make the unset operation persistent with the  **confirm** button



2. Tab: Feature Selection

[2] Change the Feature Class without SRS information. [A **<none>** as chosen SRS indicates this.] Therefore select a SRS from List and press the  **Apply** button to make the SRS information persistent.

Figure 2.17
Use the **<None>**
Button on the
bottom of the SRS
list to unset the SRS.



With SRS Transformation

Changing the Feature Class SRS with a Transformation works analog to the steps explained above with the difference that the SRS is not set to **<none>** [or resp. is set from **<none>**].

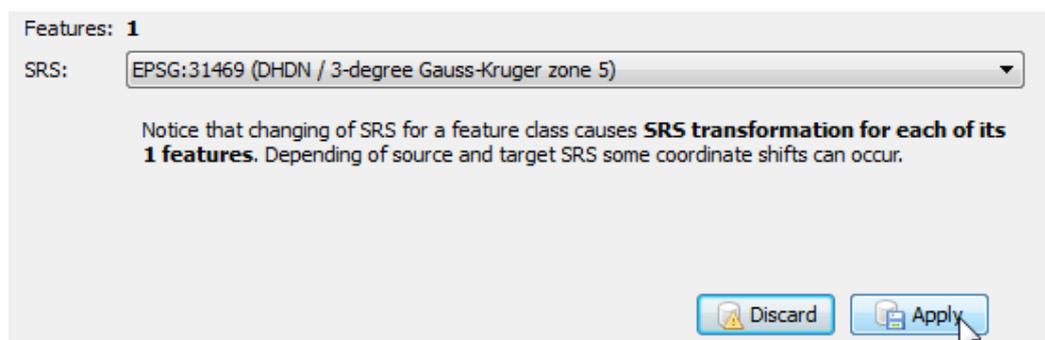
Remark when Transforming SRS

Changing the selected SRS in the **SRS** drop-down menu will cause a change the SRS of the Feature Class **plus a **Coordinate Transformation for each Feature within this class****. The Features will be transformed from the initial SRS to the selected SRS.

This can be redone inverse, but a Coordinate Transformation is never 100% exact. [That means there will be minimal numeric difference after redone the Transformation in the coordinates due to the transformation process itself that is systemic and depends on the source and target SRS.]

A message will notify you about the Transformation that will be triggered by the selection of another SRS. Press  **Apply** to save your changes and start the Transformation.

Figure 2.18
Selecting another
SRS will transform
all Features within
this class.



2.6 Import and export Feature Classes (fcdxml files)

GST Desktop offers the possibility to export Feature Classes into files. The Feature Class Detailed Descriptions (metadata about the Feature Class but not geometry data) are packed into an xml file and are written to a **fcdxml** file.

There might be several reasons to export Feature Classes. They typically are ...

- * ... simply to backup a custom base frame of Feature Classes. Backups are recommended especially if you have an enormous set of Properties and the Feature Class Creation Dialog requires many clicks to reproduce them. This is the main reason why the **Add Feature Class Dialog** offers a button to **Restore from Template** and allows to Setup **Stored Template** Feature Classes (see [Add a new Feature Class](#) on page 24).
- * ... when moving Feature Classes. This can be either used to copy Feature Classes from one User Space into another, or to restore Feature Classes on a different instance of GST Storage (e.g. from an intern platform to a presentation platform).

Note

An **fcdxml contains** no geometry information besides the geometry type. The information in a fcdxml is a list of Feature Class Detailed Descriptions that are

- * The Name of the Feature Class
- * The Owner (User or Group)
- * The Spatial Reference System
- * The Geometry Type
- * The Object Properties (Constrained and Regular)
- * The Simplex Properties (Constrained and Regular)
- * [For Constrained Properties the table name of the Foreign Key target table and the name of mapped column is stored. Take care that this tables exist when restoring a Feature Class on a different Instance.]

To export a complete Feature Class (including the geometry data) export the Geometries as well, see [Tab: Feature Selection - Downloading data](#) on page 63.

Export Feature Classes

Feature classes can be easily exported.

1. Select the Feature Classes to export in the Feature Class Table List (in [Figure 2.1](#) on page 19 the [blue box](#)).
2. Use the Context Menu (RMB) in Feature Class Table List and choose the Action **Export selected Classes**
3. Select a file location where you want to store the fcdxml file.

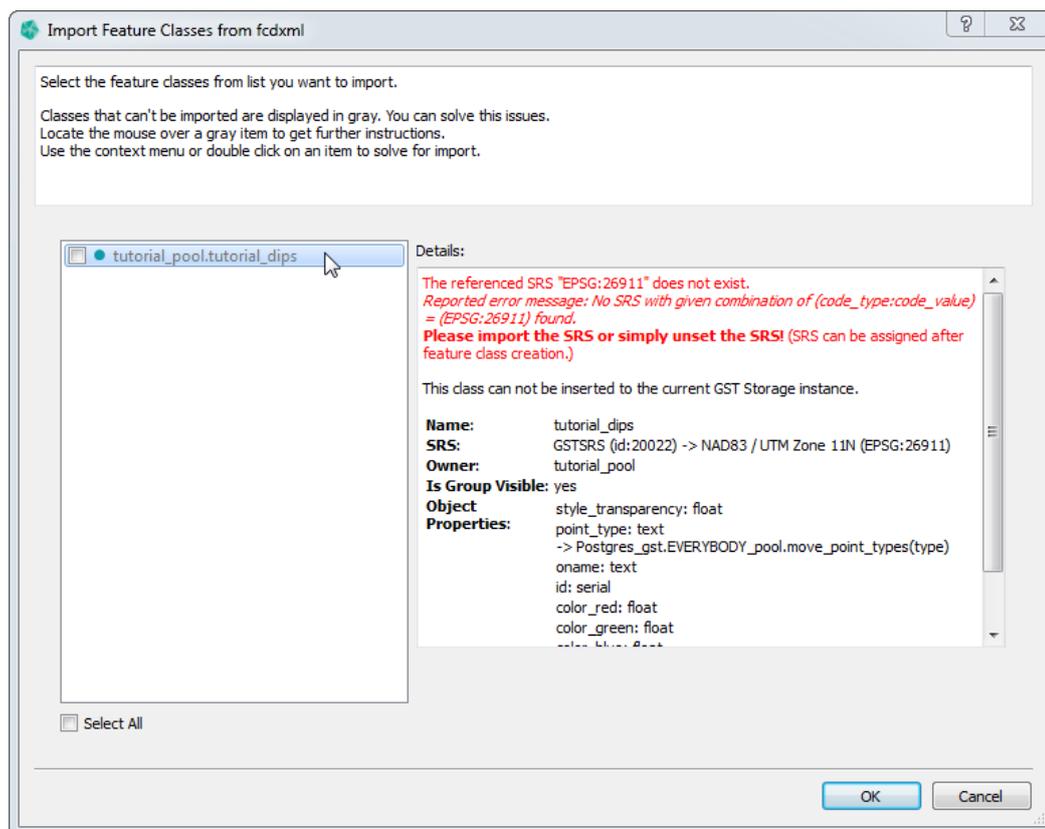
Tip

Feature Classes can be exported from **Add Feature Class Dialog** as well via the button **Save as template**, see [Add a new Feature Class](#) on page 24.

Import Feature Classes

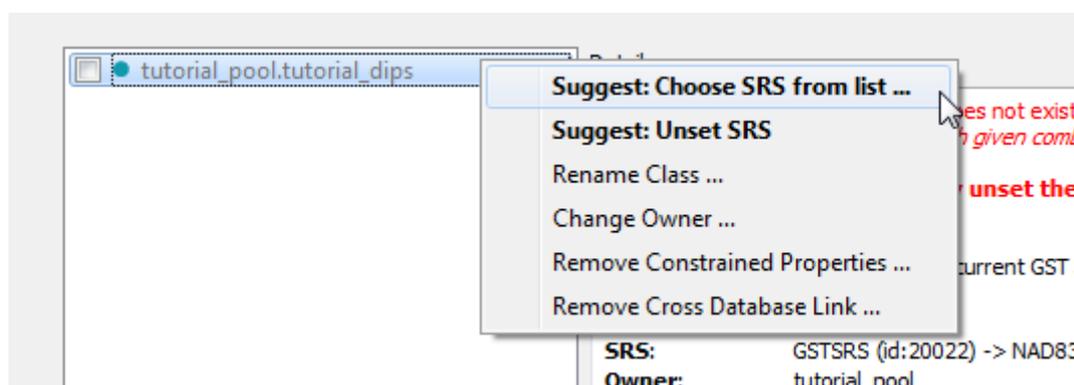
Use the context menu item  **Import Classes from file** to import from fcdxml (see [Figure 2.3](#) on page 21). Alternatively, the fcdxml can directly be imported via drag'n'drop to GST Desktop.

Figure 2.19
The content of the fcdxml is presented in the **Feature Classes Dialog**.



Select a Feature Class to get detailed information about it. **Inactive or grey items** indicate that conflicts occurred during the import of the Feature Class. **The details about the conflict are shown in the textbox on the right side colored in red.** The bold text give a possible resolution. The resolution can be applied within this Dialog. Therefore use the context menu [RMB] on the item show the resolutions. The bold text suggests a possible solution, which can be applied within this dialog. All suggestions will be shown as bold options in the context menu of the item. [You can also reach the suggested solutions by double clicking in a item.]

Figure 2.20
The context menu of each item gives resolution. The suggested resolution is highlighted in bold.



2. Tab: Feature Selection

The resolution options are

Choose SRS from list If the SRS specified by the fcdxml could not be matched automatically [see note box] with an SRS of the current GST Storage, specify one manually.

Unset SRS Sets the SRS to **<None>**.

Suggestion to recover the SRS: Create the required SRS [see section [Spatial Reference Systems](#) on page 8] and specify the newly created SRS for the Feature Class via editing the Feature Class [see section [Edit a Feature Class](#) on page 34]

Note

When importing Feature Classes from a different instance, the SRS identification can differ. Thus an **SRS automatch** tries to find an SRS with the same **code_type:code_value** pair [e.g. EPSG:4326] and will fail if no such SRS exists in the current instance.

Rename Class Changes the Feature Class name by user input to prevent name duplicates.

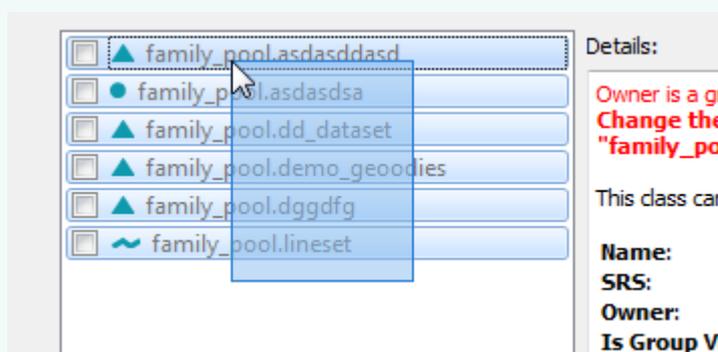
Change Owner Sets a different owner from drop down list.

Remove Constrained Properties Removes all Constrained Object and Simplex Properties. [useful if e.g. target tables are not available]

Remove Cross Database Link Remove the database label from the target table identifiers. [useful when importing fcdxml files that have been exported on a different GST Storage Instance]

Useful

When importing a **large fcdxml** file it can be useful to apply actions to more than one item. To apply a resolution to many items simply select the items to change [press **Select All** or drag with the mouse a selection rect].

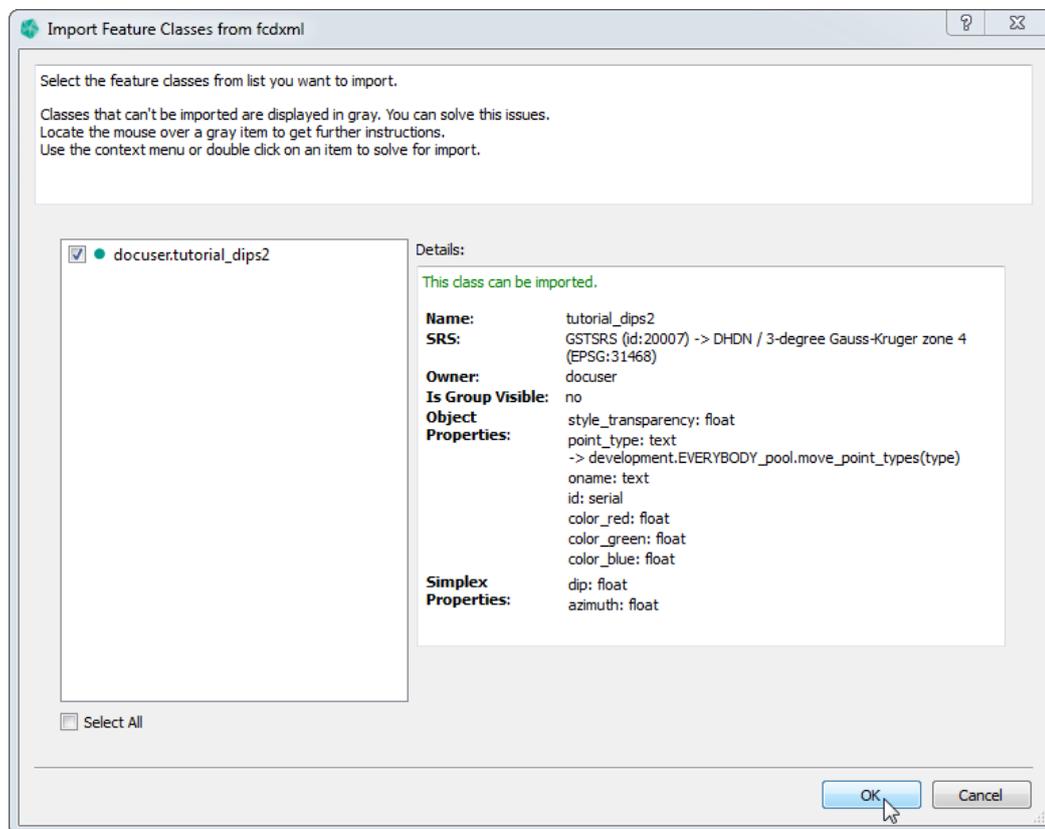


An active item with a **green info text** informs about an importable Feature Class without conflicts. Select the required Feature Classes by clicking on the item checkbox and

2. Tab: Feature Selection

confirm the Dialog with the **Ok** button.

Figure 2.21
An active item with a green info text informs about an importable Feature Class without conflicts.



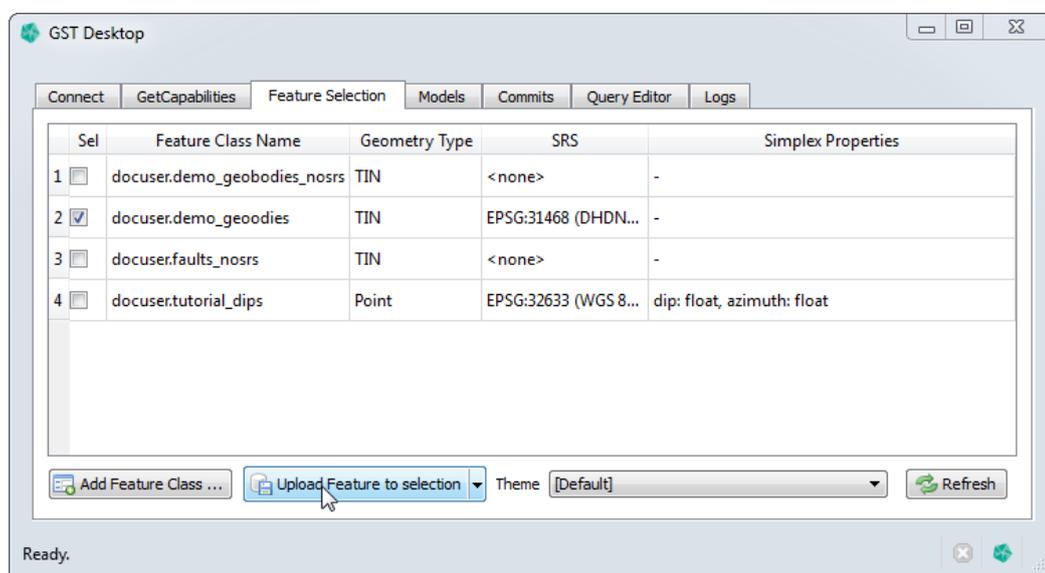
3 Tab: Feature Selection - Uploading data

The term **Uploading** has the meaning of adding data to the instance of **GST Storage**. This can be either a simple **upload** (adding new data) or can be an **update** (adding data as a new version of existing data. An update requires a  **lock key** in order to validate the data changes.) To start an upload/update you have two ways:

1. Upload data via browsing files (This allows for upload in several Feature Classes in one step.) page 41
2. Upload data via Drag'n'Drop page 42

3.1 Upload data (browse files)

Figure 3.1
Feature selection
dialog



1. Select a target Feature Class. When you have selected a Feature Class in the Feature Class list, the button  **Upload Feature to selection** becomes active.
2. Click the  **Upload Feature to selection** button to start the upload into the target class.

Tip: Uploading same data into several Feature Classes

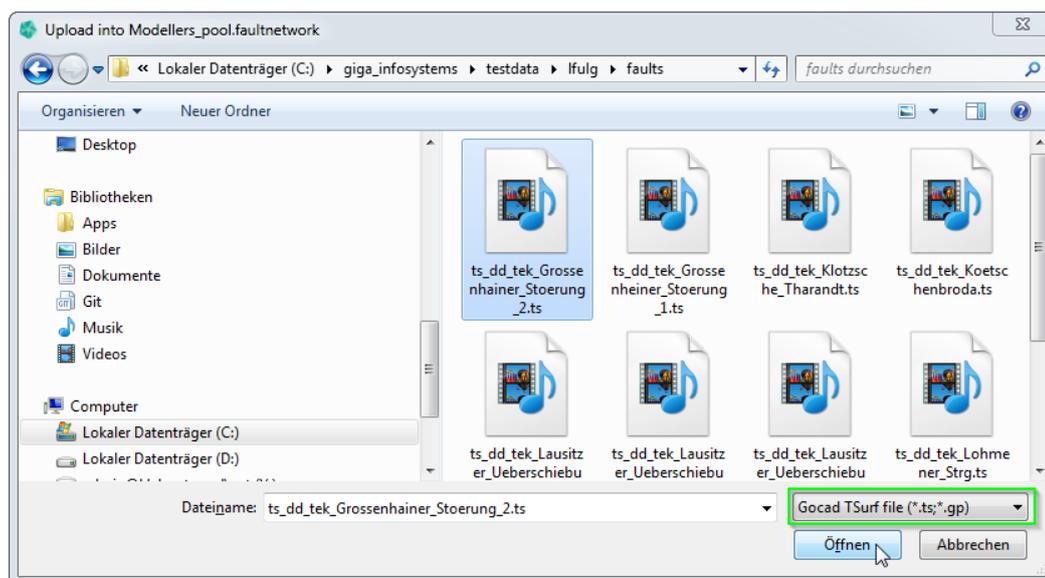
If you want to upload the same data into several classes, select more than one class in the list.

Tip: Uploading with context menu

Alternatively you can use the context menu to upload data. For this, click with the RMB on the target Feature Class and choose  **Upload into: ...**

3. Select files for uploading in the **Open File dialog** (Figure 3.2)

Figure 3.2
Open File Dialog:
Browse and select
the files to upload.
Please remark the
file extension filter
(green box)
on the
bottom right to
control the displayed
file types.



After the Open File Dialog is confirmed the files are parsed and the **Upload Wizard** (Upload Wizard on page 44) will guide through the upload.

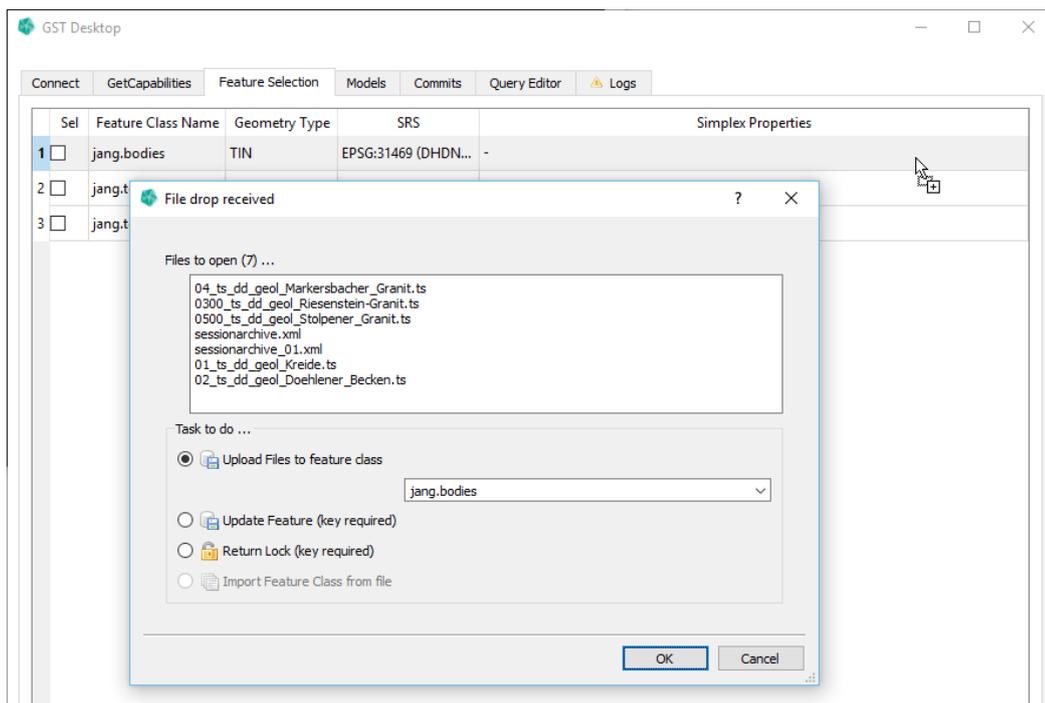
3.2 Upload data (Drag'n'Drop)

As an alternative to the browse files method, you can drag'n'drop files you want to upload from your file manager onto **GST Desktop**. The following file types are accepted:

- * **geometry files** (like Gocad ASCII files, Surpac STR/DTM files etc.)
- * **session or object archive files**. This allows to easy start updates when the archive files are containing a  **lock key**. On the other hand this method can be used to return a  **lock key**.
- * **fcdxml files** (Feature Class Description files). See [Import and export Feature Classes \(fcdxml files\)](#) on page 36 for more information about recreating Feature Class on other instances of **GST Storage**.

3. Tab: Feature Selection - Uploading data

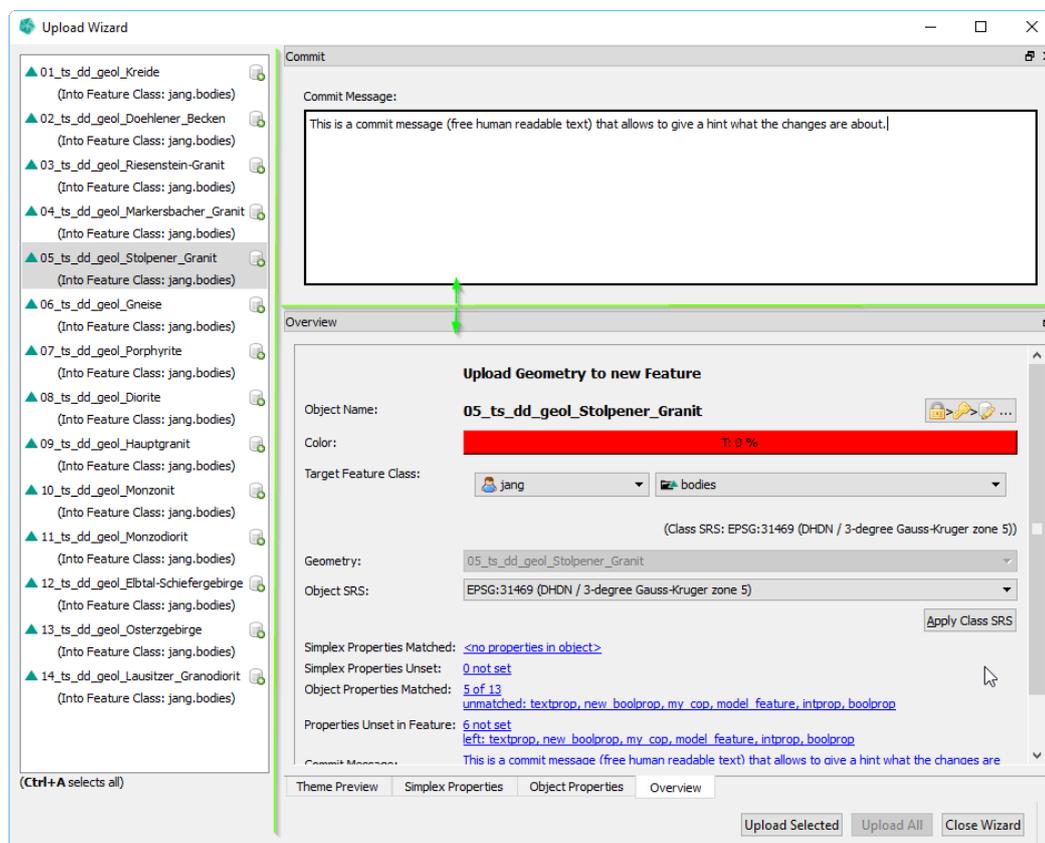
Figure 3.3
After you drop files on GST Desktop a dialog asks for what action to perform with the files.



After the action was specified a process starts to read the files. The file contents will be presented in the **Upload Wizard**, where the **Target Feature Class**, **Feature Properties**, **Simplex Properties**, **SRS** definition and more can be applied for inserting the data into **GST Storage**.

4 Upload Wizard

Figure 4.1
The Upload Wizard.
Remark the realizability [green lines in this screenshot]



The **Upload Wizard** guides you through the upload process. This Dialog shows the content of the opened and parsed files in the list on the left side. Select one or more items on the left side to show details about the selection on the right side. Remark the tabs [**Simplex Properties**, **Object Properties** and **Overview**] on the bottom. You can perform changes on the selected objects (e.g. change or set object properties, set SRS, etc as explained in the following section).

When all configurations and changes are correct (use the **Overview** section to show all information in one place), use one of the buttons on the bottom of the wizard to start the upload.

- * **Upload Selected** Uploads the selected object(s). (No more changes can be applied to these objects afterwards.)
- * **Upload All** Uploads **all** objects. Please verify that the settings for all objects are correct.
- * **Close Wizard** Closes the Wizard (discards all remaining objects within this Upload

Session].

The tabs as well as the box **Commit** are dockable widgets (see tip below). Their function will be explained in the following pages:

- * **Commit** page 46
- * **Overview** page 47
- * **Object Properties** [for Single Selection on left list] page 55
- * **Object Properties** [for Multi Selection on left list] page 57
- * **Simplex Properties** page 58
- * **Theme Preview** page 60

Tip: Customize the Upload Wizard

The sections are placed in so called "dockable widgets". These widgets allow resizing, moving and rearranging in order to customize the upload wizard's appearance. You can drag them by clicking on titlebar and place, move or resize the widgets [as known from other applications].

Tip: Links in overview

A click on a blue highlighted link at the bottom of the **Overview** section brings the corresponding section to the front.

Tip: Drag'n'Drop

You can add additional archive or geometry files to the active upload sessions by drag'n'dropping them onto the Upload Wizard window.

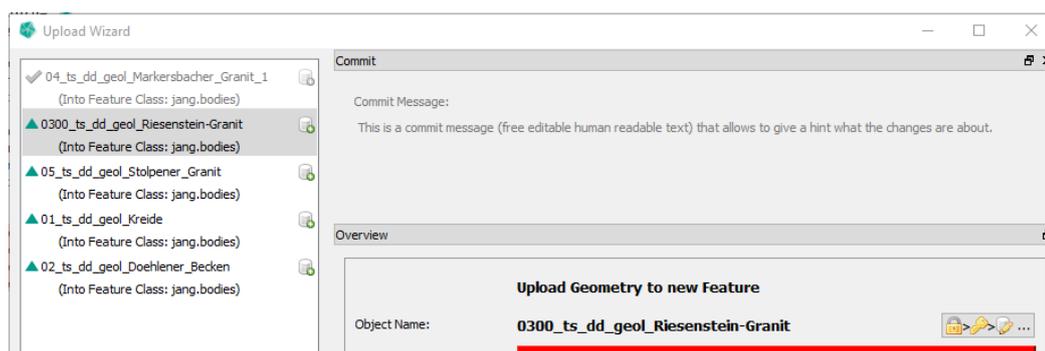
This can be useful when you have added an updated object file but forgot to add the corresponding session archive file [containing the  **lock key**]. Geometries from drag'n'dropped files will be added to the list on the left side.

4.1 Section: Commit Message

This text field is mandatory. Give a brief but meaningful hint about what data will be uploaded or are going to be changed and why.

The commit message text is valid for the whole upload process. The commit will be finalized as soon as the first object is transferred to the database. No further changes to the commit message will be possible after that. From this moment the commit message textbox is no longer required and can be **✕ closed**.

Figure 4.2
The commit message text box becomes unavailable when the first object is committed.

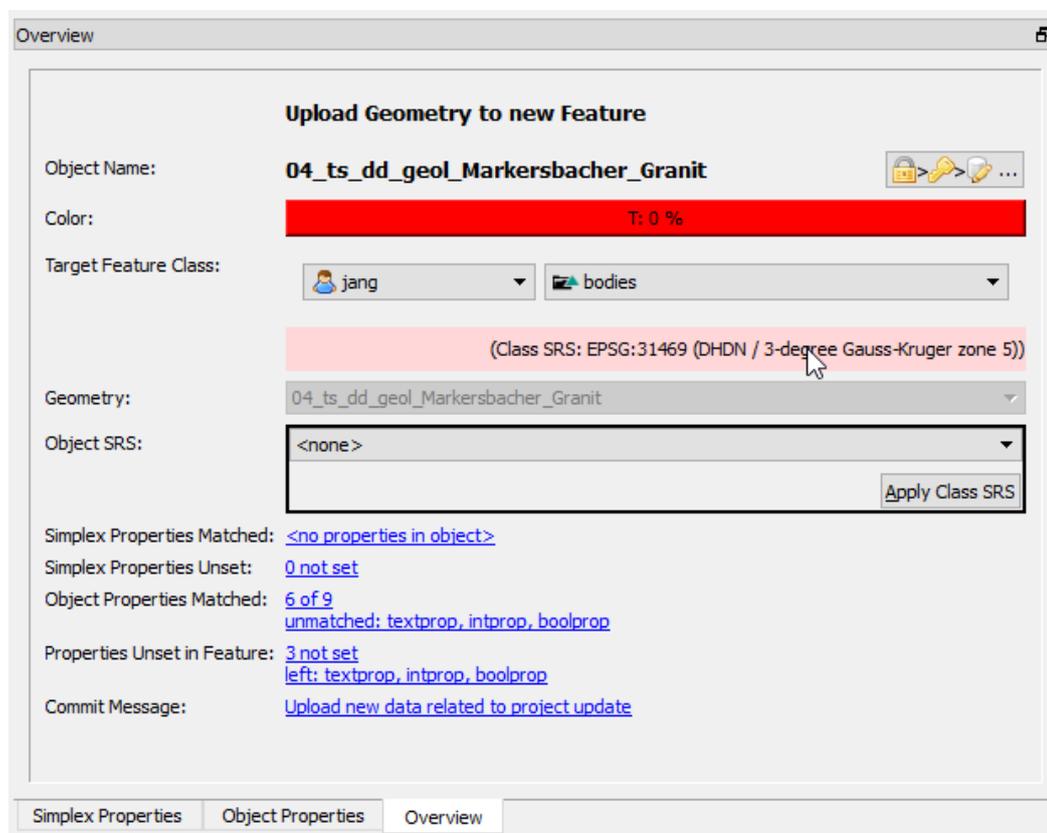


Note

The commit message and all assigned Feature changes can be seen by any user in the **Commit Tab** in the **GST Desktop** main tab list, see [Tab: Commits](#) on page 76.

4.2 Section: Overview

Figure 4.3
The overview section shows all relevant information in one place and highlights missing input.



The overview section shows all relevant information in one place and highlights missing input [like in figure 4.3 it highlights the missing SRS information for the current object 04_ts_dd_geol_Markersbacher_Granit.]

From top to bottom the information and controls are:

Headline A text about what will be done [Upload or Updating]

Object Name The geometry name as parsed from its file

 **Lock a Feature** Connect a geometry with a Feature in order to update it. [Instantly a lock key will be received.] page 49

Color The color of the geometry as parsed from its file. You can click on the color button **T: 0 %** [the label is indicating the transparency channel of the color] to change the color of the Feature.

Target Feature Class Shows the target Feature Class for the selected geometry. The target class can be changed by first selecting the owner [left dropdown box] and second the Feature class within the owner's pool [right dropdown box]. Below the two dropdown boxes

is the Feature class SRS.

Geometry Shows which geometry will be uploaded. This dropdown box will be enabled for  **Unresolved Items**. Use this box to connect a unresolved item with a geometry. A unresolved item can occur when specifying an archive file for the upload/update but the corresponding geometry file could not be resolved from that archive. This can happen when the filename of the geometry was changed from a third party software or the geometry name has been changed since it was locked. . . . page [50](#)

Object SRS Use the drop down box to specify the Spatial Reference System of your object's coordinates. The button **Apply Class SRS** sets the SRS to the one set on the target Feature Class. **Please be aware that coordinate transformations due to different SRS can possible cause shifts in the coordinates.** page [53](#)

Simplex Properties Matched Shows the number of matched simplex properties from the object. A mouse click highlights the **Simplex Properties** section.

Simplex Properties Unset Shows the number of simplex properties defined in the Feature Class that are not present or could not be matched in the current object. Those properties will obtain a NULL value after uploading (indicating a "value is missing"). A mouse click highlights the **Simplex Properties** section.

Object Properties Matched Shows the number of matched object properties from the object. A mouse click highlights the **Objects Properties** section.

Properties Unset in Feature Shows the number of object properties defined in the Feature Class that are not present or could not be matched in the current object. Those properties will obtain a NULL value. Object properties can be later set or changed in the Feature dialog [see [Context Menu in Feature Class list](#) on page [22](#)]. A mouse click highlights the **Objects Properties** section.

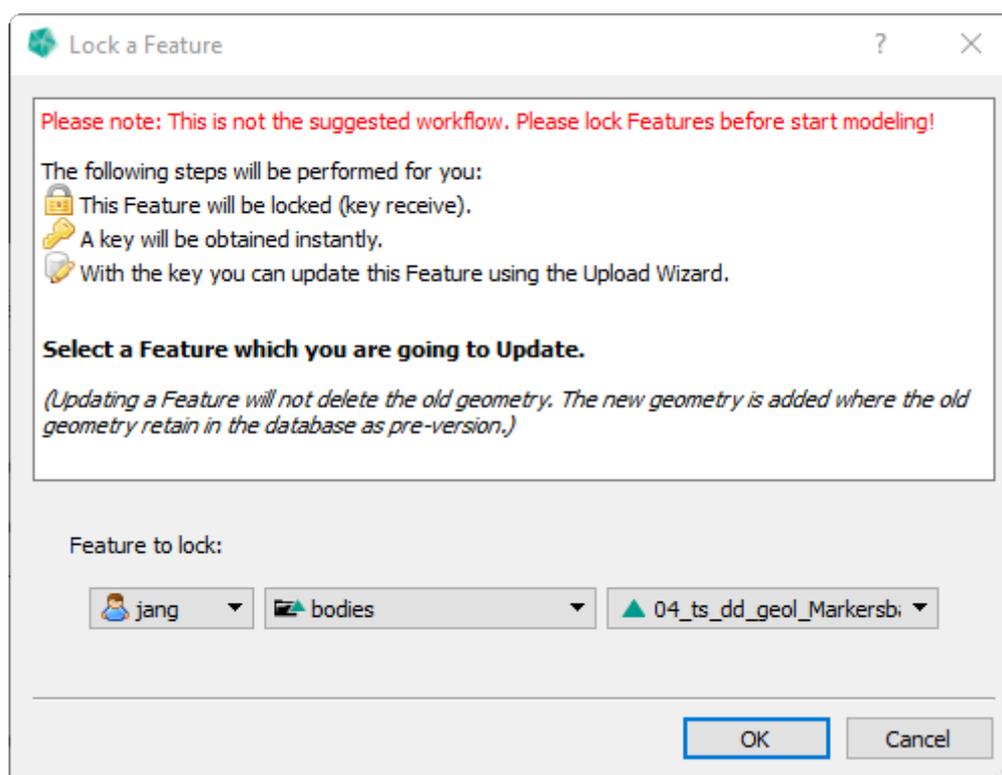
Commit Message Displays the commit message. When the **Commit** section has been  closed, a mouse click will reopen the **Commit** section.

Lock a Feature in the Upload Wizard

Important Note

Lock a Feature in the Upload Wizard is not the suggested workflow. Use it as exception! It is possible that an user in meantime starts modeling. To prevent you from lost updates please lock Features before start modeling!

Figure 4.4
Select a Feature to
instantly request a
lock



Locking a feature is only active for items to **upload** [see figure 4.5 left side].

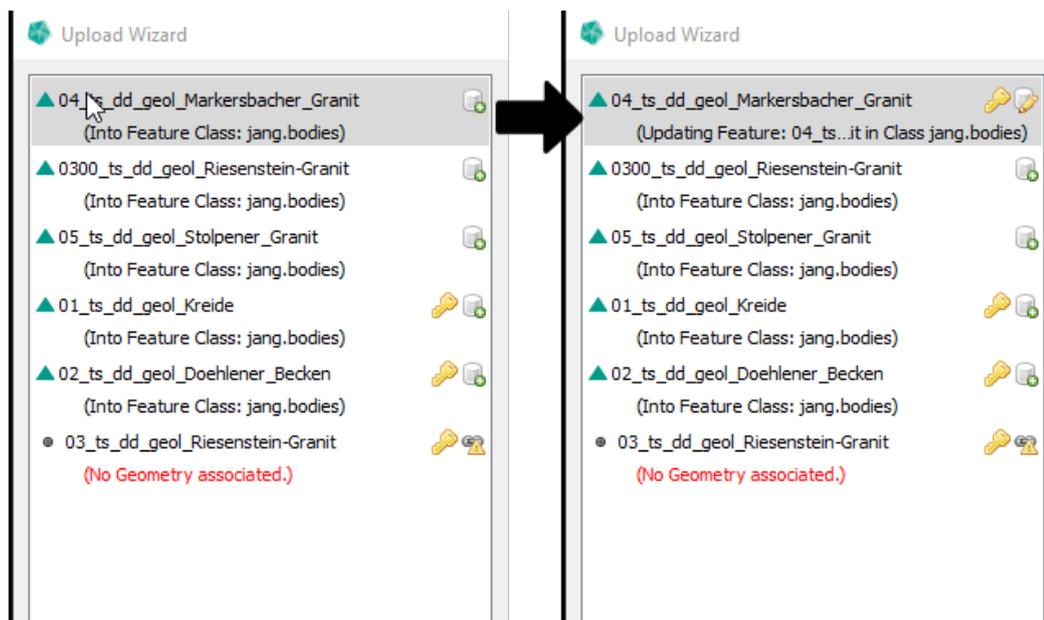
When pressing the button **Lock a Feature** a dialog pops up asking for a Feature to lock. In the three drop down elements first select the owner pool your Feature Class is in. Second select a Feature Class and third select the Feature to lock. When confirming this dialog with the **Ok** button the selected Feature will be requested for a lock. As long as no other user is still locking this Feature a valid **lock key** will be returned from the database and assigned to the current selected geometry. Remark the changed symbol from **upload** to **update** in figure 4.5.

Important: Disk Space

Updating a Feature will not delete the old geometry. The new geometry is added where the old geometry retain in the database as pre-version. Extensive usage requires more disk space for your **GST Storage** instance.

Figure 4.5

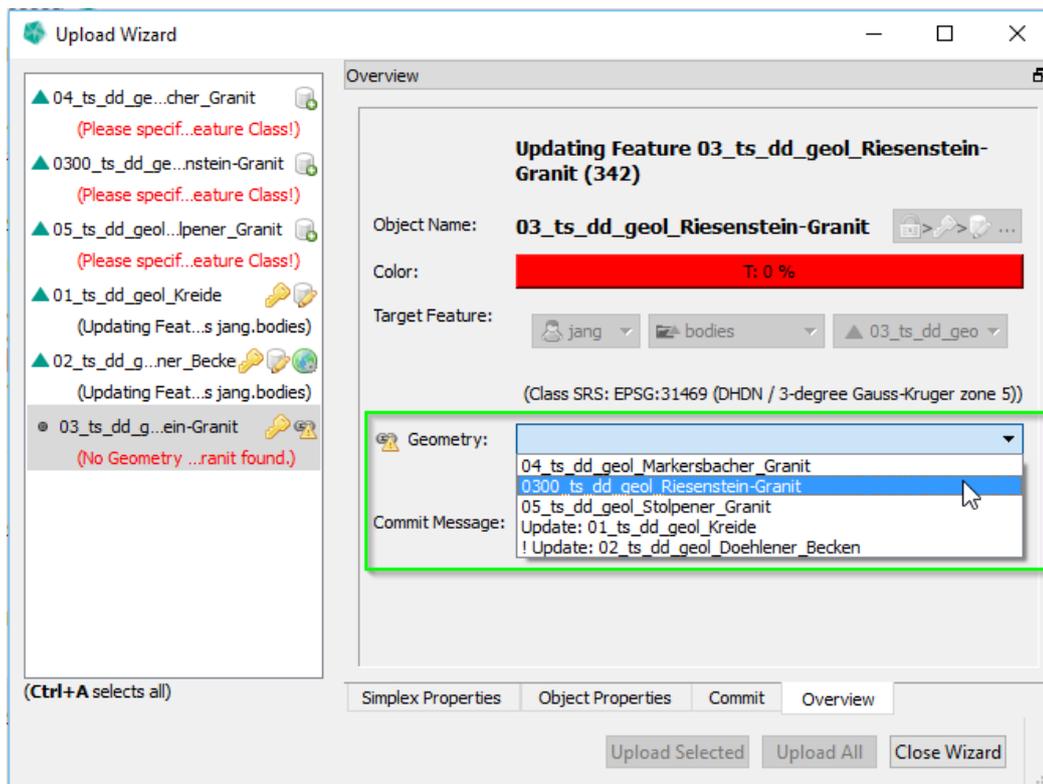
Lock a Feature is available for new and unassigned geometries. These are indicated as items to **upload**. After locking the item is marked as item to **update**



Link a Geometry to an Unresolved Item

4. Upload Wizard

Figure 4.6
For a **Unresolved Item** select a Geometry from the drop down list in the **Overview** section.



Given is the following situation: A user downloaded data from GST in the Gocad file format with a lock in order to edit the data. [See [Locking – Download data for modification](#) on page 64 on how to download data with a lock.] On the hard disk several Gocad object files were written plus a session archive file [containing the lock keys]. The user imported said data into Gocad and started modeling. During this process the user renamed an object and also created some new objects. After the modeling process, the data [the edited objects and the new objects] was loaded back into GST Desktop for an upload/update back into GST. [This can be simply done by drag'n'drop the Gocad files and the archive file onto **GST Desktop**, like stated earlier in this chapter see page 41.]

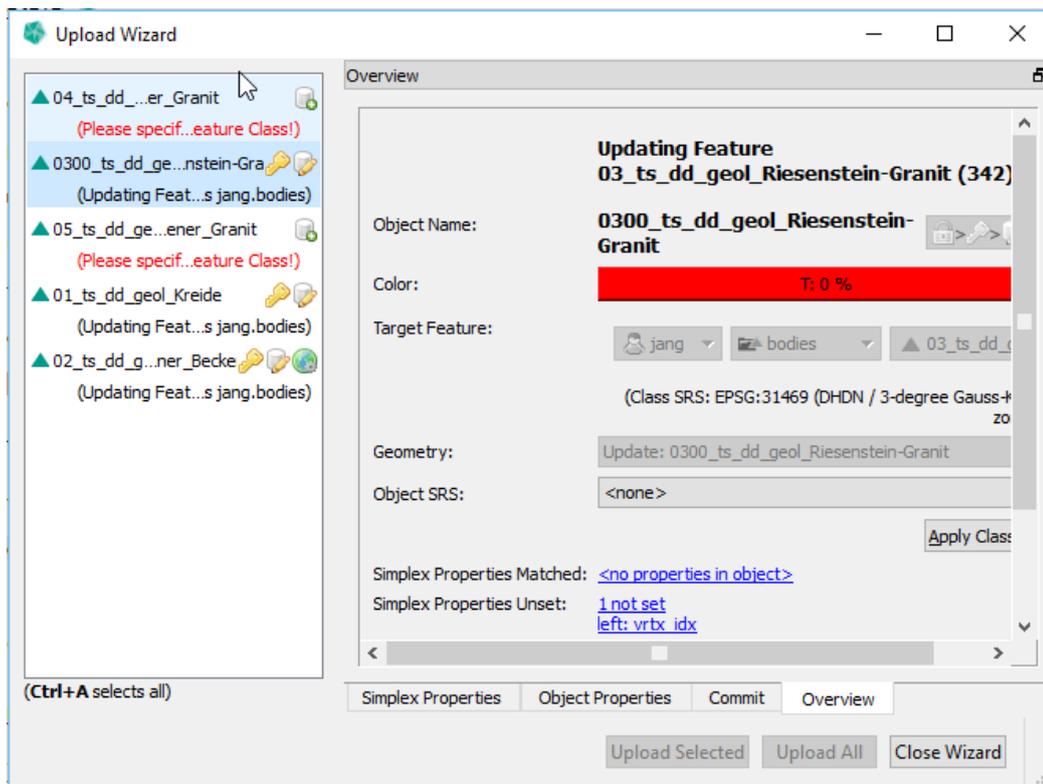
In situations like explained above an object or object file name have been renamed which was referenced by a session archive. As a result the connection from the session archive [containing the  **lock key**] and the object file [containing the Gocad modeling result] is broken. The updated geometry is represented wrongly as a new item to  **upload** in the Upload Wizard list. The entry of the session archive with a broken connection to a geometry file is represented as  **Unresolved Item** in the left list [see figure 4.6]. In order to connect the  **Unresolved Item** with a geometry select the  **Unresolved Item** in the list and choose the geometry in the **Geometry** drop down box [in figure 4.6 highlighted by a [green box](#)].

Important

It is required that the geometry to be linked is within this upload wizard session. [This means it should be selected or drag'n'dropped together with the session archive.]

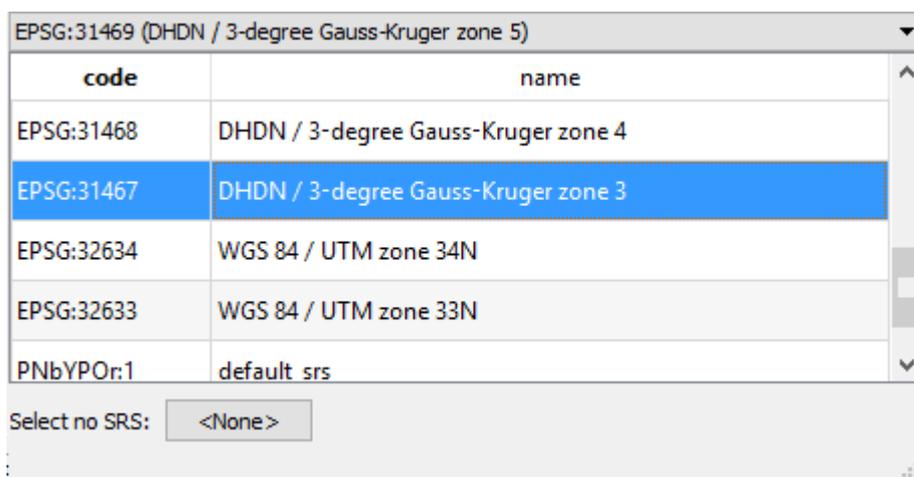
4. Upload Wizard

Figure 4.7
After the link operation is performed the **Unresolved Item** and the geometry to **upload** have been merged.



Specify an Object SRS

Figure 4.8
SRS drop down box



To specify a Spatial Reference System for an object simply select an SRS from the list. You can type the SRS name or the EPSG code to filter the table.

Important information about SRS transformations

Upload Geometry to new Feature

Object Name: **04_ts_dd_geol_Markersbacher_Granit**

Color: **T: 0 %**

Target Feature Class: **jang** / **bodies**

(Class SRS: EPSG:31469 (DHDN / 3-degree Gauss-Kruger zone 5))

Geometry: **04_ts_dd_geol_Markersbacher_Granit**

 Object SRS: **EPSG:31468 (DHDN / 3-degree Gauss-Kruger zone 4)**

Object coordinates will be transformed. (Reason: Class and object SRS are different.)
 Since the transformation can cause some deviation depending on source and target SRS.

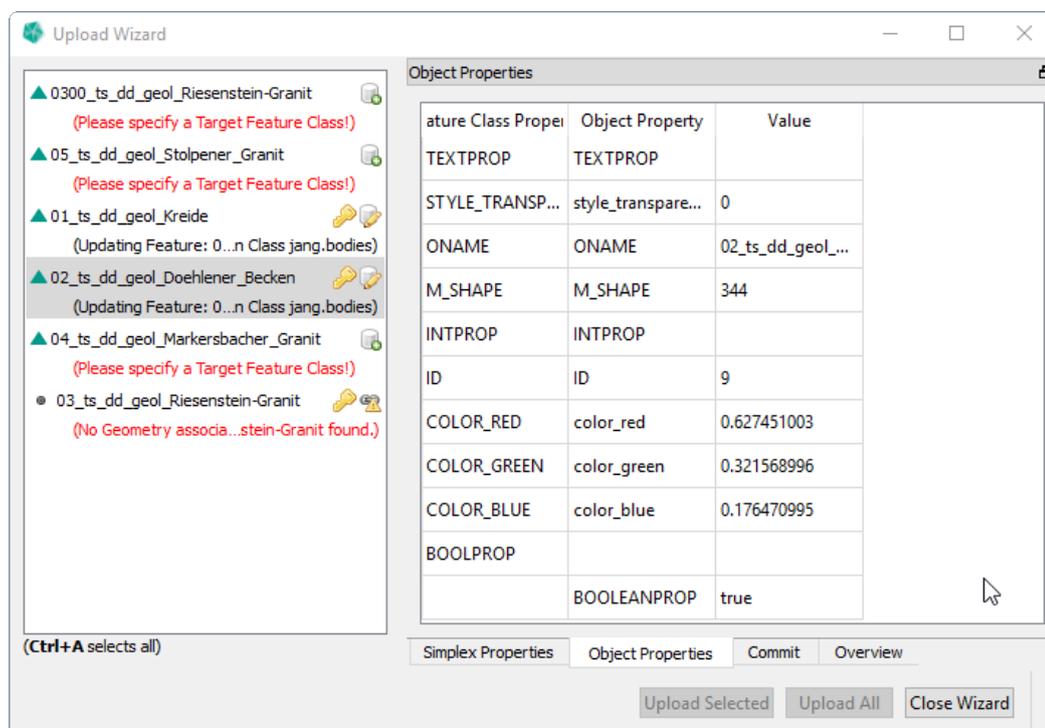
Simplex Properties Unset: [not set](#)

[Apply Class SRS](#)

If the chosen object SRS differs from that of the target Feature Class, a coordinate transformation will be performed. An  **transformation icon** in front of **Object SRS** indicates this. Depending on the source SRS [SRS of the object] and the target SRS [SRS of the Feature class] shifts or inaccuracies may occur. These differences may be not constant, depended on the source and target SRS and on the location of the points to be transformed. To minimize this error, take care that your points are inside the valid boundaries of your source SRS and that the target SRS is valid for the expected point location.

4.3 Section: Object Properties

Figure 4.9 Table listing the object properties and values found from the file next to the object properties present in the Feature Class.

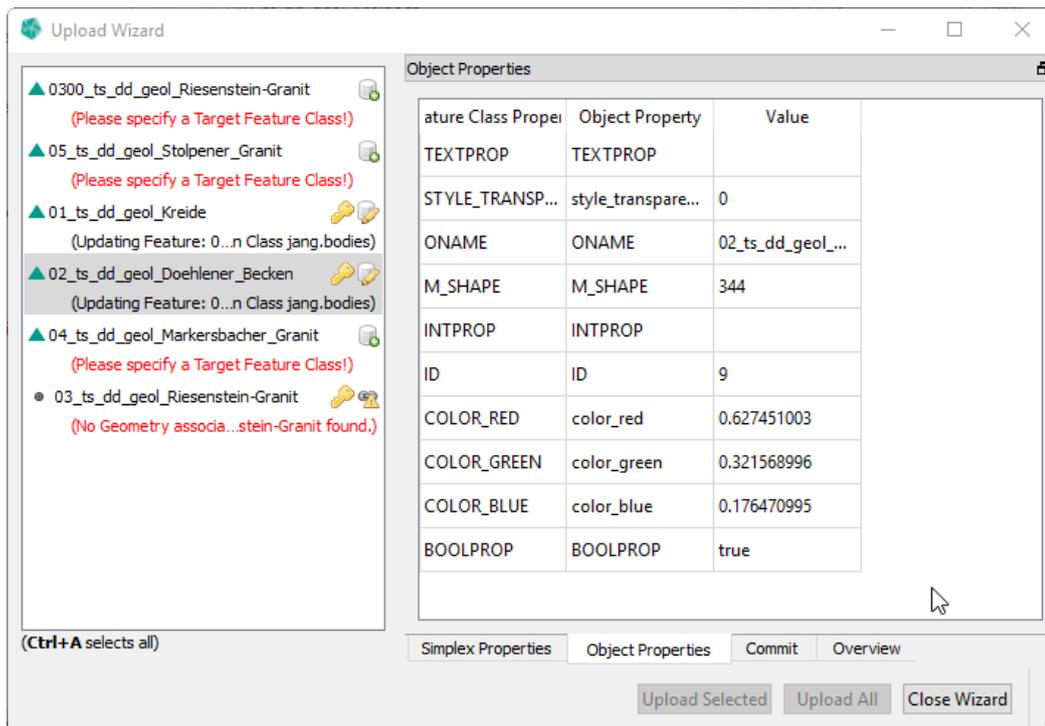


In the section **Object Properties** all parsed properties (from the object file being selected in the left list) are represented in column **Object Property**. The **Feature Class Properties** are under the column with the same name. If the names of the properties matches between both, they have values next to each other in one row (see **ONAME** in figure 4.9). If a property from the file could not be matched with one of the target Feature Class **Feature Class Property** will be blank. Accordingly, if a property of the Feature Class was not found in the file, **Object Property** will be blank. (see property **BOOLEANPROP** resp. **BOOLPROP** in figure 4.9). In order to match the properties simply rename the object property to be equal to the Feature Class Property. (Editing of the table cell depends on your OS. Typically this is done via a double click into the cell.) Change the name and press enter. When the names are matching the two columns will be merged (see figure 4.10).

You can also edit the **Values** or add missing ones before the upload. In order to change a **Value** for several objects, select them in the left list (see the next section 4.3).

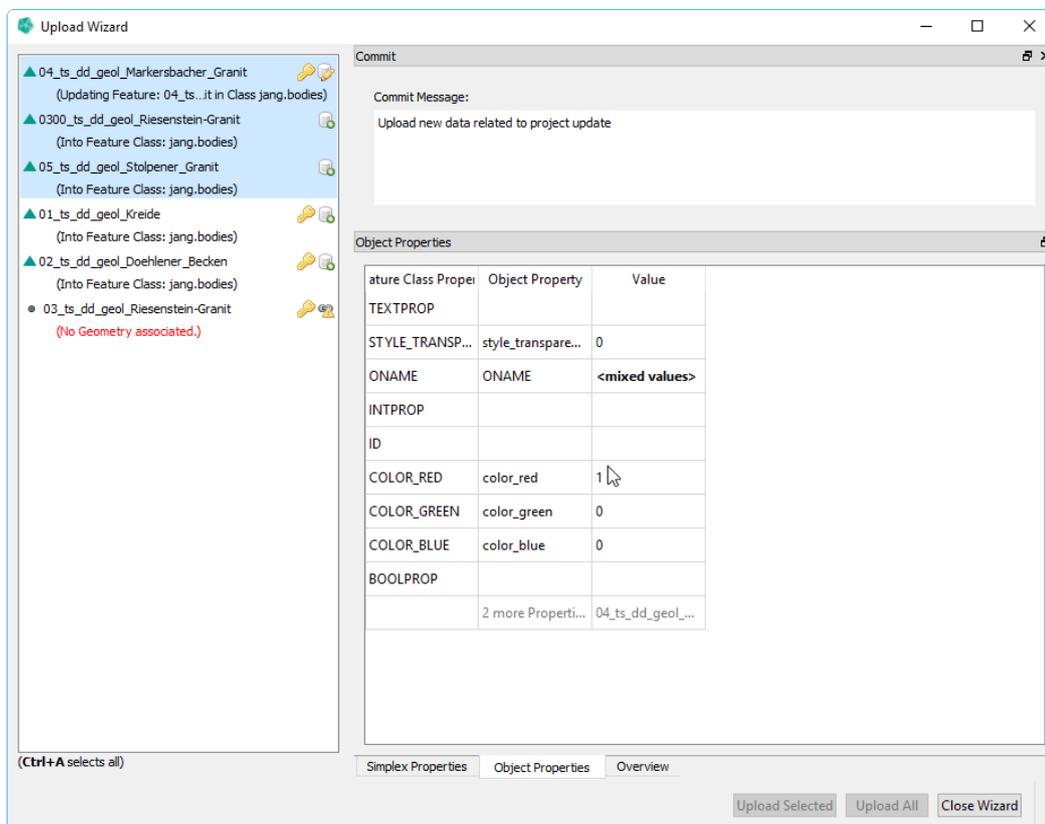
4. Upload Wizard

Figure 4.10
To match properties
rename the object
property. Compare
Property **BOOLPROP**
with figure 4.9



Multi Selection / Set Property Values in bulk

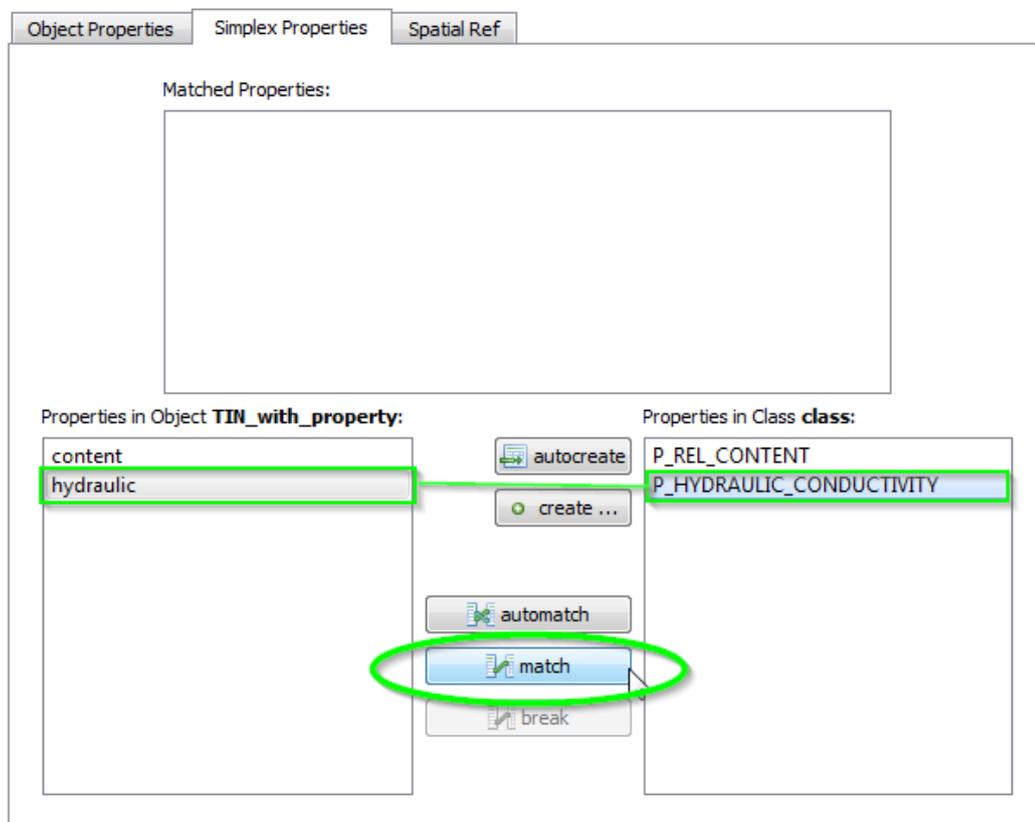
Figure 4.11
Multiselection of
object items in the
Upload Wizard



In order to set property values for several object, simply select multiple objects in the left list. (For this, drag a selection box over the list or use the Ctrl-key + mouse click.) The table in section **Object Properties** will list all common properties and indicates unique ones in the last column. To change object values for several objects edit the value in column **Value**.

4.4 Section: Simplex Properties

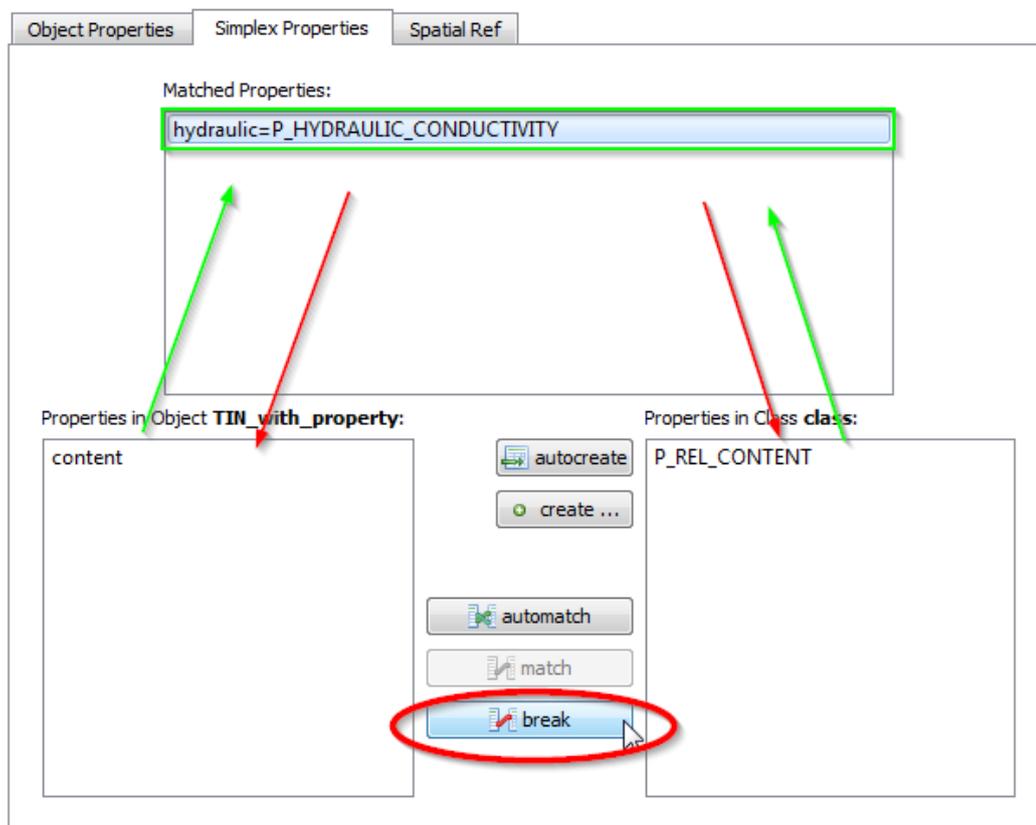
Figure 4.12
Simplex Properties
section after a file
was parsed.



The **Simplex Properties** section shows the simplex properties found in the file on the left and the ones of the Feature Class on the right. If the names of the properties are equal GST tries to match them automatically. You can force this by clicking on the  **automatch** button.

If properties are not matched automatically you can do it manually. To do so, select the simplex property from the file in the left list and the corresponding simplex property of the Feature Class on the right and click the  **match** button [see [green circle](#)].

Figure 4.13
Simplex Properties
section after a
manual match.



The match is symbolized in the list on top of the screen, where the two properties are connected with an equal sign ["="]. You can undo the match by clicking the  **break** button [red circle].

To store simplex properties of the file that are not present in the Feature Class, you have to add them to the Feature Class first.

1. The  **autocreate** button automatically creates a simplex property in the Feature Class on the database for each simplex property from the list on the left.
2. The  **create ...** button allows you to create a new simplex property in the Feature Class on the database. You will be asked for its name and type.

Note

Creating a new simplex property in a Feature Classes will also create it for every existing Feature of that class. This also means that, for existing Features, the value for this property will be set to NULL [meaning value is missing].

4.5 Section: Theme Preview

The dockable section **Theme Preview** shows how the current selected object will be represented in the different Themes that are available on the current GST instance.

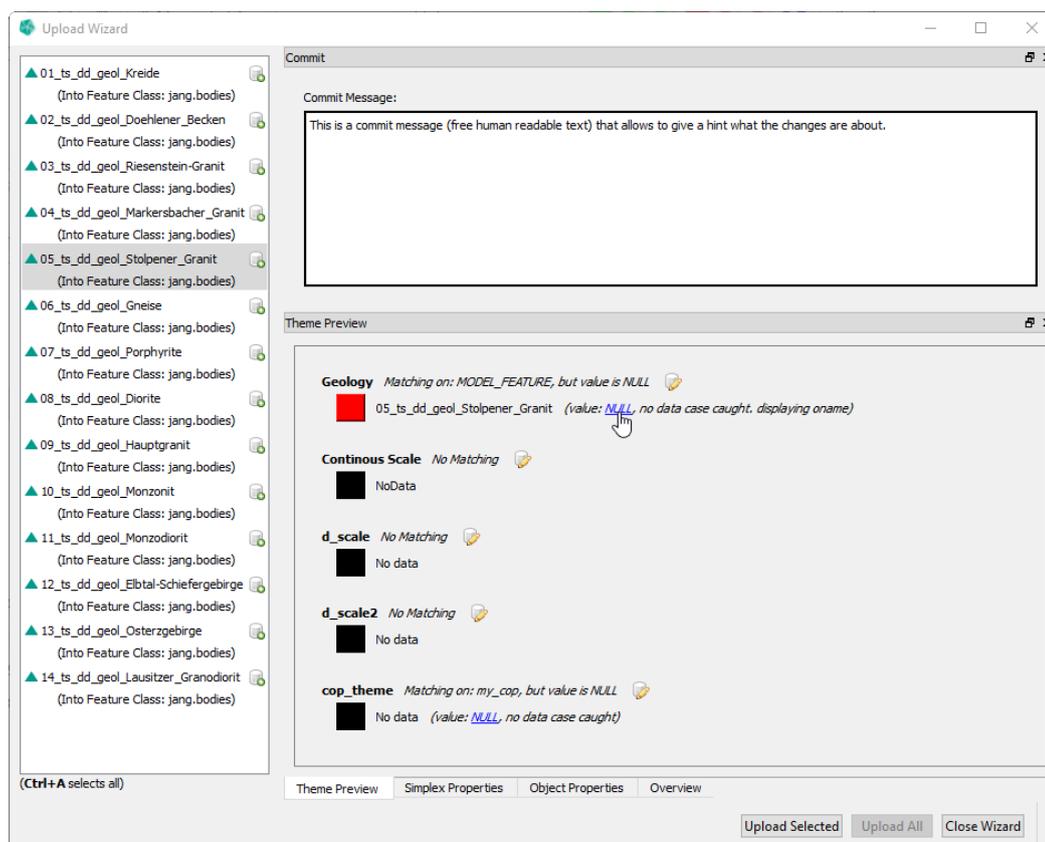
Note

This chapter requires some basic knowledge about Themes. If you are not familiar with them, please consult the chapter [Manage Themes](#) on page 113 and then continue reading!

If no Object Properties are supplied all Themes will interpret the Feature within the No Data case -- see figure 4.14. (In this example the Theme "Geology" will display the no data case with the native color.) In order to change the Theme definition you can use the quick link button  to open the **Theme Editor** for that Theme. (The Editor will be explained in chapter [Manage Themes](#) on page 113).

The object value causing the match is displayed as blue link. (In this case [NULL](#) matches the no data case).

Figure 4.14
If no Object Properties are supplied all Themes will interpret the Feature within the No Data case.

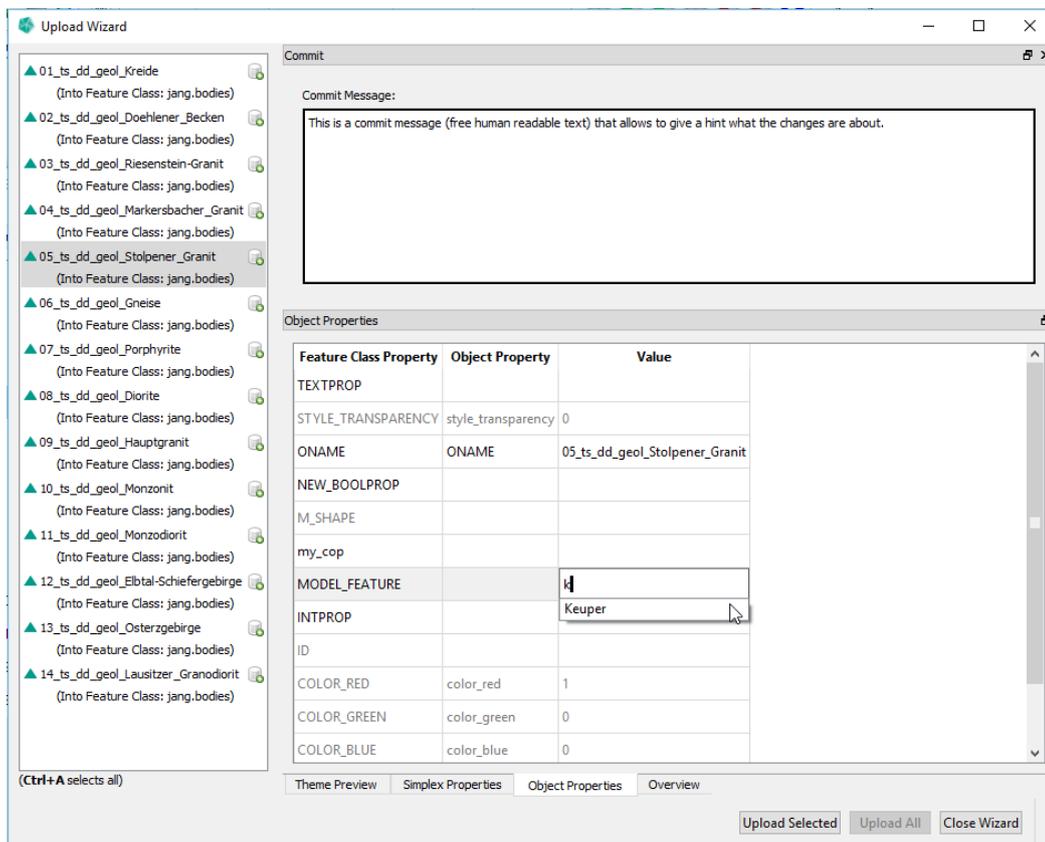


Clicking on the link will forward to the **Object Properties** section and will highlight the matched

4. Upload Wizard

property. While typing, the values that are available in the Theme, will be suggested in a list [please refer to figure 4.15].

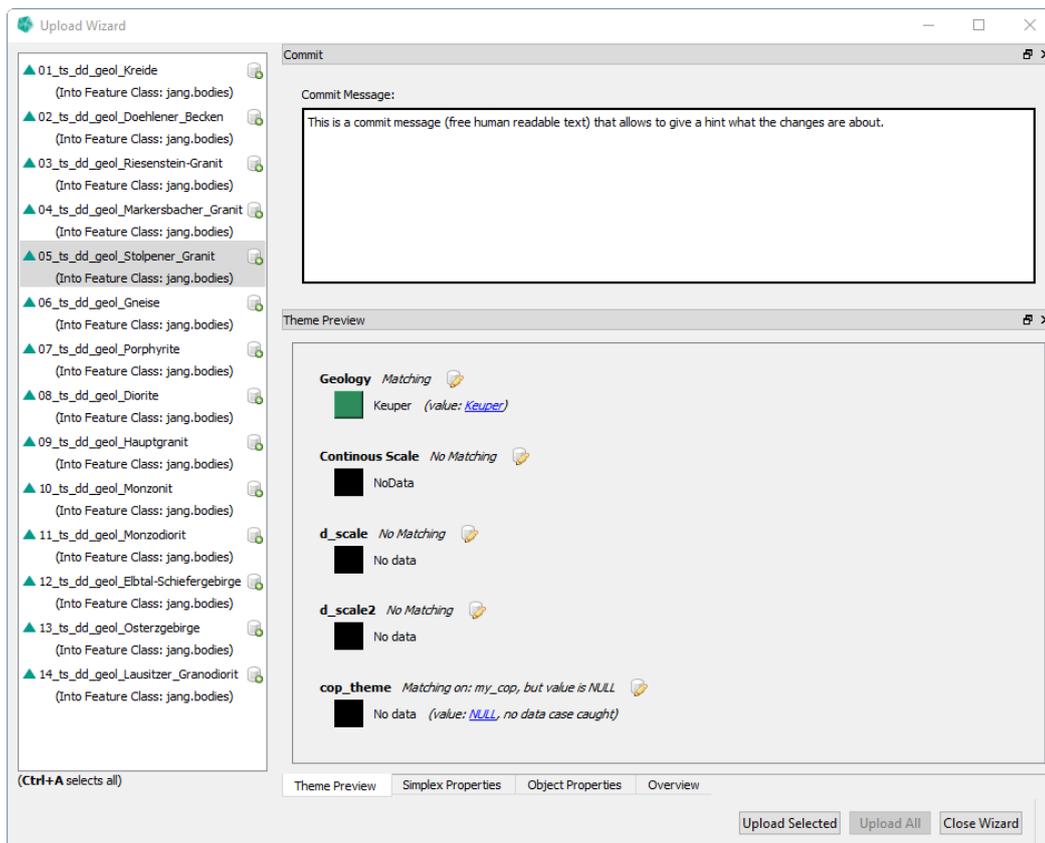
Figure 4.15
While typing, the values that are available in the Theme will be suggested in a list



If you enter a property value that is covered by a Theme the **Theme Preview** section shows the object interpreted [and gives a hint which value causes that].

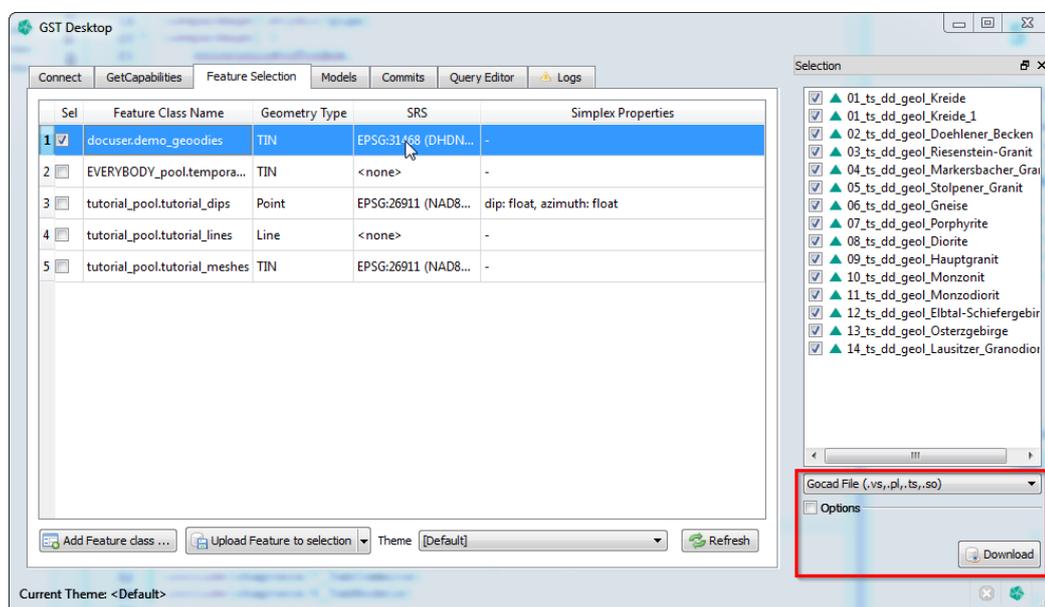
4. Upload Wizard

Figure 4.16
If you enter a property value that is covered by a Theme the **Theme Preview** section shows the object interpreted.



5 Tab: Feature Selection - Downloading data

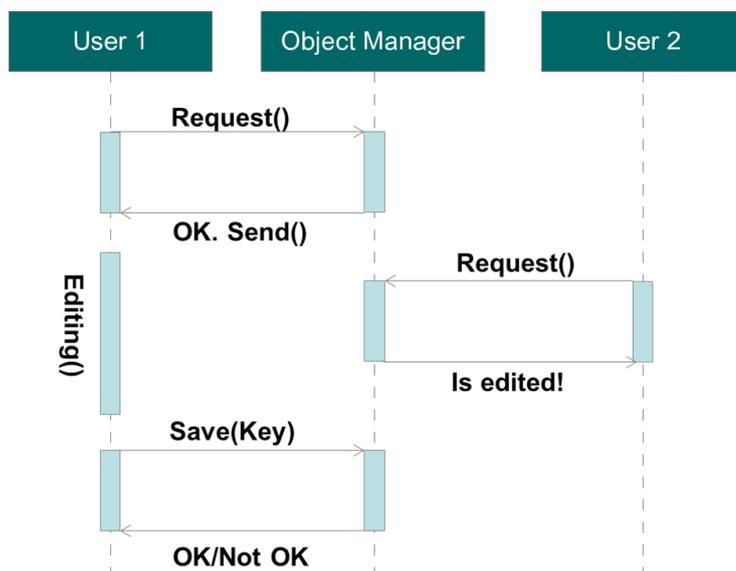
Figure 5.1
"Feature selection"
dialog



1. In order to download data, select features or feature classes in the Tab **Feature Selection** that you want to download. (The **Selection** widget is shown, listing all data that will be downloaded.)
2. Choose a file format
3. Press the button **Download** in order to download all selected features from feature classes.
4. In the following GST Desktop asks for a location where downloaded content shall be written to.

5.1 Locking – Download data for modification

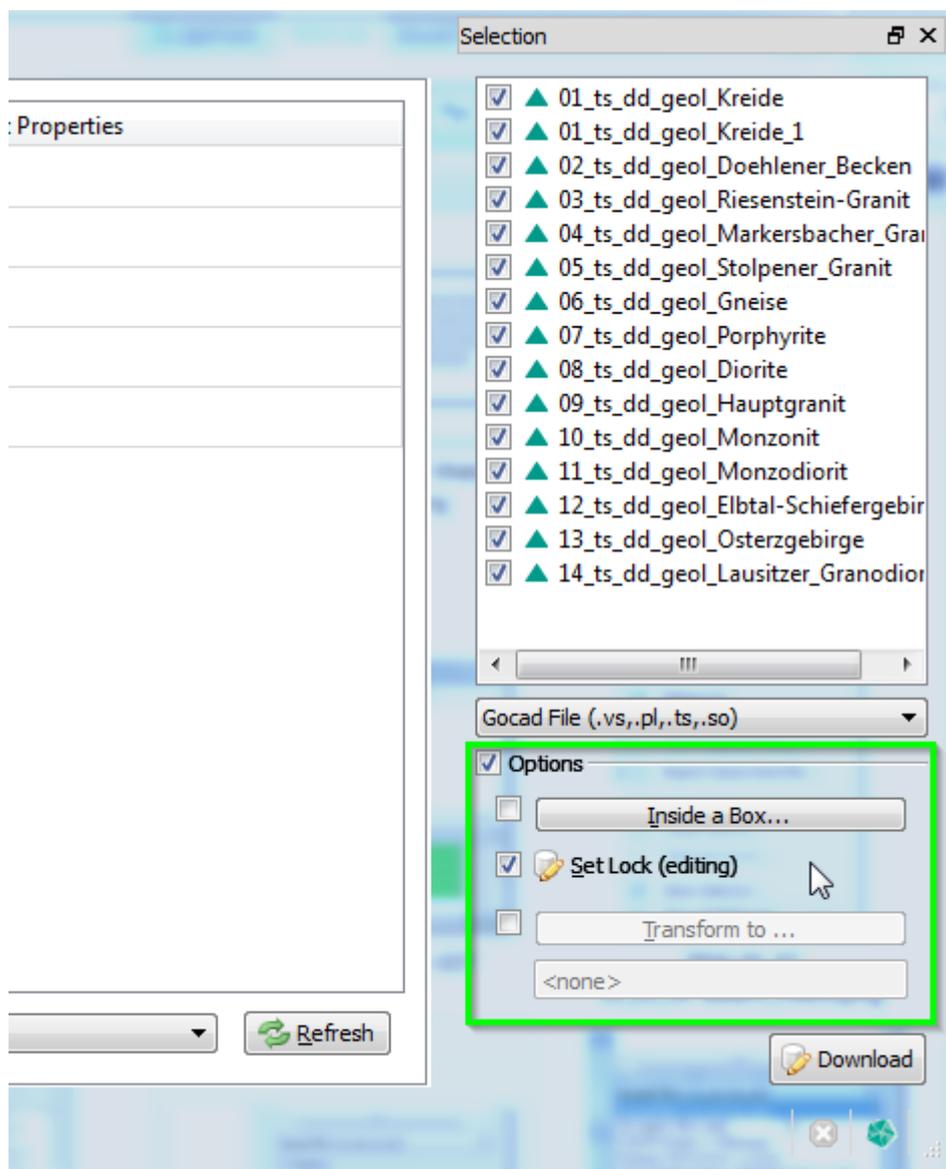
Figure 5.2
Changing data
requires a lock key



If you want to modify data it is recommended to request the geometry together with a lock key [check out]. Thus no other user can modify the data until you finished your modification and update the geometry later [check in].

1. To request a lock key for a download use the **Options** list in the **Selection** Widget [see [green](#) box].

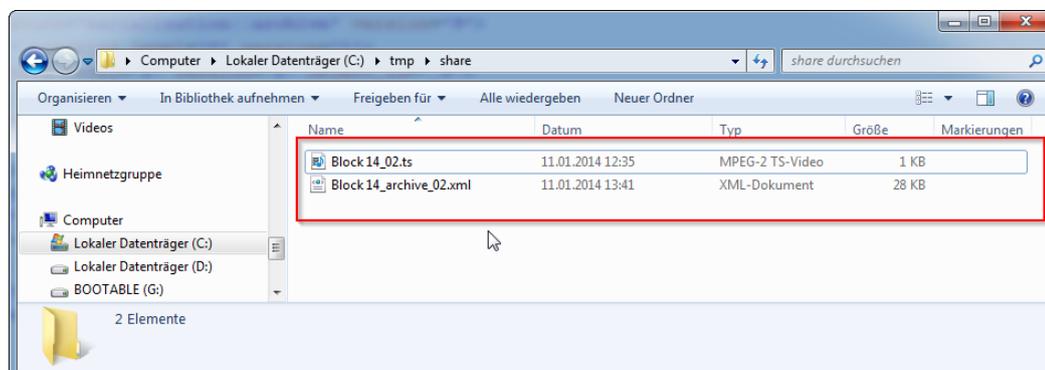
Figure 5.3
Activation of the
checkbox "Set Lock
(editing)"



2. Activate the checkbox **Set Lock (editing)** in the menu. In order to verify the download type (with/without lock), the button icon changes to the database symbol with a pen if you are requesting a lock.
3. Choose a file format and press the **Download** button to start!
4. In the following GST Desktop asks for a location where downloaded content shall be written to.

Downloaded files

Figure 5.4
Downloaded files

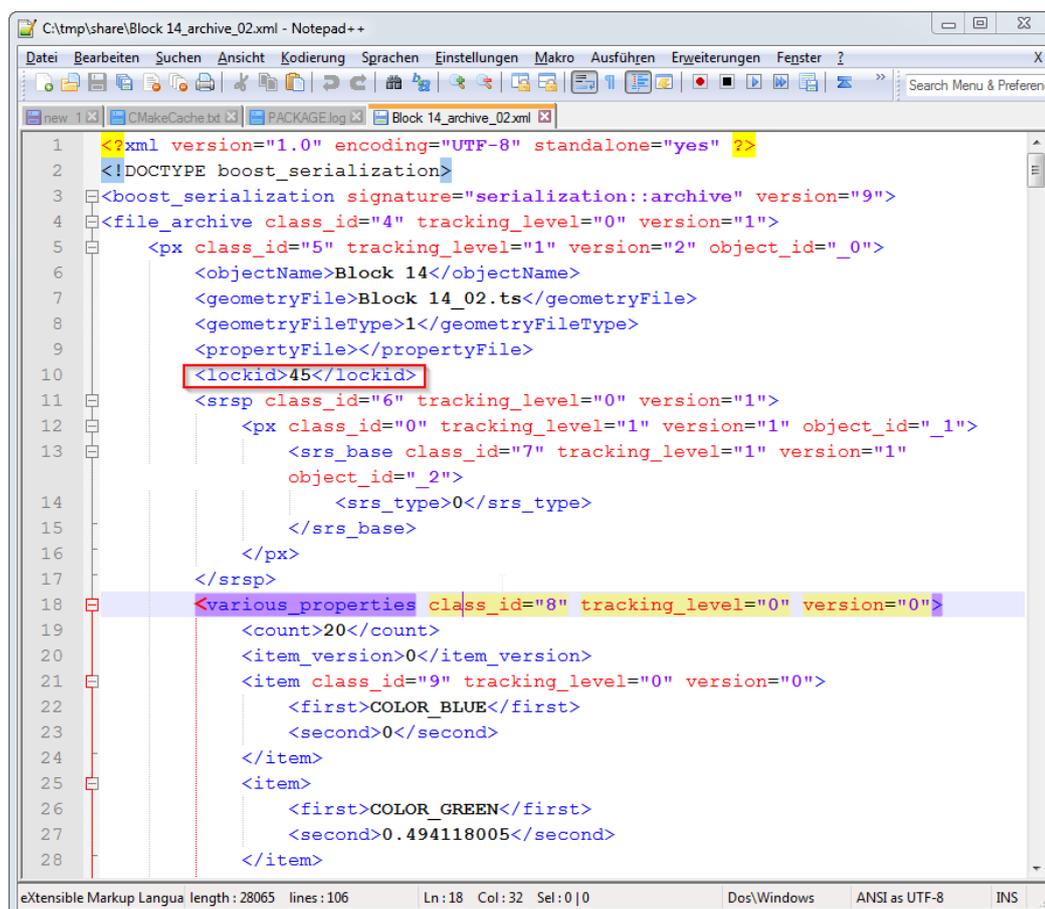


When navigating to the download folder you had selected for the download you will see your requested file (in this example Block14_02.ts) and an additional file with the xml extension. This file is the GST archive file. It includes diverse information about the download e.g. all associated files, object name, SRS, lock id etc. Object properties are also stored in order to reconstruct them if the specified file format does not support object properties. If you downloaded the geometry with a lock request the GST archive file stores the lock id, which will be needed if you are going to check in your data again.

You can open the xml file with any text editor.

5. Tab: Feature Selection - Downloading data

Figure 5.5
Opened XML file



```
1 <?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
2 <!DOCTYPE boost_serialization>
3 <boost_serialization signature="serialization::archive" version="9">
4 <file_archive class_id="4" tracking_level="0" version="1">
5   <px class_id="5" tracking_level="1" version="2" object_id="_0">
6     <objectName>Block 14</objectName>
7     <geometryFile>Block 14_02.ts</geometryFile>
8     <geometryFileType>1</geometryFileType>
9     <propertyFile></propertyFile>
10    <lockid>45</lockid>
11    <srsp class_id="6" tracking_level="0" version="1">
12      <px class_id="0" tracking_level="1" version="1" object_id="_1">
13        <srs_base class_id="7" tracking_level="1" version="1"
14          object_id="_2">
15          <srs_type>0</srs_type>
16        </srs_base>
17      </px>
18    </srsp>
19    <various_properties class_id="8" tracking_level="0" version="0">
20      <count>20</count>
21      <item_version>0</item_version>
22      <item class_id="9" tracking_level="0" version="0">
23        <first>COLOR_BLUE</first>
24        <second>0</second>
25      </item>
26      <item>
27        <first>COLOR_GREEN</first>
28        <second>0.494118005</second>
29      </item>
```

In this sample request we got the lock id 45.

In the XML tag `<various_properties>` all object properties and their values are stored.

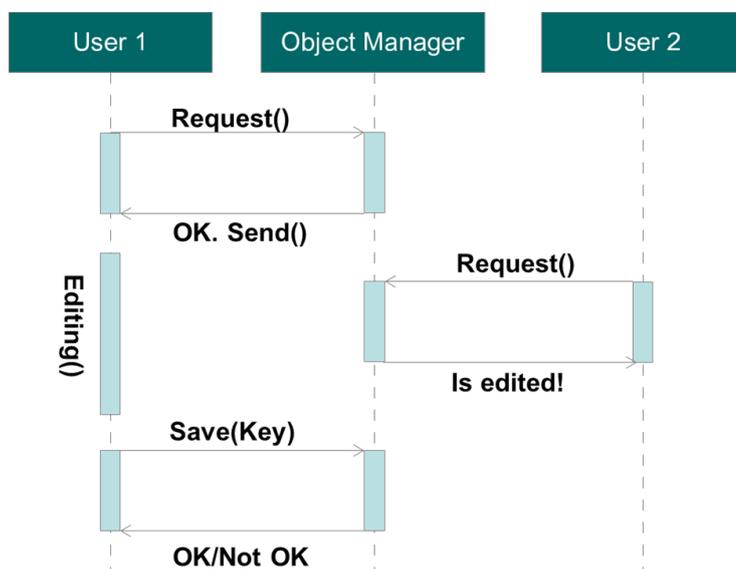
You can modify the property values [text inside the tag `<second>...</second>`] if your modelling software does support you with a GUI for this. **But never change the structure of the GST archive file!** This may corrupts the serialization process and disable the possibility to check in your data again.

Note

When checking in data [upload data with GST Desktop] the object properties are being read from GST archive with a lower priority then the object file exported by your software. If a property value was not found in the object file, GST Desktop uses the value of the archive file.

6 Tab: Feature Selection - Unlocking

Figure 6.1
Changing data
requires a lock key



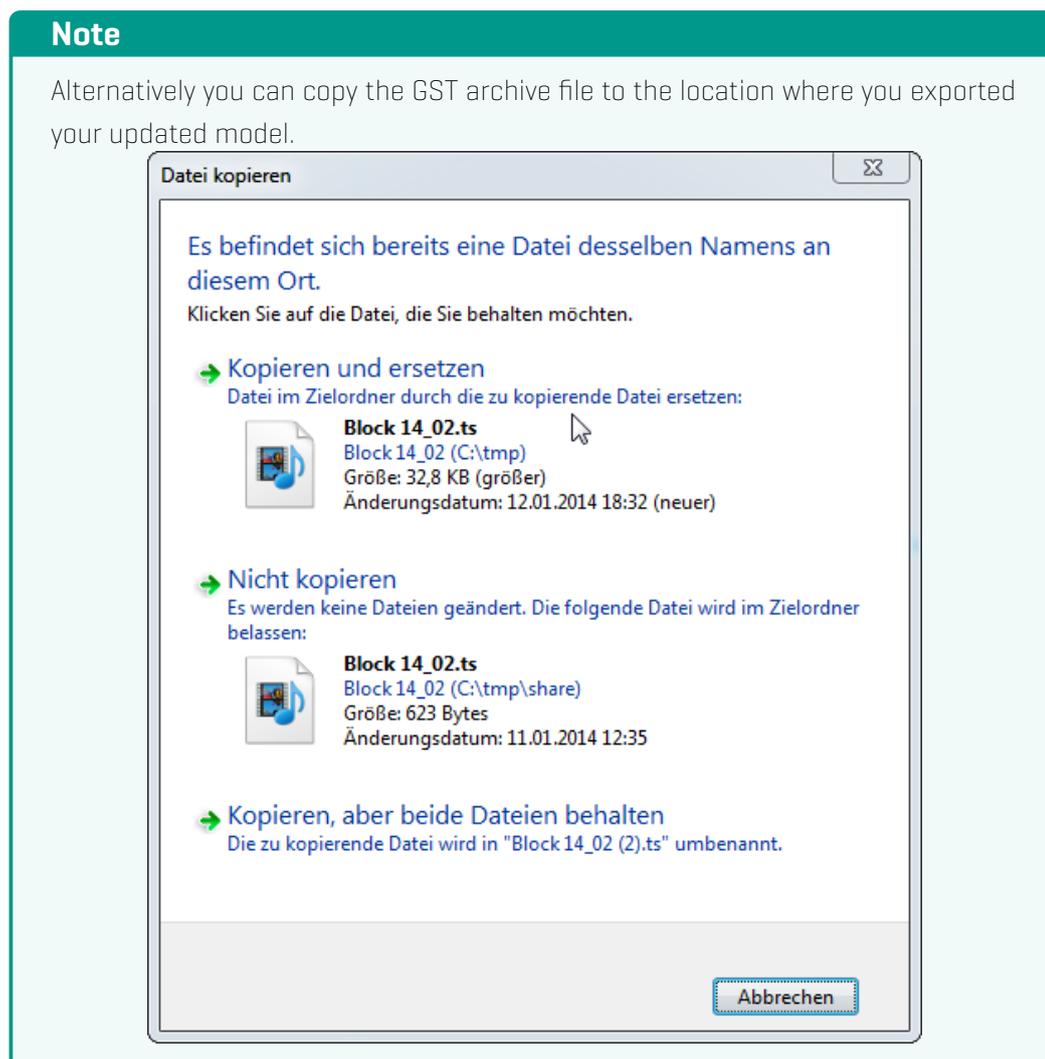
When you are modifying data, the data is locked for other users. They can view the data, but are not allowed to request a lock, unless you unlock the data. Unlocking can be done:

- * When updating features. [Normal update. Therefore select the GST archive when uploading the modified geometry.] page 68
- * Unlock a feature without updating them. [E.g. if you stopped modelling work and do not want to save.]page 70
- * Force to remove all locks from a geometry. [E.g. if the lock id is getting lost or the person who gains the lock has forgotten to check in]page 73

6.1 Unlock: Updating a Feature

If you have done your modelling work using a downloaded file, please export the model from your modelling environment. [Consult the manual of your modelling software on how to do this.]

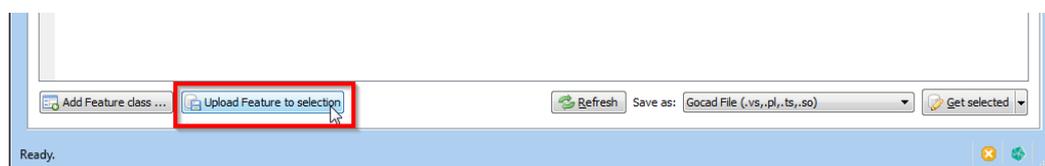
1. Copy the file into the folder where you originally downloaded the file to. The GST archive file should be in this folder
2. Replace the old download object file.



Take care that the new file has the same name as the old downloaded file. [Of course with new content].

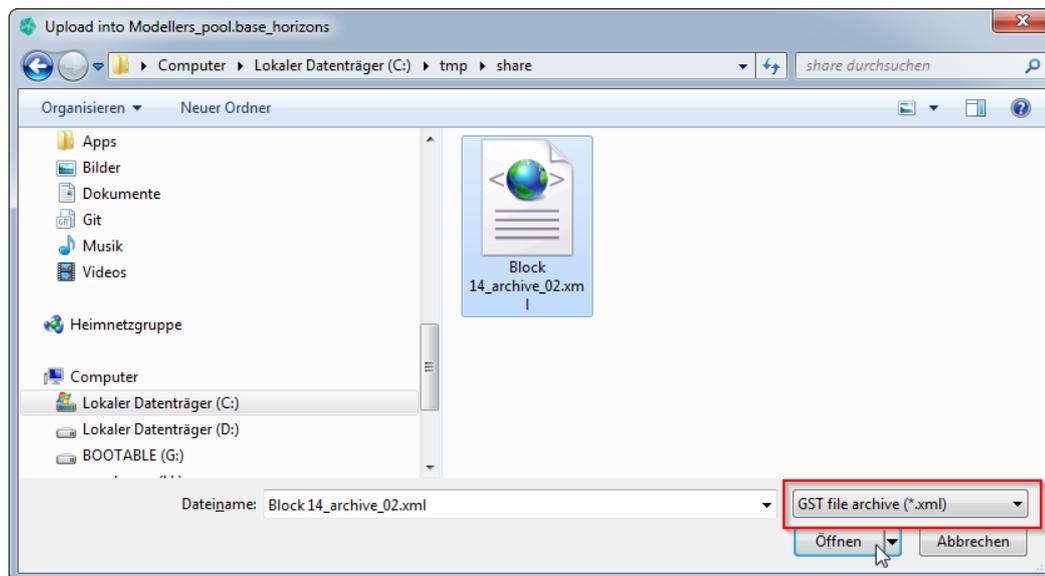
3. Do a normal update process by selecting a target class and pressing the **Upload Feature to selection** button.

Figure 6.2
Pressing the **Upload Feature to selection** button



3. When selecting a file to upload select the GST archive file! [Remark to set the extension filter to **GST file archive (*.xml)**]

Figure 6.3
Setting extension
filter to "GST file
archive [*.xml]"



Continue as known with the upload process setting a commit message, property matching etc. [How to upload: see section [Tab: Feature Selection - Uploading data](#) on page 41]

6.2 Unlock a Feature without Updating

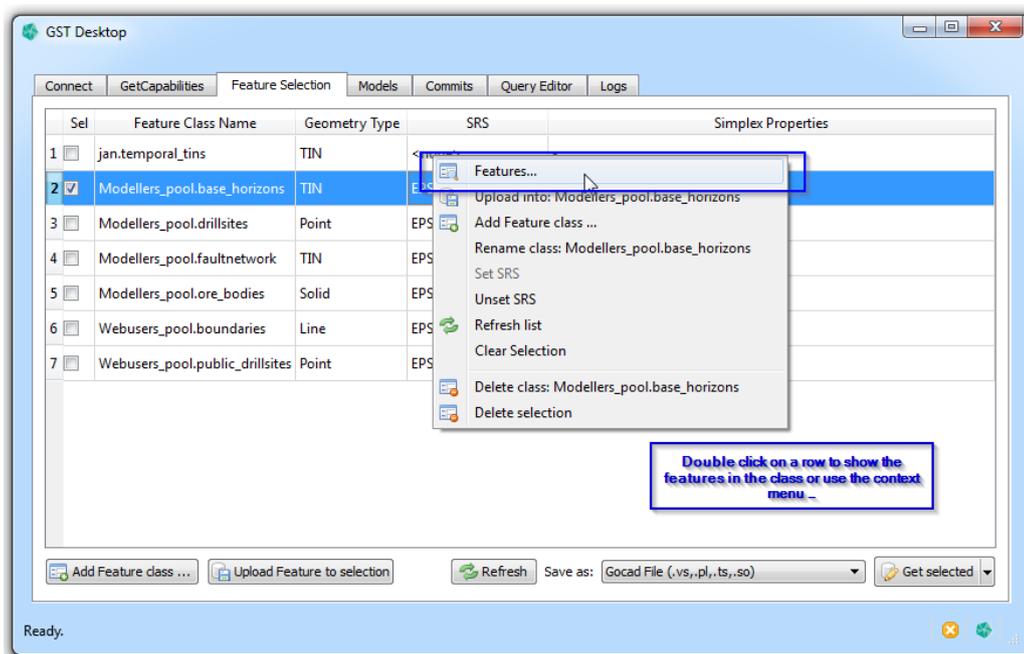
If you lost your GST archive file, you have also lost your lock id. The lock id is required to unlock a geometry. Only an administrator can unlock a geometry without a key / without the GST archive file [This is shown later in this section.]

If you do not have lost your GST archive but want to unlock the geometry [e.g. you didn't have changed the geometry and it is time to go home for today ;-)]:

1. Browse to the feature class for the geometry to unlock.
2. Therefore double click on a row in the **Tab Feature Selection** or use the context menu item  **Features ...**].

6. Tab: Feature Selection - Unlocking

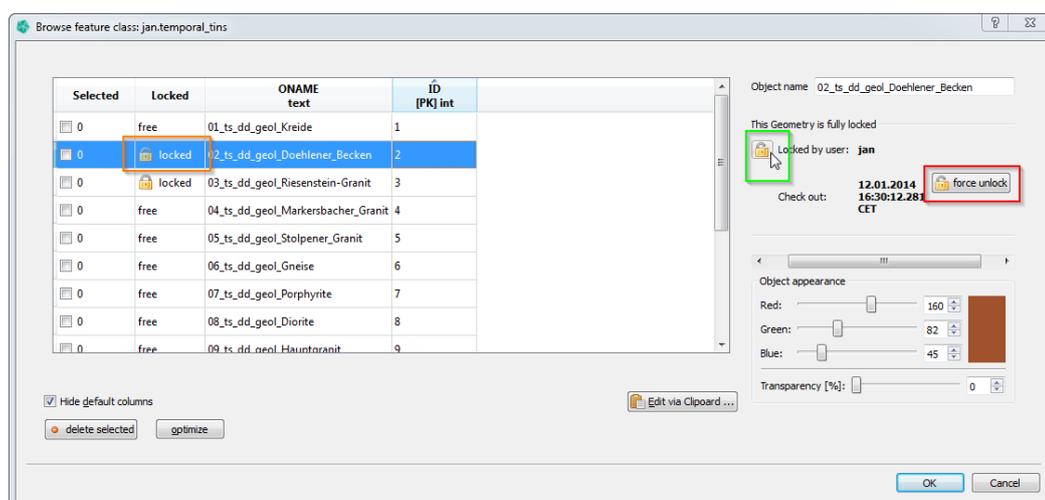
Figure 6.4
Showing the features in the class



In the list of the features for the current class the locked features are indicated by a lock symbol [orange]. If you select a feature additional information about the lock are displayed on the right, e.g.

- * What kind of lock is it?
- * Who has locked it?
- * When was it locked?

Figure 6.5
Unlocking a feature



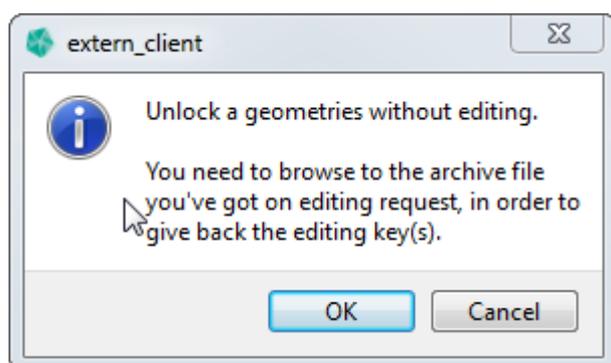
6. Tab: Feature Selection - Unlocking

For unlocking you have two possibilities:

1. Unlock with the archive file (green)
2. Force the unlock (red) – only an administrator can do this

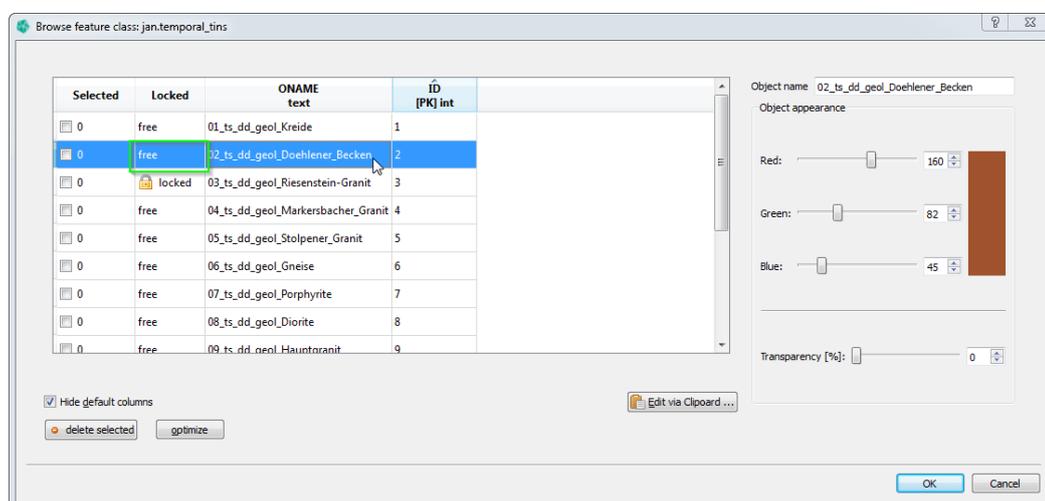
If you click on the lock symbol in front of your user name (green), you are asked to browse to the GST archive file which you have obtained when locking the geometry (see section [Locking – Download data for modification](#) on page 64).

Figure 6.6
Unlocking a Feature
dialog



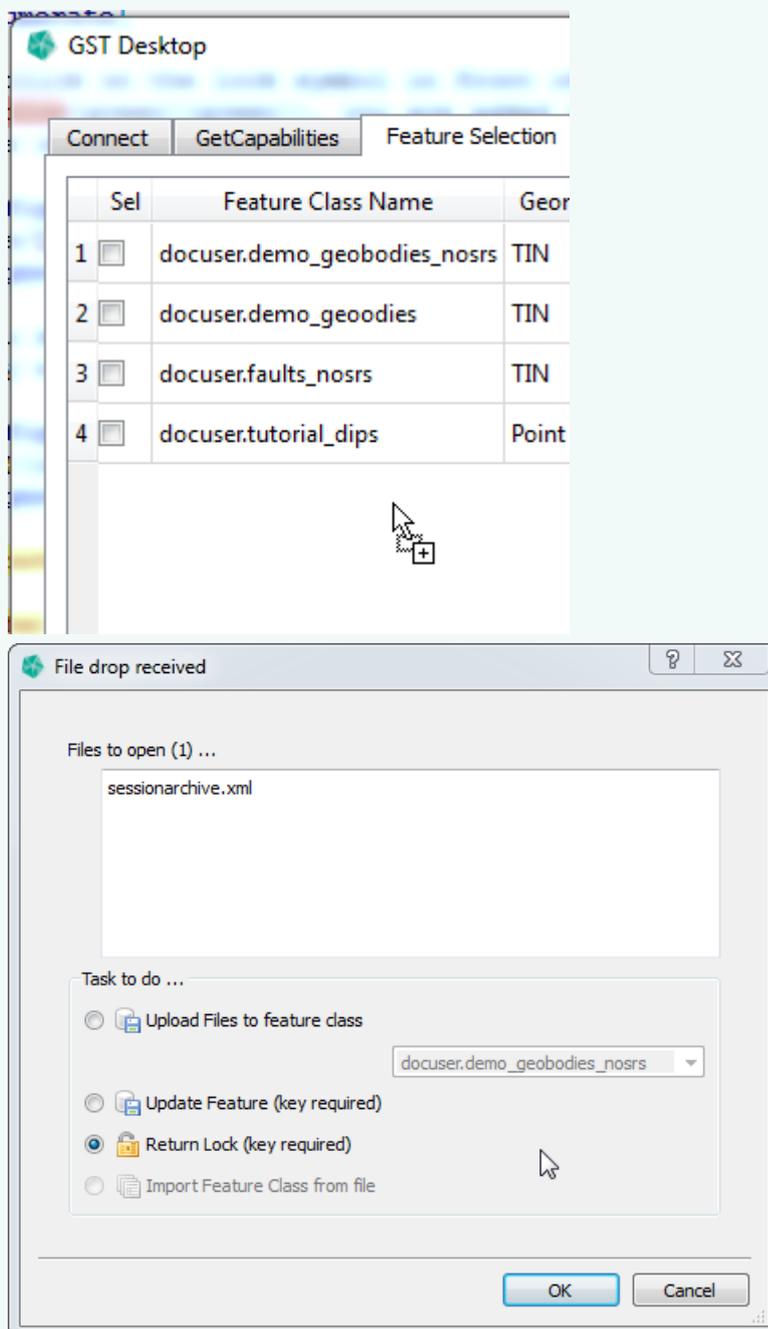
When you selected the archive file and the lock id is valid for this lock, the geometry will be unlocked/is free for editing by others.

Figure 6.7
Unlocked feature



Note

You can also return a lock by drag'n'drop the GST archive file from your file browser into GST Desktop.



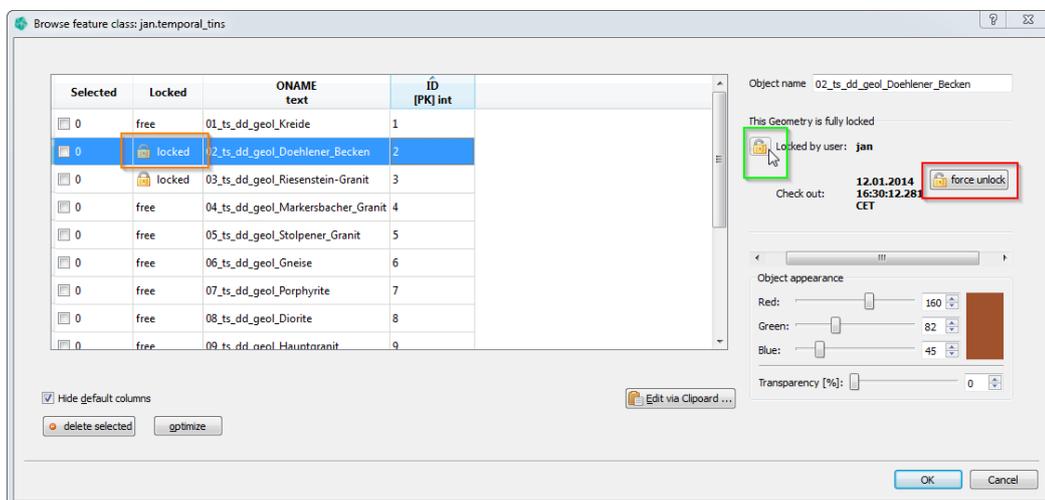
6.3 Unlock a Feature without a GST archive file

If you have lost the archive file or the user who has locked it is not present (and you are sure he is not working on the locked geometry) you can unlock the geometry. Therefore you need the account details of a privileged user (administrator account).

6. Tab: Feature Selection - Unlocking

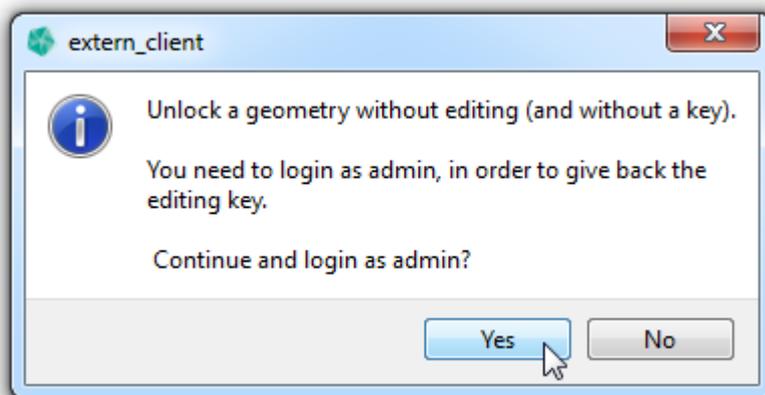
1. Browse to the Feature class where the geometry resides you want to unlock.

Figure 6.8
Browsing to the
feature class



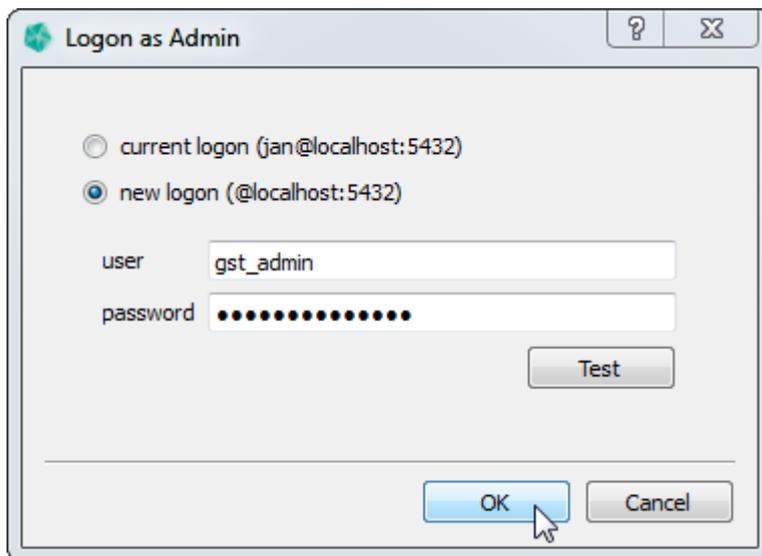
2. Click on the force unlock button (red)

Figure 6.9
Confirmation dialog



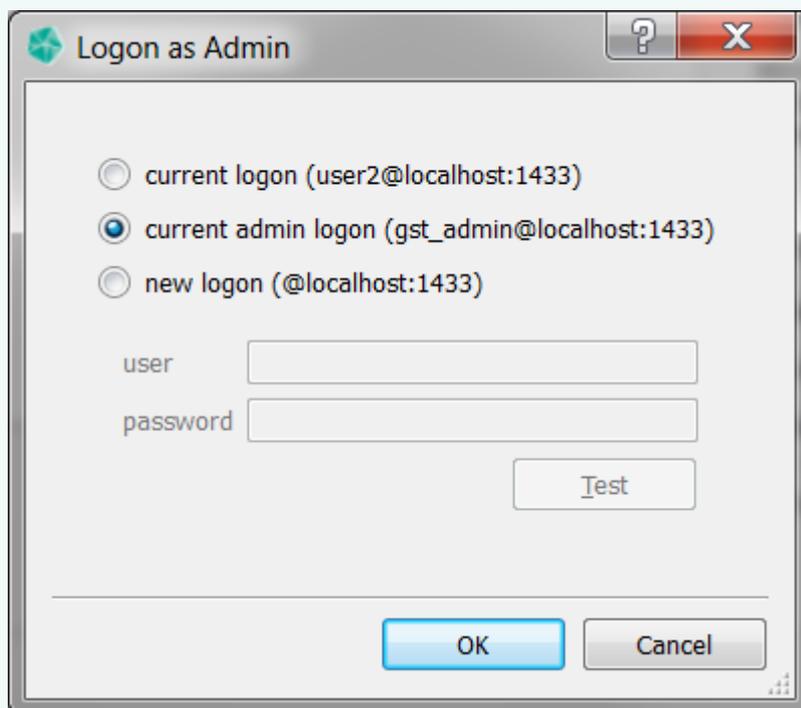
3. Enter the administrator account details. [If you do not know this information, tell your project administrator about your plan. He may help you.]

Figure 6.10
Logon as admin



Note

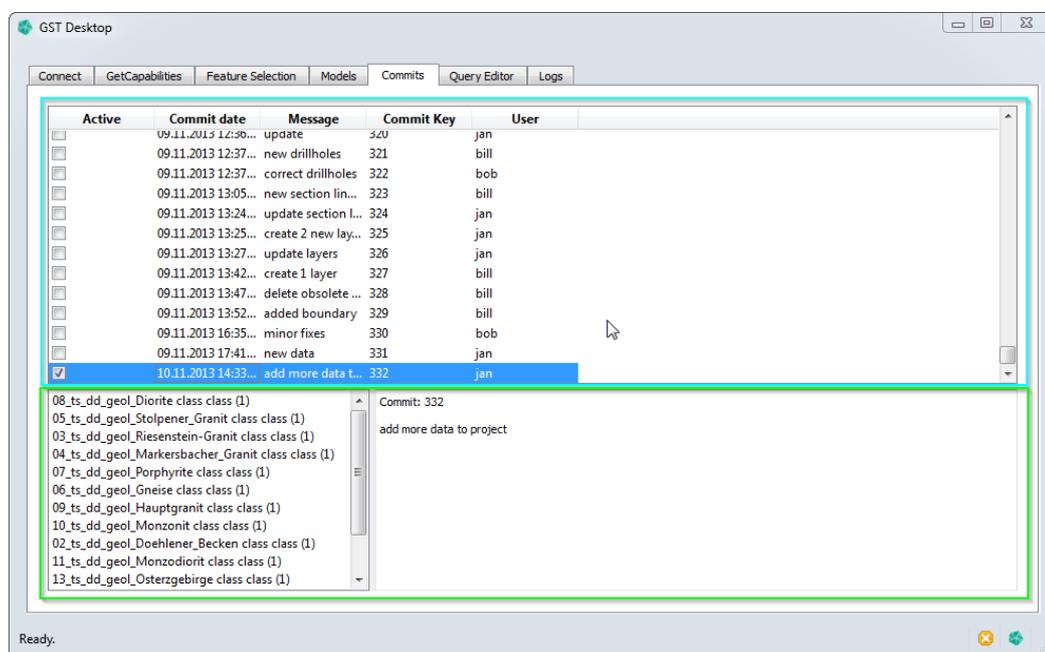
If you already are logged on as an administrator in this session, you can use the existing admin account to force unlock:



You are done and the geometry is unlocked.

7 Tab: Commits

Figure 7.1
Tab "Commits"



The Tab **Commits** lists the progress of uploads and updates of geometries. The Tab is divided into commit list (turquoise) and the commit details below (green).

The commit list shows the following columns:

- * **Active:** Indicating the current active commit. When you download data in Tab **Feature Selection**, data of the active commit is downloaded.
- * **Commit date:** The commit date column shows the timestamp the commit was done.
- * **Message:** The first line of the message is shown here.
- * **Commit Key:** The commit key is a unique reference for the commit.
- * **User:** Shows who has made the commit.

When selecting a commit in the commit list you get the commit details in the lower part of the window.

- * On the left side the geometries affected by the commit are listed in the following form

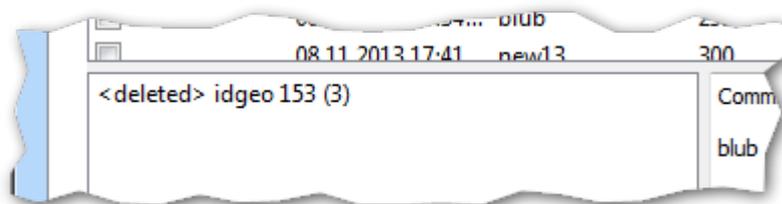
<feature name> class <feature class name> [<geometry version>]

- * On the right side the commit message is displayed

7. Tab: Commits

If a geometry gets deleted it gets deleted from commit history too and cannot be restored. In such a case the geometry in the commit details is listed as follows:

Figure 7.2
Geometry in commit
details



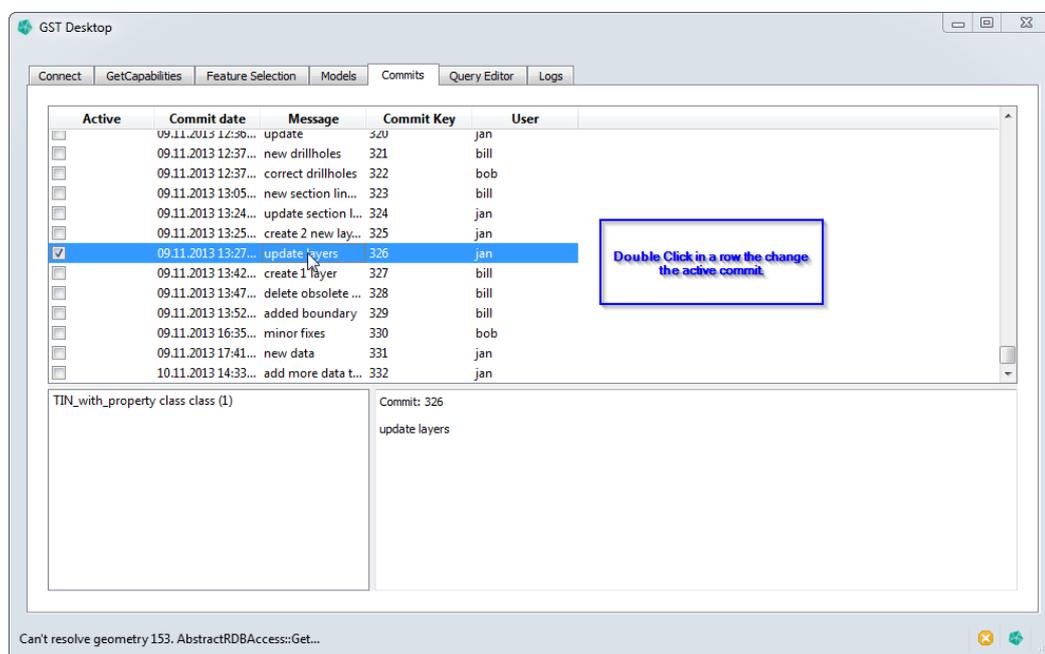
This indicates a geometry that was involved in the commit, but does not exist in the current instance of GST Storage. Its latest version was version 3.

7.1 Active Commit

At default the current active commit is always the latest commit. Thus if you download data you always get the latest version of your data.

In order to step back in history, e.g. if you want to reproduce an older state of your data, you need to change the active commit to the timestamp you want to reproduce. Therefore double click on the commit.

Figure 7.3
Double Click to
change the active
commit

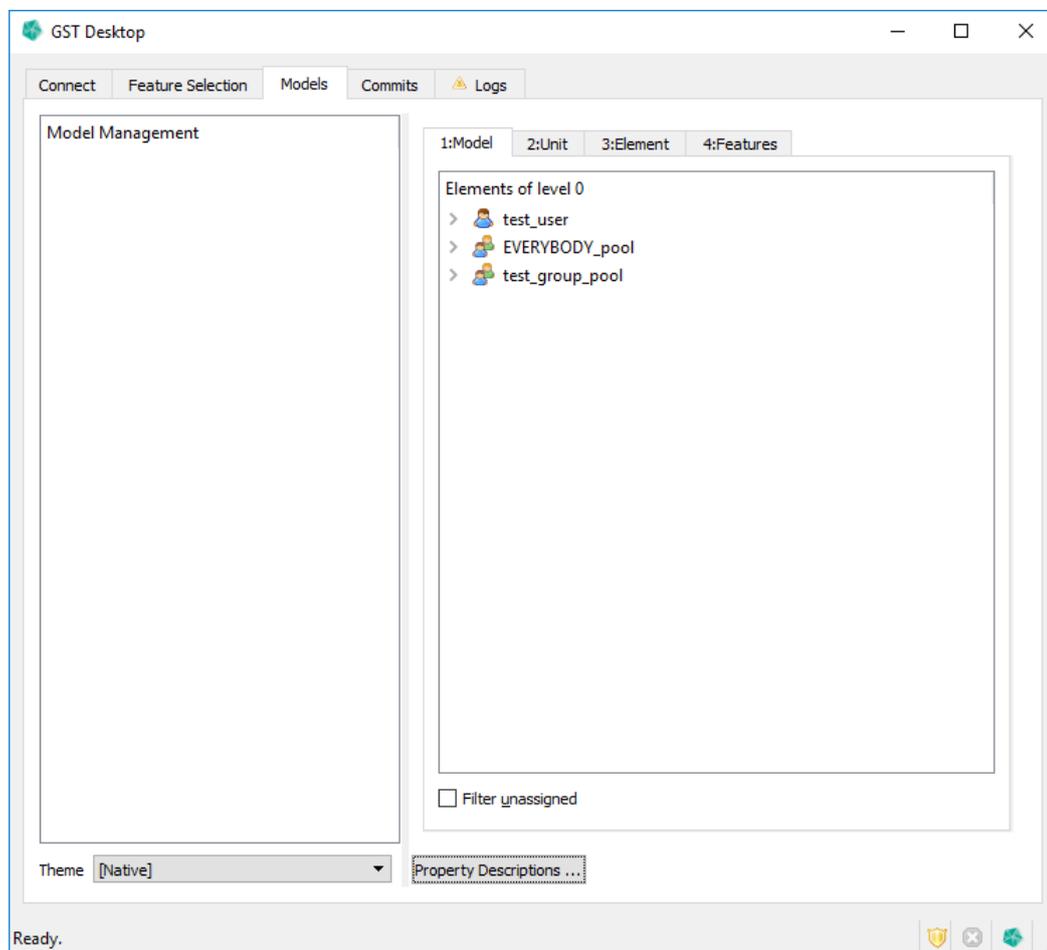


To download the data in the active commit, continue downloading in Tab: **Feature Selection**.

8 Tab: Models [Model Management]

The **Model Management** can be found under the **Models** tab.

Figure 8.1
"Models" tab

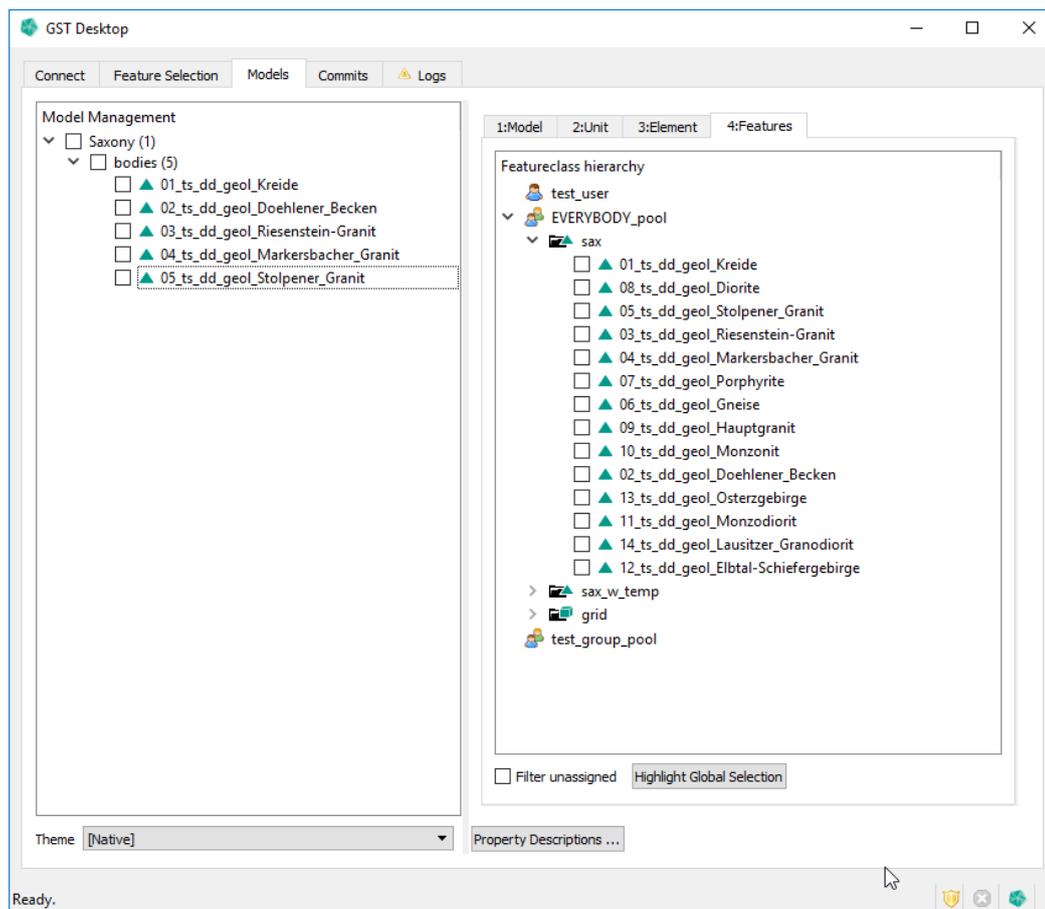


The above picture shows what the Model Management dialog looks like in an empty state.

Model Management [MoMa abbreviated] is a way to arrange and view your features in a file-structure-like tree view. A MoMa tree consists of Elements and Features. Each Element is associated to a specific level [or depth] of the tree. Features can be linked to any level of the tree, but for the top level [you need to have at least one Element to link a Feature to]. The number and names of levels are defined during the installation of GST.

8. Tab: Models [Model Management]

Figure 8.2
Populated Model
Management tree



Here you can see a populated MoMa tree, just so you get an idea what it could look like.

A short overview of MoMa features [explained in more detail below]:

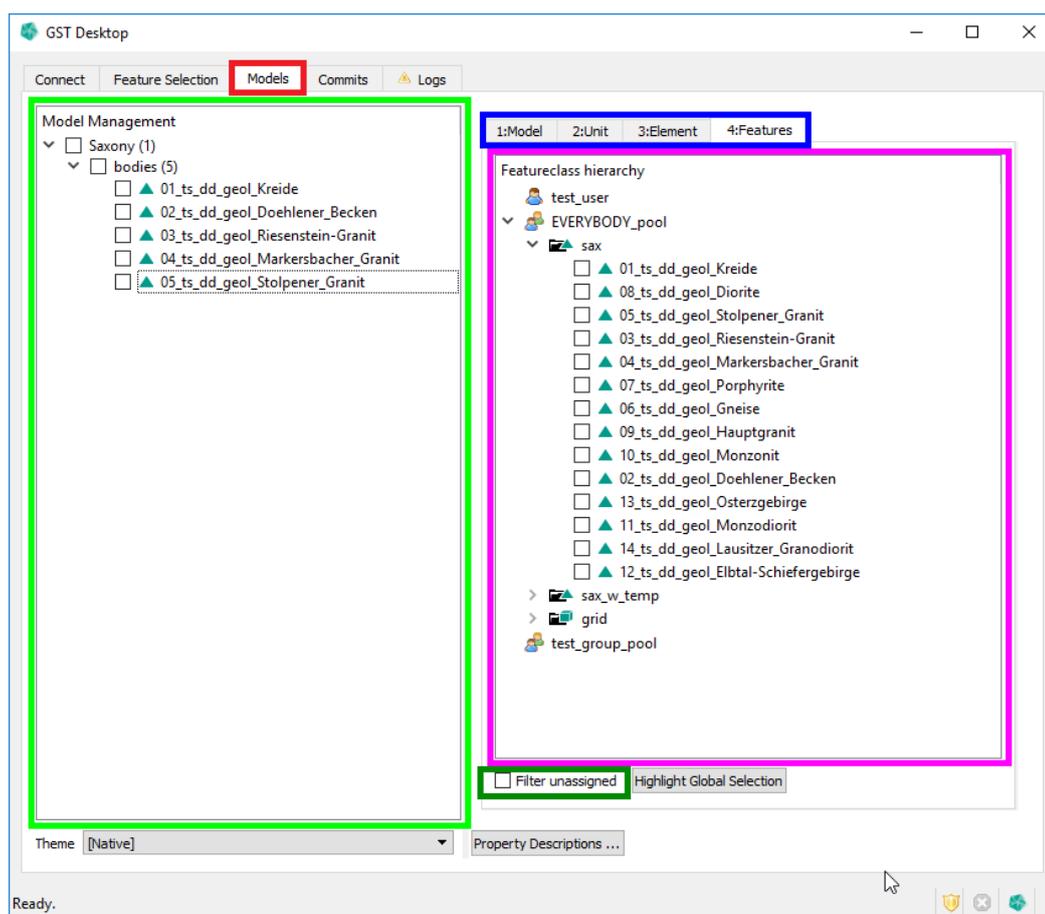
- * Arrange your features in predefined structures (e.g. you have three levels, models, units and elements. Models could be something like model of Saxony. Units could be some subparts of the model like a specific region let's say the city of Freiberg. Finally elements could be more modelling specific parts like faults or mineshafts. This is just an example, you can define this on your own.
- * The MoMa tree conforms to the GST user system. Meaning users can only see that part of the tree they have created themselves or was published to a group for which they have access to.
- * Download all features linked in a subtree.

Some definitions

1. If we talk about child and parent node, we mean that a child is directly below the parent in the context of the tree hierarchy. A child also can be a parent in another context. E.g. Unit1 is the child of Model1 in the above picture, but it is at the same time the parent of Element1.
2. A subtree consists of a part of the tree, starting with a parent and all of its children and grandchildren. The subtree starting with Element2 would be: Element2 and test_freature1-2.
3. An Element in the following pages is a placeholder for one type of node [e.g. Model, Unit or Element]. If you see the word Element in the following pages, you can replace it with Model or Unit and the functionally explained will remain the same.

8.1 Explanation of the Models Tab

Figure 8.3
Explanation of the
Models Tab



* **Models Tab:** Get to MoMa by selecting the **Models** tab.

8. Tab: Models [Model Management]

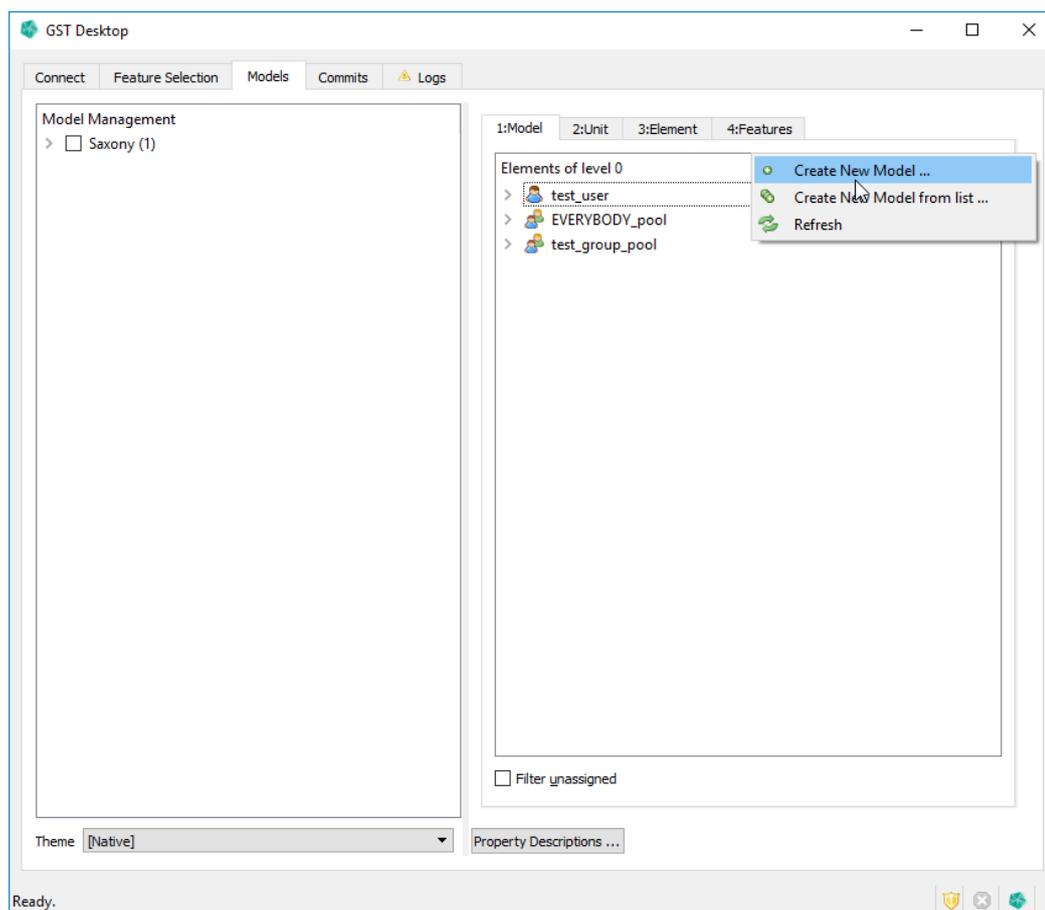
- * **Tree View:** The left pane will show the MoMa tree.
- * **Node View:** The right pane will show the different elements or features that can be put into the tree. The elements are divided by their owning user and/or group.

The features are also divided by their owning user and/or group and further by their feature class. Symbols: User Group
- * **Models Tab Bar:** With the tab bar above the **Node View** you can select the level of the elements shown in the **Node View**. The last tab will show the features, as seen in the picture.
- * **Filter unassigned Checkbox:** If you activate the checkbox, the Node View will only show those elements or features that are not yet assigned in the tree.

8.2 Element Creation, Deletion and Assignment

Create a new MoMa Tree Element

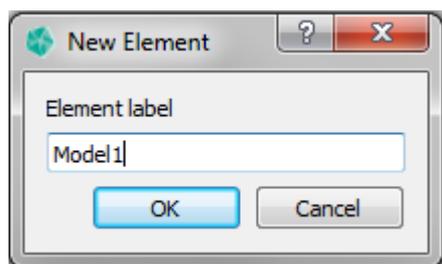
Figure 8.4
Create a new MoMa
Tree Element



8. Tab: Models [Model Management]

1. Select the level of the new element by clicking the appropriate tab from the [Models Tab Bar](#).
2. Decide if the new element should be private to your user or public to one of the groups you user is in.
3. Right click one user or group and click on the **Create New Element** entry from the context menu.

Figure 8.5
"New Element"
Dialog

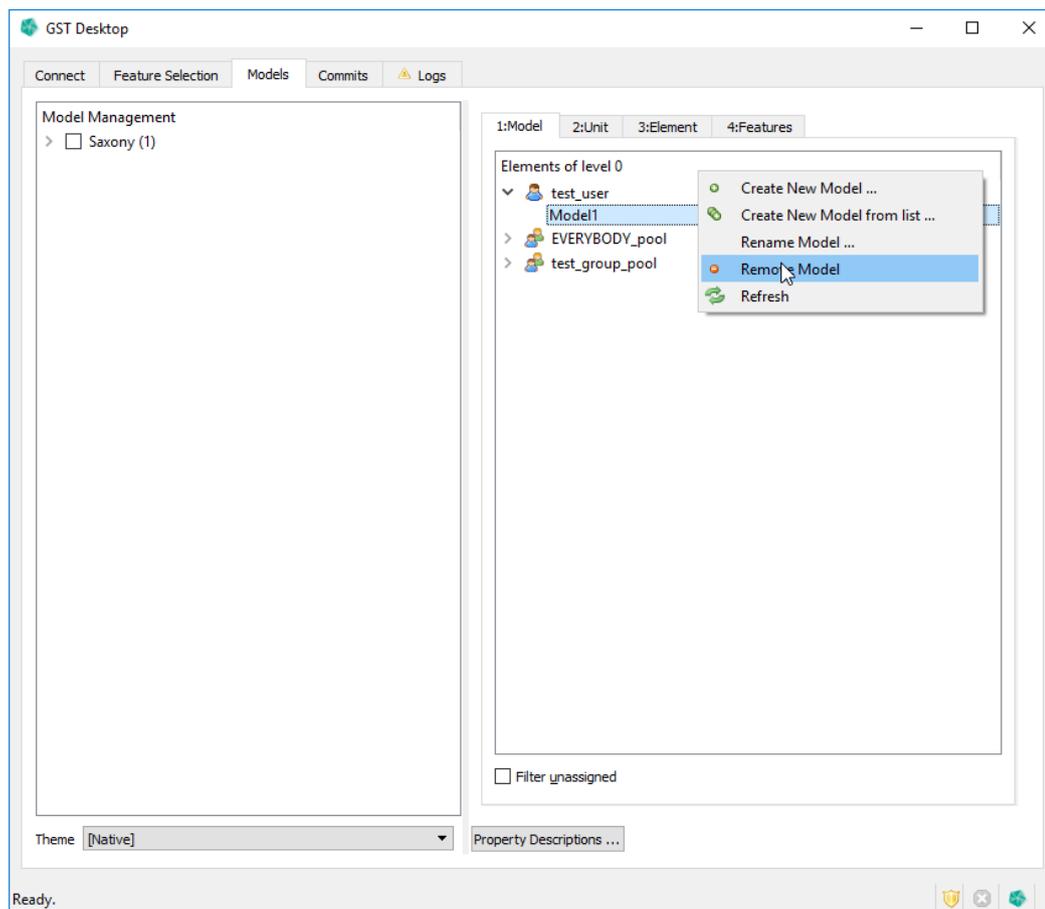


4. In the **New Element** Dialog type in the name of the new element.
5. Press
 - a) **Ok** to confirm the Element creation.
 - b) **Cancel** to abort the Element creation.

Delete an Element

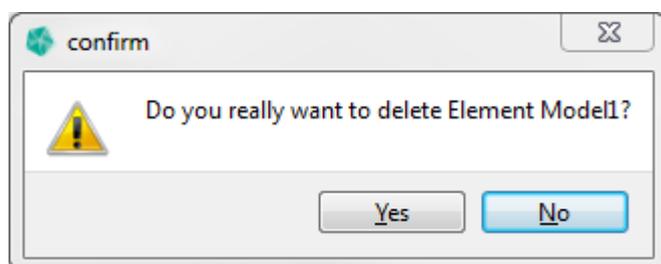
8. Tab: Models [Model Management]

Figure 8.6
Remove Modell



1. Right click on the element you want to delete inside the **Node View**.
2. Click on the **Remove Element** entry from the context menu.
3. You will be presented with the **Confirm Element deletion** dialog.

Figure 8.7
Confirm deletion



4. Press
 - a) **Ok** to confirm the Element deletion.
 - b) **Cancel** to abort the Element deletion.

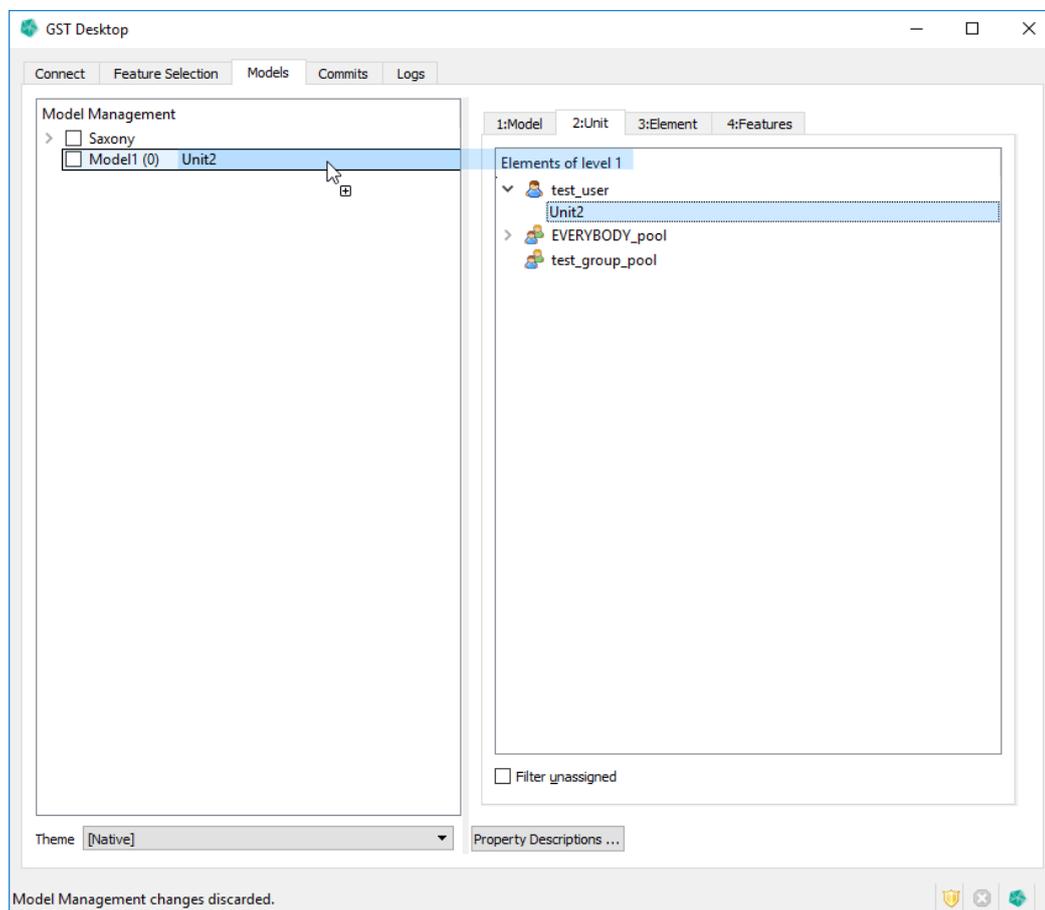
Restriction for deleting an Element

You can only delete an element that is not assigned anywhere in the MoMa tree. For example if you want to delete an element from a public group and the element is not assigned in the tree visible to you, but the deletion fails anyway. Why? Because the element was still assigned in the private part of the tree from another user of the public group.

If the deletion fails, view the log for information about which user still has the element in their tree.

Assign Element or Feature to the tree

Figure 8.8
Assign Element



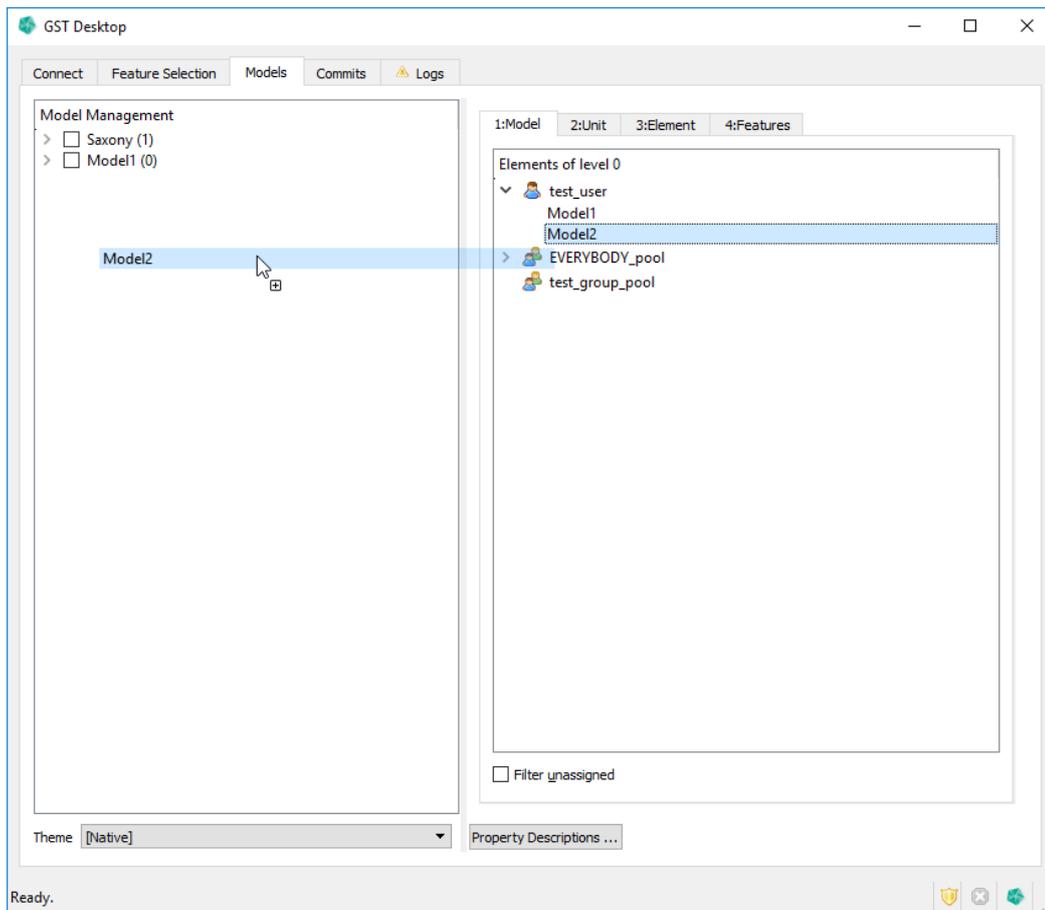
Restriction for Elements

Elements are restricted in the level [depth] at which they can be assigned to in tree. Elements of the first level can only be assigned as top elements of the tree; The ones from the second level can only be assigned directly to a top element, etc. These restrictions do not apply for features.

Restriction for Features

Features cannot be at the top [root] level and can't have child nodes.

Figure 8.9
Assign Element as
top element



To assign an element at the top level:

1. Drag it from the **Node View** to the **Tree View**
2. Drop it on an empty space in the tree view.

To assign an element or feature to another element of the appropriate level

1. Drag it from the **Node View** to the **Tree View**
2. Drop it on the element you want to have it assigned to.

Note

You cannot assign anything to a feature.

Reorder MoMa nodes [since 3.2.0]

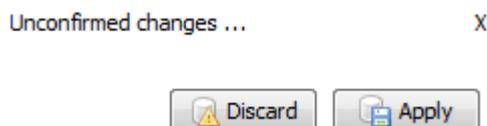
You can drop an element between, above or below existing elements of the same level to set its position to that place.

You can reorder sibling nodes by drag and drop.

Save the changes

After you have successfully assigned the element or feature with one of the above methods you should see it slightly greyed out in the tree. You also should see the **Unconfirmed changes** dialog on the bottom of the Tree View.

Figure 8.10
"Unconfirmed changes" dialog

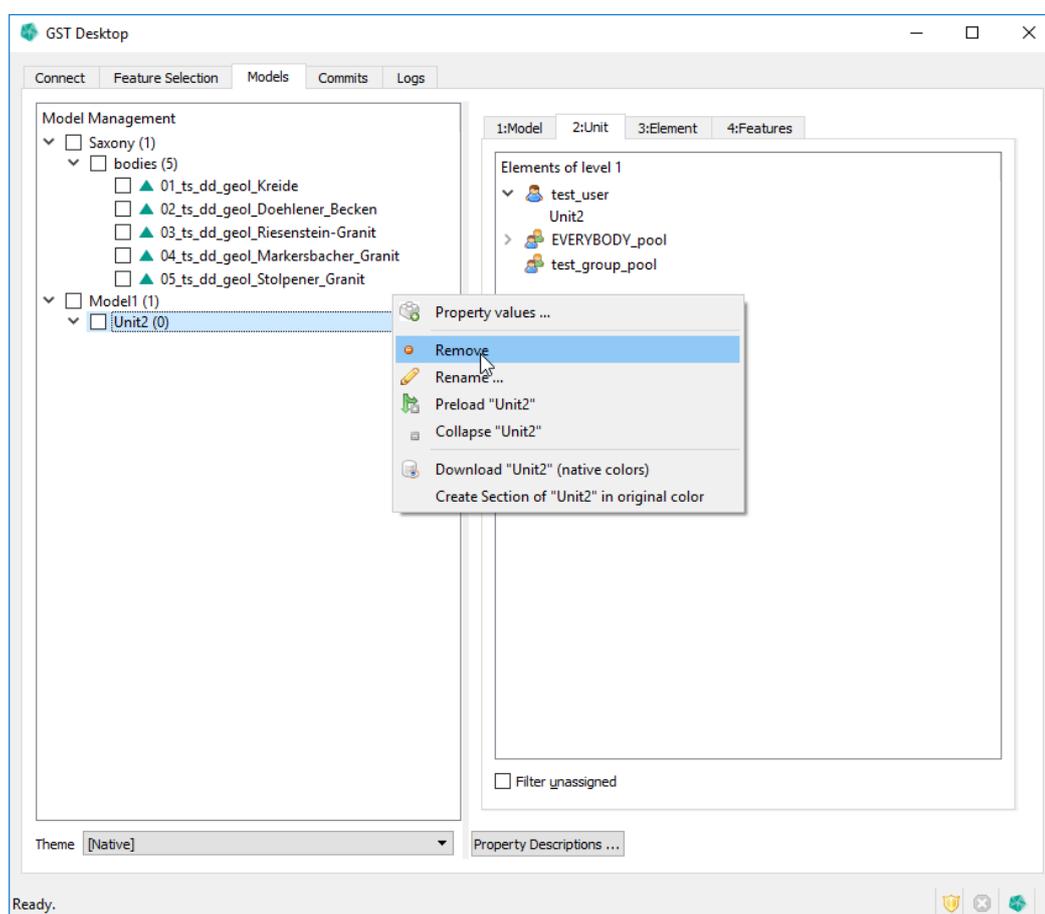


3. Press

- a)  **Apply** to confirm the assignment.
- b)  **Discard** to reject the assignment.

Unassign Element or Feature from the tree

Figure 8.11
Unassign element

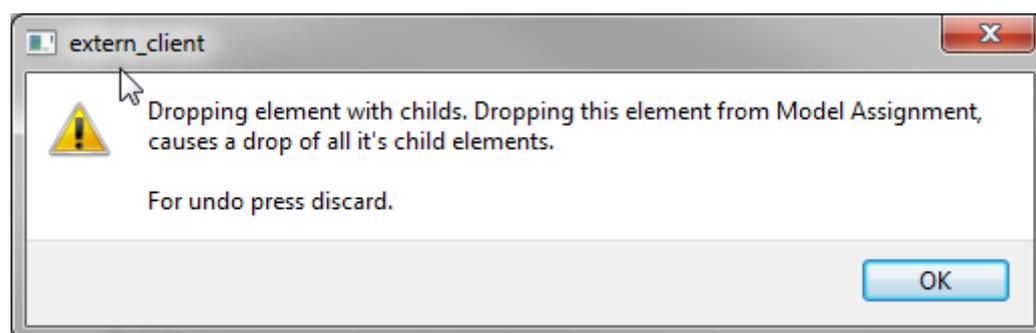


8. Tab: Models [Model Management]

1. Right click the element or feature you want to unassign from the tree
2. Choose the **Remove** entry from the context menu.

You can also do this for a whole subtree by right clicking the top most element of the subtree instead. This will produce following warning:

Figure 8.12
Warning dialog



3. Press ok, you can still discard this in the step.

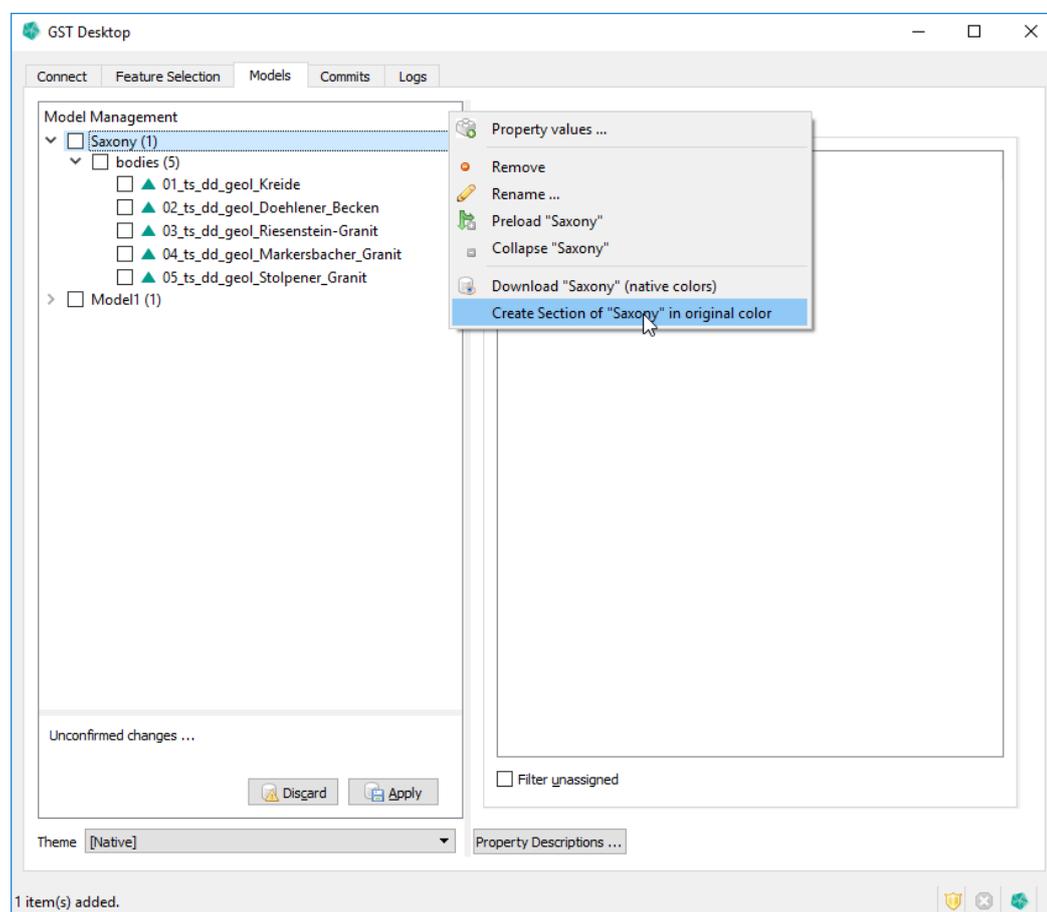
After you applied one of the above methods to unassign an element or a feature from the tree you should see the discarded element(s) or feature(s) slightly grayed out in the tree.

4. Confirm or discard the changes as above with "assign Element or Feature to the tree".

9 Tab: Models [GST Sections]

9.1 Initiate a Section

Figure 9.1
Initiate a section



1. Choose a tree element you want to intersect.
2. Right click the element .
3. Select **Create Slice of <element_name>**

This will open the **Section Image Designer** Dialog.

9.2 Section Image Designer

The **Section Image Designer** Dialog helps you constructing section through models. Here you can set all parameters, design sections with the parameters to deploy your section service.

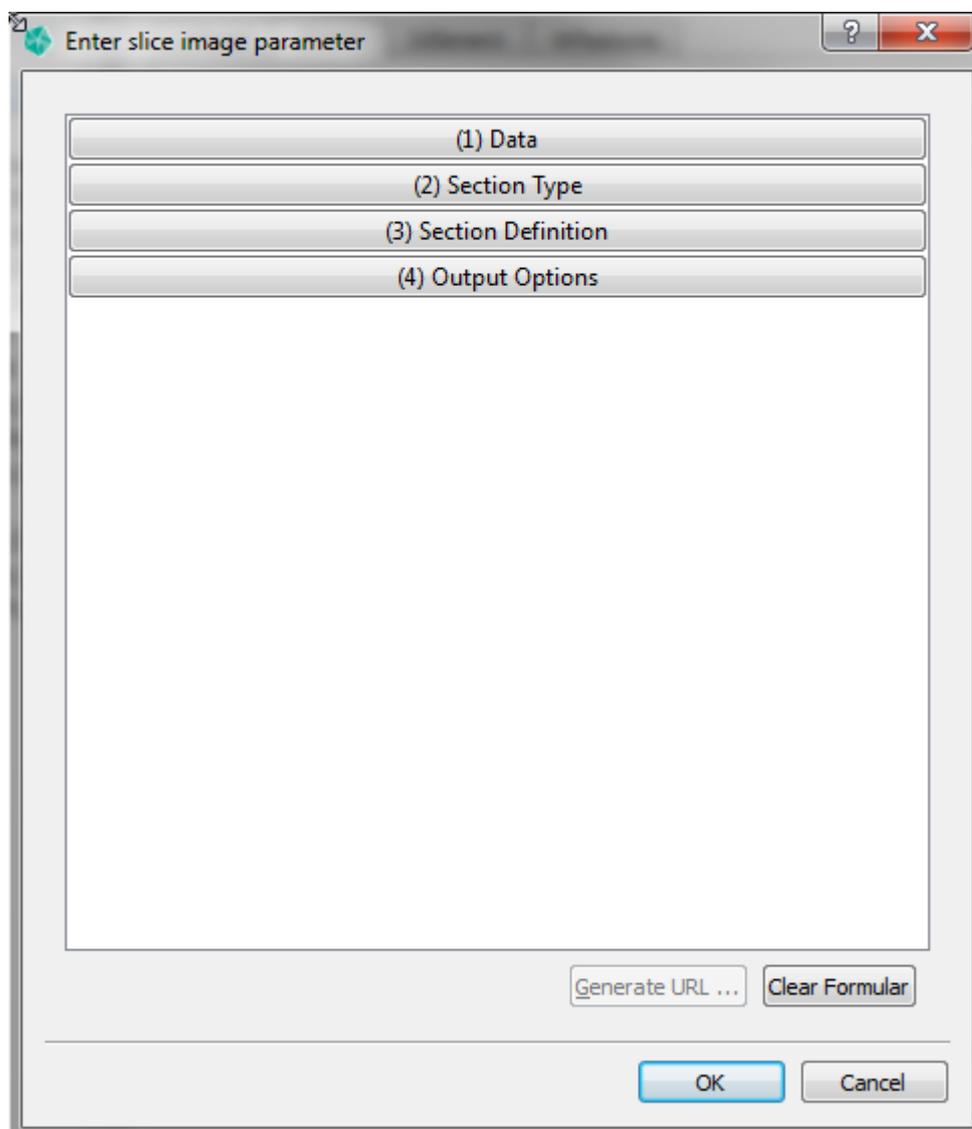
Section Image Designer

The dialog helps to

- * Generate a Borehole, a Section or a Map output of a Model
- * Design an URL to use the GST Section Module in third party services. Refer to page 109 how to setup an URL.

Overview

Figure 9.2
Section Image
Designer dialog after
first entrance



9. Tab: Models [GST Sections]

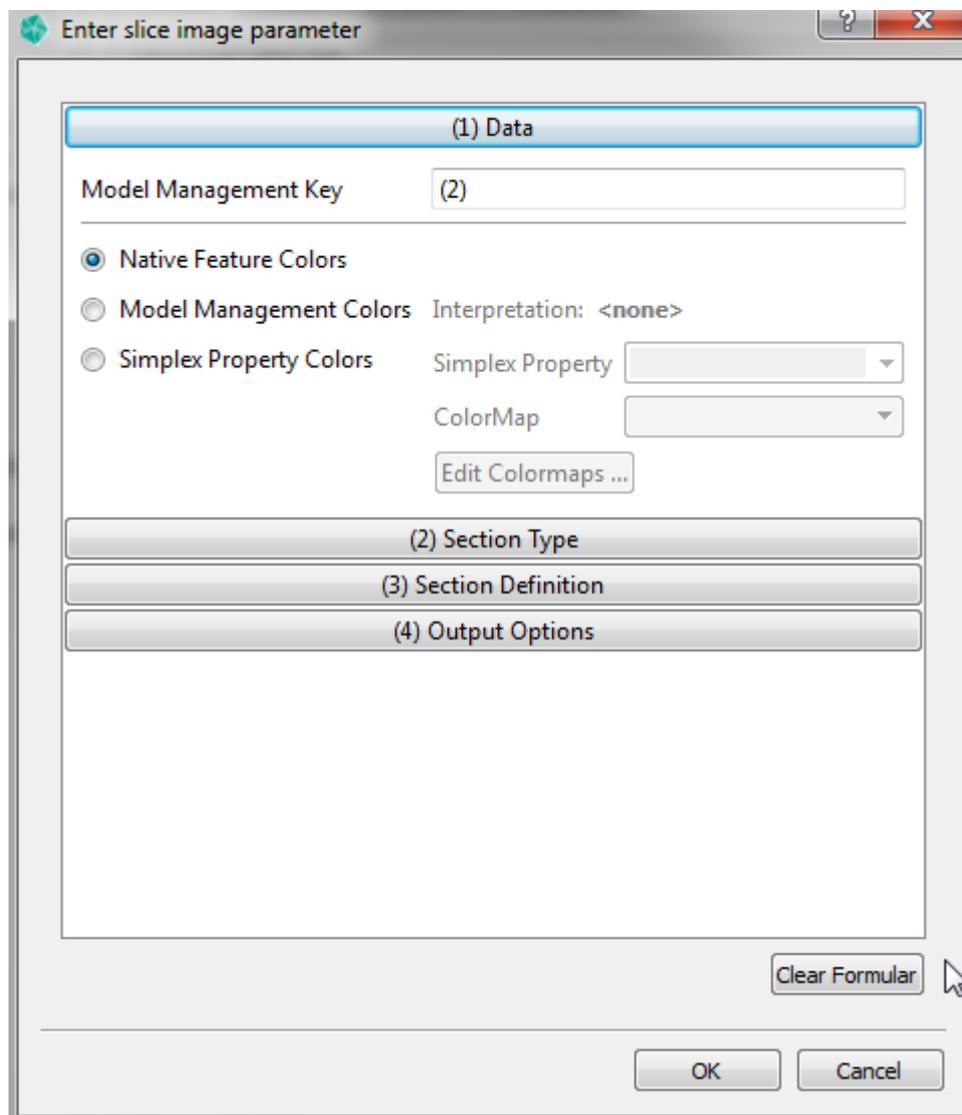
1. Click on one of the four tabs to expand the respective section.
2. Click again to collapse each section.

The four sections are:

- * Data [Choose between native, interpreted and property colors.] page 92
- * Section Type [Choose between virtual borehole, virtual section, virtual map] page 94
- * Section Definition page 95
 - * Define borehole point page 96
 - * section line page 97
 - * map area page 98
- * Output Options page 100
 - * Define output location of result image.
 - * Define output image scale.
 - * Define template file input location.

[1] Data tab

Figure 9.3
Data tab



On the data tab you see in the **Model Management Key** textbox the key of the selected element.

1. Choose the color type for the intersection.
 - a) **Native Feature Colors** :
generates the intersection with the native feature colors.
 - b) **Model Management Colors** :
generates the intersection with the interpreted colors. The **Interpretation** label shows the active interpretation.
 - c) **Simplex Property Colors** :

generates the intersection with color from a simplex property value. The specific colors can be defined via a color map. **Simplex Property** lists the available simplex property name for the features resolved by the given Model Management Key above. [Of course the available simplex properties depends on the feature classes the features belonging to.] With the help of the **Edit Colormaps** Button you can create, modify or delete colormap that are available in your GST Storage instance. Please refer to section ?? on page ?? for more infos about how to manage colormaps.

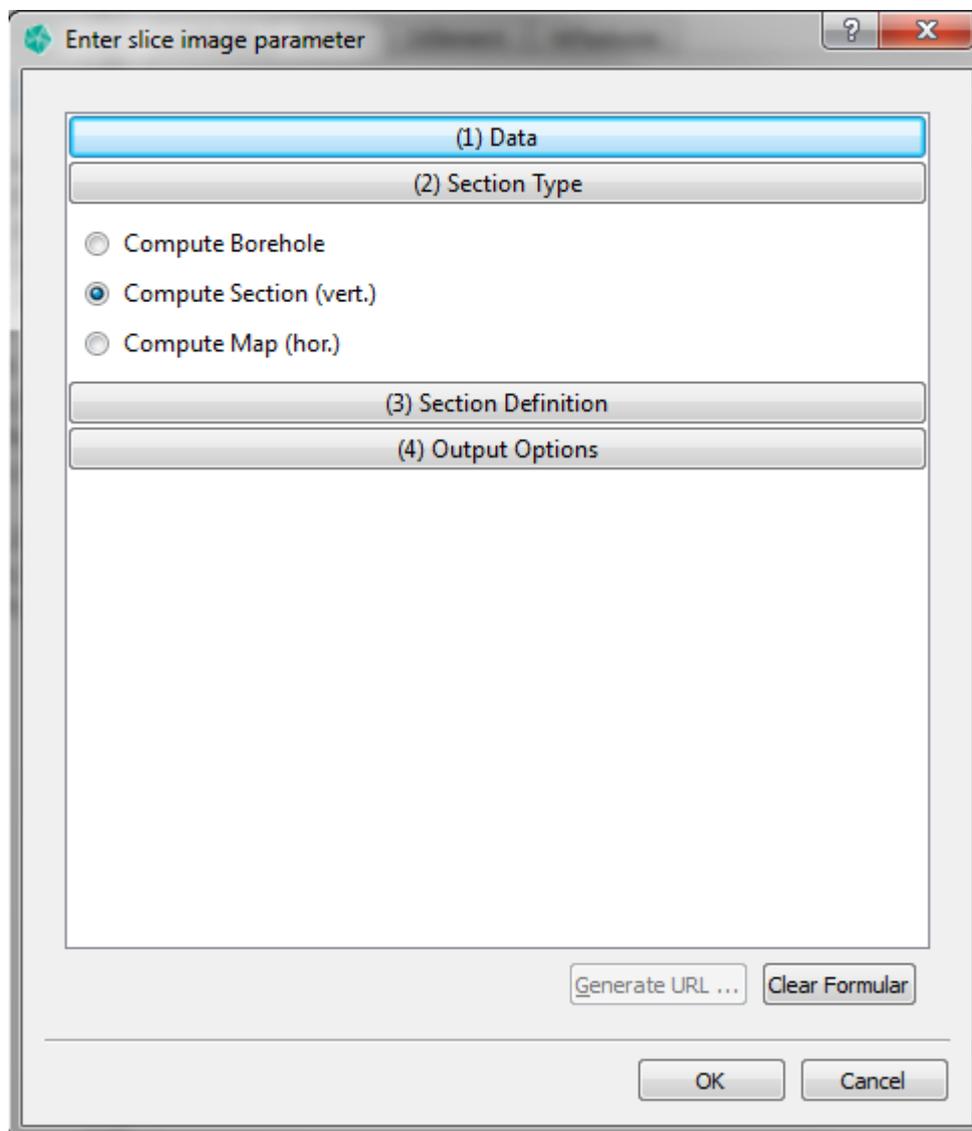
The dropdown box **Color Map** lists all in your GST Storage instance available Colormaps [created or modified by **Edit Colormaps...**]. Choose one from the list that is used for the Slice colouring.

Note

Features without interpretation will be skipped if you are choosing the **Model Management Colors**.

[2] Section Type tab

Figure 9.4
Section Type tab



1. Choose the section type for the intersection. The choice changes the layout of the Section Definition tab explained on page **??**.
 - a) **Compute Borehole** :
computes a virtual borehole image.
 - b) **Compute Section (vert.)** :
computes a virtual section image.
 - c) **Compute Map (hor.)** :
computes a virtual map image.

[3] Section Definition tab

Figure 9.5
Common
parameters in
Section Defintion
tab

The screenshot shows a dialog box titled "Enter slice image parameter" with a close button (X) and a help button (?). The dialog is organized into four main sections:

- (1) Data**: A header section.
- (2) Section Type**: A header section.
- (3) Section Definition**: The active section, containing:
 - Define Point**: Selected radio button. Two input fields for "P1 [x, y]" with values "5.40369e+6" and "5.66765e+6".
 - Read from file**: Unselected radio button. A text field "Select point file!" and a "Browse ..." button.
 - Spatial Reference**: A dropdown menu currently showing "<none>".
 - Inclined**: An unchecked checkbox. Below it are two input fields: "Dip [angle deg]" with "90,00" and "Azimut [angle deg]" with "0,00".
 - Start z [depth]**: An unchecked checkbox with an input field containing "start depth (0)".
 - End z [depth]**: An unchecked checkbox with an input field containing "end depth (model depth)".
- (4) Output Options**: A header section.

At the bottom of the dialog, there are four buttons: "Generate URL ...", "Clear Formular", "OK", and "Cancel".

Independently of the choice in the **Section Type** tab the **Section Definition** tab has some **common elements**.

1. If you want to read from a geometry file with point data for borehole or line data for section select **Read from file**. This file has to be in one of the valid input formats of GST. E.g. a gocad .pl file with line data.
2. Select the SRS of the input by using the **Spatial Reference** drop down menu [optional]. All features will be transformed to this SRS if they have a different SRS.

Note

If no SRS is selected no SRS transformation will be performed while the section generation. This make sense only if all features beyond your selected Model item are in same SRS.

[3] Section Definition tab for Boreholes

Figure 9.6
Section Definition
tab for computing
boreholes

The screenshot shows a dialog box titled "Enter slice image parameter". It is divided into four sections:

- (1) Data**: A header bar.
- (2) Section Type**: A header bar.
- (3) Section Definition**:
 - Define Point**: P1 [x, y] with input fields containing 5.40369e+6 and 5.66765e+6.
 - Read from file**: "Select point file!" button and "Browse ..." button.
 - Spatial Reference**: A dropdown menu showing "<none>".
 - Inclined**:
 - Dip [angle deg]: 90,00
 - Azimut [angle deg]: 0,00
 - Start z [depth]**: start depth (0)
 - End z [depth]**: end depth (model depth)
- (4) Output Options**: A header bar.

At the bottom of the dialog, there are buttons for "Generate URL ...", "Clear Formular", "OK", and "Cancel".

If **Compute Borehole** is chosen in the Section Type tab some specific elements need to be set:

1. Define the Cartesian x and y coordinate of the borehole point or choose the com-

9. Tab: Models [GST Sections]

mon element **Read from file**.

2. Define the Dip and Azimut angle to define an inclined borehole
3. If specified a **Start z** it will cut of from the generated path from the model top to the given depth.
4. If specified a **End z** it will cut of from the generated path below the given depth [measured from Model top].

[3] Section Definition tab for Vertical Sections

Figure 9.7
Section Definition
tab for computing a
section

Enter slice image parameter

(1) Data

(2) Section Type

(3) Section Definition

Define Line

P1 [x, y] 5.40369e+6 5.66765e+6

P2 [x, y] easting northing

Read from file Select line file! Browse ...

Spatial Reference <none>

z Range [zmin] minmal displayed z values (mo...

z Range [zmax] maximal displayed z values (m...

Project Points [distance from section] maximum projection distance (0)

(4) Output Options

Generate URL ... Clear Formular

OK Cancel

If **Compute Section** is chosen in the Section Type tab some specific elements need to be

set:

1. Define the Cartesian x and y coordinate for the start and end point of the section line under **Define Line**.
2. Define the min and max coordinate of the height- [z-] axis [optional] by selecting **z Range [zmin]** and **z Range [zmax]**.
3. Define a distance for points on plane projection [optional] by selecting **Project Points**. All points that have an orthogonal distance that is smaller than the input distance will be projected onto the intersection image.

[3] Section Definition tab for Map generation

Figure 9.8
Section Definition
tab for computing a
map

The screenshot shows a dialog box titled "Enter slice image parameter" with a help icon and a close icon in the top right corner. The dialog is divided into four sections: (1) Data, (2) Section Type, (3) Section Definition, and (4) Output Options. Section (3) is currently active and contains the following controls:

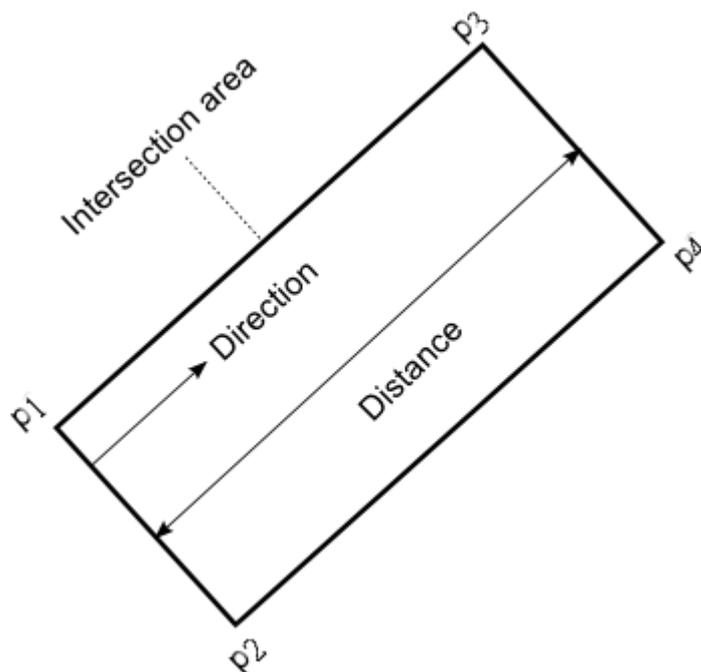
- A radio button labeled "Define Map" is selected.
- Two input fields for "P1 [x, y]" containing the values "5.40369e+6" and "5.66765e+6".
- Two input fields for "P2 [x, y]" containing the values "easting" and "northing".
- A dropdown menu for "Side".
- An input field for "Width" containing the text "Map width".
- An input field for "Depth" containing the text "Map depth".
- A radio button labeled "Read from file" is unselected.
- A text field containing "Select file!" and a "Browse ..." button.
- A dropdown menu for "Spatial Reference" containing the text "<none>".

At the bottom of the dialog, there are two buttons: "Generate URL ..." and "Clear Formular". At the very bottom, there are "OK" and "Cancel" buttons.

If **Compute Map** is chosen in the Section Type tab some specific elements need to be set:

1. Define the Cartesian x and y coordinate for the start and end point of section line under **Define Map**.
2. Define the side to which the area extends, seen from the line defined before by using the **Side** drop down menu.
3. Define how far the area extends from the line defined above in the **Width** textbox.
4. Define the starting height [z] of the map area **Depth** textbox.

Figure 9.9
Map definition with
the parameters **P1**,
P2, direction [=Side],
distance [=Width].



[4] Output Options tabFigure 9.10
Output Options tab

1. Set output location for the generated intersection image. Using the **Browse ...** button for selecting the location.
2. Set output image format of the generated intersection image by using the **Output format** drop down menu.

Requesting SHP format / Additional Parameters

Additional information about the shape file format, files and information that are generated can be found on [Additional JSON Parameters](#) on page 151.

3. Set the location of the intersection template file. Using the **Browse ...** button for selecting the location.
4. Chose the scale by:
 - a) selecting **Compute best scale and exaggeration** to set the scale automatically so that the image fits the template.
 - b) selecting **Set fixed Scale** to chose own values for the scale. First change the scale for the width in the **Scale** box. Second set fixed **Vert. exaggeration** to changes the scale for the height. This is "height scale" = "width scale" * "vertical exaggeration".

Note

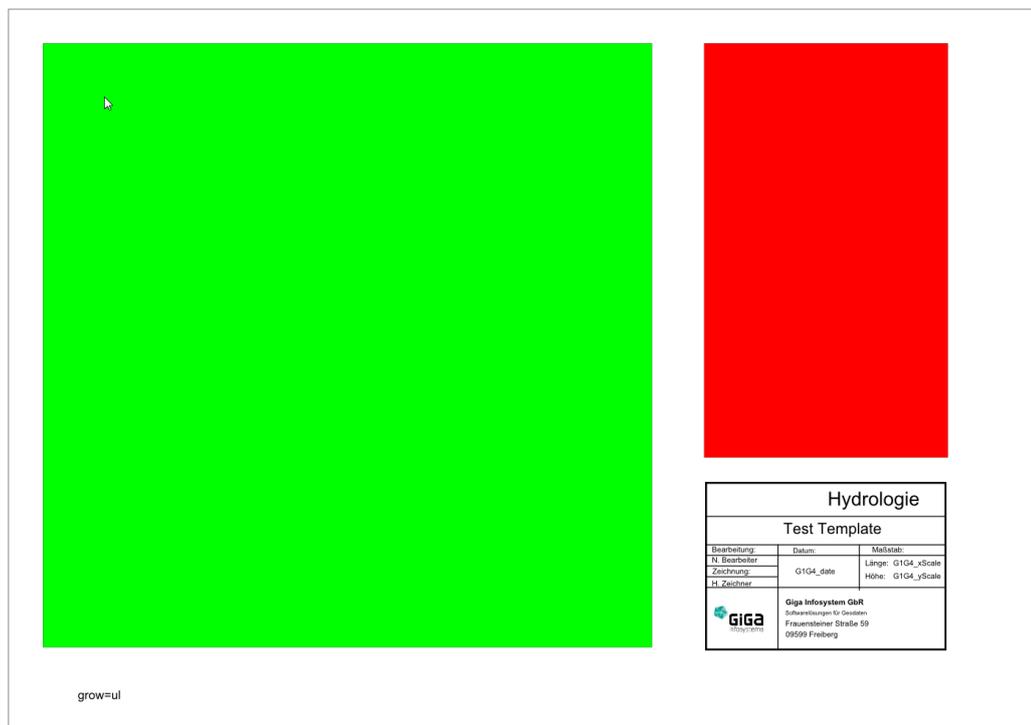
Setting a specified scale or exaggeration value might cause the image to grow outside of the boundaries defined in the template file. See the [Section Template File](#) on page 108 for more information.

10 Section Template File

Template files are used to customize the Section output. They can be used to control the following:

- * Template allows to layout the output. This means in the template **area placeholders** can define the location where at runtime the section output and legend output will be written to. Additionally the template allows to place static content onto the section output, e.g. your company logo or a disclaimer text.
See subsection [Section Template File](#) on page 103.
- * In the template **text placeholders** can be defined. They are replaced on section generation runtime. They can be used e.g. to print the current date and model information like the displayed scale.
See subsection [Section Template File](#) on page 107.
- * In the template parameters can be defined to control the output (like setting font size in the generated [area] content).
See subsection [Section Template File](#) on page 108

Figure 10.1
Example of a user defined template file, modified from the template skeleton.



Note

Sample Template files are located in GST Desktop setup directory `GiGa infosystems/GST Desktop/templates`

Template Structure and Area Placeholders

Figure 10.2
Skeleton file opened
in a text editor

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <svg xmlns="http://www.w3.org/2000/svg"
3      version="1.1"
4      width="297mm"
5      height="210mm"
6      viewBox="0 0 297 210">
7      <rect
8          x="10"
9          y="10"
10         width="175"
11         height="175"
12         fill="rgb(0,255,0)"
13         stroke-width="0.05"
14         stroke="rgb(0,0,0)"
15         id="G1G4_isec" />
16     <rect
17         x="200"
18         y="10"
19         width="70"
20         height="120"
21         fill="rgb(255,0,0)"
22         stroke-width="0.05"
23         stroke="rgb(0,0,0)"
24         id="G1G4_legend" />
25     <text
26         x="20"
27         y="200"
28         fill="#000000"
29         font-size="3.5"
30         font-family="Sans"
31         id="G1G4_params">
32         grow=ul
33     </text>
34 </svg>

```

To understand the template structure we open the template file in a text editor. The template is a regular SVG xml file that has several predefined `<rect>` and `<text>` tags with well-defined id values that behave like placeholders or input parameters for the section

10. Section Template File

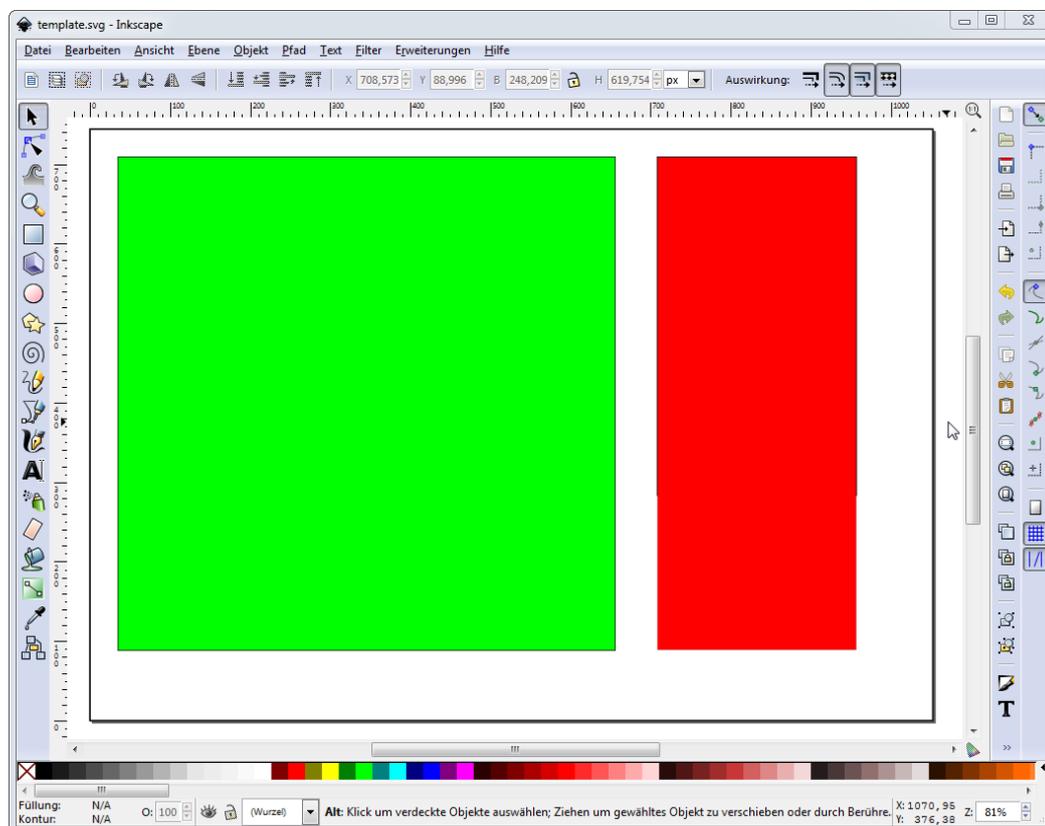
output. The template file can be customized to your liking (e.g. adding additional elements, moving/resizing the existing boxes, etc.).

You can add items to your template as you like (e.g. adding: disclaimer texts, copyright information, icons, your Cooperate Design elements etc.).

Note

Usually you don't need to open a template with a text editor. Use a SVG-editor of your choice to edit the template skeleton. We recommend Inkscape (<http://www.inkscape.org>) as a free open source SVG-editor allowing to browse the structure of the SVG with an build-in xml editor.

Figure 10.3
Skeleton file opened
with a SVG-editor
(here Inkscape)



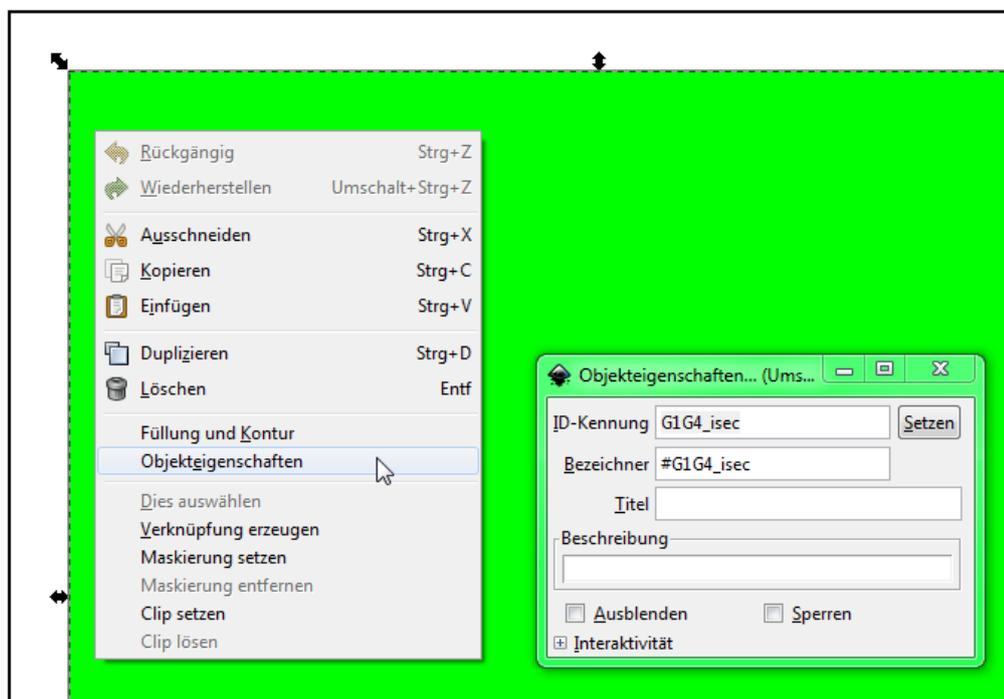
The simplest template consists one or two **placeholder parts**. A placeholder part is referenced by its xml-tag **id** (as shown in the section above you can browse them with any text editor). If you are using Inkscape you can browse the **id** of an object using the context menu -> "Object Properties".

Tip

You should almost never need to change those ids by hand. Also some editors are known not allowing to change the tags `id`'s.

We recommend to use the template skeletons provided by GST Desktop Setup and modify them to your needs using your favorite SVG editor.

Figure 10.4
Display object ids
with Inkscape



The basic placeholders are:

- * **G1G4_isec** The green box represents the area where the intersection image will be placed. The size of this area will also determine the size of the intersection image. This box is mandatory and the intersection will exit with an error if it is not present. The color of the box has no usage [it is just for easy visual identification beside the `id`.]
- * **G1G4_legend** [Optional] The red box represents the area where the intersection legend will be placed. As with the green box, the area also determines the size of the legend.
- * **G1G4_params_json** [Optional] Advanced output parameters that are controlling the section and legend generation
- * **G1G4_overview** [Optional] A placeholder of an overview map. The map will show the current location/section on an WMS map. [Note: The overview map replacement is

available only by the Section generation on GST Web.]

You can move the placeholders around and resize them according to your needs. You can also place more elements into the template like a disclaimer text, an author/ownership text, your logo etc. There are also a set of placeholder strings available to make these additional [static] elements more flexible and enrich them with more information about the section [e.g. time/date of creation, Scale information etc.]. Please consult section [Section Template File](#) on page 108 to get a detailed list about the available placeholder strings.

Note

There is a restriction for the minimum size of a placeholder box. This is dependent on the overall document size. For an A4 document as example, a box needs to have a minimum of 50mm in width and height. See [Intersection Template detailed information](#) on page 134 for further information.

The maximum size of any box cannot exceed the size of the document.

If you overlap boxes or move them out of the document area, the content of those boxes will also be overdrawn or be outside the document area in the final image.

Note

In some cases the **G1G1_isec** box can "grow". This will happen if a user requests a section or borehole to be in a certain scale (see [parameter scale](#) on page 100 resp [parameter scale at the URL parameters](#) on page 154). This requires to display the section or borehole in a certain scale that might enlarge the **G1G1_isec** placeholder box. See [parameter grow](#) on page 107 to control in which direction the **G1G1_isec** can grow.

Text placeholders

Any of these parameters present in a text field will be replaced by the mentioned value in the final image.

- * **G1G4_date**

- * Will be replaced by the current date.
- * Format: "dd.mm.yyyy".
- * Example: "20.03.2014".

- * **G1G4_xScale**

- * Will be replaced by the width scale.
- * Format: "1 : xxxxxx".
- * Example: "1 : 20000".

- * **G1G4_yScale**

- * Will be replaced by the height scale.
- * Format: "1 : yyyyyy".
- * Example: "1 : 3000".

- * **G1G4_title**

- * Will be replaced by a custom title. passed as parameter

JSON parameters

The parameter textbox is identified by `id=G1G4_params_json`. The textbox will be removed from output image. All text in that box requires the JSON format.

Example:

Sample `G1G4_params_json` content:

```
{
    "unit ":" px ",
    "dpi ":300 ,
    "borehole-image-width ":800 ,
    "borehole-image-height ":600
}
```

Please refer to [the Appendix](#) on page 138 for a list of all parameters and their behavior.

Tip

You can also pass this parameters as JSON string as a parameter called **additionalParameters** by the **Section Image Designer** Dialog and the **URL Assistant** Dialog. If values are duplicated the values in **additionalParameters** will overwrite the values specified in `G1G4_params_json`.

If a parameter is defined neither in `G1G4_params_json` nor in **additionalParameters** a default value will be calculated. [Please refer to [the appendix](#) on page 138 about the default values].

10.1 Deploying Sections/Boreholes as a Service

System prerequisites

This function requires GST Web in order to deploy services.

You can deploy sections a service. Thus enables third party applications to request sections or boreholes by GST as done by GST Desktop. You can setup a section service in GST Desktop, where you define parameters that can be configured by the third party service. So the third party service functions a graphical interface or simply as parameter input service where the output is generated by the GST section service.

GST Desktop helps you with an URL Generation Assistant to generate an URL that can be used by the third party service. The generated URL contains a set of placeholder [well defined strings to search] that can be replaced by the third party service in order to push parameter values from that service.

Example:

The third party service is a map application. You want to put a function onto your map application where the user can pick virtual boreholes through the 3D model stored in GST. You want to set the location of the virtual borehole by your map application anything else should be generated by GST. For this concept GST Desktop provides you with an Assistant.

The Assistant of GST generates a KVP-Style URL with placeholders. Your application needs to replace the placeholder in order to change e.g. the location of a virtual borehole. See [the following section](#) on page 110 on howto do this.

Example:

A KVP-Styled URL looks like this:

```
http://somehost/pathToGSTWeb/createBorhole.php?key1=  
#VALUEPLACEHOLDER1#&key=value2
```

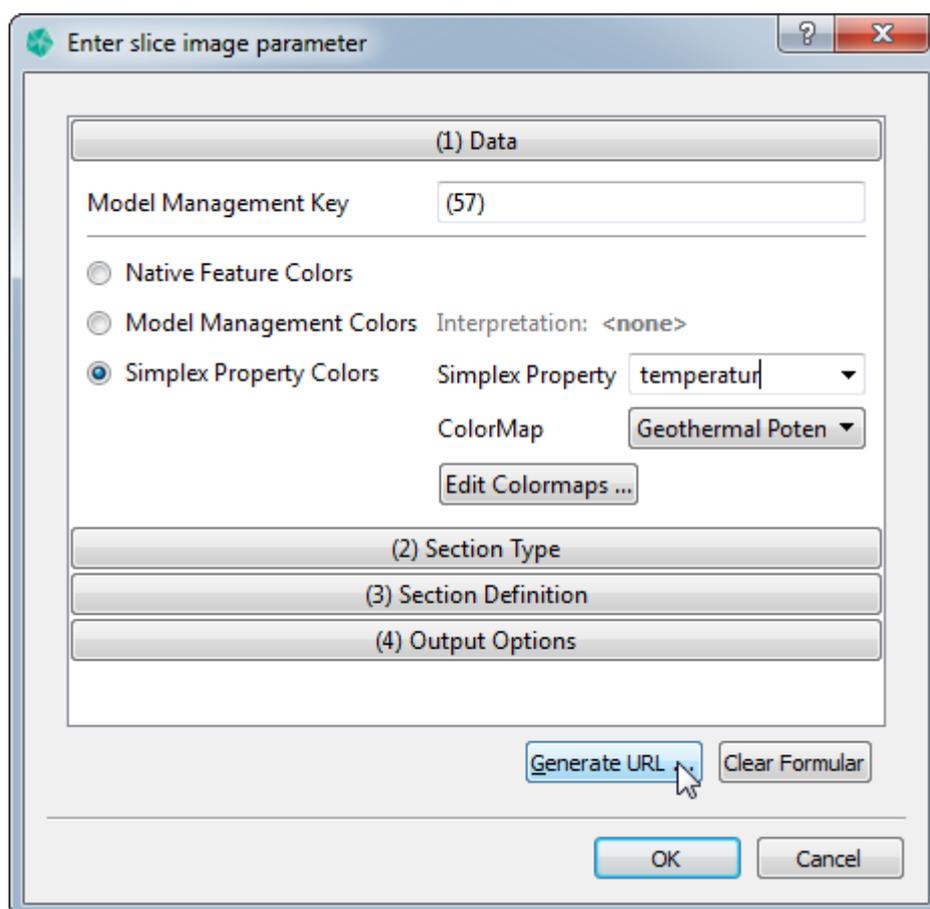
#VALUEPLACEHOLDER1# is a placeholder that should be replaced by the third party service, e.g. your map application.

Howto: Deploy a service

Use GST Desktop to design a section request. It's explained in the [sections above](#) on page 89 how to generate Sections.

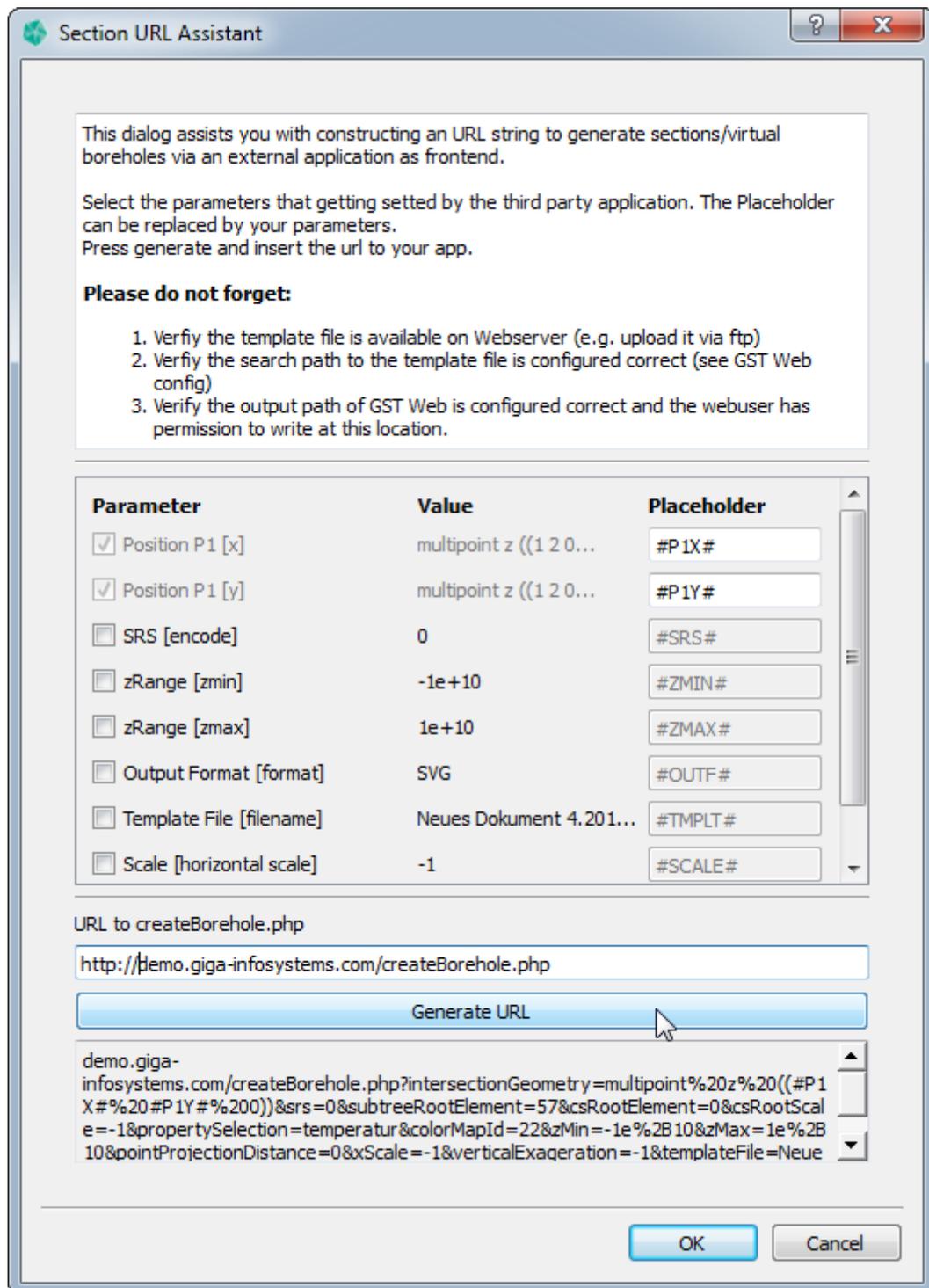
Once the section / the borehole fits your requirements and you want to deploy the section as a service press the **Generate URL** button at the bottom of the **Section Image Designer** Dialog.

Figure 10.5
Section Image
Designer



1. Press the **Generate URL** Button to open the Section URL Assistant.

Figure 10.6
Section URL
Assistant



The Section Assistant shows up all configurable parameters.

An activated checkbox on the left marks a parameter to be defined by the third party service.

Unchecked parameters are defined by the GST Desktop and getting hard coded into the

10. Section Template File

URL [as you set them in Section Image Designer].

The position of the section / borehole is always a parameter that is defined with placeholders.

1. Change the placeholder string on the right if you want to.
2. Enter the URL stump to createBorehole.php of your GST Web Instance
3. Press
 - a) **Generate URL** to generate the URL.
 - b) **Cancel** to abort.
4. To deploy the section service, copy the generated URL to the third party service administrator. The third party service should replace the placeholders by the desired values in order to generate an output.
5. Please verify that the template file you specify is available for GST Web [temporal path of GST Web, see var.inc.php]!

Note

A list of all section parameters is available in [Appendix](#) on page 154

11 Manage Themes

11.1 Motivation and concept of Themes

Themes are intended to visualize and group geomodels based on their [object] properties and display a group name instead of the technical object names. In GST Web the geomodels will be colored and represented in that group when a Theme is activated. GST Web allows to setup a default theme that is displayed at the startup.

Relevance of Themes

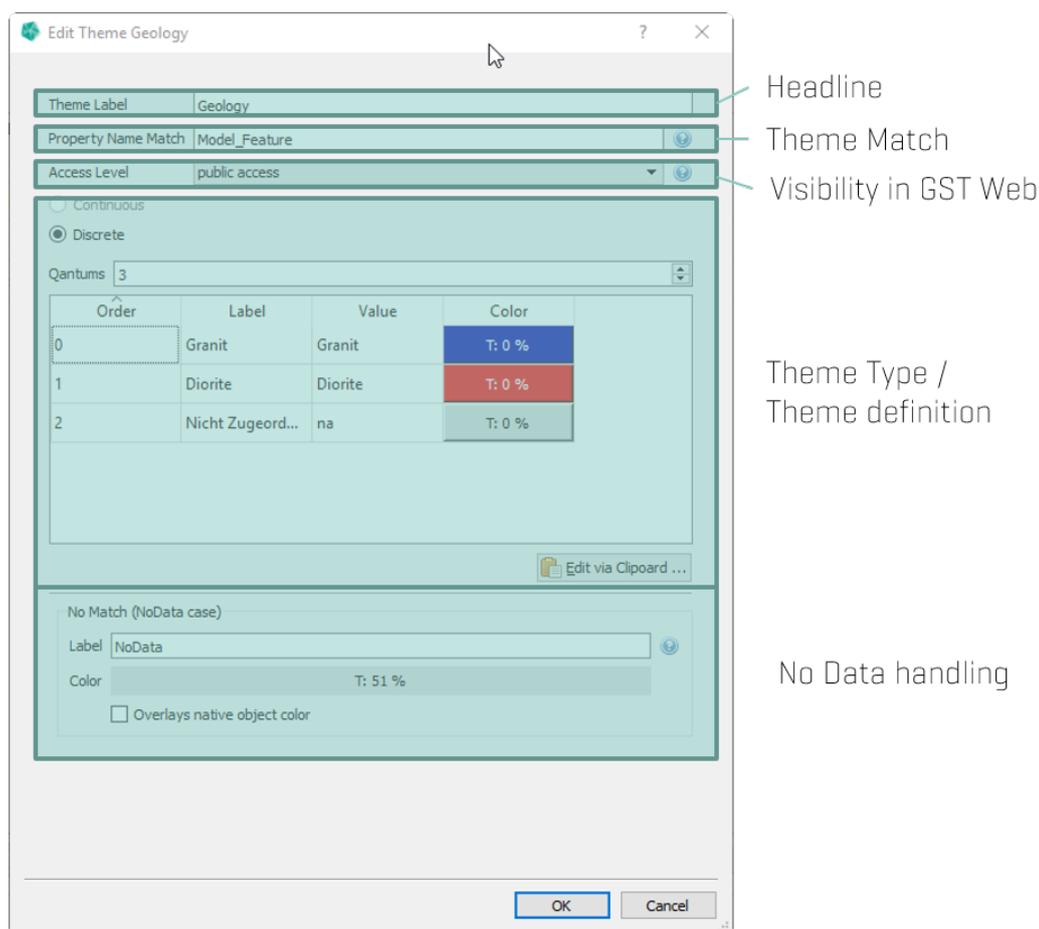
A Theme can be understood as an implementation of a **generalized legend**. Based on object properties a Feature will be interpreted to be part of something. A generalized legend could be a litho-stratigraphic view, a hydraulic view or a [thermal] potential view for a example.

Of course generalized legends can differ in context. That is why multiple Themes can be created.

A theme consists of

- * A **Theme label** - a human readable text, like a headline
- * A **Property Name Match** pattern - defines a connection from an Object Property to a Theme. page [114](#)
- * A **Access Level** - the Theme visibility on GST Webpage [114](#)
- * A **Theme type** - depending on the Property Data type the definition how property values are represented in the Legend page [115](#) ff
- * A **No data** handling - how the value "no data" is handled and which values shall be ignored in the Theme page [115](#)

Figure 11.1
Theme Editor



Match pattern

One Theme can be assigned to Features from different Feature Classes having slightly different Property names [e.g. when features are used in Model Trees each feature can be integrated from a different Feature Class]. Therefore a **match pattern** is a **semicolon ";"** **separated** list supporting **"?" [wildcard]** and **"*" [kleene]** operators and doing a **case insensitive** comparison.

Example:

Feature Properties

- * Temperature
- * Temp
- * temp

} matched by **temp;temperature**
[also matched by **temp***]

Theme visibility on GST Web / Access Levels

Within **GST Web** each Web user can be assigned to an Access Level. [Please consult the **GST Web User manual** for a howto.] They are used to filter content for specific users. Access Levels that are installed by default are:

- * **public**
- * **partner**
- * **private**

Access Levels are hierarchical [from bottom to top in the list above], thus the most restricted level is **public**. Users assigned to that level can see content assigned to that level only. The level **partner** includes all content that is available for **partner** AND **public**, and so on.

Themes can be assigned to an Access Level in order to restrict the occurrence of Themes for specific users.

Note

Themes that have an Access Level **higher than public** are only visible for web users that are assigned to that level [or higher]. By default the public login is mapped to a web user that is assigned to the Access Level **public**. Thus, Themes set to the Access Level **partner** or **private** are not accessible for the public login.

Theme types

Depending on the datatype of the property GST distinguishes between two Theme types.

- * **Continuous type** for continuous datatypes like integer, float or double
- * **Discrete type** for discrete datatypes like integer, text and boolean

Please continue with chapter [Define Themes](#) on page 117 for more information about **Continuous type** and **Discrete type**.

No Data handling

The lower part of the Dialog handles how the no data case will be displayed.

A no data value is either

- * the NULL value or
- * a value depending on the Theme type
 - * outside the defined interval [for continuous Themes]

11. Manage Themes

- * a value that is not matched with the table (for discrete Themes)

Simply define a label that will occur in the legend for the no data interpreted objects. [Useful terms here are: "no data", "not defined", "not interpreted", "other", ...].

Defining a color will show all no data interpreted objects in that color [e.g. black, grey or semi transparent].

If the checkbox **Overlays object color** is activated, this color will be ignored and the objects are displayed in their native defined colors [see [Context Menu in Feature Class list](#) on page 22].

Figure 11.2
Overlays object color
controls how the no
data interpreted
objects will be
displayed in GST
Web

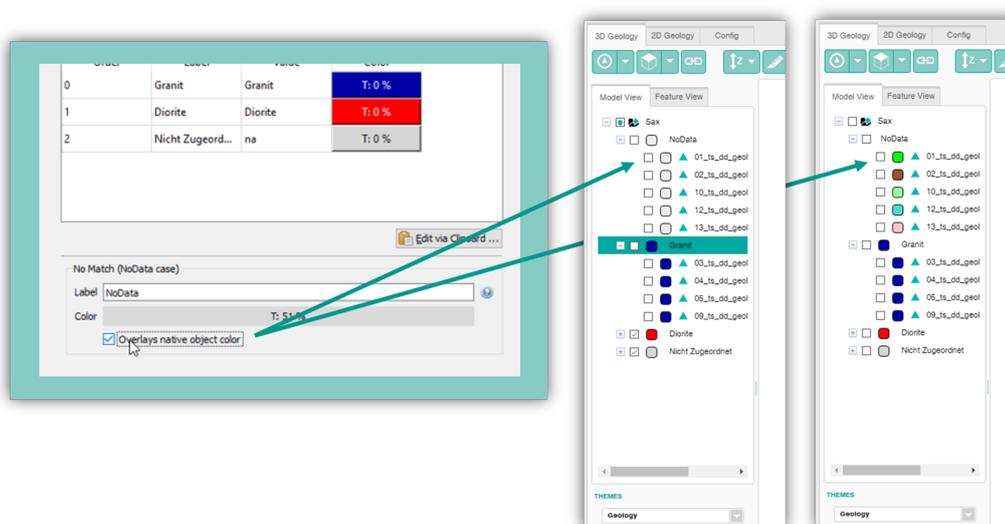


Figure 11.3
GST Web with
regular object color
(Default Theme)

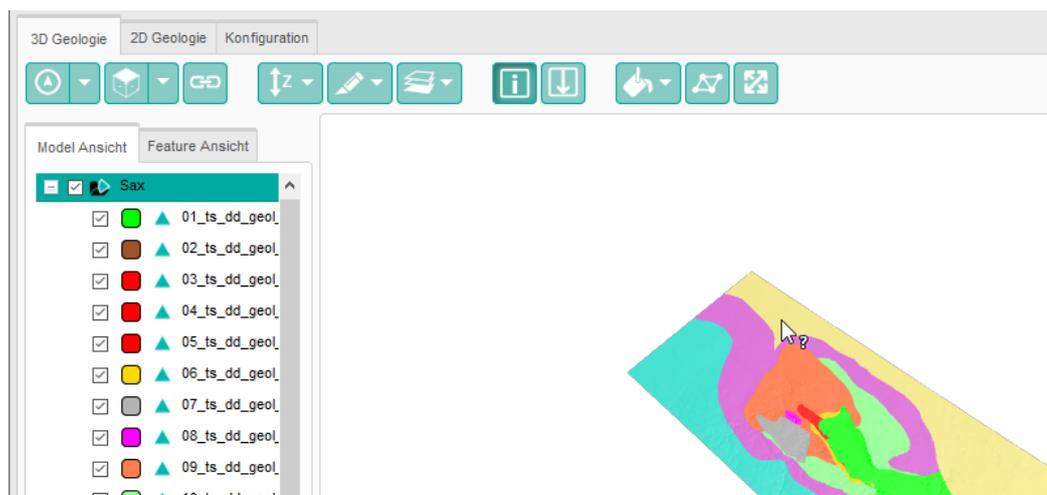
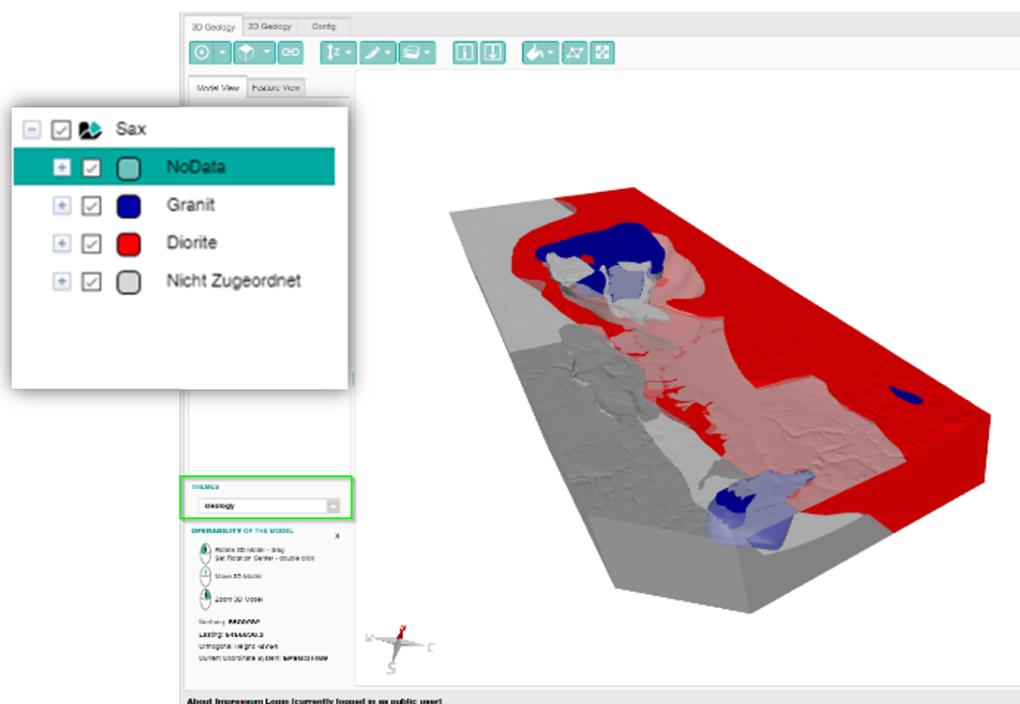


Figure 11.4
GST Web with Theme
color. The user can
switch the current
theme with the drop
down menu in the
lower left. The
default displayed
Theme can be
configured within
GST Web
administrative page.



11.2 Define Themes

Themes have a prominent appearance in GST Desktop. They are accessible within the tabs **Feature Selection** and **Model** [see Figure 11.5].

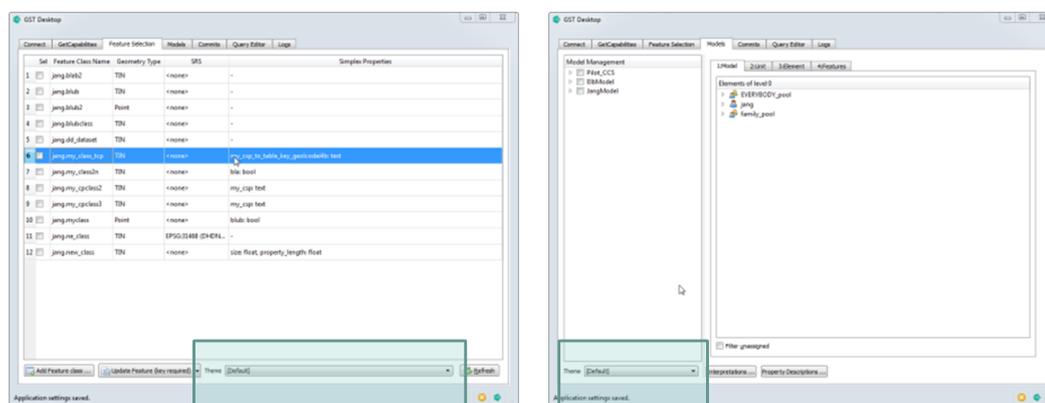
The first time GST Desktop is started the Default Theme is selected which means, no Theme is used. The objects are displayed in their object colors.

Hovering the mouse over the Theme dropdown element enables the control buttons

11. Manage Themes

- *  **add**
- *  **remove** (not available for Default Theme)
- *  **edit** (not available for Default Theme)

Figure 11.5
The Theme dropdown element has a prominent position in GST Desktop



Definition of a Continuous Theme

Figure 11.6
Concept of a Continuous Theme

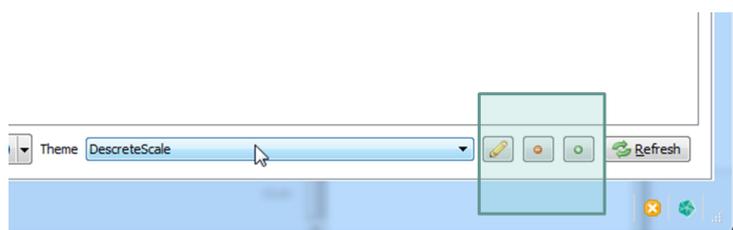


For continuous property values the values might range from the full real number space [depending on the property datatype]. Within Continuous Themes the full range is delimited into intervals. Each interval is defined by its right border and the left neighbored interval border. (As a result the intervals are in mathematic terms left open and right closed, that is depicted in Figure 11.6 with the black square brackets.)

Within GST Desktop

Within GST Desktop create a Continuous Theme by hover the Theme dropdown element with the mouse and press the  **add** button.

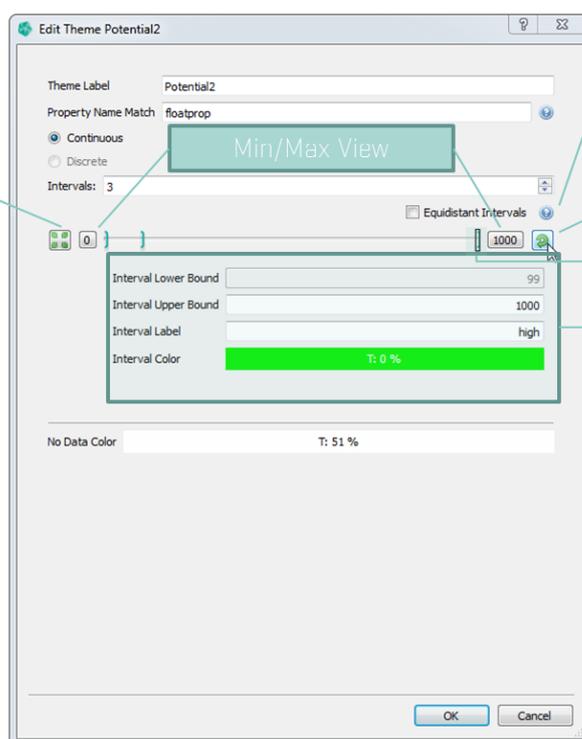
Figure 11.7
Hovering the Theme dropdown menu will show the control buttons



In the **Edit Theme dialog** type in a **Theme label** and a **Property Name Match** and select the radio button **Continuous** to create a Continuous Theme. This will change the lower part of the Dialog [compare [Figure 11.8](#) and [Figure 11.10](#)].

Figure 11.8
The lower part of the Edit Theme dialog will change when **Continuous** checkbox is activated.

Show all intervals



Place behavior when add intervals

Switch active to next interval

Active interval

Place new interval handles by increasing the **Intervals** spinbox [in [Figure 11.8](#) it is set to **3**]. The way intervals are placed can be controlled by the checkbox **Equidistant Intervals** [see Note box below for additional information]. Drag intervals with the mouse to change the interval border or activate a handle by clicking the **switch** button. The current active handle is highlighted by a small box []. The interval border [**Interval Upper Bound**], the **Interval Label** and the **Interval Color** can be set below the slider for the current activated handle. Set the **No Data Color** for all Theme Interpretation left from the lowest and right from the highest interval [see [Figure 11.6](#)]

The Min/Max View buttons allow to zoom on the slider [changing visible range]. They do not change any interval value so they can be changed without care. Use the **reset zoom** to undo and view all handles. [Note that the Min/Max View buttons will change their labels to the visible range.]

Equidistant Intervals

Checked When new Intervals are added (Incrementing Spinbox value above) the Interval handles are placed in equal distances on the multislider. This means existing intervals will change their values in order to form equidistant intervals.

Unchecked Non Equidistant Intervals are always inserted in the last Interval. No Existing Interval is changed.

Definition of a Discrete Theme

Figure 11.9
Concept of a
Discrete Theme

	rtype
	5 ← sediment
	6 ← metamorphite
	7 ← volcanic

Discrete Themes are 1:1 mappings from Property Values to Theme Value, label and Color. They can be used to group data or visualize geocodes.

Within GST Desktop

Within GST Desktop create a Discrete Theme by hover the Theme dropdown element with the mouse and press the **add** button. In the **Edit Theme Dialog** select the radio button **Discrete** to create a Discrete Theme.

11. Manage Themes

Figure 11.10
Discrete Themes in
Edit Theme Dialog

List of Quantums, the mapped value, the associated label and color

Number of discrete mappings [Quantums]

Useful to copy in multiple quantums e.g. via Excel

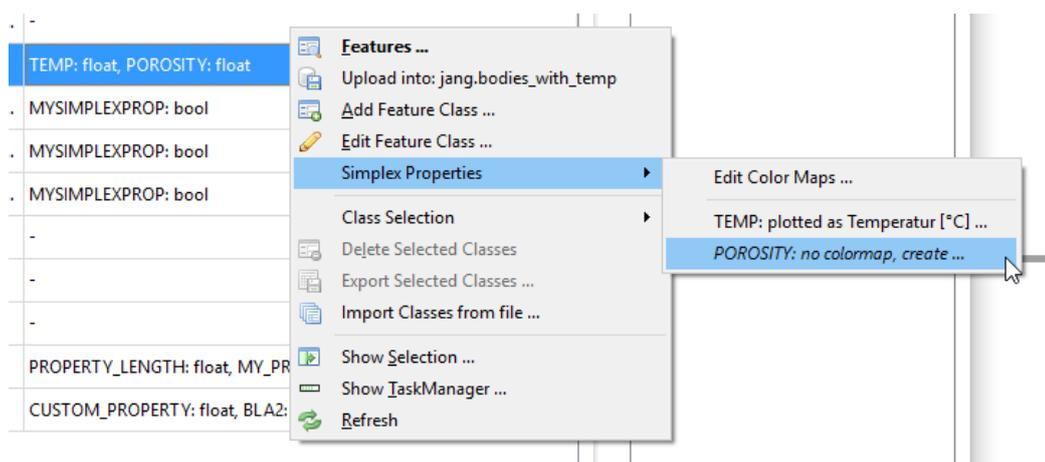
Order	Label	Value	Color
0	Granit	Granit	T: 0 %
1	Diorite	Diorite	T: 0 %
2	Nicht Zugeord...	na	T: 0 %

The table below the **Quantums** spinbox represent the mapping. The column **Value** represents the Property Value that will be mapped to the **Label** and **Color**. **Order** can be used to control the order of the Theme Interpretations, e.g. in GST Web legend [see box in ??, lowest **Order** left increasing to the right].

12 Manage Simplex Property Color Maps

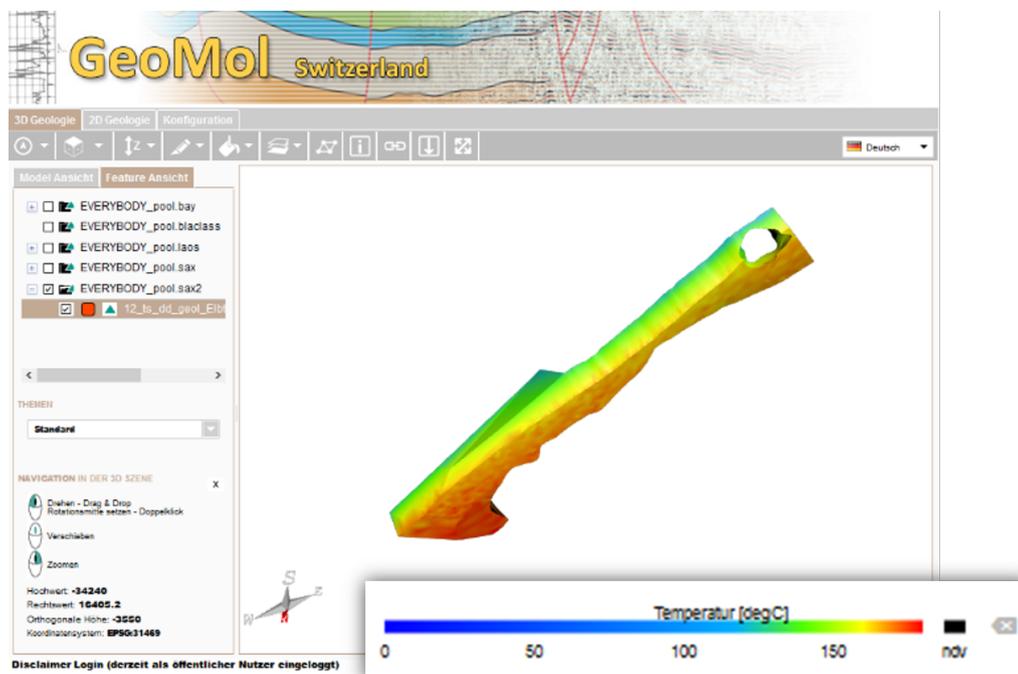
The context menu of a Feature Class shows all Simplex Properties assigned to that Feature Class. Simplex Properties which are not connected to any Color Map are displayed in italic font.

Figure 12.1
The context menu of a Feature Class shows all Simplex Properties assigned to that Feature Class. Simplex Properties which are not [yet] connected to any Color Map are displayed in italic.



Simplex Properties are used color code Simplex Property values in the 3D scene of **GST Web**. This can be customized by defining Color Maps. A legend allows the user to trace back a color to a value.

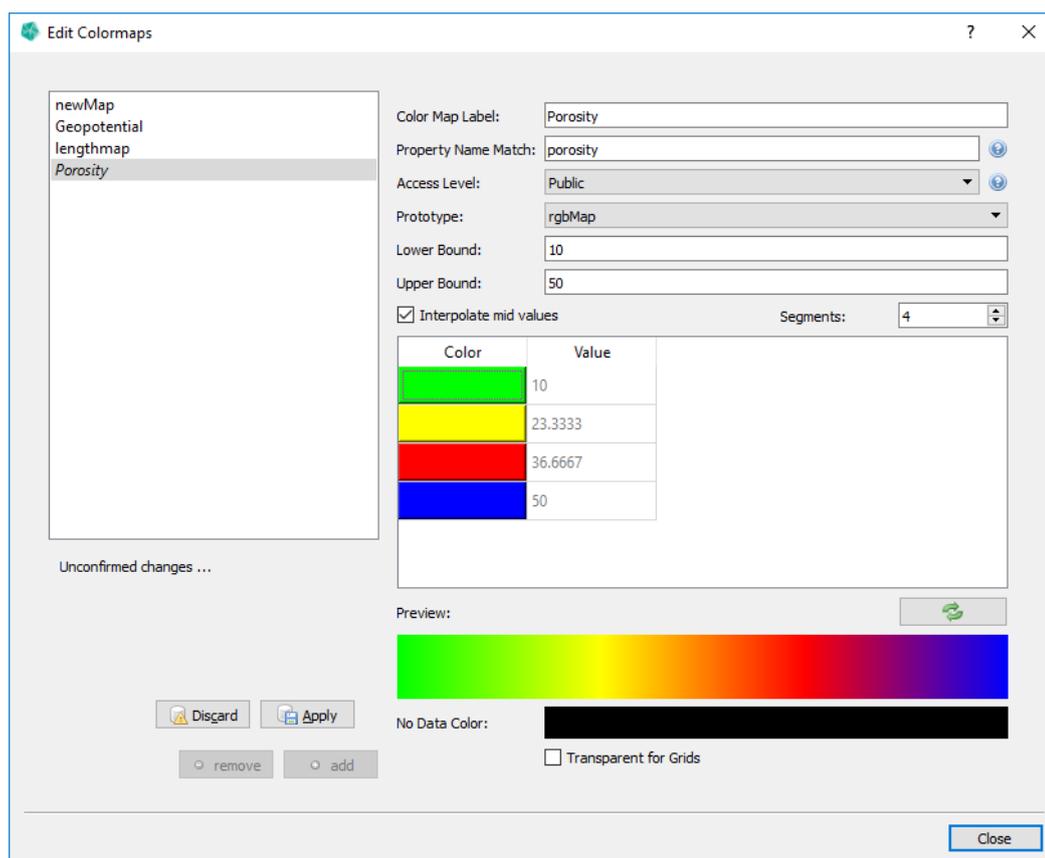
Figure 12.2
Color Maps are used color code Simplex Property values in the 3D scene of GST Web. A legend allows the user to trace back a color to a value.



12.1 Create or edit a Color Map

In order to create a Color Map, click on a non assigned Simplex Property (printed in italic font), see figure 12.1. [To edit a Color Map specify an assigned Simplex Property ,printed in non italic font.] The Color Map Editor opens up (figure 12.3), where the **Property Name Match** is adjusted to connect the Color Map with the Simplex Property specified before.

Figure 12.3
Define the Color Map name and the way the Simplex Property should be visualised.



Within the Color Map Editor you define how the Simplex Property is going to be visualized in GST Web. The following controls are available to define the Color Map. A legend **Preview** is available at the bottom of the Color Map Editor.

Color Map Label defines the label or name of the Color Map (displayed next to the legend in GST Web)

Property Name Match defines the Simplex Properties this Color Map is connected to. Analogue to Themes this match string supports a semicolon separated lists, * and ? operator in order to match multiple Simplex Properties differing in name. Please refer to the example box in subsection **Match pattern** of chapter **Motivation and concept of Themes** on page 114 for an example of match patterns!

12. Manage Simplex Property Color Maps

Access Level defines the level of GST Web users this Color Map is visible to. Please refer to subsection **Access Levels** of chapter [Motivation and concept of Themes](#) on page 114 for an explanation about Access Levels!

Prototype has some predefined color schemes. Helps to auto fill the table with color value pairs.

Lower Bound, Upper Bound helps to auto fill the table. Type in numbers and check the checkbox **Interpolate mid values** in order to fill the table in a quick and easy way.

Segments defines the number of color value pairs of the Color Map.

No Data Color defines the color used for no data values [NULL values].

Transparent for Grids If active, no data values [NULL values] for Grid Geometries will be visualized transparently. This affects the presentation in GST-Web and Intersections. Otherwise, the **No Data Color** applies.

When the Color Maps is defined do not forget to  **Apply** the settings in order to store the Color Map in **GST Storage**.

12.2 Manage or Remove Color Maps

In order to remove a Color Map or to create a second Color Map for the same Simplex Property click on **Edit Color Maps ...** at the Feature Class context menu [figure 12.1].

Select the Color Map to edit or remove on the left side in the Color Map Editor [figure 12.3] and use the control button  **remove** [to remove the selected Color Map].

To create a Color Map use the button  **add**. The **Property Name Match** is empty and requires to match with a Simplex Property Name in order to be connected with a Simplex Property.

Note

For one Simplex Property multiple Color Maps can be created e.g. to emphasize different value ranges. Therefore simply create a new Color Map with the same **Property Name Match** string.

[Alternative the **;**, ***** or **?** operators can be used to match a Color Map with multiple properties. See [Motivation and concept of Themes](#) on page 114 for more info about **Property Name Match**.]

13 Member Properties

Within GST Desktop it is possible to define **Member Properties**. Member Properties are indicated by an *m_* prefix in their property name. Commonly Member Properties are used to link external data files with geometry objects.

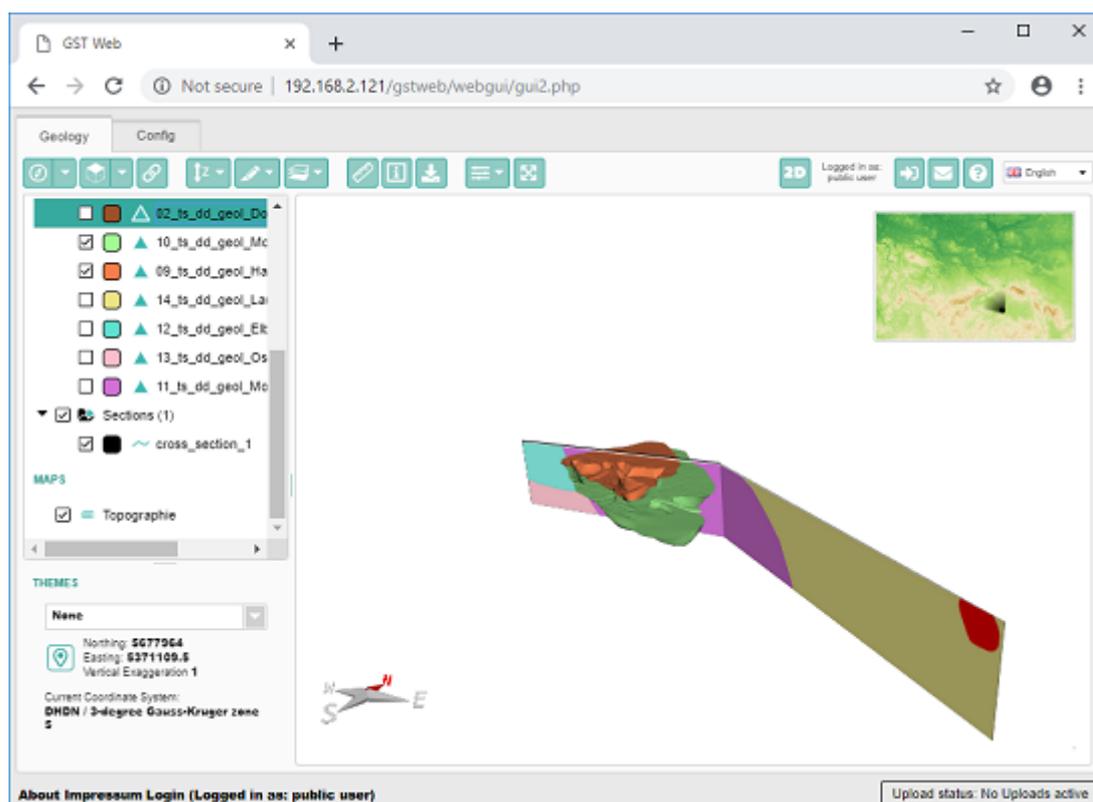
Supported Member Properties are

- * Textured Lines page 125
- * Linked Files page 129

13.1 Textured Lines

Textured lines enable the visualization of images within the 3D scene of GST-Web. They can be any image file like a section scan or a seismic image.

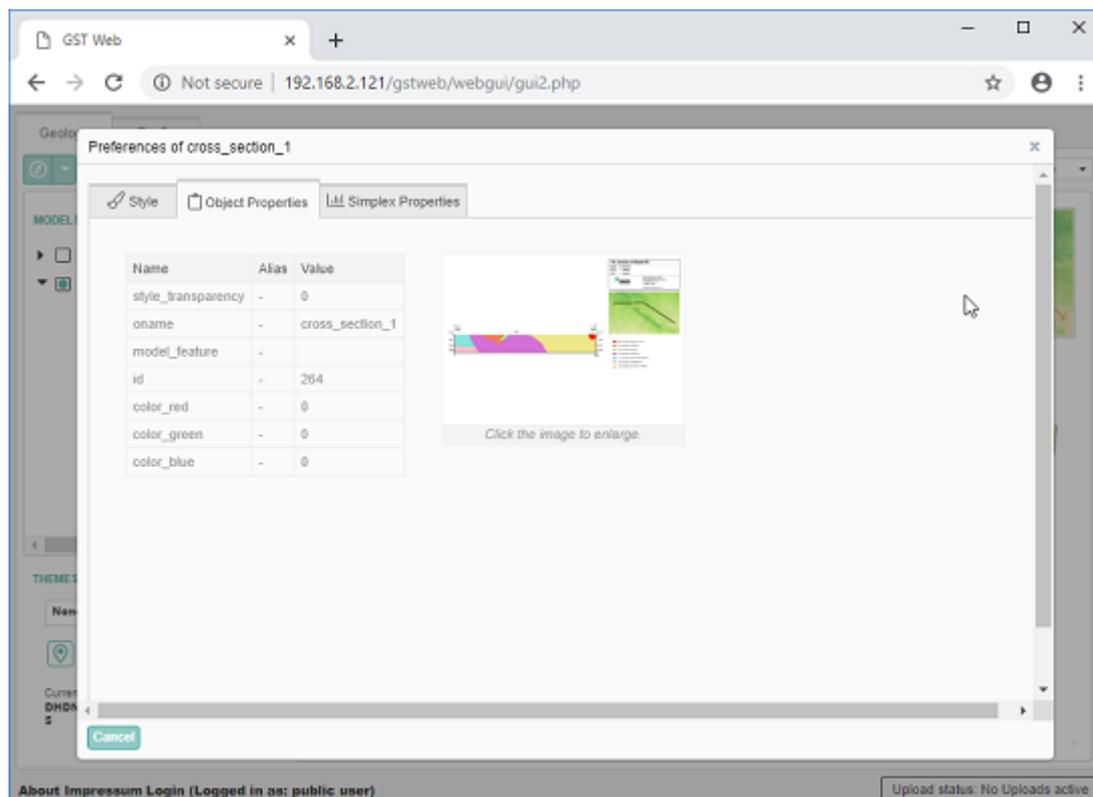
Figure 13.1
A cross section
image in the
GST-Web 3D scene.



The Textured Line image can be seen and downloaded in the Properties window.

13. Member Properties

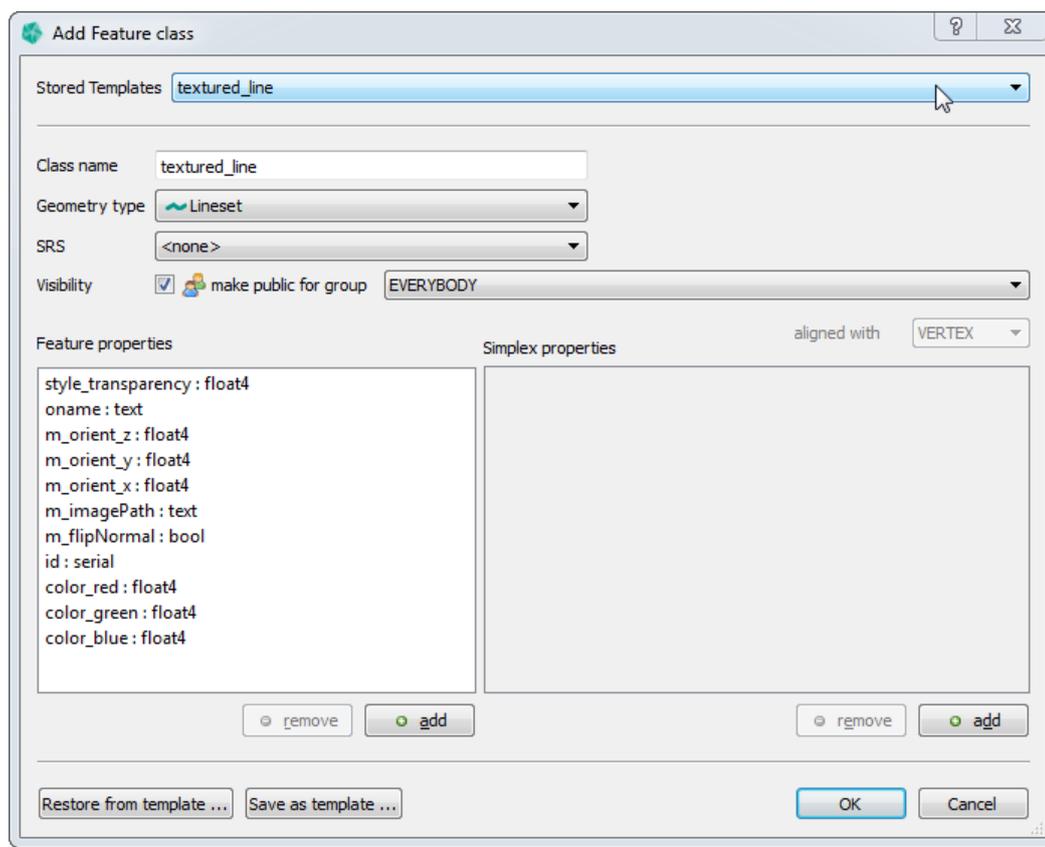
Figure 13.2
Properties window
with cross section
image.



Add a Textured Line to GST

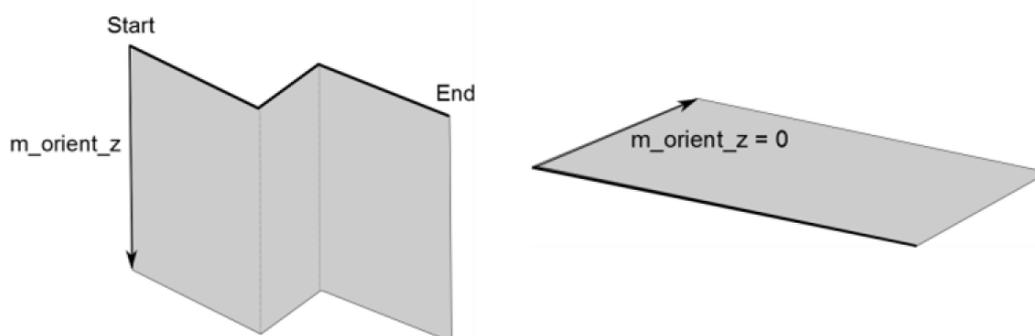
In order to add a Textured Line to GST a Feature Class needs to be of type **Lineset** and have some special Member Properties. To simplify the creation, use the **Stored Templates** drop-down element in the **Add Feature Class** dialog (see figure 13.4). Adjust the name and add additional properties as required.

Figure 13.3
Using Stored
Templates



Special Member Properties for Textured Lines

Figure 13.4
The orient vector.



- * **m_orient_x** -- x component of the surface orientation. Set to 0 for a vertical image.
- * **m_orient_y** -- y component of the surface orientation. Set to 0 for a vertical image.
- * **m_orient_z** -- z component of the surface orientation. Set to the height of the image. A negative value places the image below the line string, a positive one above.

- * **m_imagePath** -- The image filename. Images have to be placed onto the GST-Web instance. Place them in **Client Data**, either directly or in a subdirectory. The filename is relative as seen from **Client Data**.
- * **m_flipNormal** Controls whether the image texture will be flipped / mirrored. If **false** the first point of the input line string is aligned with the upper left corner of the image. If **true** the first point of the line string is aligned with the upper right corner of the image.

The width of the image in the 3D scene is equal to the length of the line string. The height to the length of the orient vector.

You can set these values like any object property, either during the upload [see [Section: Object Properties](#) on page 55] or later in the Feature Class view [see [Context Menu in Feature Class list](#) on page 22].

Crop image with offset JSON

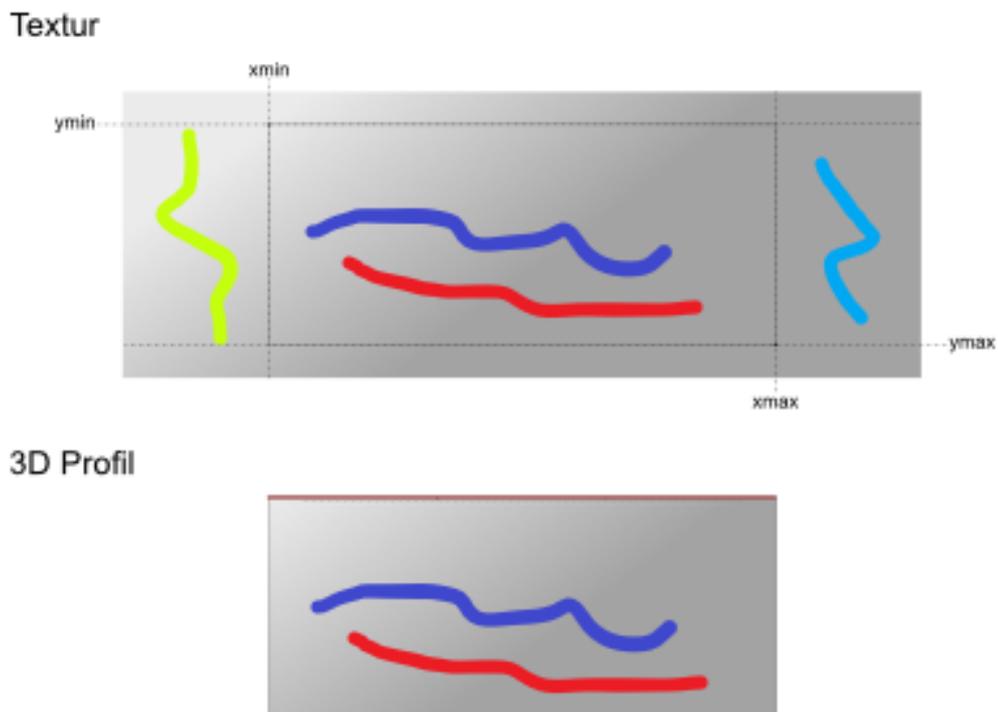
To only show part of the input image in the 3D scene, place a JSON config file next to the image in the **Client Data** directory. The config file must have same name as the input image with **.json** as file extension. The structure of the offset JSON is as follows.

```
{
  "xmin": 10,
  "ymin": 10,
  "xmax": 610,
  "ymax": 410,
  "width": 800,
  "height": 600
}
```

(**xmin**, **ymin**) define the upper left, (**xmax**, **ymax**) the lower right point of the cropped image. **width** and **height** have to be set to the values of the input image [before cropping]. Values are in pixels and all are mandatory.

With the values above, the input image of size **800x600** will be cropped to a image starting from pixel (**10**, **10**) with a size of **600x400**.

Figure 13.5
Cropping example



13.2 Linked Files

Linked files are displayed as hyperlinks in GST Web when the Property Page is being displayed [see figure 13.2]. To define a Linked File, you need to define a Member Property with the prefix `m_path_` to a custom property name, e.g. `m_path_PdfDoc` displays a hyperlink in GST Web next to the label **PdfDoc**. Like textured lines the value of this property can be set during uploading an object [see [Section: Object Properties](#) on page 55] or later in the Feature Class view [see [Context Menu in Feature Class list](#) on page 22].

The value of the `m_path_` Member Property should be a relative path that is accessible from the server that is running GST Web. The easiest way to do so is to upload your files to a location into GST Web. This location can be set in the GST Web Admin interface with the parameter **Path to Textures**. Please consult the GST Web documentation for further information.

14 File Formats

- * ISATIS ASCII [Grids] page 131

14.1 ISATIS ASCII Format (Grids)

How to Create the ISATIS ASCII File

To create the file in ISATIS so that GST can read it, you need to use the following settings:

- Coordinates Mode: "Do Not Store Coordinates"
- CSV Output: "yes"
- Save a Description Header: "yes"
- Comment Leader: '#'
- Output Grid Sorting: "+X +Y +Z"
- Values Separator: Can be set freely
- Decimal Symbol: Can be set freely

To make sure that GST can detect that you want to upload an ISATIS ASCII file, the file extension has to be **.hd** as in **mygrid.hd**.

Troubleshooting

- Check that you have used the correct settings as described above
- Check that your file has a '.hd' file extension (e.g. mygrid.hd)

Supported ISATIS parts

As input, GST currently supports the following parts of the ISATIS file:

- structure [Geometry information]
 - sorting=+X +Y +Z
 - x0, y0, z0 [Origin]
 - dx, dy, dz [Grid length per direction]
 - nx, ny, nz [Cell count per direction]
 - theta, phi, psi [Rotation per axis]
- field [Property information]
 - name
 - type
 - f_type
 - ffff [nodata value]
- type mappings [ISATIS => GST]
 - type = numeric and f_type = Integer => integer
 - type = numeric and f_type != Integer => double
 - type = alpha [f_type ignored] => text

GST ignores [means skips and doesn't store] the following:

- structure: x_unit, y_unit, z_unit
- field: unit, comment, f_length, f_digits, description

GST will fail for any of the following conditions:

- structure != grid
- sorting != +X +Y +Z
- Required settings not as described at the start
- File extension != '.hd'

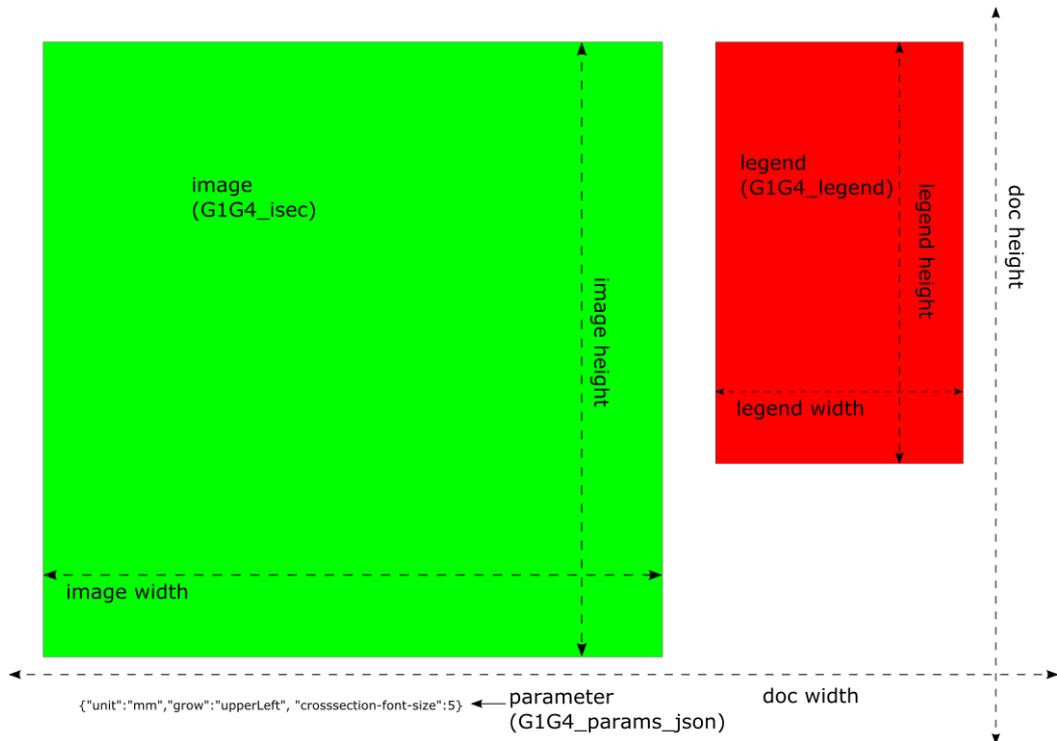
Example ISATIS ASCII File

```
#
# FILE SAVING: Directory: 03_Grids  File: Grid_Temp_01
#
# structure=grid, x_unit="m", y_unit="m", z_unit="m";
#           sorting=+X +Y +Z ;
#           x0=2496915.06 , y0=1090415.06 , z0= -9500.00 ;
#           dx=  5000.00 , dy=  5000.00 , dz=  1000.00 ;
#           nx=           2 , ny=           2 , nz=           2 ;
#           theta=       30 , phi=           0 , psi=           0
#
# csv_file=Y, csv_separator=",", csv_decimal_symbol="."
# nskip=1
# field=1, type=numeric, name="Temp", bitlength=32;
#           ffff="-9999", unit="C";
#           f_type=Decimal, f_length=10, f_digits=2;
#           description="Creation Date: Oct 31 2017  14:39:25"
#
Temp
220.23
196.36
196.36
161.94
161.94
139.78
121.43
99.94
```

A Intersection Template detailed information

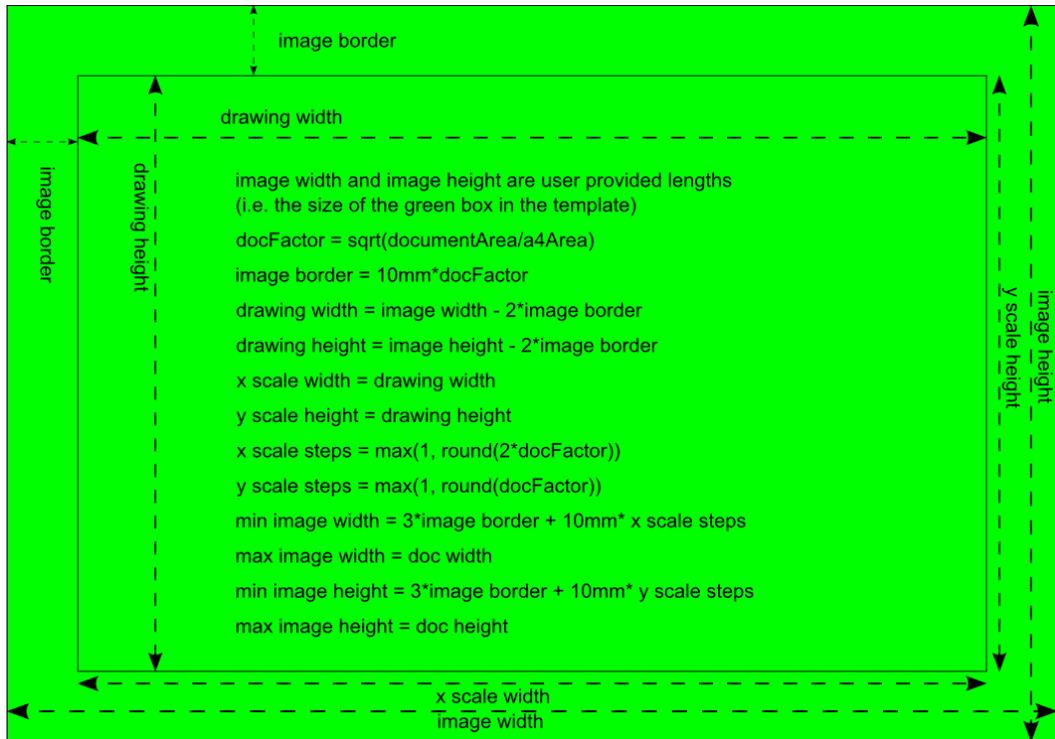
A.1 Overview

Figure A.1
Overview over the
template with some
parameters
explained



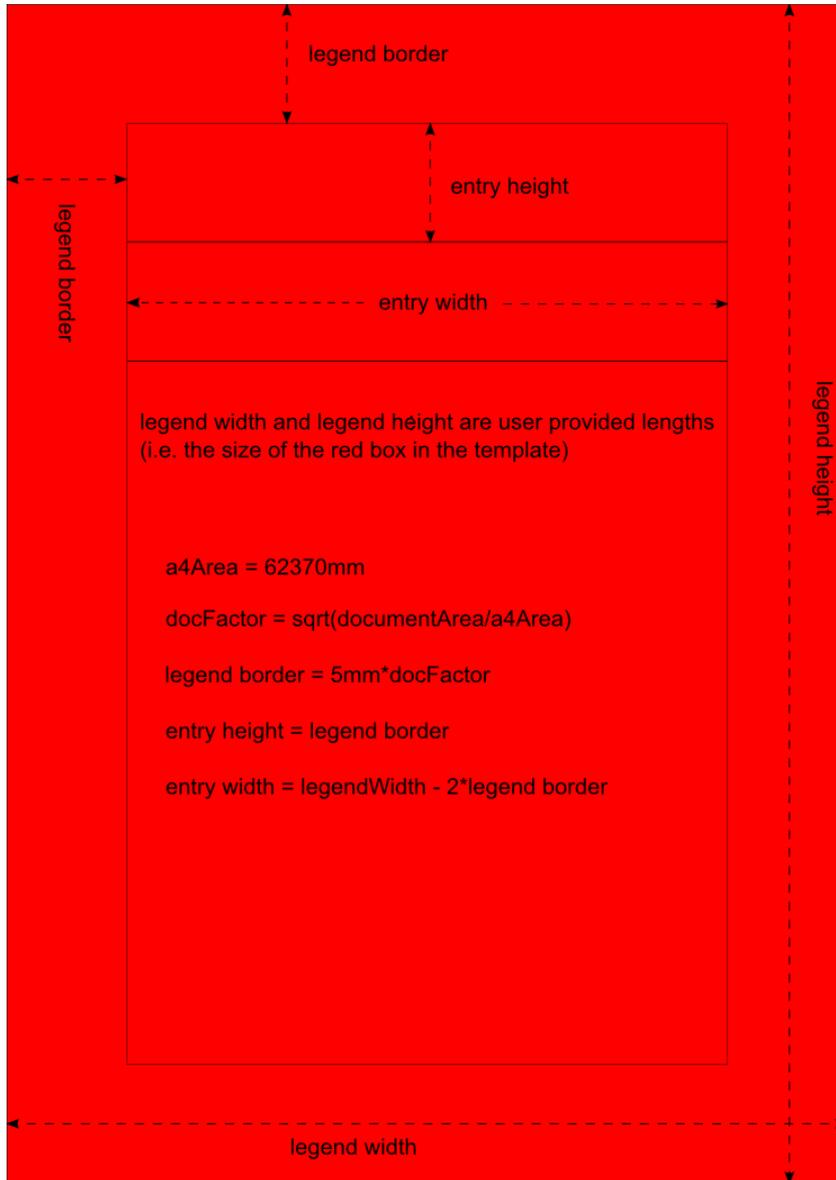
A.2 Image details

Figure A.2
Detailed parameter
explanation to the
intersection image
box



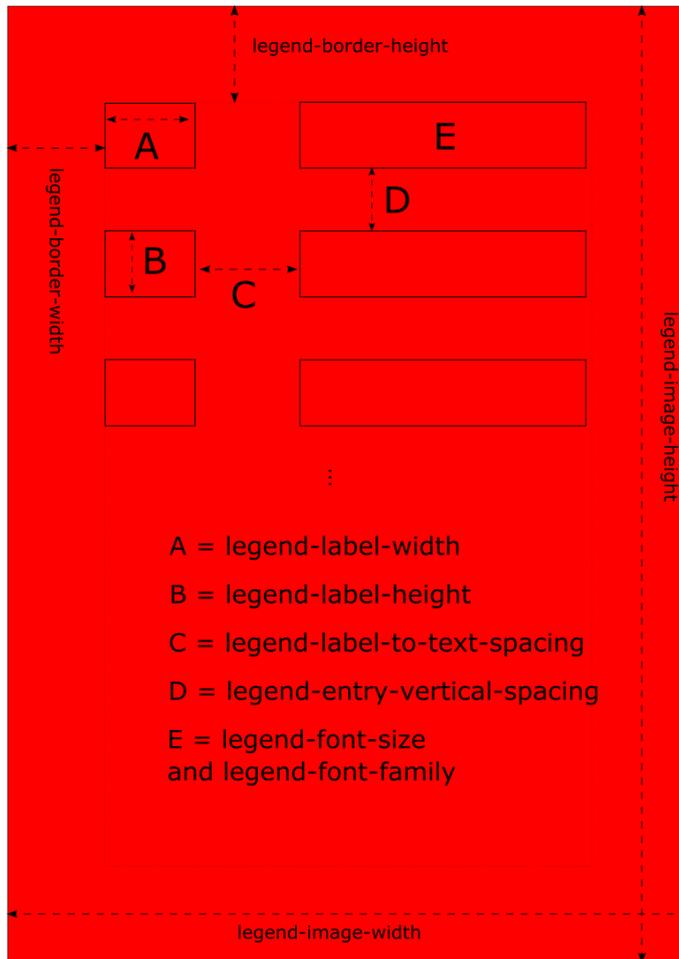
A.3 Legend details

Figure A.3
Detailed parameter
explanation to the
legend box



A. Intersection Template detailed information

Figure A.4
json parameter
explanation



A.4 Additional JSON Parameters

Passing parameters in the Template text box `G1G4_params_json` or as `additionalParameters` to the `URL` or `Slice Parameter Dialog` in GST Desktop allows you to customize the section output.

Example:

Parameters are necessarily encoded in JSON format, e.g.

```
{
  "unit ":" px ",
  "dpi ":300 ,
  "borehole-image-width ":800 ,
  "borehole-image-height ":600
}
```

Below a complete list of parameters

General JSON Parameters

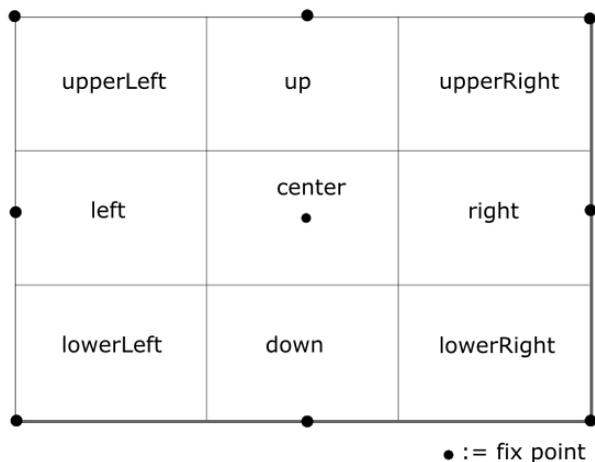
Parameter	Possible Values / Hints	Default value
unit	String Used to transform length properties in the <code>json_params</code> <ul style="list-style-type: none"> * "px" [Pixels], if set requires dpi * "mm" [Millimeter] * "cm" [Centimeter] 	Required
	<p>Hint It is a good idea to specify "mm" or "cm" when using a template. Use "px" when generate a section without templates just using JSON. (URL Parameter templateFile and legendTemplate are optional). Section Template File on page 102</p>	

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
dpi	<p>Integer</p> <p>Controls the resolution of the output image.</p> <ul style="list-style-type: none"> * If the output format is a pixel format [e.g. png] this parameter is required. * If the output format is a vector format [e.g. svg] this parameter is required if unit is px. * If the output format is a vector format [e.g. svg] this parameter is ignored if unit is not px. 	300
grow	<p>String</p> <p>Direction of growing. [Keeps the opposite corner of G1G4_isec fixed.]. Possible values:</p> <ul style="list-style-type: none"> * "upperRight" * "upperLeft" * "lowerRight" * "lowerLeft" * "none" [deny growing.] <p>This parameter has no effect when generating a section with a template.</p>	"none"
image-align	<p>String</p> <p>Override the alignment of the intersection image in the G1G4_isec box. Possible values [please also refer to figure A.5]:</p> <ul style="list-style-type: none"> * "upperRight" * "up" * "upperLeft" * "left" * "center" * "right" * "lowerLeft" * "down" * "lowerRight" <p>See Figure A.5 below this table.</p>	The opposite side of grow . [If grow is set to "none" then image-align defaults to "center".]

A. Intersection Template detailed information

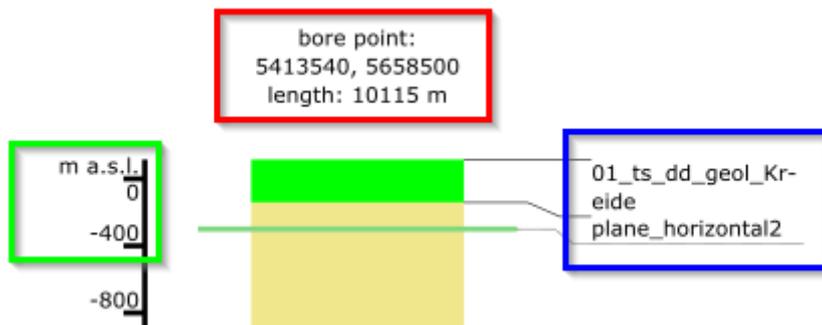
Figure A.5
Alignment values for
image-align



Within the following sections parameters are dependent on the Intersection type. These parameters are indicated by the prefixes

- * **borehole-**... page 142
- * **crosssection-**... page 146
- * **mapsection-**... page 148
- * **legend-**... page 149

Figure A.6
Font identifiers for
font-size and
font-family



___-font-size, ___-font-family borehole-font-size, borehole-font-family, crosssection-font-size, mapsection-font-size

___font-size, ___-scale-font-family borehole-y-scale-font-size, borehole-y-scale-font-family, crosssection, mapsection

borehole-label-area-font-size

Important for font-family

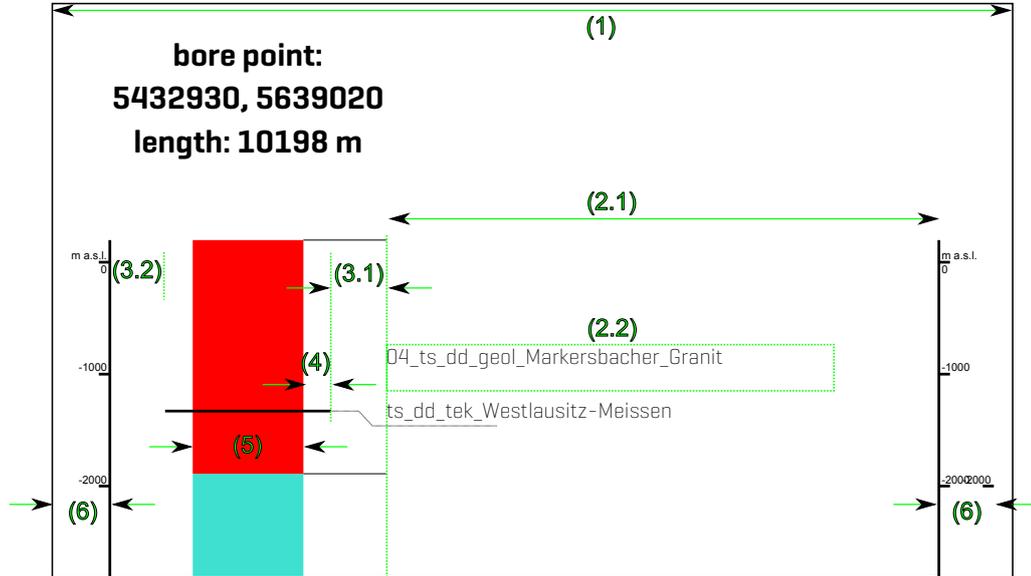
Please note for **font-family** values, that this font is **required to be installed on the rendering machine**. The rendering machine is the machine displaying the SVG Section output (or even renders PNG or PDF from SVG if the Section was requested in one of these formats).

Example:

In most infrastructures the rendering machine is **GST Desktop** (if the section is requested via GST Desktop) and/or **GST Web** (if section is requested via GST Web). The font is not required on the machine running GST Storage.

Borehole JSON Parameters

Figure A.7
Borehole pillar and
labeling



The numbers are referenced in the table below.

Parameter	Possible Values / Hints	Default value
[1] borehole-image-width	Double Width of g1g4_isec image [see Figure A.2] in specified unit . Value is required if no template is specified.	If not specified: width of the g1g4_isec box
borehole-image-height	Double Height of g1g4_isec image in specified unit . Value is required if no template is specified. Hint Specify borehole-image-width and borehole-image-height only for requests without a template [see Section Template File on page 102]. The image size is given by the template g1g4_isec box size.	If not specified: height of the g1g4_isec box
borehole-font-size	Double Info text [Text in red box, see Figure A.6] font size in specified unit.	Relative to image size

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
borehole-font-family	String Info text Font family name. [Text in red box, see Figure A.6]	"Verdana"
borehole-y-scale-reference-marker	String Defines a reference marker for the y-scale. This value is added after the unit [currently always "m"] above the y-scale. E.g. for a reference marker "a.s.l." it would say "m a.s.l." or for "NN" it would say "m NN". This value is only used if "borehole-y-scale-height-reference"="masl".	"a.s.l."
borehole-y-scale-height-reference	String or Double Defines y-scale reference points <ul style="list-style-type: none"> * "masl", z zero refers to z coordinates (and negative values downwards) * "depth", z zero refers to borepoint (and positive values downwards) * Double Value: analog to "depth" but z zero refers to given z coordinate. This is useful if you do not have a DEM in your data. (depth or masl are specified at the scale top, see Figure A.6 text in the green box)	"masl"
borehole-y-scale-mode	String Defines on which side the y-scale should be drawn. <ul style="list-style-type: none"> * "none" (hide scale) * "left" * "right" * "both" 	"left"
borehole-y-scale-step-length	Double Defines distance of the ticks of the y-scale in z units [typical: meter]. [In Figure A.6 this value is 400, see green box] Note: This value is currently ignored if a template file is used for the intersection.	Relative to image size and font size avoiding crossing fonts

A. Intersection Template detailed information

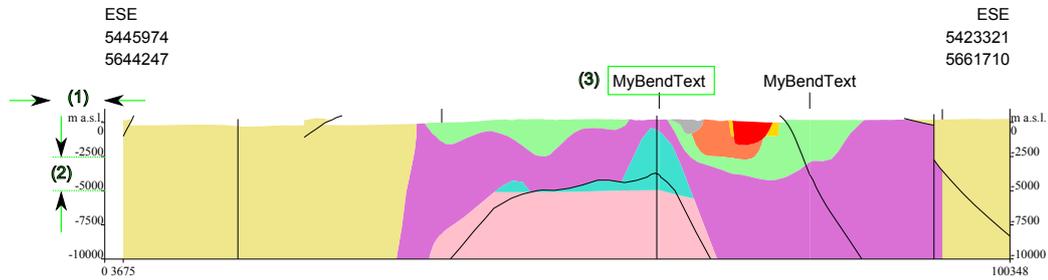
Parameter	Possible Values / Hints	Default value
borehole-y-scale-font-size	Double Scale text font size in specified unit. [green text in Figure A.6]	Relative to image size
borehole-y-scale-font-family	String Scale text font family. [green text in Figure A.6]	"Verdana"
[6] borehole-y-scale-width	Double Margin left of the left scale and right of the right scale that is reserved for the scale labeling. Increase this value if your scale labels are drawn out of the image bounds [not enough space for labeling].	Relative to image size
[4] borehole-pillar-line-overlap	Double When crossing fault objects or other non BREP models, the output in the borehole is a line. The line overlap is the distance this line is painted out of the borehole pillar [4].	Relative to image size
[5] borehole-pillar-width	Double Thickness of the borehole pillar [when bore path is filled]. The full space reserved for the borehole visualisation is the borehole-pillar-width [5] + borehole-pillar-line-overlap [4]	Relative to image size
[3.1] borehole-pillar-margin-right	Double Distance between line-overlap from borehole pillar [4] and the labeling text. Within this distance the marker line from the object in the pillar to the label text is drawn. Do not make it too small. A good idea is to use $\frac{1}{2}$ to $\frac{1}{3}$ of the pillar-width.	Relative to image size
[3.2] borehole-pillar-margin-left	Double Distance between line-overlap from borehole pillar [4] to the left scale axis in specified unit .	Relative to image size

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
borehole-label-area-enabled	<p>Boolean</p> <ul style="list-style-type: none"> * true enable labeling area * false disable labeling area (all borehole-label-area parameters will be ignored) 	true
[2.1] borehole-label-area-width	<p>Double</p> <p>Width of the borehole label area in specified unit. This is the space used for labeling texts. Do not make it too small (depending on your label length).</p> <p>Hint Enabling the right scale (borehole-y-scale-mode:both) will help to visualize the borehole-label-area-width.</p> <p>Important Changing this parameter can cause labeling text being drawn out of image bounds. Check the borehole-label-area-word-wrap-threshold to break labeling lines.</p>	Relative to image size
[2.2] borehole-label-area-word-wrap-threshold	<p>Integer</p> <p>Number of character when a label line will be broken (into a new line).</p> <p>Hint This highly depends on the borehole-label-font-family and borehole-label-font-size and can not be computed on the time of image creation automatic. It is always a good idea to proceed in the following order: [1] Set font family and font size [2] "play" a bit with this parameter to fit in the borehole-label-area-width.</p>	20
borehole-label-area-font-size	<p>Double</p> <p>Label area font size in specified unit.</p>	Relative to image size
borehole-label-area-font-family	<p>String</p> <p>Label area font family.</p>	Relative to image size

Cross section JSON Parameters

Figure A.8
Crosssection
labeling



Parameter	Possible Values / Hints	Default value
crossection-image-width	Double Width of image in specified unit .	Relative to image size
crossection-image-height	Double Height of image in specified unit .	Relative to image size
	Hint Specify crossection-image-width and crossection-image-height only for requests without a template [see Section Template File on page 102]. The image size is given by the template g1g4_isec box size.	
crossection-font-size	Double Info text font size in specified unit .	Relative to image size
crossection-font-family	String Info text Font family name.	"Verdana"
crossection-y-scale-reference-marker	String Defines a reference marker for the y-scale. This value is added after the unit [currently always "m"] above the y-scale. E.g. for a reference marker "a.s.l." it would say "m a.s.l." or for "NN" it would say "m NN". This value is only used if "crossection-y-scale-height-reference"="masl".	"a.s.l."

A. Intersection Template detailed information

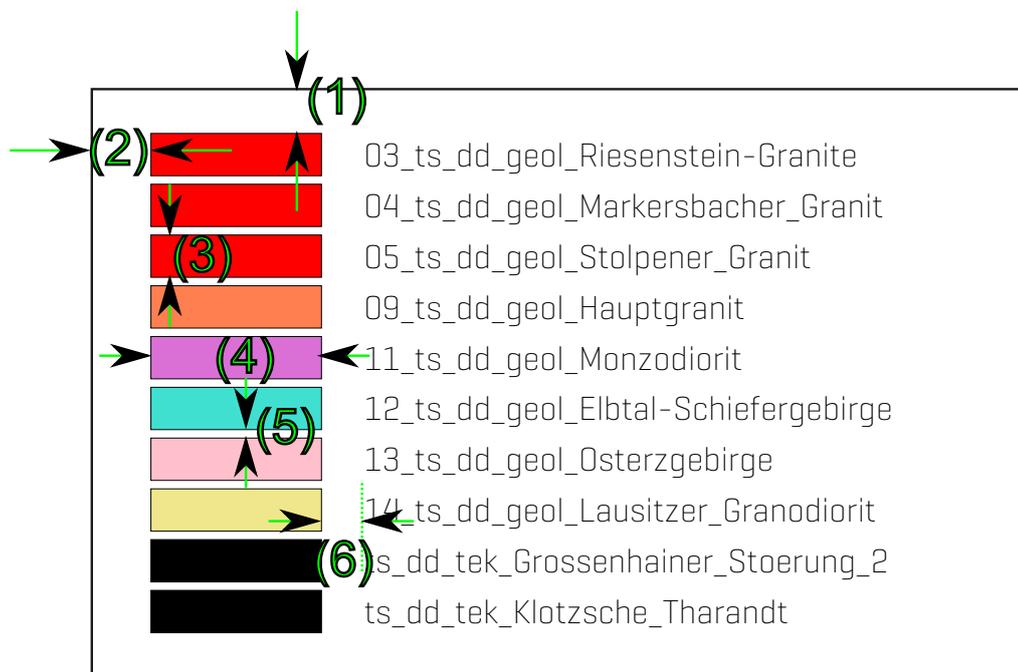
Parameter	Possible Values / Hints	Default value
crosssection-y-scale-mode	String Defines on which side the y-scale should be drawn. <ul style="list-style-type: none"> * "none" * "left" * "right" * "both" 	"both"
[1] crosssection-y-scale-width	Double Margin left of the left scale and right of the right scale that is reserved for the scale labeling. Increase this value if your scale labels are drawn out of the image bounds (not enough space for labeling).	Relative to image size
[2] crosssection-y-scale-step-length	Double Defines distance of the ticks of the y-scale in z units [typical: meter]. Note: This value is currently ignored if a template file is used for the intersection.	Relative to image size
crosssection-scale-font-size	Double Scale text font size in specified unit .	Relative to image size
crosssection-scale-font-family	String Scale text font family.	"Verdana"
[3] crosssection-bend-marker-text	String Defines the text used on Bend in Section markers for multi segment cross sections.	"Bend"
crosssection-y-scale-width	Double Width reserved for y-scale. [This can be used to circumvent y-scale entry text getting cut off at the image border.]	Relative to image size

Map section JSON Parameters

Parameter	Possible Values / Hints	Default value
mapsection-image-width	Double Width of image in specified unit.	Relative to image size
mapsection-image-height	Double Height of image in specified unit.	Relative to image size
mapsection-font-size	Double Info text font size in specified unit.	Relative to image size
mapsection-font-family	String Info text Font family name.	"Verdana"
mapsection-scale-font-size	Double Scale text font size in specified unit.	Relative to image size
mapsection-height-reference-marker	String Defines a reference marker for the height value in the info text. This value is added after the unit [currently always "m"]. E.g. for a reference marker "a.s.l." it would say "height: 1000 m a.s.l." or for "NN" it would say "height: 1000 m NN".	"a.s.l."
mapsection-scale-font-family	String Scale text font family.	"Verdana"
mapsection-y-scale-width	Double Width reserved for y-scale. [This can be used to circumvent y-scale entry text getting cut off at the image border.]	Relative to image size
mapsection-draw-outline	Boolean Specifies whether or not to draw the selection rectangle outline in the resulting image.	false

Legend JSON Parameters

Figure A.9
Legend distances



Parameter	Possible Values / Hints	Default value
legend-image-width	Double Width of legend image in specified unit.	Relative to image size
legend-image-height	Double Height of legend image in specified unit.	Relative to image size
legend-font-size	Double Legend text font size in specified unit.	Relative to image size
legend-font-family	String Legend text font family.	"Verdana"
[1] legend-border-height	Double Border height of legend in specified unit.	Relative to image size
[2] legend-border-width	Double Border width of legend in specified unit.	Relative to image size

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
[3] legend-label-height	Double Entry label height of legend in specified unit.	Relative to image size
[4] legend-label-width	Double Entry label width of legend in specified unit.	Relative to image size
[5] legend-entry-vertical-spacing	Double Vertical spacing between legend entries in specified unit.	Relative to image size
[6] legend-label-to-text-spacing	Double Horizontal spacing between legend label and legend entry text in specified unit.	Relative to image size
legend-word-wrap-threshold	Integer Number of characters after which an entry will be split up into multiple lines.	unlimited

Shape JSON Parameters

When requesting a section in shapefile format (see [Section Image Designer](#) on page 100) the section output will be written into a SHP, DBF, SHX and PRJ file and will be compressed into one ZIP file.

The generated shapefile contains one SHP Feature per intersected GST Feature. The attributes in the generated shape file are:

- * **title** The user entered title for the section
- * **exaggeration** The specified [or computed] exaggeration
- * **orig** The GST oname column [that is original object name in GST]
- * **alias** The object alias name [that is currently equal to oname]
- * **date** A time stamp of the shapefile generation
- * **model** The model name [top level element in Model Management] the Feature is assigned to. If the Feature is assigned in multiple models, the shapefile Feature output is duplicated [one per model]. Please refer to [Tab: Models \[Model Management\]](#) on page 78 for more information about Model Management.

Depending on the type of the intersected geometries [whether its of type point, line, triangle etc] and the section type [whether its a virtual borehole, a vertical/horizontal section] the type of section result can differ.

Example: Generating a vertical section and cutting a GST Multiline object will create in a point representing the intersection of the line object by the section plane. Cutting different geometries will generate different types section result geometries. On the other side Features of only one geometry type can be represented by one shapefile. This is the reason why a section can result in up to 3 shapefiles [all zipped together], representing the different section result types.

- * **points** Representing all 1D intersection results [line intersected by a plane, or surface intersected by virtual borehole]
- * **lines** Representing all [open] 2D intersection results [surface intersected by a plane]
- * **polygons** Representing all [closed] 2D intersection results [volume is intersected by a plane]

The shapefile file names and shapefile attributes can be customized by [Shape JSON Parameters](#) listed in the following table.

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
<ul style="list-style-type: none"> * title-column-name * exaggeration-column-name * orig-column-name * alias-column-name * date-column-name * model-column-name 	<p>String</p> <p>Custom name of the shapefile attribute title, exaggeration, orig, alias, date, model</p>	<p>title, exaggeration, orig, alias, date, model</p>
<ul style="list-style-type: none"> * points-file-name * lines-file-name * polygons-file-name 	<p>String</p> <p>Custom shapefile file name for the generated shape results of type Multipoint, Multiline, Multipolygon</p>	<p>points, lines, polygons</p>

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Default value
<p>bavaria-options</p>	<p>JSON object</p> <p>When this JSON object is set (not NULL), then a set of files are generated to the regular section result shapefile as follows:</p> <ul style="list-style-type: none"> * profileline A line shapefile representing the location of the generated section (equal to section location input) * bendpoint A line shapefile representing the bend points as vertical lines (in profile coordinates) * verticalline A line shapefile with two vertical line object representing the profile start and endpoint (in profile coordinates) * horizontalline A line shapefile with one horizontal line representing the NN horizon (in profile coordinates) <p>The JSON object is the union of JSON string attributes below:</p>	<p>NULL</p>
<ul style="list-style-type: none"> * profileline-file-name * bendpoint-file-name * verticalline-file-name * horizontalline-file-name 	<p>String</p> <p>Custom shapefile file name for the generated shape results listed in bavaria-options</p>	<p>profileline, bendpoint, verticalline, horizontalline</p>

A.5 URL Parameters

The List of Parameters for a vertical borehole

Parameter	Possible Values / Hints	Example Values
<p>p1x</p> <p>p1y</p> <p>p1z</p>	<p>Double</p> <p>Northing [Y], Easting [X] and Height [Z] of the bore point</p>	<p>11.425781</p>
<p>srs</p>	<p>String</p> <p>The spatial reference system of the input geometry for the section. If no SRS is given (value: 0), no transformation is performed. It data is kept as is.</p> <p>1st Character: Description Encoding 2nd Character until Ende: description Valid description encodings:</p> <ul style="list-style-type: none"> * 0 -> No Transformation * 1 -> Registered GST SRS * 2 -> WKT encoding * 3 -> PROJ4 encoding <p>Remark that for URL's the paramters must be encoded.</p>	<p>One of the following encodings:</p> <ul style="list-style-type: none"> * 0 [for "no transformation"] * 1199 [for "GST SRS with id 199"] * 2GEOGCS%5B%22 WGS+84%22%2C DATUM%5B%22WGS_1984%22%2C SPHEROID%5B%22WGS+84%22%2C 6378137%2C 298.257223563%2C AUTHORITY%5B%22EPSG%22%2C %227030%22%5D%5D%2C AUTHORITY%5B%22EPSG%22%2C %226326%22%5D%5D%2C PRIMEM%5B%22Greenwich%22%2C%2C AUTHORITY%5B%22EPSG%22%2C %228901%22%5D%5D%2C UNIT%5B%22degree%22%2C 0.01745329251994328%2C AUTHORITY%5B%22EPSG%22%2C %229122%22%5D%5D%2C AUTHORITY%5B%22EPSG%22%2C %224326%22%5D%5D * 3%2Bproj%3Dlonglat +%2Bellps%3DWGS84 +%2Bdatum%3DWGS84 +%2Bno_defs

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Example Values
projectZ	Bool If true: p1z will be set to the highest z-value at the [p1x,p1y] coordinates. Supplied p1z will be ignored. If false: p1z will be used.	true
maxBore-Depth	Float Depth of the bore hole. Default/Maximum: the greatest depth at the coordinates.	1500.50
scale	Float Fixed [horizontal] scale value. A negative value is coded as "compute best" [scale is getting computed to fit the templates width best]	<ul style="list-style-type: none"> * -1 [for "compute best"] * 50000 [for "1:50000"]
inclined	Bool Has to be false to get a vertical borehole	false [for vertical]
template-File	String Filename of the template file used to generate output [Take care this file is available in GST Webs temporal directory]	hydrotmpl.svg
legend-Template-File	String A separate legend template file. Overwrites legend parameters already defined in the standard templateFile.	hydrotmpl_legend.svg

A. Intersection Template detailed information

Parameter	Possible Values / Hints	Example Values
outputType	String Valid Values: <ul style="list-style-type: none"> * SVG * PNG * PDF 	SVG
dpi	Integer Only used for outputType=PNG. Sets the DPI for the output image.	300
title	String Title of the image	"My image"
additional-Parameters	JSON encoded String Additional output parameters [advanced]. Overwrites all parameters set in the template files.	{ "borehole-font-size":5 }
asJSON	Bool Defines if the output should be JSON or directly an image, then set to false	false [for direct image, PDF, SHP output]

The List of Parameters for a vertical an inclined borehole

Parameter	Possible Values / Hints	Example Values
p1x p1y p1z	Double Northing [Y], Easting [X] and Height [Z] of the bore point	11.425781
inclined	Bool Has to be false to get a vertical borehole	true [for inclined]
dip	Float Between 0 and 90 degree	45
azimuth	Float Between 0 and 360 degree	145
srs, projectZ, maxBore-Depth, scale, template-File, legend-Template-File, outputType, dpi, asJSON, title, additional-Parameters	same as on previous parameter list on page 154	

The List of Parameters for a vertical section

Parameter	Possible Values / Hints	Example Values
p1x p1y p1z	Double Northing [Y], Easting [X] and Height [Z] of the bore point	11.425781
zmin zmax	Double Sets the highest/lowest z-value of the section. Note: These values are restricted by the bounding box of all selected features.	5000.55
xscale	Float Fixed [horizontal] scale value. A negative value is coded as "compute best" [scale is getting computed to fit the templates width best]	* -1 [for "compute best"] * 50000 [for "1:50000"]
vertical-Exaggeration	Float Exaggeration of section height [y]	1
point-Projection-Distance	Float Points with this or smaller distance will be projected onto the section.	500
srs, template-File, legend-Template-File, outputType, dpi, asJSON, title, additional-Parameters	same as on previous parameter list on page 154	

The List of Parameters for a horizontal/map section

Parameter	Possible Values / Hints	Example Values
p1x p1y p1z	Double Northing [Y], Easting [X] and Height [Z] of the bore point	11.425781
direction	Text Left or Right Direction of area referenced from the area line.	left
boxWidth	Float Width of the intersection area.	50000
depth	Double Height of the intersection area	334.54
srs, scale, templateFile, legendTemplateFile, outputType, dpi, asJSON, title, additionalParameters	same as on previous parameter list on page 154	