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**GREAT-ER II**

# **GREAT-ER Web Manual**

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This document has been designed with L<sup>A</sup>T<sub>E</sub>X. It is available as source code, PDF- and HTML-format.

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# 1 User Interface

## 1.1 Main Window

The main window is the core of the GREAT-ER Web Interface, it consists of three frames for Menu with Status Box, Dialog Box and Map each. If a catchment has been opened a Tool Bar appears within the map.

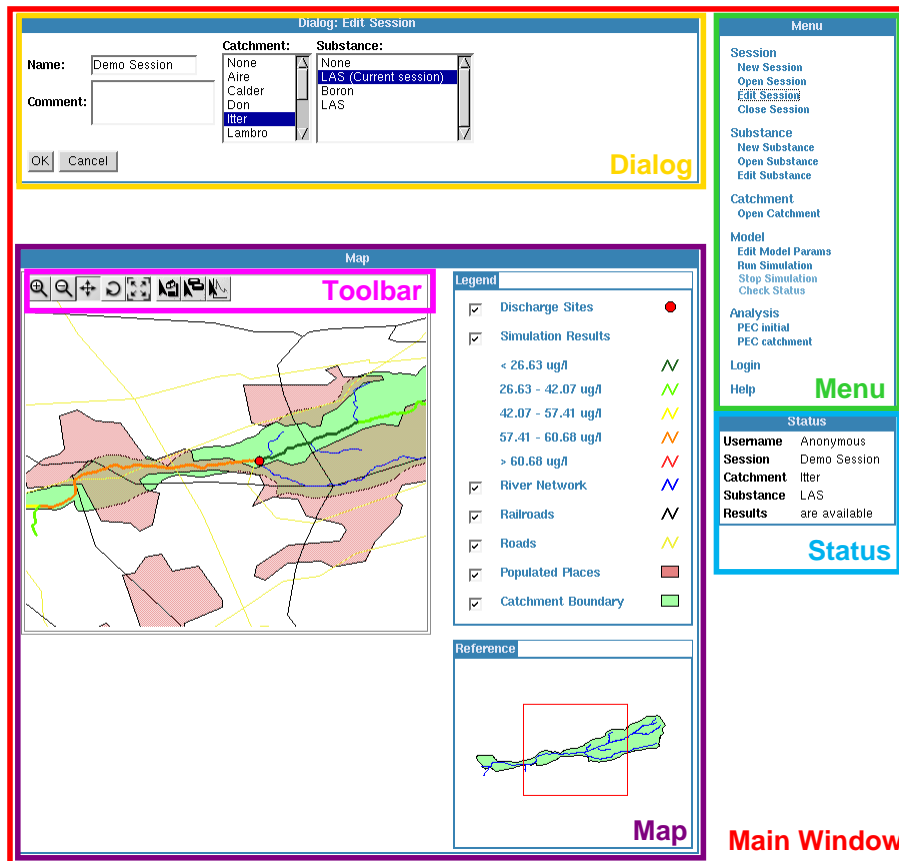


Fig. 1.1: GREAT-ER Web Elements

### **1.1.1 Menu**

The menu frame provides access to the various actions needed to perform a simulation (i.e. session management, substance editing, catchment selection, etc.). Depending on the current status of a simulation session menu items are enabled or disabled (grayed out).

### **1.1.2 Status Box**

The status bar provides information on the status of the database connection: If connected the username used for the authentication is displayed. Additionally some information about the current session is shown: If a session is open its name, catchment name and substance name is displayed. Also it is indicated if there are results available for the current session.

### **1.1.3 Dialog Box**

In the Dialog Box dialogs are displayed, offering various functionality like session selection, parameter editing or general information. These dialogs are discussed in detail below.

### **1.1.4 Map**

If already specified the map displays the catchment area: river network, discharge points and catchment boundary.

### **1.1.5 Tool Bar**

The tool bar covers first some self-explaining buttons to navigate on the geographic data displayed on the map. The last three buttons provide tools to edit the market data and discharge data by selecting discharge points on the map and to get a concentration profile by selecting a stretch. The latter is only possible if some results are available.

## 1.2 Menu Session

### 1.2.1 New Session

The menu item is enabled once a database connection is established. A dialog similar as for Edit Session (see section 1.2.3) is raised to enter the session's name, substance, catchment and comment. All but the name is optional and can also be specified later.

If a session is open with unsaved modifications the user is offered a dialog to save the session before creating a new one.

### 1.2.2 Open Session

This menu item is enabled if a database connection has been established (via Authenticate). The dialog that appears is separated into two areas: on the left a list is presented containing all available sessions, public and personal ones.

In the right area, additional information on the currently selected scenario can be displayed on command: substance and catchment name as well as the session comment. Furthermore, the access rights are shown with the owner of the session, his group and the privileges for the session. Sessions without the privileges for you to at least view it are not listed.

To load a session the OK button.



Fig. 1.2: Open Session Dialog

If the previously loaded session was modified but not saved and if the user is privileged, a dialog is raised to allow saving of the previous session.

### 1.2.3 Edit Session

If there is a current session, this menu item is enabled. A dialog is raised to modify the session's name, substance, catchment, comment and privileges.

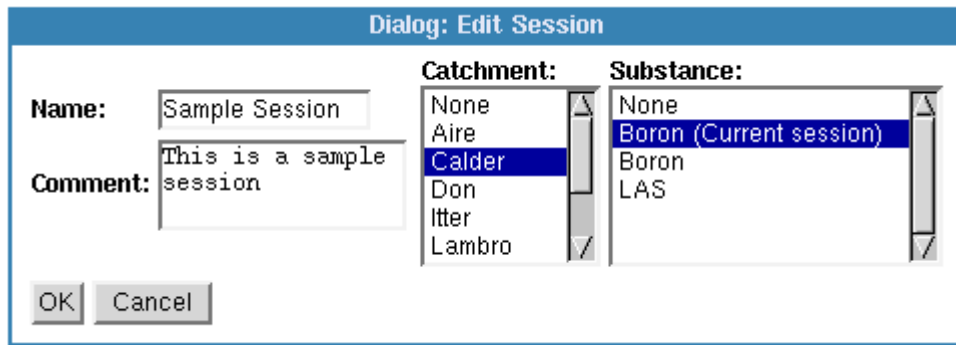


Fig. 1.3: Edit Session Dialog

The changes are not stored in the database unless a Save Session operation is performed. This is only possible for the privileged user.

The substance and catchment can alternatively be changed in the corresponding menus. The open substance dialogs shows more details on the actual substance during the selection.

### 1.2.4 Save Session

This item is only available for the privileged user. It is enabled if there is an open session which has been modified. All session data in the database will be overwritten with the current session without further request.

**Note**, that when saving a session, your ID will be applied overwriting the user ID of the previous owner.

Saving a session may fail for two reasons:

1. You don't have the permission to write.  
 This happens if you opened a session where you have only privileges to view. In this case, use 'Save Session As' to create your own copy.
2. Another user opened the same session and saved it meanwhile. In this case, use 'Save Session As' to create your own copy.

### 1.2.5 Save Session As

If a session has been opened this menu item is enabled and allows to store the current session separate from the original session.

**Note**, that the new session will be the one which will be loaded in the client after a 'Save Session As'.

A dialog is raised allowing to change name and comment of the session so that it can be distinguished from the original one.

**Note**, that the session's name does not need to be unique in the database and hence multiple sessions with the same name may exist. You should avoid this situation by specifying different names.

### 1.2.6 Close Session

This menu item is always active if there is an open session.

If the current session is modified and if the user is privileged, the user is offered the option to save the changes before actually closing the session.

### 1.2.7 Delete Session

This option is always available to a privileged user with an established database connection.

A dialog similar as for Open Session (see section 1.2.2) is opened allowing to select the session that should be removed from the database.

After selection, the user is required to confirm the action.

## 1.3 Menu Substance

The Substance Menu provides access to the substance data. The menu items 'New Substance' and 'Open Substance' are enabled if a session has been opened or newly started. For the privileged user also 'Delete Substance' is enabled in this case. The 'Edit Substance' item is only enabled if the session already contains substance data. If the user is privileged, 'Save Substance' is then enabled, too.

### 1.3.1 New Substance

A Dialog similar as for Edit Substance (see section 1.3.3) is raised to enter the substance name, comment and its various parameter. All but the name is optional and can also be specified later.

If the open session already contains substance data a warning dialog will be raised.

**Note**, that adding a new substance implies to delete all market, discharge and result data from the current session since they potentially don't have a valid link to the session data with the new substance data.

### 1.3.2 Open Substance

The dialog that appears is separated into two areas: on the left a list is presented containing all available substances.

In the right area, the comment on the highlighted substance can be displayed on command together with owner and privileges.

To load a substance hit the OK button.

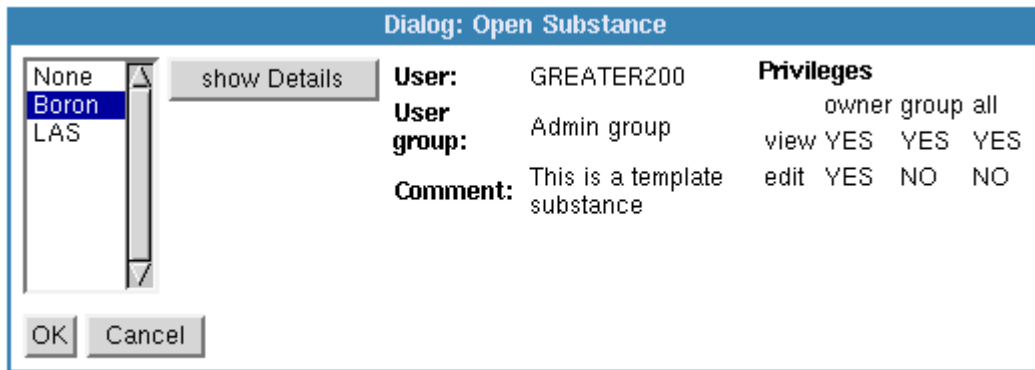


Fig. 1.4: Open Substance Dialog

**Note**, that opening another substance data set implies to delete all market, discharge and result data from the current session since they potentially don't have a valid link to the session data with the new substance data.

### 1.3.3 Edit Substance

This action is only available if a substance has been selected. A dialog is opened for entering all properties of the substance.

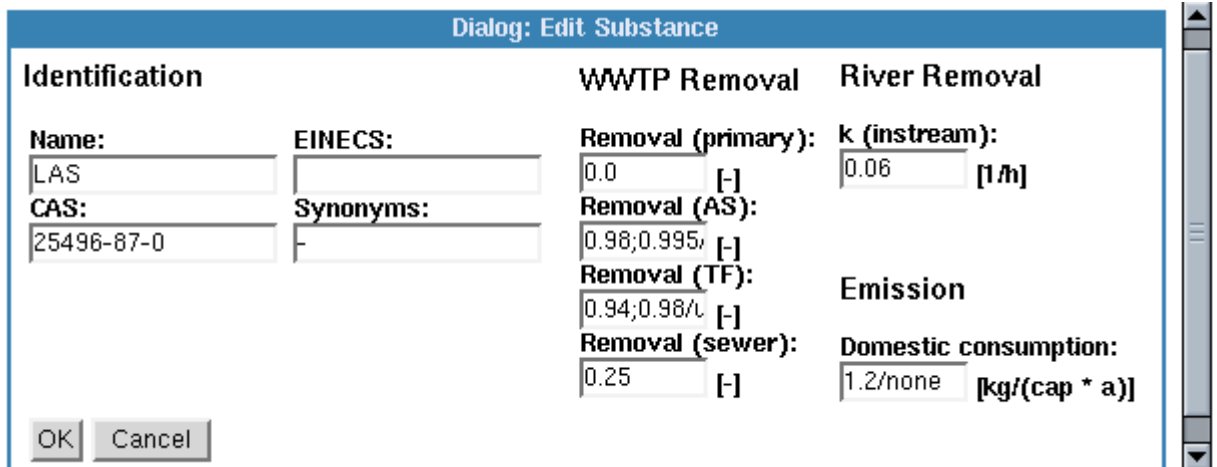


Fig. 1.5: Edit Substance Dialog

If a parameter is distributed you can recognize it by the added name of the distribution at the end of the value (p.e. '0.3/none' or '0.3;0.82/uniform'). You have the following possibilities to enter new values for a distributed parameter:

- Enter a decimal or integer: The parameter will get the distribution type 'none', i.e. not distributed.
- Enter a decimal or integer + '/none': The parameter will get the distribution type 'none', i.e. not distributed.
- Enter two decimals or integer, separated by a semicolon: The parameter will be distributed with distribution type 'uniform' which is the default distribution.
- Enter two decimals or integer, separated by a semicolon + `<dist_type>: <dist_type>` has to be one of 'normal', 'lognormal' or 'uniform'. The parameter will then be distributed with the specified distribution type.

If an incorrect value has been inserted, a dialog will be raised to inform you about the wrong parameter.

**Identification** The substance name, CAS and EINECS number and additional synonyms can be specified to aid identification. The substance name is obligatory, all other parameters are optional.

**WWTP Removal** Depending on the type of the waste water treatment plant (WWTP) different removals have to be applied. They can be specified in this section.

**River Removal** You can change the instream-removal elimination rate assumed for every stretch in the river network.

**Emission Data** You can specify a default domestic consumption (kg per capita and year) of the substance assumed for any discharge site in the simulation area.

### 1.3.4 Save Substance

This item is only available for the privileged user. The Save Substance Substance Dialog is raised allowing to specify the name and comment for the new substance entry.

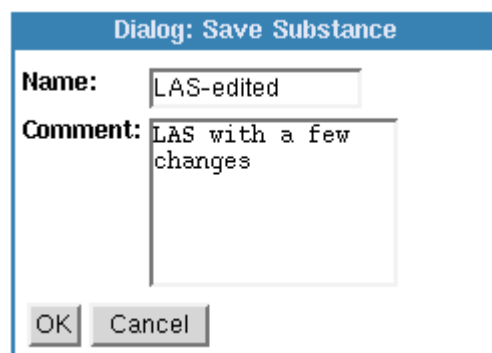


Fig. 1.6: Save Substance Dialog

### 1.3.5 Delete

This item is only available for the privileged user. A dialog similar to the Open Substance Dialog (see section 1.3.2) is raised allowing to select a substance from the database to be removed.

## 1.4 Menu Catchment

### 1.4.1 Open Catchment

This menu item is enabled if a database connection has been established and a session been opened or newly started.

A dialog is raised where you can select a new catchment for the active session from the list of catchments in the database.

**Note**, that with a the new catchment selection current simulation results, market data and discharge data entries will be deleted.

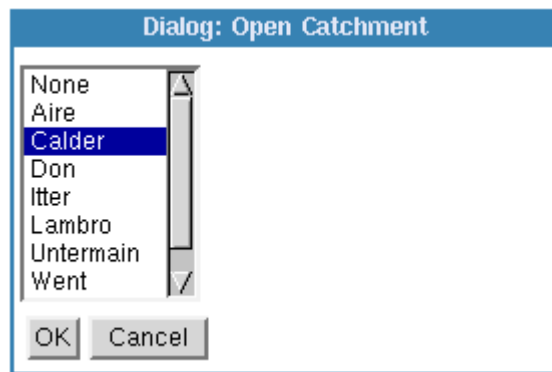


Fig. 1.7: Open Catchment Dialog

## 1.5 Menu Model

This menu provides items for simulation control.

### 1.5.1 Edit Model Params

This item is only enabled if there is an active session. It allows you to specify the number of Monte-Carlo shots of a simulation. A Monte-Carlo-Shot number of 0 is equal to a conventional, non-stochastic simulation where for all distributed parameters the mean values are applied.

Please **note** that GREAT-ER Web only allows for running a simulation in model mode 1. Editing the Monte-Carlo shots therefore also changes the model modes entries for the current session.

### 1.5.2 Run Simulation

This item is only available if there is an active session with catchment and substance. This command will start the simulation for the active session if all required data have been specified. If the parameters are not sufficiently specified, a dialog is raised to inform you about the missing parameters.

**Note:** The application won't inform you about a finished simulation of its own. You have to use the menu item 'check status' to get this information.

### 1.5.3 Stop Simulation

This item is only available if a simulation has been started. It will stop a running simulation. A dialog appears to inform you about the successfully stopped simulation.

### 1.5.4 Check Status

This item is only available if a simulation has been started. It informs you about the current state of the simulation. If the simulation has been finished, the Map will be refreshed showing the new calculated results.

## 1.6 Analysis

### PEC Initial

The spatial aggregation of concentrations in the river directly after emission.

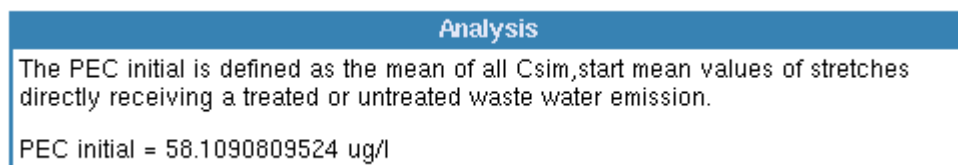


Fig. 1.8: PEC initial

This is similar to the PEC local ad defined in the EU Technical Guidance Documents (EU, 1996), although its calculation is different. Based on the  $C_{sim,start}$  mean values, the mean is calculated for all stretches receiving treated or untreated discharges. Compare Boeije et al., 1999.

### PEC Catchment

This is the average of representative concentrations over the entire catchment.

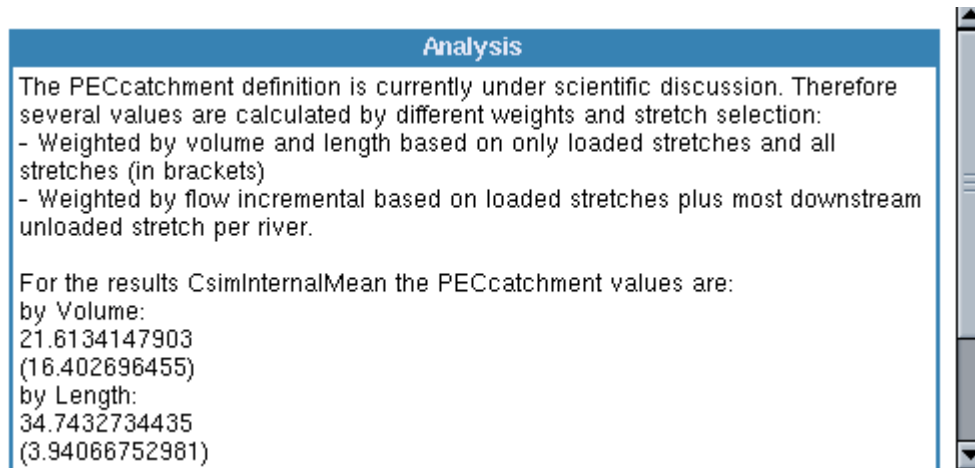


Fig. 1.9: PEC catchment

This is a new concept for geo-referenced exposure assessment, although there is some analogy with the PEC regional in the EU Technical Guidance Documents (EU, 1996).

## 1.7 Login

This menu item is available if you are logged in as normal, non privileged user. A dialog for setting up connection to a GREAT-ER database allows to enter database, username and password for the authentication process.

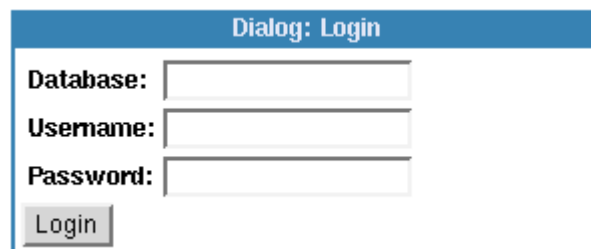


Fig. 1.10: Authentication Dialog

Successful authentication will activate display of menu items only available for privileged users, namely 'Save Session', 'Save Session As', 'Delete Session', 'Save Substance' and 'Delete Substance'. Apart from 'Delete Session' they are all disabled and will only become available after opening or creating a new session.

Also, the Login menu item disappears and a 'Logout' menu item is displayed.

The database connection can be closed via the menu item Logout. Leaving the GREAT-ER Web application by simply closing the Browser leads to unaccessible session in the database. They will be removed after two days when the user is logging in again.

## 1.8 Logout

Once a database connection has been established, this menu item is active. It will close the current session and then disconnect from the database. If the session is modified, the user is offered an option to save the modifications before closing the session.

## 1.9 Map Frame

If no catchment has been selected, the map frame is empty. Otherwise It consists of three parts.

On the left side a map with catchment boundary, rivernet work and discharge sites is displayed. On the top left corner you find a tool bar that provides facilities for navigation on the map and additional functions (see section 1.10).

On the right side a legend and a reference map is displayed. The legend enables to switch on or off specific layers of the map. Please reload the map after checking a new box (see subsection 1.10.1).

The reference map gives an orientation where the actual extent of the main map is located. Furthermore you can use the reference map to recenter the main map by clicking on the corresponding location.

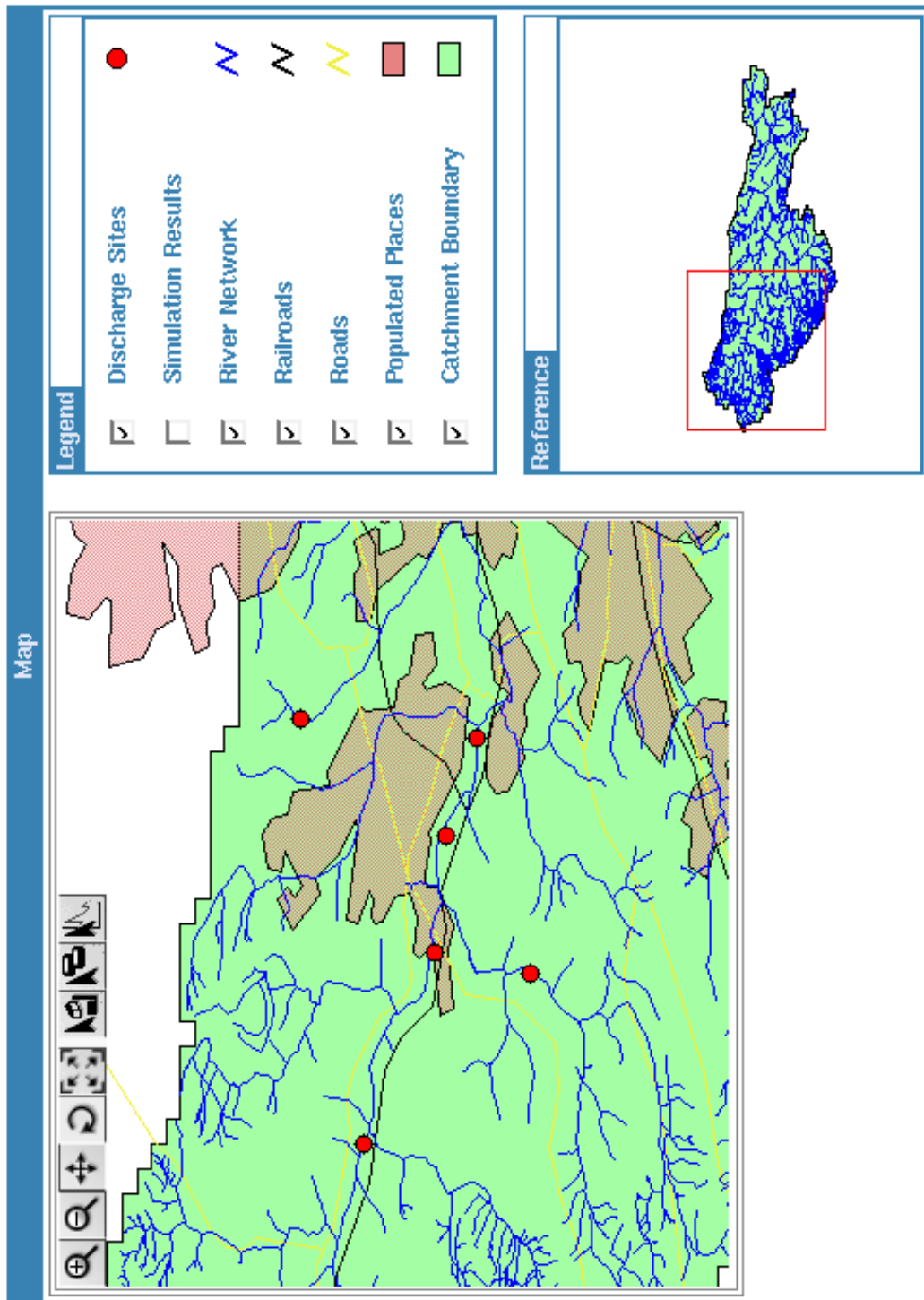


Fig. 1.11: Map Frame

## 1.10 Tool Bar

### 1.10.1 Navigation

#### Zoom In

This button activates the Zoom-in tool. You may now draw a rectangle which will define the extent of the new area to be displayed. If the shape of the rectangle and the map is different the zoom factor is automatically changed to cover the whole selected area. You can also click once anywhere in the map to zoom in with a fixed factor.

#### Zoom Out

This button activates the Zoom-out tool. Clicking it leads in zooming out with a fixed factor.

#### Recenter

This button activates the Recenter tool. You can now click on some point on the map. The map will be reloaded with this point as its new center.

#### Reload

After clicking this button the map will be reloaded. This is useful if you have checked in or out a new layer in the legend.

#### Full Extent

This button reloads the map with full extent.

### 1.10.2 Edit Emission Data



This button activates the Edit Emission Data tool. You can now select a discharge site with the mouse pointer to change its specific consumption and release attributes.

The Edit Emission Data dialog enables you to specify site-specific consumption data. To cover industrial sites, users can enter an additional input into the treatment plant. This input reflects discharges resulting from the production processes and can be calculated from the production volume.

Fig. 1.12: Edit Emission Data Dialog

Please note that in case of an unknown specific value the general value will be applied for a simulation<sup>1</sup>.

Please note that the calculation of the fraction of the production volume which will be released is not part of GREAT-ER but must be calculated manually beforehand. The input considered here is the mass flow of substance into the treatment plant in kg/a. As with the loads from domestic inputs, the industrial input is subsequently processed by the treatment plant model, if present, for the selected location.

Leaving the dialog, the Edit Emission Data tool remains active. Selecting another tool will deactivate it.

### 1.10.3 Edit Discharge Data



This button activates the Edit Discharge Data tool. You can now select a discharge site with the mouse pointer to change its specific properties.

Similar to the Edit Emission Data dialog, the Edit Discharge Data dialog enables users to modify the parameters of a specific treatment plant.

Several site-specific parameters can be changed. These include population, the elimination rate (used for complexity modes), the treated fraction of incoming sewage water (e.g. bypass or overflow) and in general the type of treatment plant. Incoming water from separate sources is also considered such as domestic input, non-domestic use (this covers mainly industrial inputs) and runoff. If only an overall value is available for treatment plants this should be entered as domestic flow.

<sup>1</sup>E.g. for an unknown consumption the simulation falls back to the consumption specified under the Substance Data Dialog

Edit Discharge	
<b>Name:</b>	Hilden
<b>Population:</b>	64383.0 [cap]
<b>Domestic flow:</b>	232.262663 [L/(cap * d)]
<b>Non-domestic flow:</b>	0.0 [m <sup>3</sup> /s]
<b>Runoff flow:</b>	0.0 [m <sup>3</sup> /s]
<b>Treated fraction:</b>	1.0 <input type="checkbox"/>
<b>WWTP removal:</b>	<input type="checkbox"/>
<b>Comment:</b>	None
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

Fig. 1.13: Edit Discharge Data Dialog

Please note that domestic flow is given in liter/(capita\*day), where non-domestic flow and run-off are considered as  $m^3/s$ .

Please note that in case of an unknown specific values the general values will be applied for a simulation<sup>2</sup>.

Please note furthermore that it is possible to specify a distribution for a general removal efficiency, but not for a site-specific removal efficiency. Nevertheless, it is possible to have a distributed general removal efficiency for e.g. activated sludge plants, and a fixed rate for a selected site.

Leaving the dialog, the Edit Discharge Data tool remains active. Selecting another tool will deactivate it.

## Concentration Profile



After selecting the profile you have to select a stretch by clicking on the map. Moving downstream the  $C_{sim,start}$  values are collected for each stretch. The collection will be displayed in a simply X/Y-profile.

---

<sup>2</sup>E.g. for an unknown WWTP removal the simulation falls back to the WWTPremoval specified under the Substance Data Dialog



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