



Manual MARS analyst viewer

08 July 2010

Document Change Log

Issue	Date	Description of changes
0.1	03-FEB-2009	Initial version
0.2	13-MAR-2009	Manual for viewer version 16-3-2009
1.0	20-MAY-2009	Manual for viewer Release 1 (20-5-2009)
1.1	16-JUL-2009	Manual for viewer Release version 17-7-2009
1.2	19-NOV-2009	Graph viewer functionality added for Release 2
1.3	18-DEC-2009	Small improvements
2.0	8-JUL-2010	Small improvements More choices are kept in memory Improved graph module interface Export Geotiff Fixed number of bugs

Table of Contents

Table of Contents	1
1. Introduction	2
2. MARS analyst viewer - maps.....	3
2.1. Starting window	3
2.2. Orientation canvas.....	4
2.2.1. Working with map layers	4
2.2.2. Map functions.....	6
2.2.3. Favorites	8
2.3. Map Window.....	11
2.3.1. Data selection and formatting	11
2.3.2. Changing, editing and managing legends	15
2.3.3. Map functions.....	21
3. MARS analyst viewer – graphs.....	26
3.1. Selection of graph target spatial entities	26
3.2. Initialization of a new graph window.....	26
3.3. Configuration of graphs	28
3.3.1. Graph Data Settings	28
3.3.2. Graph Layout.....	33
3.4. Graph functions	38
4. MARS analyst viewer – quicklooks.....	42
Annex 1 – Installing Adobe AIR and the AIR version of the viewer application	43

1. Introduction

For the implementation of the Common Agricultural Policy, the European Commission needs timely information on the agricultural production to be expected in the current season. This is a main concern of the MARS-project (Monitoring Agricultural ResourceS) of the AGRI4CAST and FOODSEC units of the Directorate General Joint Research Center (JRC) of the European Commission in Ispra (Italy).

MARS contact point:

JRC - Institute for the Protection and Security of the Citizen, T.P. 266

I-21020 Ispra (VA), Italy

<http://mars.jrc.it/>

The user manual describes the functionality of the MARS analyst viewers. The operational MARS services deliver and store large amounts of data. These data vary from static reference layers and input weather data originating from different supplying meteorological sources (weather stations, ECMWF) and data quick looks to the data that is generated in the various operational levels of the MARS services through downscaling, simulation of crop indicators, estimation of crop yields etcetera. The new MARS analyst viewers enable the analyst to perform spatial and temporal analysis of these data sets in a customized way.

2. MARS analyst viewer - maps

2.1. Starting window

The starting window that opens when a user logs on to the MARS analyst viewer, gives an overview of the available ROIs and the themes and resolutions that are available for that ROI. It allows the user to select a ROI and open the orientation canvas for that ROI.

The user can additionally select a country within the ROI. This will cause the orientation canvas to directly zoom to the extent of the specified country within that ROI.

Select region of interest:	<input type="text" value="Europe"/>
Zoom to:	<input type="text" value="Whole region"/>
	<input type="button" value="OK"/>
Available resolutions for Europe:	<input type="text" value="NUTS Level 0"/> <input type="text" value="NUTS Level 1"/> <input type="text" value="NUTS Level 2"/> <input type="text" value="NUTS Level 3"/> <input type="text" value="25x25 km"/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/> <input type="text" value=""/>
Available themes for Europe:	<input type="text" value="Weather indicators (observed) - CGMS"/> <input type="text" value="Weather indicators (simulated) - CGFS based on ECMWF analysis Deterministic Model"/> <input type="text" value="Crop indicators (simulated) - CGFS, CGFS based on ECMWF analysis Deterministic Model"/> <input type="text" value="Crop indicators (simulated) - CGMS, based on station observations"/> <input type="text" value="Crop indicators (remote sensing) - NOAA-AVHRR"/> <input type="text" value="Crop indicators (remote sensing) - SPOT-VEGETATION-P"/> <input type="text" value=""/> <input type="text" value=""/>

Currently not all data servers are fully deployed.

In case of **maps** the following data are available:

- For Europe CGMS level 1 and 2 indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution. In addition RUM (SPOT-VGT-P and NOAA) indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution. Finally, CGFS-HIS level 1 and 2 indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution.
- For other ROIs, including the world, the GWSI weather indicators are available for resolution 0.25 degree. An exception is made for ROI Asia. In addition RUM (SPOT-VGT) indicators are available for the administrative regions at level 1 (sub national) and 0 (national) of all ROIs outside Europe. Finally, QuickLooks of SPOT-VGT (approximately 1 km resolution) are offered for all these ROIs.

In case of **graphs** the following data are available:

- For Europe CGMS level 1 and 2 indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution. In addition RUM (SPOT-VGT and NOAA) indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution. Finally CGFS-HIS level 1 and 2 indicators are available at NUTS levels 0 to 3 and 25x25 km grid resolution.
- For other ROIs, including the world, the GWSI weather indicators are available for resolution 0.25 degree. An exception is made for ROI Asia. In addition RUM (SPOT-VGT) are available for the administrative regions at level 1 (sub national) and 0 (national).

2.2. Orientation canvas

2.2.1. Working with map layers

Selectable layers are (polygon) layers that can be used to visualize layers and to select features from that layer. These features can be used to create a dynamic mask, where the data for selected features is displayed while non-selected features are masked. Selected features can also be used as a basis for the creation of a new map extent by zooming to the extent of the selected features. Finally, the features can be used to create graphs for the selected features. Opening a graph window will then initialize graphs for the selected regions.

The list with selectable layers controls the status of the available selectable layers. If any geographically linked map windows are open, a change in the settings of the selectable layers will propagate to these map windows.

Selectable layers:

<input checked="" type="checkbox"/>	NUTS Level 0	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	NUTS Level 1			
<input checked="" type="checkbox"/>	NUTS Level 2	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	NUTS Level 3			
<input type="checkbox"/>	25x25 km			

Display or hide a selectable layer

The list allows the user to display or hide a selectable layer in the orientation canvas by checking the check box in front of the selectable layer name. The layer will show or hide in the orientation window as well as in all geographically linked map windows.

Activate or deactivate a selectable layer

A selectable layer can be activated or deactivated by clicking behind the selectable layer name. The currently activated layer is displayed in a blue bar. Only one layer can be activated at the same time. Regions from the active layer can be selected by using the function <Activate select feature tool> (see description of that function). Selected features can be used to zoom to (in order to adapt the map extent to the area of interest) or to make features transparent in a masking layer (see dynamic masking layer) or to be used in the graph module. The active layer is propagated to all geographically linked map windows. In addition, the activated layer will also be the initial data resolution setting in the child map window. Note that in case another layer is activated the regions of the previously active layer remain selected. More regions can be selected by clicking on them in combination with the shift-key; regions can be de-selected by clicking on them in combination with the ctrl-key.

Use as dynamic masking layer

One of the available selectable layers may be selected to be used for the composition of a dynamic masking layer by clicking the radio button behind the layer name. The selected features in this layer will then be automatically converted into a dynamic mask for the geographically linked map windows. In the map windows the data for the selected features will be displayed, while the unselected features will be masked. Note that not all selectable layers can be used for dynamic masking (e.g. the 25x25 km grid cells). This is indicated by a tool tip “This layer cannot be used as dynamic masking layer” on mouse over of the control. The control is disabled in such cases.

Show or hide selected features of a layer

Selected features of a selectable layer can be displayed and hidden by using the first check box behind the layer label. This function is propagated to the geographically linked map windows, so the selection will show or hide in the orientation window as well as in all geographically linked map windows.

Show or hide labels for a layer

The map labels for a specific selectable layer can be enabled and disabled by the second checkbox behind the layer label. Labels will only be displayed for visible selectable layers. Again, this function is propagated to the geographically linked map windows, so the labels will show or hide in the orientation window as well as in all geographically linked map windows.

Note that not all selectable layers have labels available (e.g. the 25x25 km grid cells). This is indicated by a tool tip “Labels not available for this layer” on mouse over of the control. The control is disabled in such cases.

Display or hide orientation layers

Orientation layers:

 cities rivers

Available orientation layers can be displayed or hidden by clicking the orientation layers checkbox.

Display a background layer

Background layers:

Available background layers can be displayed by selecting it from the background layers dropdown list. The legend for the selected background layer can be displayed by clicking the question mark behind that layer in the background layers dropdown list.

2.2.2. Map functions

The orientation window contains a set of user controls to operate map functions. These functions are explained in this section.

Open map window

A child map window opens. In the child map window data can be visualized in a map, using the currently active selectable layer in the orientation canvas as the spatial resolution for data aggregation. The following settings are inherited from the orientation canvas:

- The map extent.
- All settings of the selectable layers.
- The current active layer of the orientation canvas is the default resolution for the map child window.

Open graph window



A child graph window opens. In the child graph window data can be visualized as a graphs, using the currently selected features from the currently active selectable layer. The following settings are inherited from the orientation canvas:

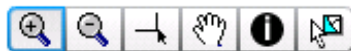
- The selected features (in case of the graph type only supports one spatial entity the first selected feature will be used if more than one feature is selected).
- The current active layer of the orientation canvas is the default resolution for the map child window.

Open quicklook window



The quicklook window is offered for all regions except Europe. It includes static maps of satellite based vegetation indices at a resolution of approximately 1 km. As these maps are static, pre-processed maps there are no additional features like map navigation, legend editing or graph display.

Map function toolbar 1



This toolbar contains a set of functions of which one is activated at a time (toggle buttons). The following functions are available:

1. Activate zoom in tool

Activates the zoom in function. A click on the map will zoom in one level, with the clicked position as the center of the new extent. It is also possible to zoom in to a specific extent by holding the mouse button and dragging the desired extent.

2. Activate zoom out tool

Activates the zoom out function. A click on the map will zoom out one level, with the clicked position as the center of the new extent.

3. Activate crosshair tool

This function activates a crosshair cursor that is synchronized for the orientation canvas and all child map windows.

4. Activate pan tool

Activates the pan function. The map can be panned by dragging it with the mouse.

5. Activate identify tool

Activates the identify function. When clicking on the map, the identify function displays the thematic properties of the feature clicked in the currently selected map resolution layer.

6. Activate select feature tool

Activates the select feature function. The select feature option allows the user to select one or more regions of the current active layer (by click or shift-click for multiple selections). The selected regions are the basis for the creation of a dynamic mask used to mask features in the

map child window. They are also the basis for the selection of regions in the graph tool. The <zoom to selected features> (see below) allows the user to adapt the extent to the selected features. De-selecting features can be done via ctrl-click.

Map function toolbar 2



This toolbar contains a set of map functions that directly cause a map action. The following functions are available:

1. *Zoom to selected features*
Allows the user to zoom to the extent of the selected region(s) of the currently active selectable layer.
2. *Zoom to full extent*
Allows the user to zoom to the full extent of the selected ROI.
3. *Zoom to previous / next extent*
Allows the user to navigate to previously selected extents and back.
4. *Zoom in / Zoom out*
Allows the user to zoom in or out one zoom level. The new map extent is centered at the center of the current map extent.

Coordinate driven map centering

Center at: lon: lat: show crosshair

The map can be centered at a chosen lat/lon coordinate. The user can enter coordinates in the input fields. Through the OK button, the map will center at the selected location. A crosshair is displayed on the map that indicates the position of the entered coordinates. The crosshair can be switched on and off.

2.2.3. Favorites

The orientation canvas offers users the option to save their current viewer windows configuration, including all settings, as a favorite for later reuse.

Favorites



An analyst user has access to all favorite management functions (save, open and delete).

1. Open favorite

The open favorite button provides the user with a popup window where previously saved favorites can be selected and opened. The open favorite combo box shows the available favorites. If the Show all checkbox is unchecked, the user will be able to select his own private and public favorites. If the checkbox is checked, the user also has access to other users public favorites. Note

that favorites are stored per ROI and resolution, meaning that for instance a favorite saved for Europe will not be available if a user has opened another ROI.

Open favourite

Open favourite: **Favorite Test Rob 1**

Show all

Favourite settings

Description: Test favorite for user manual

Type: static

Access level: public

Created: 2009/07/16

Last updated: 2009/07/16

Open **Cancel**

2. *Save favorite*

Save favourite - □ ×

Name: Favorite Test Rob 3

Description: Test favorite 3 for user manual

Type: static dynamic by month
 dynamic dynamic by year

Access level: private public

Save **Save as** **Cancel**

The save favorite function allows the user to save the current configuration of windows and the selected indicators and options for these windows as a favorite for later use.

If no favorite is currently opened by the user, the user can enter a name for the new favorite and save the configuration. If the user has already opened a favorite, the user can choose to update this favorite with the current configuration through the <Save> function or to save the configuration as a new favorite by adapting the favorite name and saving it under that name through the <Save as> function.

A favorite can be saved as a static or a dynamic favorite. Static favorites will use an absolute, fixed time period (begin and end time) for the data to be displayed, while the time period of dynamic favorites is relative to the day at which it was created and reopened. Dynamic favorites can be fully dynamic, dynamic by month or dynamic by year.

Dynamic

A dynamic favorite time period is relative to the date the favorite is used. The begin and end date of a favorite's time period are increased by the number of days between the date of creation of the favorite and the date of reopening the favorite.

Dynamic by month

The month part of a dynamic by month favorite is relative to the date the favorite is used. The begin and end month of the favorite's time period are increased by the number of months between the month at the day of creation and the month at the day of reopening the favorite.

Dynamic by year

The year part of a dynamic by year favorite is relative to the date the favorite is used. The begin and end year of the favorite's time period are increased by the number of years between the year at the day of creation and the year at the day of reopening the favorite.

A favorite can be saved with the access level private or public. A private favorite will only be visible for the creator/owner, while a public favorite will be accessible for all users (including anonymous users). The default access level is private.

3. Delete favorite

The delete favorite function allows the user to delete favorites.

Delete favourite

Delete favourite: **Favorite Test Rob 1**

Favourite settings

Description: Test favorite for user manual

Type: static

Access level: public

Created: 2009/07/16

Last updated: 2009/07/16

Delete **Cancel**

An user can select a favorite from the list of favorites displayed in the combobox. This list displays the users (private and public) favorites. The selected favorite can be deleted through the <Delete> function.

2.3. Map Window

2.3.1. Data selection and formatting

The right section of the map child window contains the controls that are related to the selection of datasets for mapping, masking etc.

Select map resolution

Resolution: show outline

25x25 km

This function allows the user to select the resolution (spatial aggregation level) of the data to be mapped. Initially, the resolution of a map window is set according to the currently active layer in the orientation canvas. The selected resolution can be displayed or hidden using the show outline checkbox. The function 'activate a layer' (clicking behind the selectable layer name in advanced tab sheet) is synchronized with function 'Resolution' in a single map child window. The functions 'show outline' and 'show a layer' (checking the check box in front of the selectable layer name in layers tab sheet) are synchronized in both directions.

Indicator selection tab

In this tab sheet the user can select the dataset to be mapped. Theme, crop- or landcover, indicator and function can be selected. Depending on the chosen combination of theme, indicator and function, additional selection for e.g. aggregation (avg, min, max), start and end of time period etc. can be configured. The available years for each theme are shown in brackets.

Indicator	Legend	Advanced
Theme (available years 1975 - 2010):		
Weather indicators (observed) - CGMS		
Crop / Landcover:		
Any land cover class		
Aggregation method:		
Overall mean (regardless land use - no unmixing)		
Indicator:		
Average daily temperature		
Function:		
Year of interest (YOI)		
Start date (yyyy/mm/dd):		
2010/07/06		
End date (yyyy/mm/dd):		
2010/07/06		
Aggregation type:		
AVG		

Depending on the chosen theme, indicator, function etc., appropriate controls are provided to configure the relevant map parameters. Some examples are displayed below:

Date selector

Start date (yyyy/mm/dd)

2009/03/01

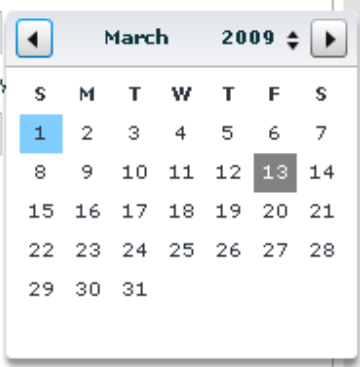
End date (yyyy/mm/dd)

2009/03/09

Aggregation

AVG

Update



S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Dekad selector

Start: year/month/dekad

2006

1

1-10

Development stage selector

Fixed development event or custom development stage

Flowering
 Ripening
 Maturity
 Custom

















100

Note that when the selection of one of the associated controls for indicator selection is updated, the current map is grayed out to indicate that the map does not correspond anymore with the currently selected settings.

Legend tab

In the legend tab, the legend classes of the legend that is linked to the currently mapped data are displayed.

Note that separate legend categories are displayed that correspond with “no data found”, values outside the defined legend classes and infinite values respectively.

Indicator	Legend	Advanced
Degrees Celsius		
	<= -15	
	> -15 - <= -10	
	> -10 - <= -5	
	> -5 - <= 0	
	> 0 - <= 5	
	> 5 - <= 10	
	> 10 - <= 15	
	> 15 - <= 20	
	> 20 - <= 25	
	> 25 - <= 30	
	> 30 - <= 35	
	> 35 - <= 40	
	> 40	
	no data found	
	value outside legend classes	
	infinite value	

Advanced tab

Indicator	Legend	Advanced
Selectable layers:		
<input checked="" type="checkbox"/>	NUTS Level 0	<input type="radio"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<input checked="" type="checkbox"/>	NUTS Level 1	<input type="radio"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	NUTS Level 2	<input type="radio"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	NUTS Level 3	<input type="radio"/> <input type="checkbox"/> <input type="checkbox"/>
<input type="checkbox"/>	25x25 km	<input type="radio"/> <input type="checkbox"/> <input type="checkbox"/>

On the advanced tab, the user can configure the selectable layers.

The functionality offered for the selectable layers in the map window is identical to the functionality in the orientation canvas:

- Display or hide a selectable layer.
- Activate or deactivate a selectable layer.
- Use as dynamic masking layer (only if dynamic masking is allowed for the layer).
- Show or hide selected features of a layer.
- Show or hide labels for a layer (only if layers are available for the layer).

Please refer to the details described in the orientation canvas section (paragraph 2.2.1) for details on the usage of these functions.

Selectable layer settings are initially inherited from the orientation canvas. If a map window is geographically linked, a change in one of the settings of the selectable layers will propagate to the orientation canvas and all other currently linked map windows.

2.3.2. Changing, editing and managing legends

2.3.2.1. Legends structure

For a better understanding, before explaining the legend functionality in the viewer application, we briefly explain the way that datasets and legends are linked.

Datasets

A dataset is a selection of data from the MARS database selected through a combination of resolution, theme, indicator, function, parameter and parameter values as displayed in a map.

Legends

A legend defines a set of classes and the colors and labels per class.

Three types of legends exist:

- Normal legends
A normal legend defines a set of legend classes where the lower and upper boundary of every class can be defined by the user.
- Equal area legends
An equal area legend only allows the user to choose the number of classes and the colors used to represent these classes in the map. The system will determine the class boundaries in such a way that every class represents an equal area in the map.
- Equal width legends
An equal width legend also only allows the user to choose the number of classes and the colors used to represent these classes in the map. The system will determine the class boundaries in such a way that every class has the same width between the minimum and maximum value of the dataset.

Three types of access levels exist for legends in the MARS analyst viewer:

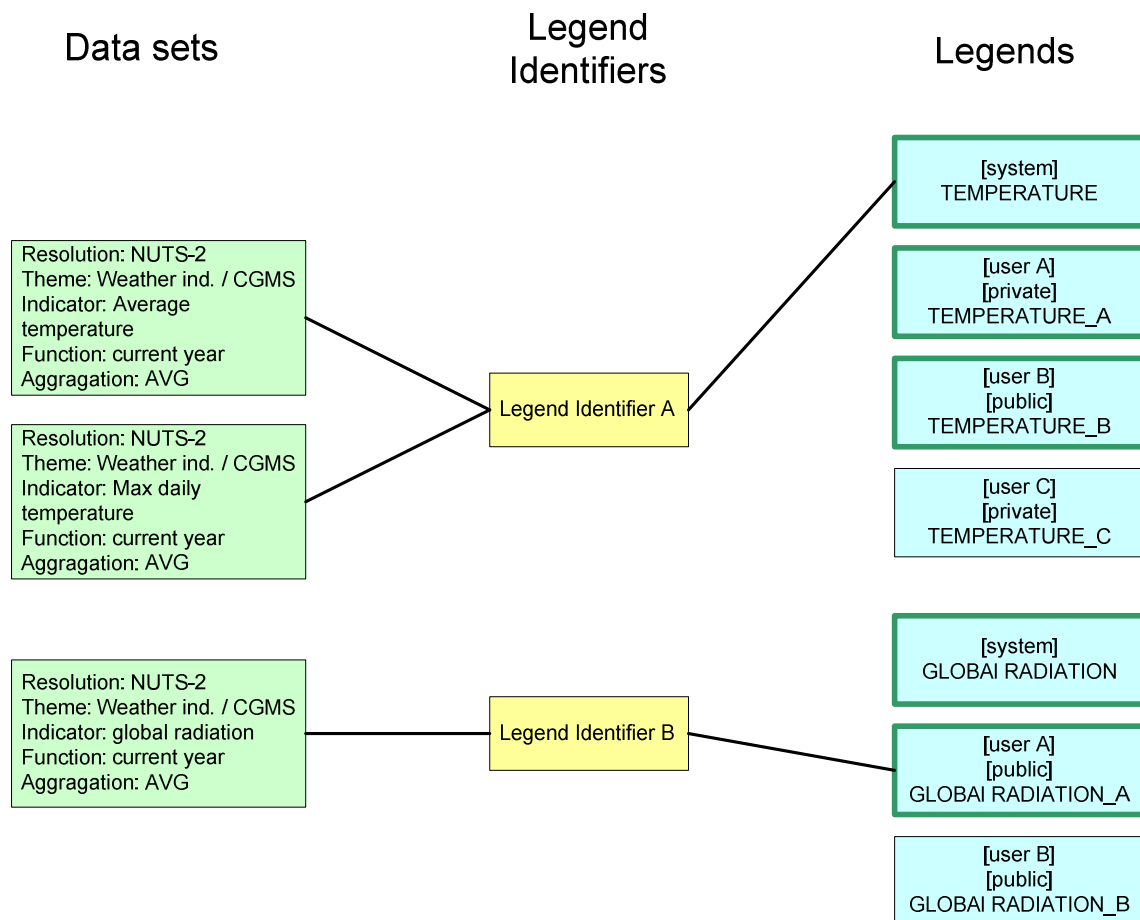
- System legends:
Non editable legends. These are the legends that are linked by default to the MARS datasets. They cannot be edited, but can be replaced by a user by other legends.
- Public legends:
Legends that are user-defined. They are defined by a specific user and are only editable by that user. These legends are available for all users.

- **Private legends:**
User-defined legends that are marked as private and are only available for the user that creates and owns the legend.

Legend identifiers

Groups of datasets that are supposed to be based on the same legend (e.g. temperature, minimum temperature and maximum temperature) share a legend identifier. Thus, every combination of resolution, theme, indicator, function, parameter and parameter values is linked to a legend identifier. Each legend identifier has a default link to a system legend.

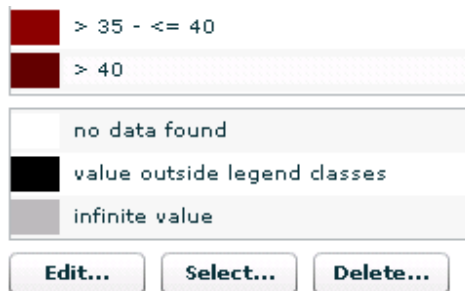
Linking of legends with datasets



The figure above displays an example of the possible relations between datasets, legend identifiers, legends and users. If we focus on user A, we can see that user A has linked the (default) system legend for temperature to the legend identifier for the two temperature datasets. He has also linked a customized public legend for global radiation to the legend identifier for global radiation. Besides, user A could use (green borders) all other available system legends and all public legends from other users as legends to be linked to a legend identifier.

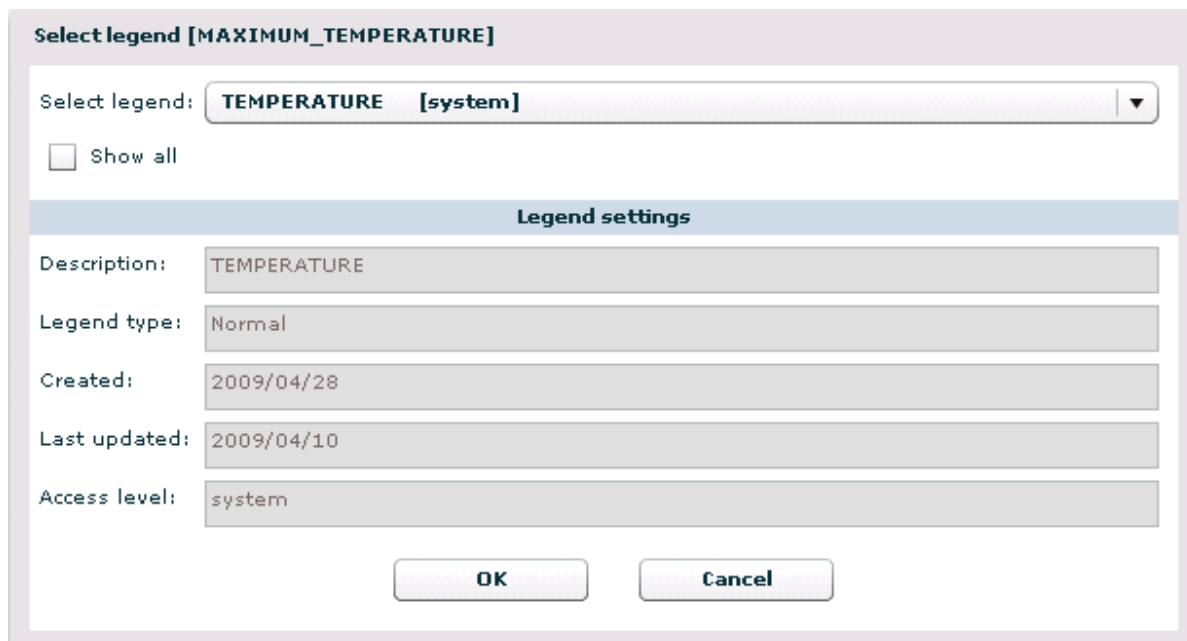
2.3.2.2. Legend editing and management functionality

The MARS analyst viewer offers functions to select, to edit and to delete legends:



Select Legend

The select legend function offers functionality to select a legend for the selected dataset from the available set of legends.



The select legend dropdown list contains the available legends. As a reference, the legend properties (description, legend type, data created and last updated and the access level) are displayed for the selected legend.

By default, the available legends are restricted to the legends that are currently linked to the legend identifier for the selected dataset in the map viewer. The following legends are displayed in the select legend dropdown list:

- The system legend that is linked to this dataset by default.

- The public legends that have been linked by any of the users to the legend identifier belonging to the dataset.
- The private legend that has been linked to the legend identifier belonging to the dataset by the current user.

If the Show All check box is checked, all legends are available. The following legends are displayed in the select legend dropdown list:

- All system legends.
- All public legends that have been defined by any of the users.
- All private legends that have been defined by the current user.

Note that this option should be used with care to avoid misleading classification of the selected dataset, since many of the available legends are legends that are have been defined for other types of data, usually with other units etc.

Through the OK-button, the selected legend can be applied to the currently displayed dataset in the map window. The current legend will be replaced with the chosen legend and a new map will be displayed. Note that the user also links this new legend to the legend identifier for this dataset. This means that all new maps for this dataset (also in later sessions) will be displayed with this legend.

Edit Legend

#	Min value	Included	Max value	Included	Label	Color
1	-1,000.0000	N	-15.0000	Y	<= -15	Dark Blue
2	-15.0000	N	-10.0000	Y	> -15 - <= -10	Blue
3	-10.0000	N	-5.0000	Y	> -10 - <= -5	Light Blue
4	-5.0000	N	0.0000	Y	> -5 - <= 0	Cyan
5	0.0000	N	5.0000	Y	> 0 - <= 5	Light Green
6	5.0000	N	10.0000	Y	> 5 - <= 10	Yellow-Green
7	10.0000	N	15.0000	Y	> 10 - <= 15	Yellow
8	15.0000	N	20.0000	Y	> 15 - <= 20	Orange
9	20.0000	N	25.0000	Y	> 20 - <= 25	Dark Orange
10	25.0000	N	30.0000	Y	> 25 - <= 30	Red-Orange
11	30.0000	N	35.0000	Y	>30 - <= 35	Red
12	35.0000	N	40.0000	Y	> 35 - <= 40	Dark Red
13	40.0000	N	1,000.0000	N	> 40	Very Dark Red





The Edit Legend function allows users to edit existing legends and create new legends based on existing legends.

The Edit Legend function by default opens the legend currently used in the map window for editing.


Editing a legend class

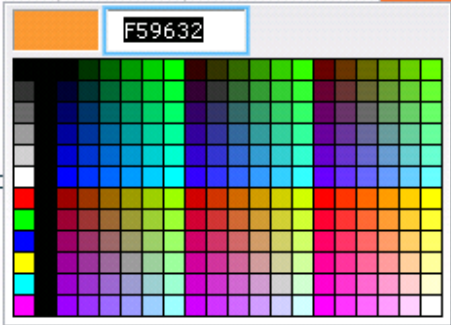
Legend editing is described here for the editing of a normal legend. Editing of equal area and equal with legends is identical, except that certain options (editing the legend class boundaries) are not available.

An existing legend class can be edited by clicking on a field in that class. The field will become editable and the value can be changed.

#	Min value	Included	Max value	Included	Label	Color
1	-1000	N	-15	Y	≤ -15	
2	-15	N	-10	Y	$> -15 - \leq -10$	
3	-10	N	-5	Y	$> -10 - \leq -5$	
4	-5	N	0	Y	$> -5 - \leq 0$	

The color for a class can be adapted by using a special color selector.

8	15	N	20	Y	$> 15 - \leq 20$	
9	20	N	25			
10	25	N	30			
11	30	N	35			
12	35	N	40			
13	40	N	1000			







Legend classes can be added and removed by selecting one of the classes in the editor and adding or removing it with the Add Legend Class and Remove Legend Class buttons.

Adding or removing legend classes

Add legend class

Remove legend class

Remove legend class removes the selected class from the class list. Add legend class adds a new legend class to the class list under the selected legend class.

10	30	N	35	Y	$>30 - \leq 35$	
11	-	-	-	-		
12	35	N	40	Y	$> 35 - \leq 40$	
13	40	N	1000	N	> 40	

A legend that is adapted by the user can be applied to the current dataset in two ways.

Updating maps and saving legends

Save as: public private

Using the <Update map> function, the user can apply the updated legend to the current dataset, without saving it to the MARS database. Changes to the legend will be applied to the map, but the legend will not be saved and associated with the respective legend identifier. New map windows in the current or new sessions will remain using the old legend. An edited legend with its new properties can be saved by the <Save> function. The <Save as> function allows to save the edited legend as a new legend. First a new name for the legend should be provided by the user.

A legend that has been adapted can be saved as a public or a private legend. A system legend cannot be changed and saved. It can only be changed and saved as a public or private legend.

New legends can not be saved under a name that already exists for another legend. Users are advised to rename the legend to a unique name. If conflicts arise, the MARS analyst viewer will rename the legend with a unique name automatically.

Delete Legend

The delete legend function allows the user to delete his private and public legends.

Delete legend

Select legend: ▼

Legend settings

Description:

Legend type:

Created:

Last updated:

Access level:

An user can select a legend from the list of legends displayed in the combobox. This list displays the users private and public legends. The selected legend can be deleted through the <Delete> function.

2.3.3. Map functions

The map window contains a set of buttons to operate map functions. These functions are explained in this section.

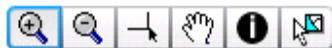
Open graph window



A child graph window opens. In the child graph window data can be visualized as a graphs, using the currently selected features from the currently **selected resolution**. The following settings are inherited from the map window:

- The selected features (in case of the graph type only supports one spatial entity the first selected feature will be used if more than one feature is selected).
- The selected theme and resolution.

Map function toolbar 1



This toolbar contains a set of functions of which one can be activated (toggle buttons). The following functions are available:

1. Activate zoom in tool

Activates the zoom in function. A click on the map will zoom in one level, with the clicked position as the center of the new extent. It is also possible to zoom in to a specific extent by holding the mouse button and dragging the desired extent.

2. Activate zoom out tool

Activates the zoom out function. A click on the map will zoom out one level, with the clicked position as the center of the new extent.

3. Activate crosshair tool

This function activates a crosshair cursor that is synchronized for the orientation canvas and all child map windows.

4. Activate pan tool

Activates the pan function. The map can be panned by dragging it with the mouse.

5. Activate identify tool

Activates the identify function. When clicking on the map, the identify function displays the thematic properties of the feature clicked in the currently active selectable layer.

6. Activate select feature tool

Activates the select feature function. The select feature option allows the user to select one or more regions of the current active layer (by click or shift-click for multiple selections). The selected regions are the basis for the selection of regions in the graph tool. De-selecting features can be done via ctrl-click.

Map function toolbar 2



This toolbar contains a set of map functions that directly cause a map action. The following functions are available:

1. *Zoom to selected features*

Allows the user to zoom to the extent of the selected region(s) of the currently active selectable layer.

2. *Zoom to full extent*

Allows the user to zoom to the full extent of the selected ROI

3. *Zoom to previous/next extent*

Allows the user to navigate to previously selected extents and back.

4. *Zoom in / Zoom out*

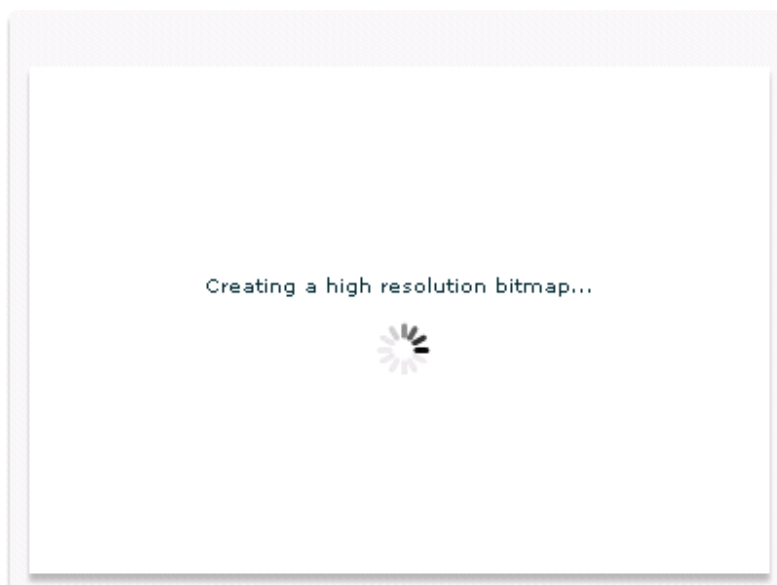
Allows the user to zoom in or out one zoom level. The new map extent is centered at the center of the current map extent.

Printing or exporting a map window



The print map button generates a bitmap for export and printing. It opens a window containing the current map, including headers, logos, legend etc. for exporting and printing.

Before opening the print/export window, a progress window will be visible while the system is busy generating the requested bitmap:



Refresh map



The Refresh map button executes a refresh of the data set according the choices made in the indicator tab.

The Export Map window that is opened shows the map as it will be printed and offers function to print and to export to different file types:



1. Print map

Allows the user to print the map. The print function opens a common print dialog, which allows the user to print the map. For optimal fit-to-page the user might have to change the default printer settings.

2. Export to PDF

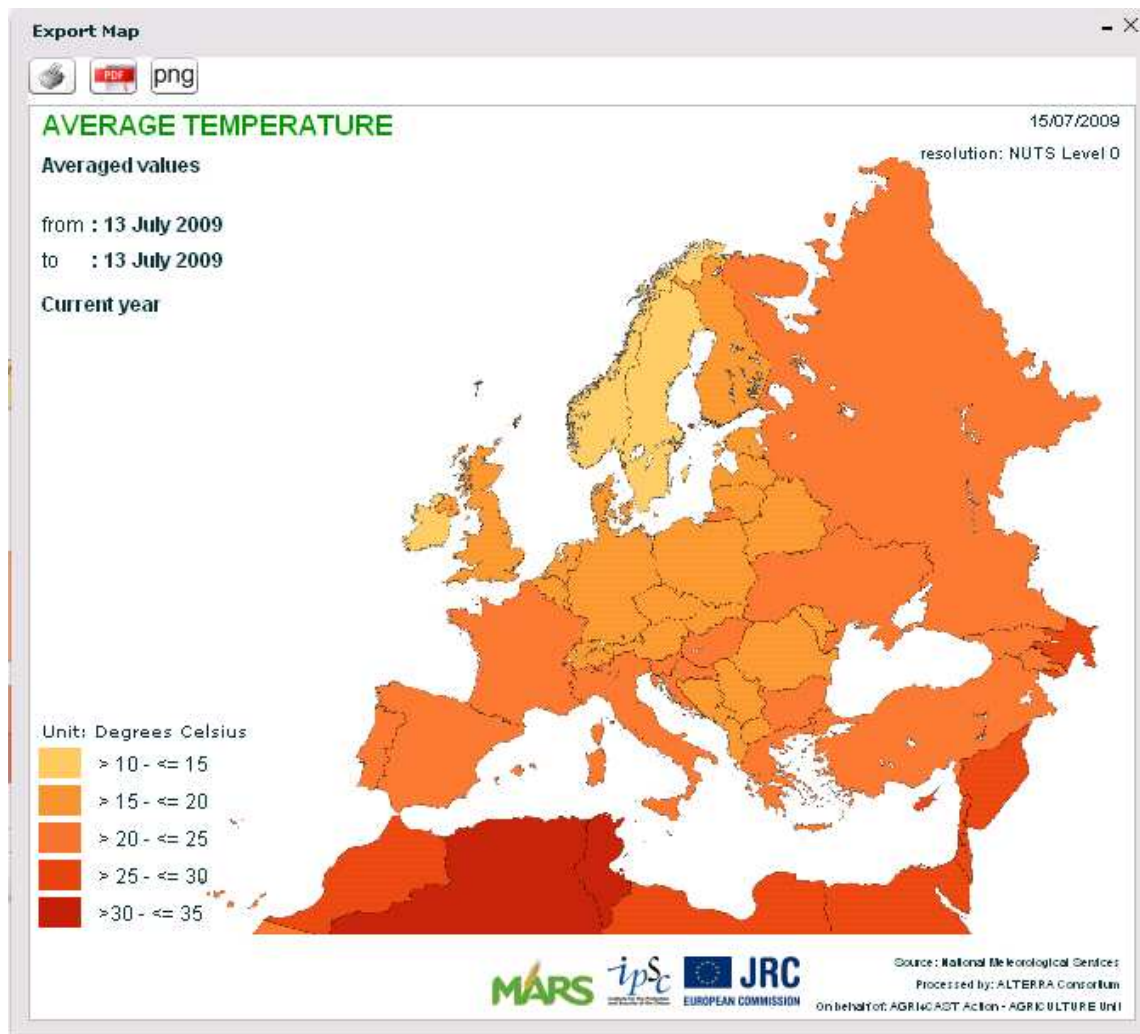
Allows the user to export the map as a PDF document on the local file system. During the export the lay-out is optimized according specific requirements of the MARS bulletin. The export to PDF function opens a common MS-Windows save file dialog, which allows the user to save the PDF-document.

3. Export to png

Allows the user to export the map as a *.png file on the local file system. The export to png function opens a common MS-Windows save file dialog, that allows the user to save the *.png file.

4. Export to GeoTiff

In case a grid resolution has been selected the GeoTIFF export is offered. Data are exported according the GeoTIFF format. GeoTIFF is a public domain metadata standard which allows georeferencing information to be embedded within a TIFF file.



- The export function only works for the analyst viewer in the Adobe AIR environment. An instruction for installation and setup is included in the Annex to this document.
- The export function currently supports the *.pdf , *.png and *.tif formats.

Link / Unlink map window



The Link/Unlink button allows the user to link or unlink the map child window to the orientation canvas and other linked map windows.

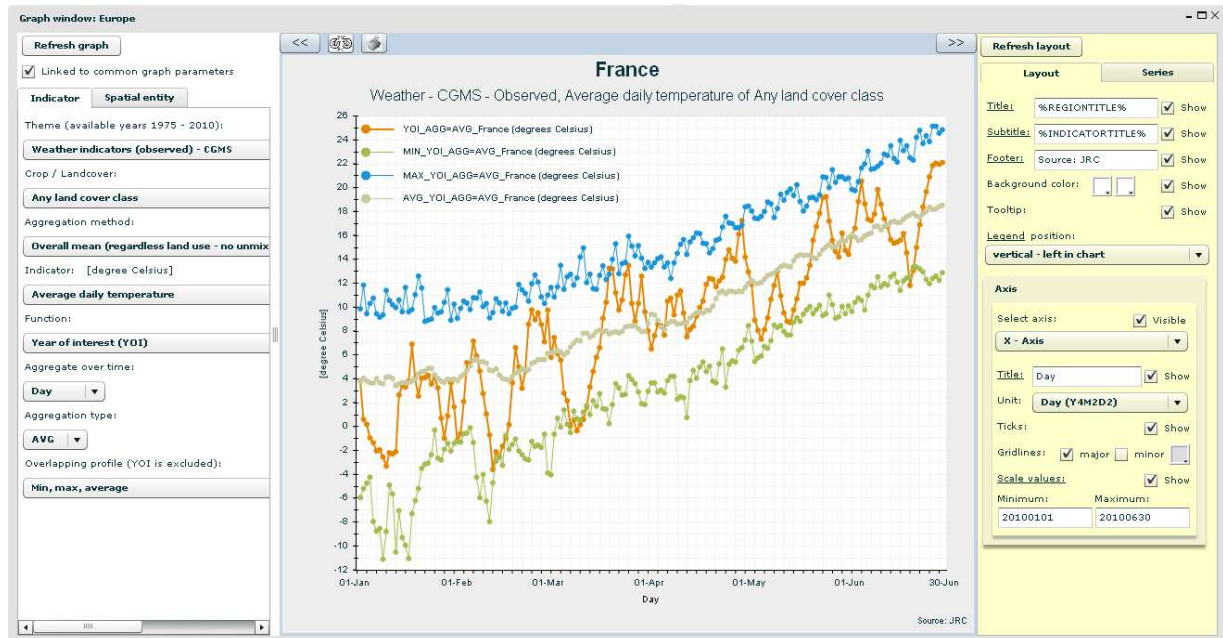
If linked, the map window will share the following characteristics with the orientation canvas and other linked map windows:

- The map extent.
- The selectable layer settings:
 - Display or hide a selectable layer.
 - Activate or deactivate a selectable layer.
 - Use as dynamic masking layer.

- Show or hide selected features of a layer.
- Show or hide labels for a layer.

Unlinked windows are fully independent from other windows, but when they are re-linked, all shared settings will be reset according to the settings of the orientation canvas.

3. MARS analyst viewer – graphs



The graph window allows a user to produce graphs based on the data in the MARS database. Graphs are primarily based on spatial entities (e.g. NUTS-x areas, grid cells) that are selected by the user and display one or more indicators for one or more selected spatial entities.

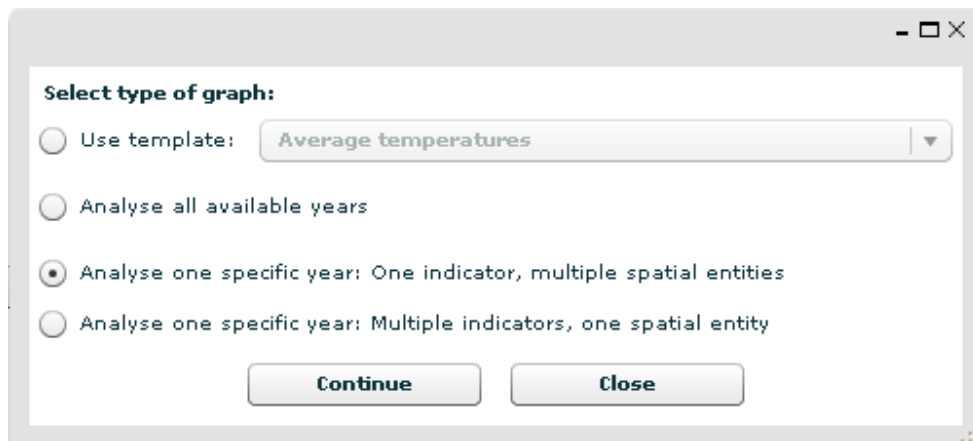
3.1. Selection of graph target spatial entities

Currently, spatial entities to be displayed in graphs can only be selected through the select feature functionality that is available in the orientation canvas and the map window. After activation of the select feature tool, the user can select areas using the mouse as described in paragraph 2.2.2 and 2.3.3. A maximum of six spatial entities can be selected.

3.2. Initialization of a new graph window

When a new graph window is opened, first of all a choice must be made between different graph types. The following choices are available:

- Create a graph using a graph template.
- Create a graph for analysis of all available years.
- Create a graph for one specific year, displaying one indicator and multiple spatial entities.
- Create a graph for one specific year, displaying multiple indicators for one spatial entity.



The <Continue> function will provide the user with the required configuration settings for the chosen graph type. The <Close> function will close the graph window.

*Option: Create a graph for one specific year, one indicator and **multiple spatial entities***

The selection of this option opens a graph window that is designed for the configuration of a graph with multiple data series covering one year of data of one specific indicator and function, where each data series represents the data of one of the selected regions. Up till 6 spatial entities can be selected. Every single data series displays the same indicator for a different spatial entity. The spatial entities are in this option preset to the entities that are selected by the user. In the graph window, the user is allowed to select just one indicator to be displayed for each spatial entity.

*Option: Create a graph for one specific year, **multiple indicators** and one spatial entity*

The selection of this option opens a graph window that is preset for the configuration of multiple data series covering one year of data for one spatial entity, where each data series represents a specific indicator. Up till 6 different indicators can be displayed. All graphs represent a different indicator data for the same single spatial entity. The selected spatial entity is fixed and the user is allowed to select up till 6 different indicator settings.

*Option: Create a graph for analysis of **all available years***

This option enables the user to display graphs that contain data covering data from all available years for the selected theme. It allows for the selection of one spatial entity and one indicator. Data aggregated for each year are displayed for the selected spatial entity and the selected indicator for all available years.

Option: Create a graph using a graph template

This option initializes the graph window to graph settings that are specific to the chosen template. This effectively means that certain configuration settings are pre-set to the values that are required for graphs that follow the chosen template.

3.3. Configuration of graphs

3.3.1. Graph Data

The data specific settings of a graph can be configured using the available graph settings options: indicator, spatial entity (optionally) and period (optionally). These graph settings options are divided into a graph window specific settings part (indicator and optionally the spatial entity) and a common graph settings part (period). The graph specific settings have to be set for every individual graph window, while the common graph settings can be set for more than one graph window. The common graph settings contain all settings that might potentially be shared by different graph windows, e.g. the begin and end date of the graph or a set of comparison years. Graph windows can be linked or unlinked to the common graph settings window. If linked, a graph window will use these common settings. If unlinked, the same parameters can be set in the tab called period.

Refresh graph



A user can refresh the data set in the graph window through the <Refresh graph> button.

3.3.1.1. Indicator

The indicator tab allows the user to set the data that are displayed in the graph window which are specific to the graph window (so cannot be shared over a set of graph windows).

The following settings can be configured:

Theme

The MARS theme that contains the desired datasets. The available years are shown in brackets.

Crop / Landcover

This option offers to select a specific crop or land cover for which data are simulated, processed or aggregated.

Aggregation method

Weather indicators of CGMS/CGFS level 1 are crop specific aggregated to administrative regions applying one aggregation method for two thresholds: 0 and 5%. This is way to exclude grid cells that are marginal for the chosen crop / land cover. Also RUM indicators are aggregated to administrative regions applying two aggregation methods: one using several thresholds that differ per ROI (ROI Europe: 25, 50, 75 and 100% and other ROIs (except Europe): 20 and 80%) and one with so called optimized thresholds.

Indicator

The MARS indicator to be displayed in the graph.

Indicator	Spatial entity
Theme (available years 1975 - 2010):	
Weather indicators (observed) - CGMS	
Crop / Landcover:	
Any land cover class	
Aggregation method:	
Overall mean (regardless land use - no unmixing)	
Indicator: [degree Celsius]	
Average daily temperature	
Function:	
Year of interest (YOI)	
Aggregate over time:	
Day	
Aggregation type:	
AVG	
Overlapping profile (YOI is excluded):	
None	

Function

The function to be applied to the chosen indicator. E.g. current year values, long term average, difference with long term average etc.

Aggregate over time

The time resolution to be displayed in the graph (e.g. day, dekad, month, quarter). This is only available for themes 'weather indicators (observed) - CGMS', 'Weather indicators (simulated) - CGFS based on ECMWF analysis Deterministic Model' and 'Weather indicators (simulated) - GWSI based on ECMWF analysis Deterministic Model'.

Aggregation type

The aggregation method to be used for aggregation if the selected time resolution is coarser than the original time resolution e.g. average, minimum, maximum.

Overlapping profile

Selection of a set of overlapping profiles, e.g. display the data series of the selected indicator plus minimum, maximum and average or the average and 10, 30, 70 and 90 percentiles. This way the current year can easily be compared with the reference (long term average). The selected overlapping profile is calculated for the spatial entity that appears first in the list of selected

spatial entities. Note that the selected Year of Interest (YOI) is excluded in the calculation of the overlapping profiles.

For specific combinations of indicators and functions, extra settings might be available. Examples are the selection of the maximum temperature as criterion for the number of hot days or the difference type (absolute or percent) and year number for the comparison of the current year with another year.

If the user has chosen the option of “analyze one specific year: multiple indicators, one spatial entity”, a maximum of 6 tabs with graph settings are available to set the graph settings for up till 6 different indicators.

Indicators
Spatial entity

1
2
3
4
5
6

Visible

Theme (available years 1975 - 2010):

Weather indicators (observed) - CGMS ▼

Crop / Landcover:

Any land cover class ▼

Aggregation method:

Overall mean (regardless land use - no unmixing) ▼

Indicator: [degree Celsius]

Average daily temperature ▼

Function:

Year of interest (YOI) ▼

Aggregate over time:

Day ▼

Aggregation type:

AVG ▼

Overlapping profile (YOI is excluded):

None ▼

In case the user has chosen the option “analyse all available years”, the settings for theme, crop / landcover, aggregation method, indicator, function, aggregation type and overlapping profile are available.

Indicator
Spatial entity

Theme (available years 1975 - 2010):

Weather indicators (observed) - CGMS
▼

Crop / Landcover:

Any land cover class
▼

Aggregation method:

Overall mean (regardless land use - no unmixing)
▼

Indicator: [degree Celsius]

Average daily temperature
▼

Function:

Year of interest (YOI)
▼

Aggregation type:

AVG
▼

Overlapping profile (YOI is excluded):

None
▼

Show only values outside confidence interval

Standardize values

Order by: value asc

Besides the user can choose the following options.

Show only values outside confidence interval

With this option the user chooses to exclude values within the confidence interval and only displays the years with extreme values.

Standardize values

Yearly values are standardized, the value displayed is the difference between the specific year and the average of all displayed years divided by the average.

Order by

Lets the user order the yearly values in descending or ascending order, either by year or by value.

3.3.1.2. *Spatial entity*

In this tab the user can select the spatial entity (grid cell, NUTS region etc) but only if the graph window is not linked to the map child window or orientation window. See for more information section 3.4.

3.3.1.3. *Period*

In case the user disables the feature “Linked to common graph settings” the graph window is no longer linked to the common graph settings window and an additional tab appears in the graph window called “period”. This tab contains the same settings compared to the common graph settings. See for more information section 3.3.1.4.

Linked to common graph parameters

3.3.1.4. *Common graph settings*

The common graph settings allow the user to set the data specific settings for the graph window that might be shared between different graph windows. Graph windows can be linked to the common graph settings or unlinked. In the case of a linked graph, the common graph settings are set through a separate common graph settings window and these settings will be shared by every linked graph window. In the case of an unlinked graph window, a second tab additional settings appears in the unlinked graph window, which allows for configuration of the same options for that individual graph.

The following graph settings can be set as common graph settings:

Timescale: Day

Through this option, the user can set the start and end date of the data series expressed in calendar days. The dekads (see below) are synchronized with these entered days.

Timescale: Dekad

Through this option, the user can set the start and end date of the data series expressed in dekads. The days (see above) are synchronized with these entered dekads.



Timescale: Development Stage

Through this option, the user can set the start and end date of the data series expressed in development stages. This option will become available once the CGMS level 2 crop indicators are supported in the graph window. Currently these indicators are offered in the user interface but the underlying data server does not return the data sets.

Common graph settings






Timescale: Day

Start date: End date:






2010/01/01  2010/06/30 

Timescale: Dekad

Start dekad:

2010   1   1-10 

End dekad:

2010   6   21-end 

Timescale: Development stage

Last available data (available next version)

Comparison years:

1: 2: 3:

Refresh all linked graphs

Last available data

This option will become available in the future.

Comparison years

This option allows the user to select one to three years for comparison of the selected year with a set of other years.

A user can update all graphs that are linked to the common graph parameter window through the <Refresh all linked graphs> button.

3.3.2. Graph Layout

The graph layout provide options to configure the layout of all aspects of the displayed charts and graph series.

Refresh layout

A user can refresh the layout in the graph window through the <Refresh layout> button.

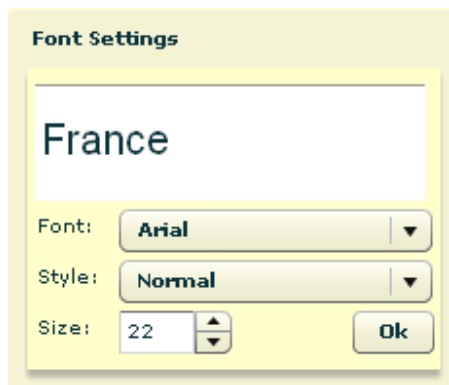
3.3.2.1. *Layout*

The layout tab allows for the configuration of all chart layout settings, varying from chart titles to colors and axis-settings.

The following chart settings are available, many of the available settings allow for editing and either displaying or hiding the specific chart element through a <Show> check box.

Title

With this option, the title of the graph can be set. Selected placeholders can be used to generate a standardized title text. By default the graph title is set to the name of the selected region (placeholder = REGIONTITLE). Other text, entered by the user, will be maintained and only the placeholder part will be refreshed each time. By activating the “Title” caption a small window appears in which the user can change font settings like type, style and size.



Subtitle

With this option, the subtitle of the graph can be set. Selected placeholders can be used to generate a standardized subtitle text. By default the graph subtitle is set to the name of the (combined) selected indicator(s) (placeholder = INDICATORTITLE).

- Placeholders for title and subtitle should be placed within % characters, e.g.. %REGIONTITLE%. Currently the following placeholders are available:
 - %REGIONTITLE%
 - %INDICATORTITLE%
 - %CROP%
 - %PERIOD%

By activating the “Subtitle” caption a small window appears in which the user can change font settings like type, style and size.

Footer

With this option, the user can set the footer of the graph. By activating the “Footer” caption a small window appears in which the user can change font settings like type, style and size.

Background Color

This option allows the user to set the background color of the chart. Two colors can be selected. The background color will gradually change if the colors differ. To obtain an uniform background color, the required color should be selected twice.

Tooltip

With the tooltip option, the user can toggle the tooltip option. Tooltips displays the x and y value of data points in the graph when the user moves the mouse over a specific data point in the graph.

Legend position

This setting provides several options to determine the position of the legend in the chart. By activating the “Legend” caption a small window appears in which the user can change font settings like type, style and size.

Select Axis

This control allows the user to select the axis to which the settings in the Axis configuration area apply.

Axis Title

With this option, the title of the selected axis can be set. By activating the “Title” caption a small window appears in which the user can change font settings like type, style and size.

Axis Unit

This option allows the user to select the unit to be displayed on the selected axis. In case of a graph displaying ‘multiple indicators for one spatial entity’ each indicator can have a different time unit (time resolution) e.g. days and dekads. One of the time units can be selected for displaying common labels on the x-axis. Default the smallest time unit is set.

Axis Ticks

This option toggles the display of ticks on the selected axis.

Axis gridlines

This option allows for the toggling of major and minor gridlines on the chart canvas. It also allows the selection of a color for the gridlines.

Scale values

This option toggles the display of the labels on the selected axis. By activating the “Scale value” caption a small window appears in which the user can change font settings like type, style and size.

Axis minimum and maximum

With these settings the user can configure the minimum and maximum value of the selected axis. For time values on the x-axis, the format selected in the unit setting should be followed.

3.3.2.2. *Series Settings*

The series settings tab allows the user to configure series specific settings, varying from series labels to colors and styles for the display of individual data series.

Many of the available settings for data series allow for editing and either displaying or hiding the specific series element or setting through a <Show> check box. The following series configuration settings are available.

Select series

This control allows the user to select data series to which the visible settings in the series settings tab apply. It also allows to show or hide the selected series.

Label

With this setting, the label of the selected series can be adapted. The label is used in the legend text for the series and as a series description in the tooltips showing the series values. By default the placeholder LABEL (noted between %) is used to generate a standardized label text. Other text, entered by the user, will be maintained and only the placeholder part will be refreshed each time.

Type

Using this option, the user can select the type of graph to be displayed. Currently available types are line, area, bar and stock graphs. In case the type 'line' is selected it can be presented as a smoothed line by enabling the smooth option.

Style

Allows the configuration of the line style (e.g. solid, dashed etc.) of the selected series. This option is only available for graphs of type line.

Symbol

This option allows for the visualization of the series data points using symbols (e.g. diamond, circle etc.). This option is only available for the line type. The symbol size can be resized through the radius option.

Color

The two color controls can be used to set the stroke color and the fill color of the selected data series. The fill color option is only available for the types area and bar.

Thickness/width

This option determines the thickness of the graph types. In the case of line, area and stock graphs it determines the thickness of the line/stroke. In the case of a bar graph series, the option determines the width of the bars.

Stock second series

This option allows the user to choose the second data series to be used to display the stocks in the case of a stock type graph series.

3.4. Graph functions

The graph window provides a set of graph window functions, which are described in this section.

*Link / Unlink graph window*

The Link/Unlink button allows the user to link or unlink the graph window to the orientation canvas or a map child window depending on the window from which the graph window was opened. If opened from the orientation window it will be linked or unlinked to the orientation window. If opened from a map child window it will be linked or unlinked to the map child window. In case the map child window is linked to the orientation window this difference is not important as both windows are synchronized.

If linked, a graph window will use the selected spatial entities (features) of the selected resolution in the orientation canvas or map child window as the basis for the spatial entities to be displayed in the geographically linked graph. A maximum of six spatial entities can be selected and

displayed in the graph window. A geographical link is synchronized, so a geographically linked graph window will automatically adapt the displayed graph series if the user changes the selection of spatial entities or the even the selected resolution (as long as features are selected!) in the orientation canvas or map child window.

Unlinked windows are fully independent from other windows, but when they are re-linked, the shared settings will be reset according to the settings of the orientation canvas or map child window.


If unlinked the user can select spatial entities in the settings tab. At the national level this can be done by selecting one or more countries.

The screenshot shows the 'Spatial entity' settings tab. At the top, there are two tabs: 'Indicator' and 'Spatial entity'. Below the tabs is a 'Resolution:' dropdown menu set to 'NUTS Level 0'. Underneath, there are two columns: 'Available' and 'Selected (max. 6)'. The 'Available' column contains a list of countries: Albania, Algeria, Andorra, Armenia, Azerbaijan, Belarus, Belgique-België, and Bosnia and Her. The 'Selected' column contains 'France'. A right-pointing arrow button is between the two columns. Below the 'Selected' column is a 'Remove' button.

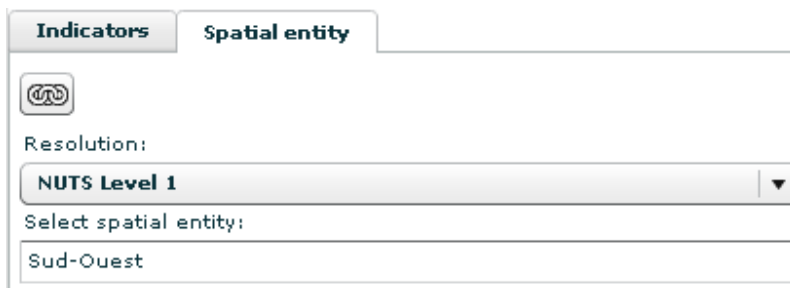
In case of a lower (more detailed) resolution the user must enter the exact name or grid number.

The screenshot shows the 'Spatial entity' settings tab. At the top, there are two tabs: 'Indicator' and 'Spatial entity'. Below the tabs is a 'Resolution:' dropdown menu set to 'NUTS Level 1'. Underneath, there is an 'Enter spatial entity:' text input field containing 'noord-nederland'. To the right, there are two columns: 'Selected (max. 6)'. The 'Selected' column contains 'noord-nederland'. A right-pointing arrow button is between the input field and the 'Selected' column. Below the 'Selected' column is a 'Remove' button.

The above examples are valid for the graph type “*one specific year, one indicator and multiple spatial entities*”. For the graph type “*Create a graph for one specific year, multiple indicators and one spatial entity*” and “*Create a graph for analysis of all available years*” the Spatial entity tab has the following format at national level:



And the following format at sub national level or grid level:



Printing or exporting a map window



The print map button generates a bitmap for export and printing of the graph canvas. It opens a window containing the current graph canvas, for exporting and printing. The Export Graph window that will be opened shows the graphs as it will be printed and offers function to print and to export to different file types:



1. *Print map*
Allows the user to print the graph. The print function opens a common print dialog, which allows the user to print the graph.
2. *Export to PDF*
Allows the user to export the graph as a PDF document on the local file system. The export to PDF function opens a common MS-Windows save file dialog, which allows the user to save the PDF-document.
3. *Export to png*
Allows the user to export the graph as a *.png file on the local file system. The export to

png function opens a common MS-Windows save file dialog, that allows the user to save the *.png file.

- The export function only works for the analyst viewer in the Adobe AIR environment. An instruction for installation and setup is included in the Annex to this document.
- The export function currently supports the *.pdf and *.png formats.

Hide / Unhide graph data settings section



This function allows the user to hide or unhide the graph data settings section of a graph window. It thus allows to create extra space to display the graph canvas.

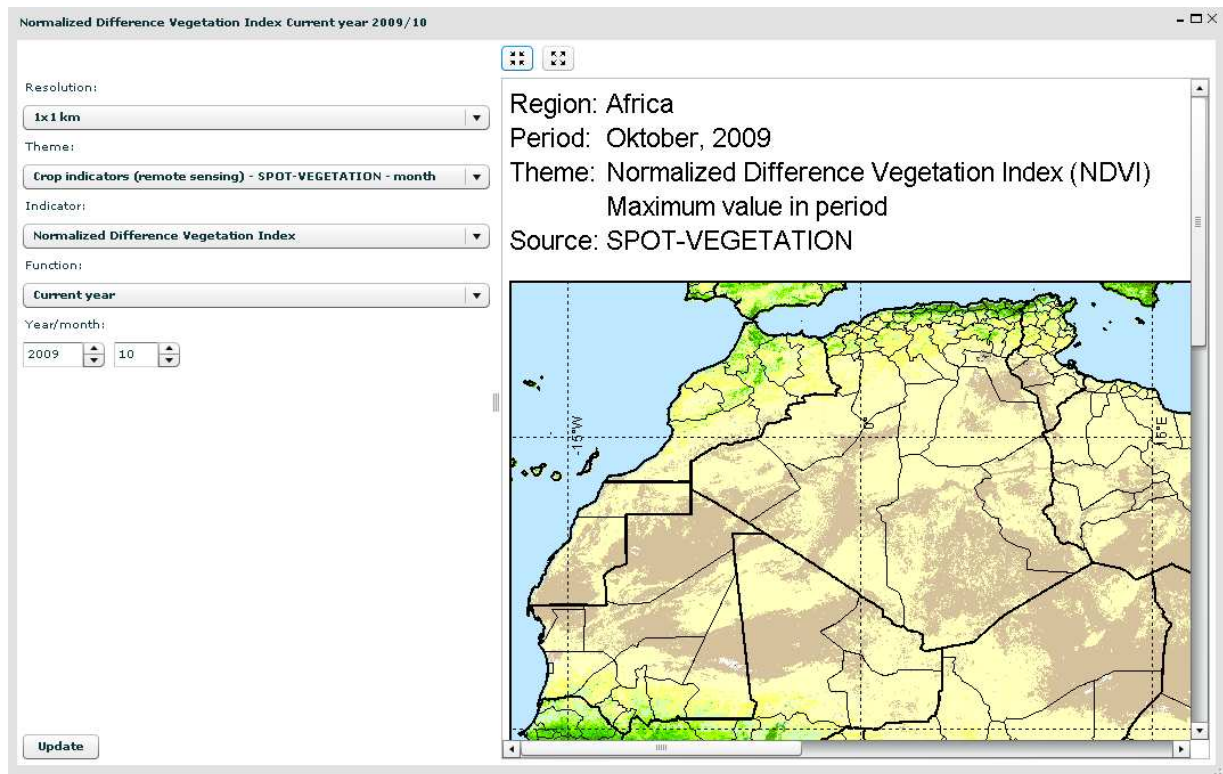
Hide / Unhide graph layout settings section



This function allows the user to hide or unhide the graph layout settings section of a graph window. It thus allows to create extra space to display the graph canvas.

4. MARS analyst viewer – quicklooks

The quicklook window is offered for all regions except Europe. It includes static maps of satellite based vegetation indices at a resolution of approximately 1 km. As these maps are static, pre-processed maps there are no additional features like map navigation, legend editing or graph display.



Selection of quicklook

Within the quicklook window the user can select the quicklook map of his/her choice. The following choices have to be made: resolution, theme, indicator, function and time step. Afterwards the user confirms by clicking the update button. The quicklook is presented in the original size. In case it does not fit in the window scroll bars will appear.

Simple zoom



The size of the quicklook can be decreased by clicking on the left button. The decrease goes in predefined steps. Restoring the original size can be accomplished by clicking the right button.

Annex 1 – Installing Adobe AIR and the AIR version of the viewer application

This Annex describes how to install the AIR version of the viewer application. The AIR version of the viewer application runs on the client in the Adobe AIR environment. This enables the application (among others) to access the local file system to export files.

Step 1 – Installing Adobe Air

- Run the file AdobeAIRInstaller.exe
This will install the Adobe AIR environment on your PC and allows you to run the MARS analyst viewer locally.

Step 2 - Install the AIR version of the viewer application

- Run the file MarsViewer.air
A .air file is associated with the Adobe AIR environment. Running this file will install the AIR viewer application. It will also be added to the menu and (if selected) as a desktop item.

Step 3 – Run the AIR version of the viewer application

- Open the application through the menu item or desktop shortcut “MarsViewerAir”.