ARIS Grid & Raster Editor for ArcMap 10
User's Manual

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ARIS B.V.

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1. Introduction

The ARIS Grid & Raster Editor for ArcMap is designed to edit raster datasets easily in ArcMap, without the need of Spatial Analyst. One can, for instance, change the value of a single cell, or change the value of more cells by sketching in the map.

One possible use of the ARIS Grid & Raster Editor is to correct errors in an existing raster. For example, when a raster is generated from satellite or photo imagery, automatic classification can cause misclassified cells through problems with reflection or atmospheric conditions. With the ARIS Grid & Raster Editor these cell values can simply be modified.

The ARIS Grid & Raster Editor can also be used as a sketch tool. The Grid & Raster Editor can be used to interactively design plans, which can be processed and evaluated with Spatial Analyst tools immediately.

At version 4.0 the tool is renamed from **ARIS GRID Editor** (only able to edit ESRI GRID) to **ARIS GRID & Raster Editor** (being able to edit various raster formats).

At this moment the below versions are available (check website):

- ARIS GRID Editor version 2.2 supports only ESRI GRID and is the release for ArcMap 9.2, 9.3.x.

- ARIS GRID Editor version 3.3 supports only ESRI GRID and can be used with ArcMap 10.0 - 10.3.1.

- ARIS Grid & Raster Editor version 4.5.1 supports various editable single- and multi-band raster formats (including ESRI GRID). This version can be used with ArcMap 10.0 - 10.8.

This manual only describes the latest ARIS Grid & Raster Editor for ArcMap 10 version. For other ArcGIS versions check the Grid & Raster Editor website:

> http://www.aris.nl/gridrastereditor_arcmap

2. Installation

2.1 Requirements

Required is one of the following ArcGIS 10.0, 10.1, 10.2, 10.2.1, 10.2.2, 10.3, 10.3.1, 10.4, 10.4.1, 10.5, 10.5.1, 10.6, 10.6.1, 10.7, 10.7.1 or 10.8 licenses:
• ArcView / ArcGIS Desktop Basic
• ArcEditor / ArcGIS Desktop Advanced
• ArcInfo / ArcGIS Desktop Enterprise

ArcGIS is not required for the "License Manager only" setup.

Additional extensions like Spatial Analyst are not required.

For other ArcGIS versions check the Grid & Raster Editor website:

http://www.aris.nl/gridrastereditor_arcmap

2.2 Install

2.2.1 Single User and Floating License Client setup

Installation of the ARIS Grid & Raster Editor for ArcMap is accomplished by the following steps:

1. The automatic setup of your choice needs to be executed by the administrator:
   • Single User License: ARISGridRasterEditorSetup<version>.exe (Trial License included)
   • Floating License: ARISGridRasterEditorSetupFL<version>.exe (License Manager included). If not (yet) available for download, please send a request to helpdesk@aris.nl

2. In ArcMap 10, from the *Customize* menu choose *Toolbars* and make sure there is a checkmark next to ARIS Grid & Raster Editor to make the toolbar visible.
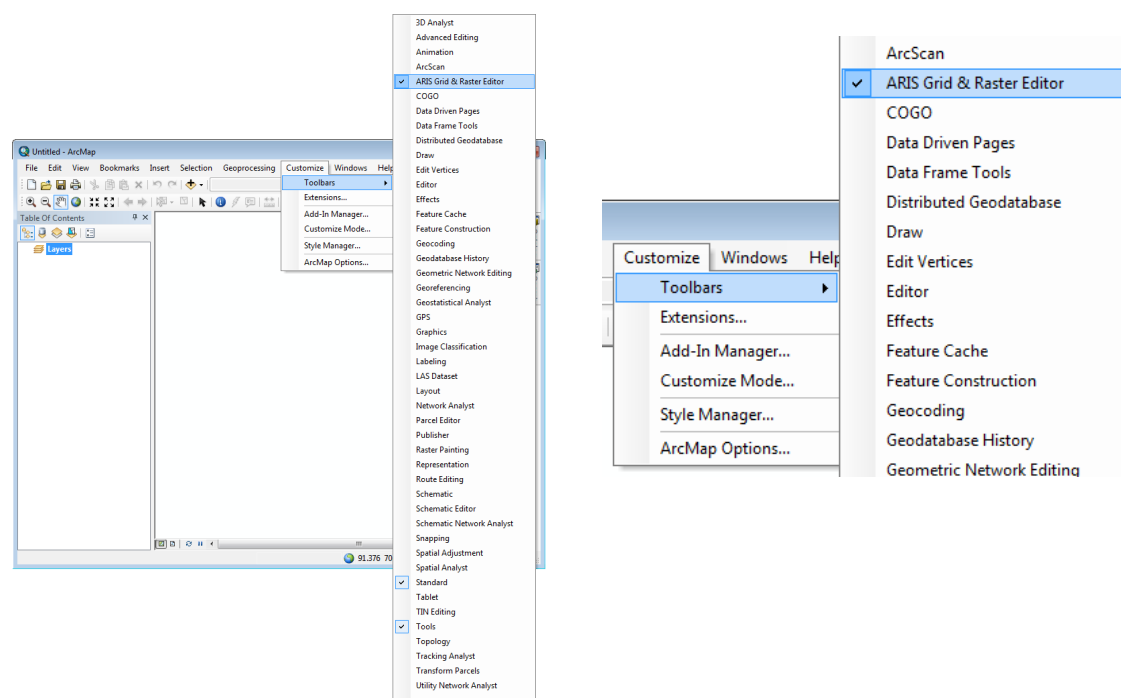
2.2.2 Floating License Manager setup

If one of the PC's with ArcGIS is serving as floating license manager no further installation is needed (jump to Register Floating License paragraph).

Having a Floating License it is also possible to do a License Manager only setup to avoid the requirement for ArcGIS on the License Manager Server:

- License Manager: ARISGridRasterEditorSetupLM<version>.exe. If not (yet) available for download, please send a request to helpdesk@aris.nl

3. Registration

ARIS Grid & Raster Editor has two license types:
- Single User License. One license is valid for one computer only;
- Floating License. A floating license is handled by a central server and allows a maximum number of users to simultaneously use the executable.

3.1 Single User License

3.1.1 Trial license

The distributed version of the ARIS Grid & Raster Editor is a full functional version with a trial license. This means it can be used for evaluation purposes for 5 days. During this period the number of edit actions within one ArcGIS session is limited to 5. After this period, the Grid & Raster Editor will be locked until a valid license key is entered.
While in trial mode, each time you start editing a raster and each time you change the drawing tool, a reminder message will be shown.
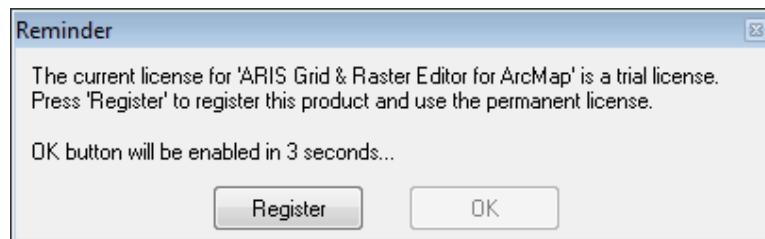
Pressing the *Register* button will present you with the following dialog, where you must enter your name and the registration key (If you want to use Grid & Raster Editor in trial mode, wait till the *OK* button comes available and press *OK*).
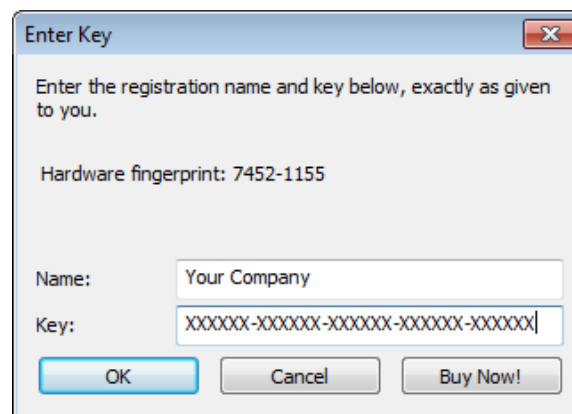
3.1.2 Register

If you do not yet have a registration key press the *Buy Now!* button. This will take you to our online store, where you can order this product or go to the appropriate Buy link on the Grid & Raster Editor website:

http://www.aris.nl/gridrastereditor_arcmap

Note that you will need the hardware fingerprint of the computer where you want to install the tool, shown in the dialog above. After you complete your purchase, a personal registration key will be sent to you by email. Please store this key in a safe place.

Once you have entered a valid registration key, press *OK*. This key will be stored on your pc. The reminder message will not be shown again.
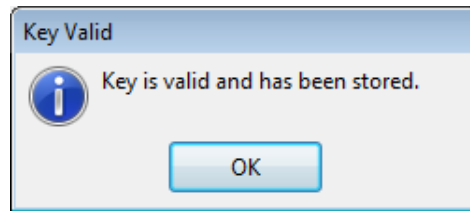
Note: To store your license persistent between sessions it may be necessary to run the registration as administrator. Having administrator privileges may not be sufficient.

3.1.3 Update license

When your license is not valid anymore through changes on your PC or if you want to move your license to a new PC, you can obtain a new license (fair use policy) after you unregister the license (best to notify us beforehand about your plans so we can assist you). Please contact us at helpdesk@aris.nl for assistance with the unregister process.
You will need to issue the following command as the Administrator user in a DOS-box or Windows Powershell and copy the unregister code:

```
cd "\Program Files (x86)\ARIS\GridRasterEditor"
ARISGridRasterEditorA.exe unregister
```

Send an e-mail to helpdesk@aris.nl with:
- ARIS product name and version
- Original hardware fingerprint (active license, if available)
- Registration name (active license)
- License key (active license)
- Confirmation code (from unregister, contact us for instruction)
- New hardware fingerprint (from register)

If you are entitled to receive a new license key, a new key will be sent to you by e-mail as soon as possible (same day, but might also take some days as this is not an automated process).

3.1.4 Invalid license

When major changes to your hardware have caused the license to become invalid, you can obtain a new valid license if you provide the necessary information (fair use policy).

To verify that hardware changes are the cause of the invalid license, you need to send a 'Hardware Change Log' file with the request for a new license. To get this Hardware Change Log contact us at helpdesk@aris.nl for assistance. You will need to issue the following command as the Administrator user in a DOS-box or Windows Powershell:

```
cd "\Program Files (x86)\ARIS\GridRasterEditor"
ARISGridRasterEditorA.exe hwchangelog
```

Send an e-mail to helpdesk@aris.nl with:
- ARIS product name
- Original hardware fingerprint (from license information sent by email)
- Registration name (from license information sent by email)
- License key (from license information sent by email)
- AHCL file (from HWchangelog, contact us for instruction)
- New hardware fingerprint (from Register/Enter Key)

3.2 Floating License

3.2.1 Register

A floating license is handled by a central server and allows a maximum number of users to simultaneously use the tool. This paragraph describes how to register and start the central server license manager.

The floating license executable has no evaluation period. After the floating license executable is installed the Floating License must be registered first. Entering the following command as the Administrator user in a DOS-box or Windows Powershell does this:

```
cd "\Program Files (x86)\ARIS\GridRasterEditor"
ARISGridRasterEditorA.exe SERVER REGISTER
```

The "Enter key" dialog-box appears:
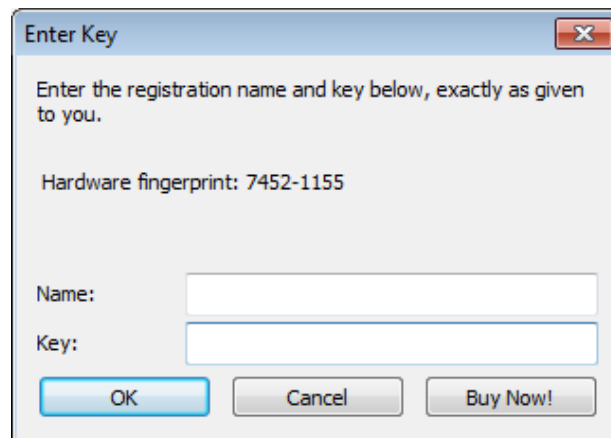
Remember the hardware fingerprint and send it back to ARIS (mail to helpdesk@aris.nl). In return you will receive a name and key to register. You can enter these in the "Enter Key" dialog. A message box should confirm your registration:

Once you have entered a valid registration key, press *OK*. This key will be stored on your PC.
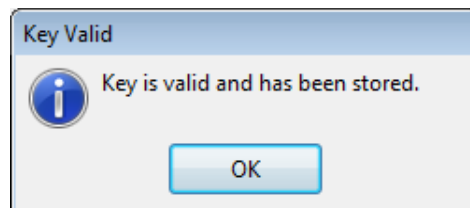
It may be necessary to register explicitly as administrator to let the license key be persistent between sessions (administrator privileges might not be sufficient).

3.2.2 Start License Manager

After you have registered you can start the license manager:

```
ARISGridRasterEditorA.exe SERVER
```

This shows the server dialog-box for sixty seconds. There can be only one server instance at a time per program.

The Floating License manager may require a port to be opened in the firewall as will be notified while starting the license manager.

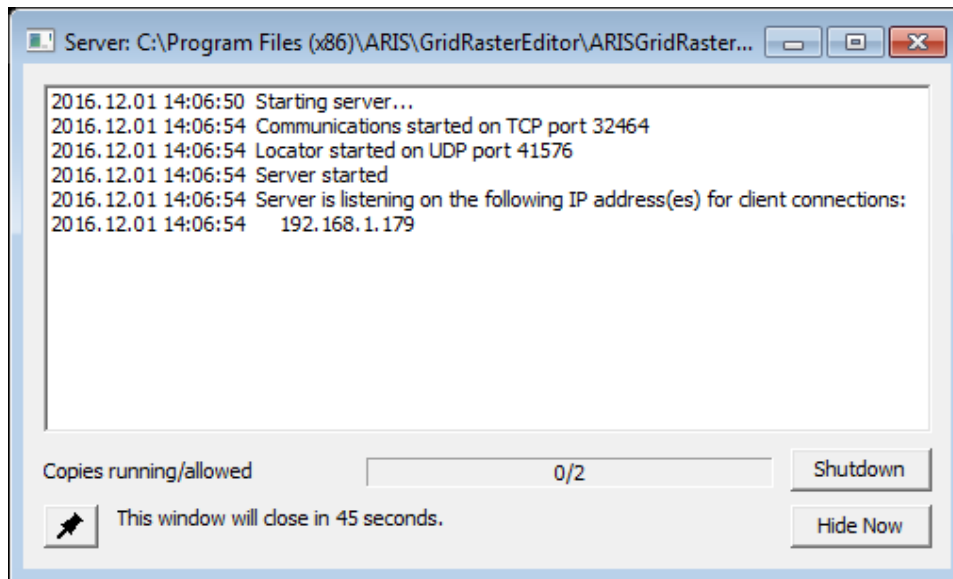When the server is running the tool can be used on any client machine. A maximum number of users can use the tool at any time. The server window displays how many users are running the tool and how many are allowed to run the tool. For each licensed user one licensed copy is provided.

Other useful commands on the server-side are:

To start the server and display the server window for a certain time period instead of the normal 60 seconds:

   ARISGridRasterEditorA.exe SERVER10

This will display the server window for a maximum of 10 seconds. There should be no blanks between the SERVER and the time-out period.

To start the server window without a timeout use the command:

   ARISGridRasterEditorA.exe SERVERX

Alternatively you can press the timer-button in the server window.

To shut down the server:

   ARISGridRasterEditorA.exe SERVERDOWN

After this the server must be re-started before any clients can obtain a license.

3.2.3 Using a Floating License

Using a Floating License may require a port to be opened in the firewall (see also Start License Manager).

A license is obtained after a user starts an edit session by choosing "*Start Editing with Immediate Saves*" in the Grid & Raster Editor toolbar. This license is kept during the entire ArcMap session.

A license is released after ending the ArcMap session. Note that it may take a short time (approximately 30 sec.) before the server notices that someone has exited the tool.

When someone tries to use the tool while no licenses are available that user receives an error message:
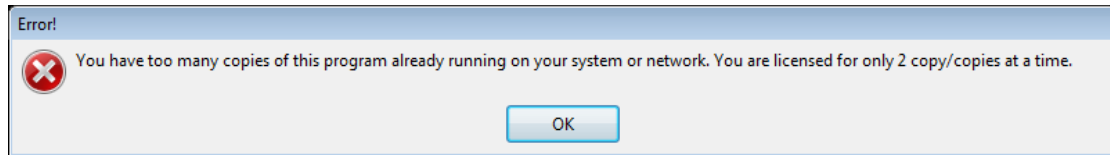
If the Floating License Manager cannot be found from a client machine (e.g. when the License Manager is in a different subnet) an ini-file needs to be placed on the client in the same directory as ARISGridRasterEditorA.exe:

    ARISGridRasterEditorA.ini

Containing:

```
[LICENSE]
Server=192.168.20.1
```

Replace the above IP with the IP-address or name of the server.

In this ini-file you can use:
- Server=<IP address> or <server name> (case-insensitive)
- Timeout=<seconds> (default is 3, if network/connection is slow it might be increased)

3.2.4 Update license

When you plan to upgrade your server hardware or want to transfer to a new server, you can obtain a new license (fair use policy) after you unregister the license (best to notify us beforehand about your plans so we can assist you). Enter the following command as the Administrator user in a DOS-box or Windows Powershell and copy the unregister code:

    ARISGridRasterEditorA.exe SERVER UNREGISTER

Send an e-mail to helpdesk@aris.nl with:
- ARIS product name and version
- original hardware fingerprint (active license, if available)
- registration name (active license)
- license key (active license)
- confirmation code (from unregister)
- new hardware fingerprint (from register)

If you are entitled to receive a new license key, a new key will be sent to you by e-mail as soon as possible (same day, but might also take some days as this is not an automated process).

4. Using the ARIS Grid & Raster Editor

4.1 Start editing

In ArcMap, from the *Customize* menu choose *Toolbars* and make sure there is a checkmark next to ARIS Grid & Raster Editor to make the toolbar visible (see also chapter 2 Installation).
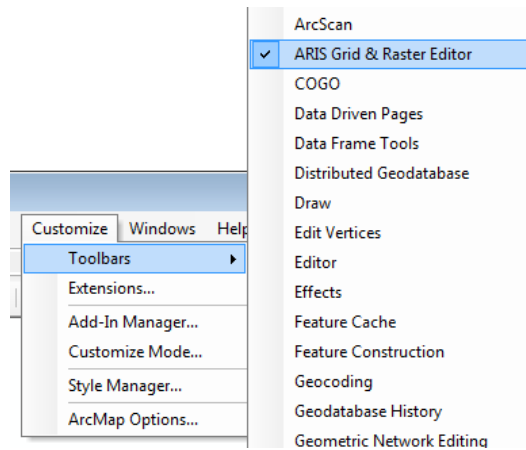
Open the example as described below or add a raster of your choice to the map. For evaluating the ARIS Grid & Raster Editor it is advised to use the example first.

To work with the example:
1. Preferably **copy the example directory** (<program files>\ARIS\GridRasterEditor\Example) to a directory of your choice e.g. C:\Test
2. **Open the example** C:\Test\Example\Example.mxd.
3. In the table of contents in ArcMap, **activate** the Data Frame "Integer rasters" (right click on the Data Frame and choose Activate).
4. **Activate** (select or highlight) the layer "LandUse" ("LandUse - GRID") in the example or activate another layer which dataset's format is raster (click on the Layer Name).
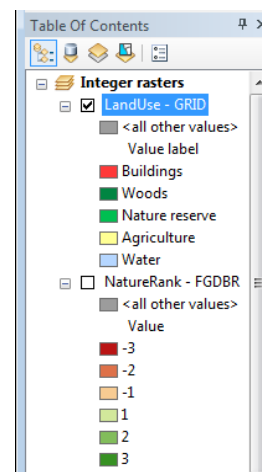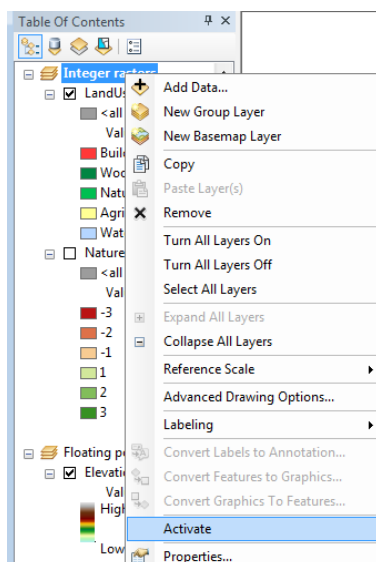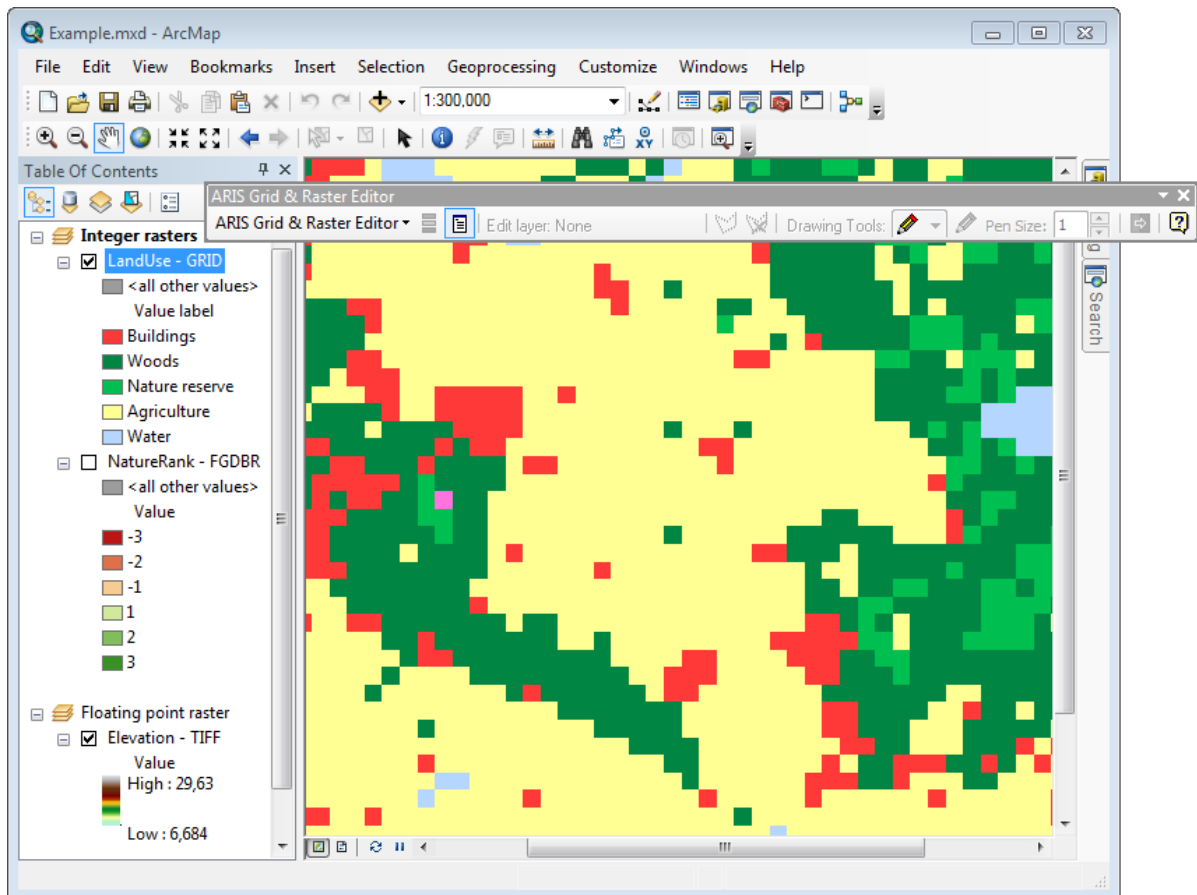
It is recommended to use a *Unique Values* classification and define the "all other values" symbol.

Tip: Set the NODATA symbol and "all other values" symbol to easily detectable symbology (not a hollow symbol) as in the below example.
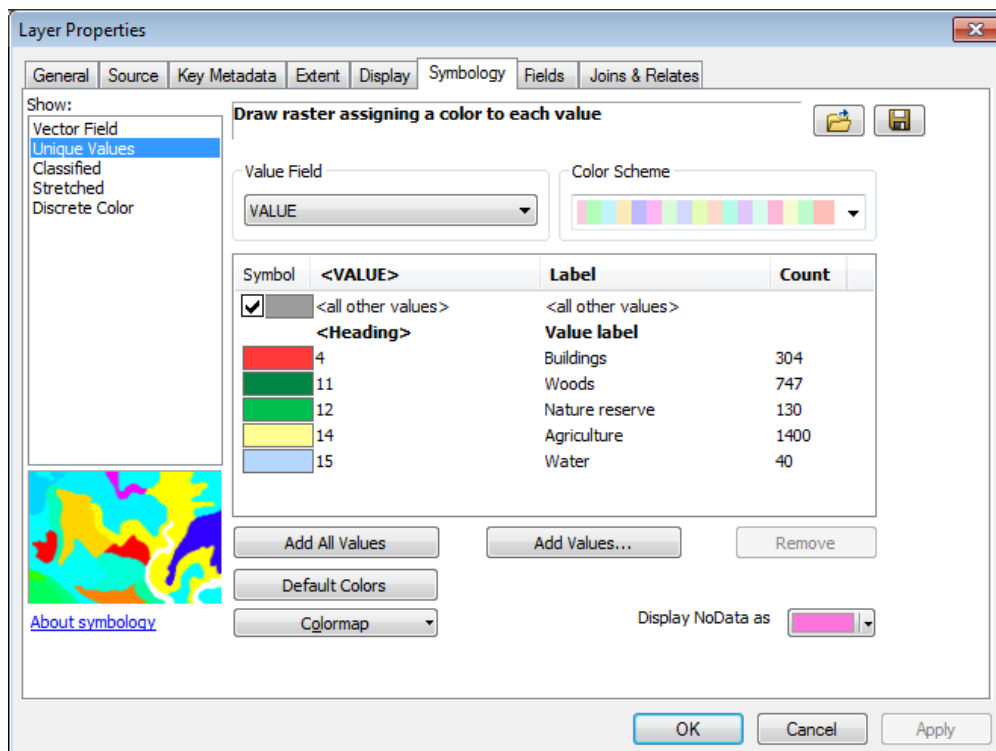
Be sure to have a good **backup** of your raster. From the Grid & Raster Editor dropdown menu, choose *Start Editing with Immediate Saves*.
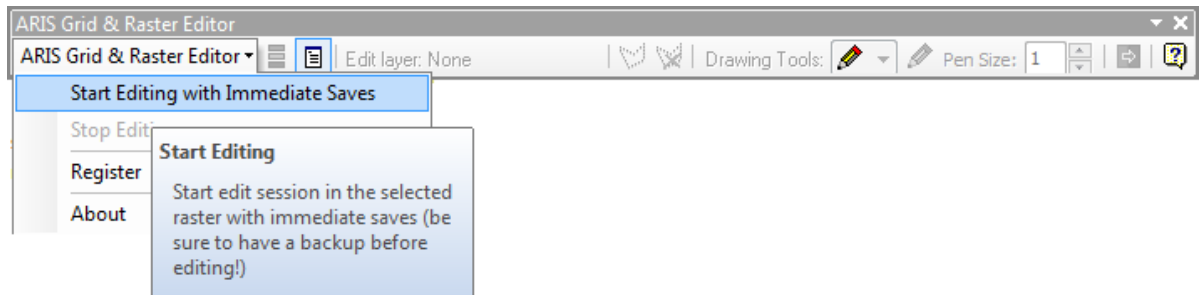
The Grid & Raster Editor Legend will be opened, and the ArcMap table of contents will be hidden.
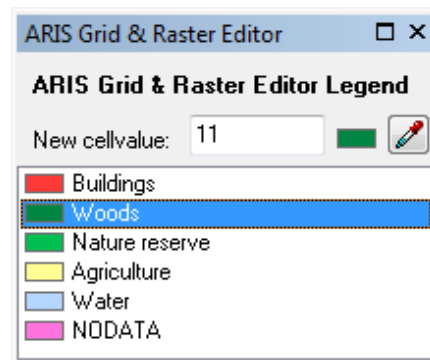
The Grid & Raster Editor Legend reflects the current symbology for your raster.

While editing you will be able to Undo and Redo only a limited number of actions through the ArcMap Edit / Undo and Redo menu or the Undo / Redo buttons on the ArcMap toolbar. Undo/Redo is limited to a certain number of actions and is NOT subject to selection area. Undo/Redo will be disabled with operations on a large number of cells to prevent memory problems (see Known Issues).

4.2 Editing a raster

The Grid & Raster Editor Legend shows a list of available classes and the *New value*. Beside the available classes an extra legend item with the NODATA-symbol may be added to the list (for File Geodatabase Raster and SDE Raster only available in ArcGIS 10.6; See Known Issues). You can either select a legend item in the list, manually enter it's numerical value in the edit box or pick a value in the map with the color picker tool. Edited raster cells will be changed to this value.
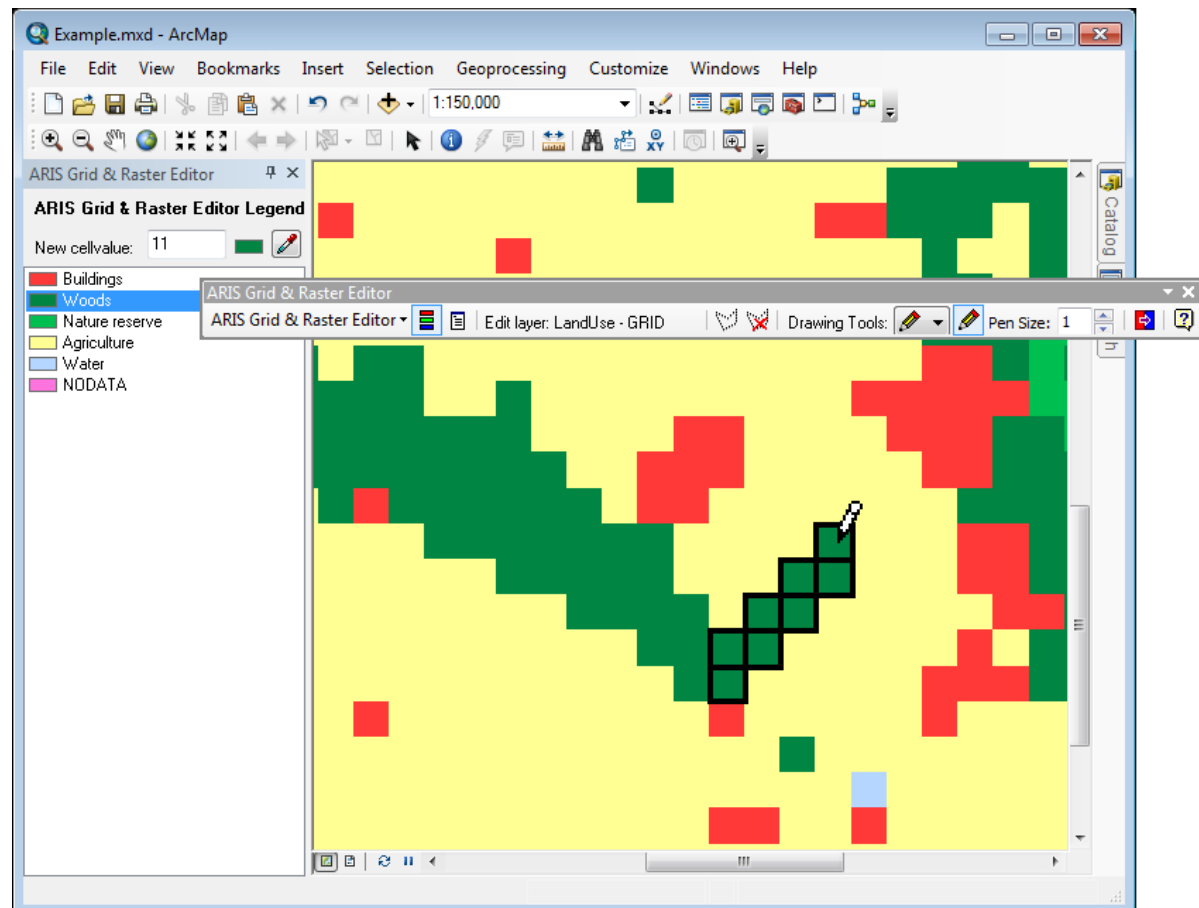
To use the Nodata-value as New value, select the NODATA legend item in the list or enter the word *NODATA* in the edit box.

After selecting the desired legend item, choose a *drawing tool* from the *Drawing Tools* dropdown list:

Or activate an already chosen tool directly:

These tools work similar to most painting applications, such as *Paint*, *PhotoShop* and *Paint Shop Pro*. See paragraph 4.8 for a description of the available drawing tools in the ARIS Grid & Raster Editor Toolbar.

Note: You can set the New value in three ways:

- Enter a value in the editbox
- Click on the legend item in the Grid & Raster Editor Legend
- Use the Color Picker to select a color/value from the map

When a value is entered in the *New value* editbox that's not defined in the current classification, a yellow exclamation mark is shown, indicating that cells you edit may not show up on the map.

The symbol used for drawing cells with values not falling within the defined symbology (the Warning ⚠ symbol may appear) depends on the type op classification:
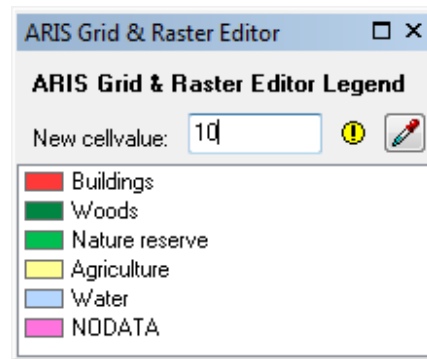
Unique Values classification
The cells will typically be drawn using the "all other values" symbol if defined for the symbology. If "all other values" is not defined, new values will be drawn using the NODATA symbol, as defined in the layer properties. It's advised to always set "all other values" to an easily detectable symbology.

To draw the not previously defined value and update the ArcMap legend, it may be necessary to use the Add Values button in the Symbology properties tab of the layer. (see also 4.9 Known problems for a ESRI bug regarding legend problems with add values).

Classified or Stretched classification
The cells will typically be drawn using the NODATA symbol that's defined for the symbology if no symbol is available for that value.

To draw the not previously defined value and update the ArcMap legend, it may be necessary to reclassify in the Symbology properties tab of the layer.

RGB Composite classification
Only values within the RGB range will be accepted, so a color conforming to the classification will always be drawn.

Note: The Warning ⚠ symbol may appear when some additional symbology settings have been made in the layer properties such as:

- Use of the Alpha Channel
- Stretch Type other than "None"
- Stretch Type Statistics other than "From Each Raster Dataset"
- Apply Gamma Stretch (with Gamma Values other than 1)
- Use Hillshade Effect
- Stretched renderer based on integer values

This only effects the preview of the edit symbol, edits can still be done, but initially a transparent symbol might be used while drawing.

Setting the Stretched or RGB Composite rendering to Invert will automatically take the inverted colors correctly.

4.3 Edit with pen size

The tools Pencil and Line use the pen size to determine how many pixels (cells) must be affected.
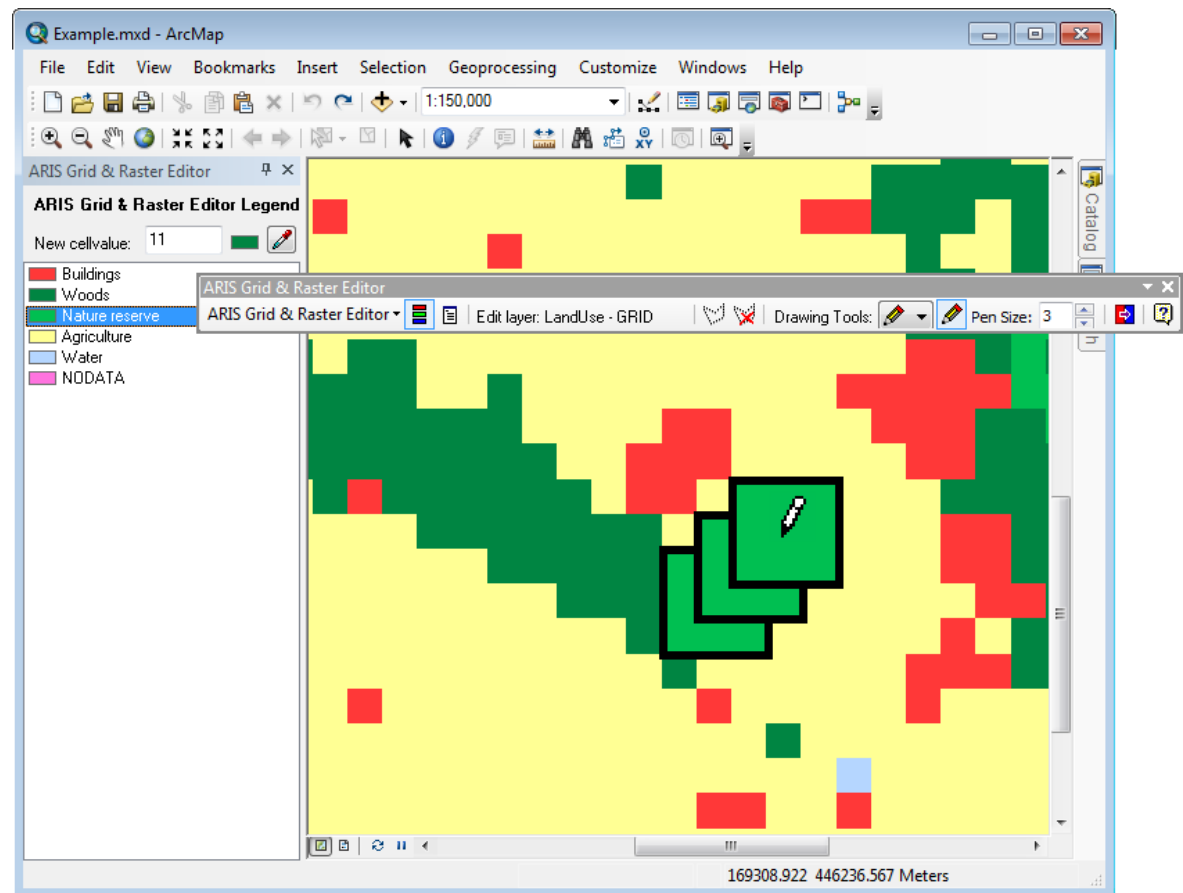
If you chose by example a pen size of 3 (as in the above example), not only the cell pointed at but also all cells next to the pointed cell will be edited. With greater pen size this increases accordingly. If you use even pen size, there is a priority of cells in the upper left to be edited.
Using the Pencil tool, a freehand line is drawn as long as the left mouse button is being pressed.
With the Line tool, first a line is drawn following the clicks made in the map. A double click will finish the Line draw and the affected pixels/cells will get their new value.

4.4 Edit within selected area

Choose the "Draw selection area" tool to draw an area within which all edit actions will take place (also know as a Selection Mask).
Click one or more times to create the selection polygon. Double click to finish drawing.
The selection area only shows the exact outline of the selected cells. As soon as a selected area is present, the edit tools will only work for cells falling completely within this area. Also the replace value tool will only work on cells inside this area.

After creating the selection area, choose a drawing tool of your choice to make any edits.

The selection area will remain active until you press the "Remove selection area" button .
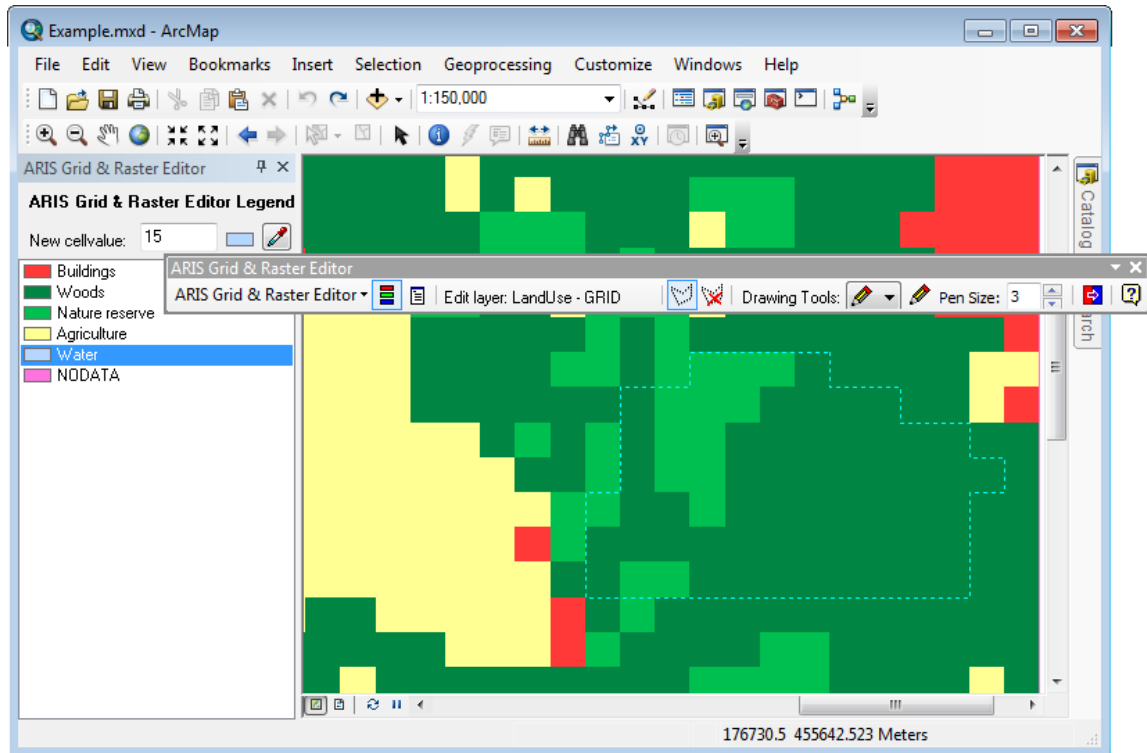
Use an editing tool like the Polygon Drawing Tool and draw a polygon:
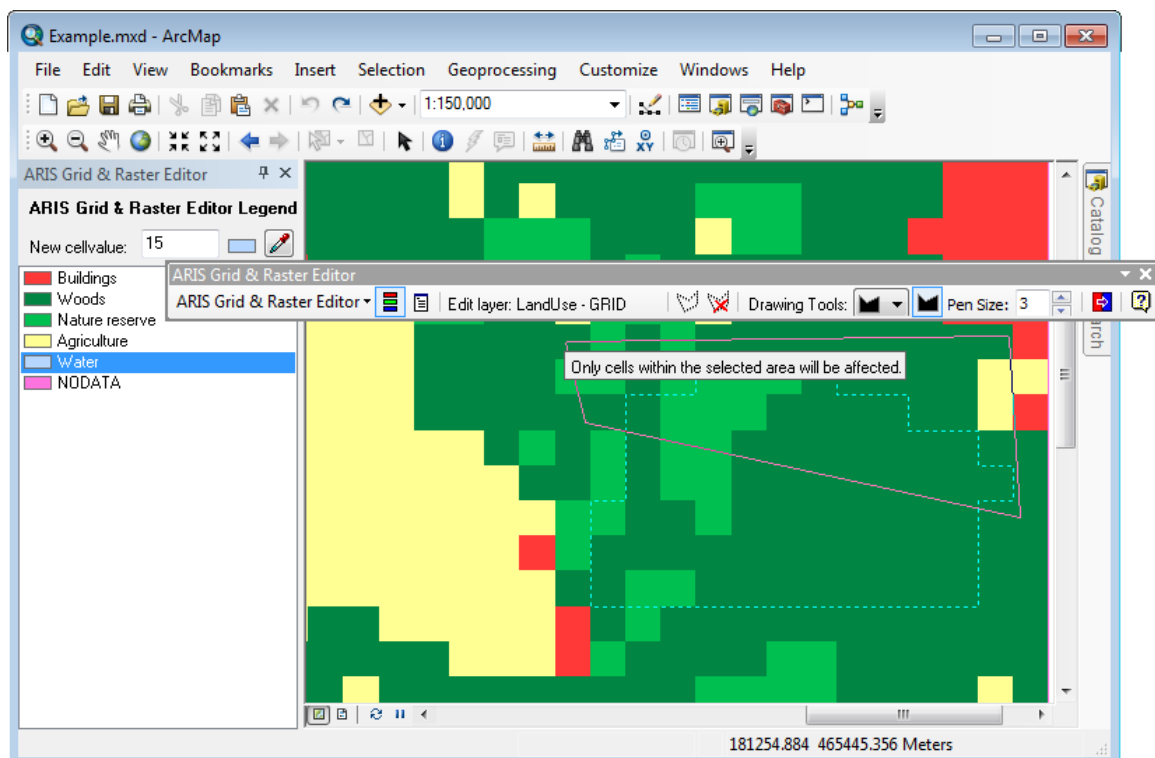
Only the cells that fall completely within the selection area will be affected:
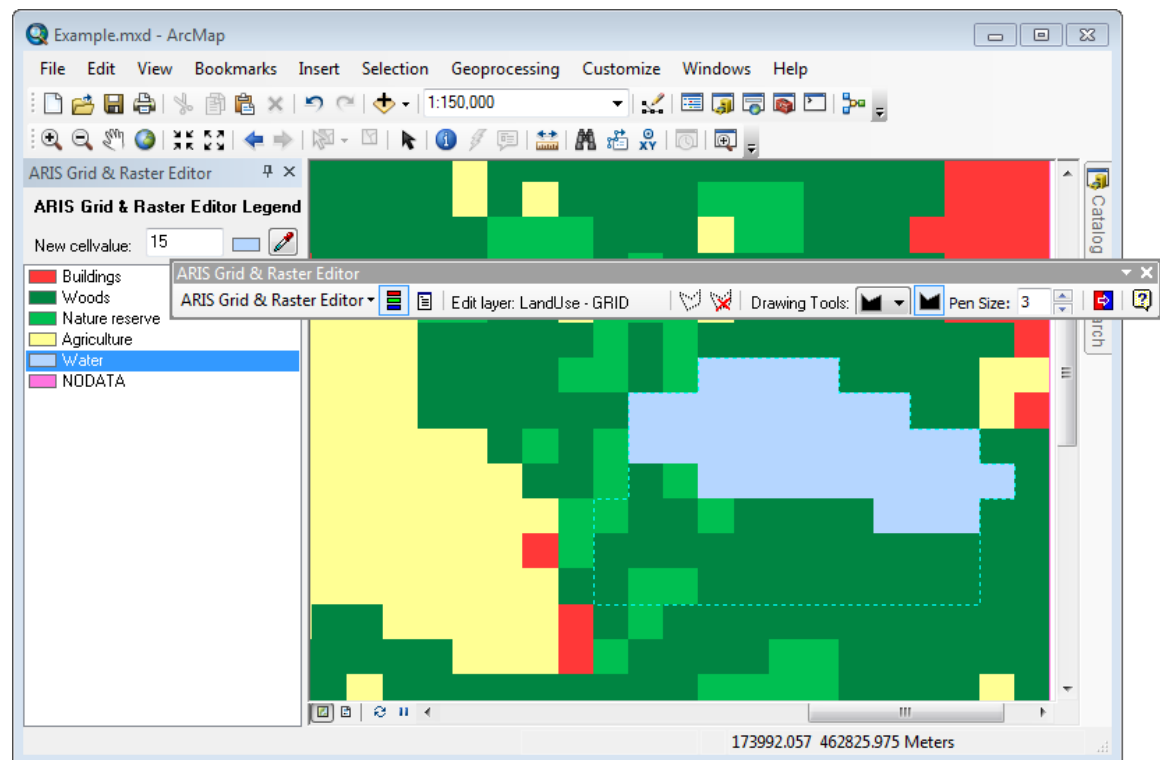
Press the "Remove selection area" button as soon as the selection area needs to be removed in order to perform edits on the entire raster again.

4.5 Replace values

With the Replace Values tool (Value Replacer) values throughout the raster or within the selection area can be replaced. A window is shown to select the values:
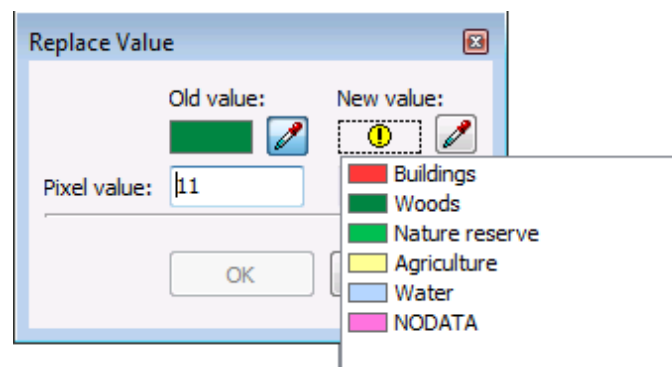
For Old value an existing value in the raster has to be entered or selected from the legend by clicking the Warning symbol or picking a color from the raster with the color picker . To New value applies the same, but also new (not yet existing) values in the raster may be used.

4.6 Stop editing

To stop editing, choose Stop Editing from the Grid & Raster Editor dropdown menu. The edit session will be closed and if already present the attribute table of the raster will be rebuilt. When new values have been used in the raster, it may be necessary to change the symbology of the layer (and "Add value" or Add all values" to the legend).

4.7 The Grid & Raster Editor toolbar

If the Grid & Raster Editor toolbar is not visible in ArcMap, make sure *ARIS Grid & Raster Editor* is checked in the *View | Toolbars* menu.

The toolbar contains the following commands:

|	
	The Grid & Raster Editor dropdown menu contains the following options: Start Editing with Immediate Saves: The highlighted layer in the table of contents will be edited. No copy or backup will be made. Stop Editing: The edit session will be closed and if present the attribute table will be rebuilt.
	Toggle the visibility of the Grid & Raster Editor legend window. This button is enabled when a user starts editing, and disabled when editing is stopped or cancelled.
	Toggle the visibility of the ArcMap table of contents.
	The name of the currently editable layer, or *None* if the Grid & Raster Editor is inactive.
	Draw Selection Area: Create an area within the map where changes can be made. Click one or more times to create the selection polygon. Double click to finish drawing, or press the *Escape* key to cancel drawing. All edit tools only apply to the selected area if this area is set.
	Remove Selection Area: Remove the selection. All edit tools apply to the whole extent of the GRID if the selection area is not set.
	The Drawing Tools dropdown list allows the user to change the drawing tool. The command button to the right of the combo box is used to actually perform the drawing operations on the grid.
	Pencil: Tool for drawing individual pixels in the selected color. Either click on a cell, or drag the mouse over the map to create a sketch as freehand drawing (subject to selection area and pen size).
	Paintcan: Tool for filling connected pixels of the same value. When clicking on a cell, all connecting cells of the same value will be filled with a new value (subject to selection area).
	Line: Tool for drawing a line point-to-point. Click one or more times to create a *polyline*. Double click to finish drawing, or press the *Escape* key to cancel drawing (subject to selection area and pen size).
	Polygon: Tool for drawing a solid polygon. Click one or more times to create a polygon. Double click to finish drawing, or press the *Escape* key to cancel drawing (subject to selection area).
	Pen size: Select pen size for pixel editing. Only affects pencil and line tool. Best effect with uneven pen size.

Replace Value / Value Replacer: Tool to replace one value with another within the entire raster or the selected area (subject to selection area).

Displays the help file.

ARIS Grid & Raster Editor while editing uses Undo in the standard ArcMap menu:
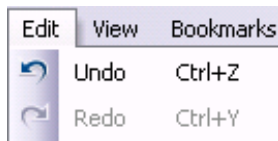
Undo: Undo an edit action in the edit raster (the operation will be specified in this menu).

Redo: Redo an edit action in the edit raster (the operation will be specified in this menu).

Undo / Redo is limited to a certain number of actions and is NOT subject to selection area.

Undo / Redo will be disabled with operations on a large number of cells to prevent memory problems (see Known Issues).

In ArcGIS 10.5.1 and older for File Geodatabase Raster and SDE Raster the Undo of previously NODATA will not Undo the edit operation and will leave the value unchanged (see Known Issues).

In ArcGIS 10.5.1 and older for SDE Raster the Undo may not work when NODATA is in the extent of the edit cells (see Known Issues).

4.8 Restrictions

There are a number of restrictions that apply while editing a raster.
- See Chapter 5 "Raster formats" for the supported and unsupported raster formats.
- Only one raster can be edited at a time.
- Changing to Page Layout mode will result in ending the Edit Session.
- Opening another ArcMap document will result in ending the Edit Session.
- The Data Source of the edit layer can be changed, but ARIS Grid & Raster Editor does not detect this change. Edits will be saved in the original data source of the edit layer and will not be visible in the map anymore.

4.9 Known issues and hints

If the Grid & Raster Editor toolbar is not available from the *Customize* menu after installation, de-install the tool and try to install it again and explicitly run the setup as administrator. Note: Having administrator-privileges may not be sufficient.

After registering the Grid & Raster Editor for a permanent license it could occur that you have to enter your registration name and code every time you start up ArcGIS. Be sure to register the tool as administrator. Note: Having administrator-privileges may not be sufficient.

The Current Coordinate System of the Data Frame should be the same as the Coordinate System of the raster to be edited. Otherwise changes in the raster might not correspond with the drawings on the screen and/or you are not able to change values (You will get a message: "Only cells within the extent of the raster will be affected"). To change the Current Coordinate System choose View | Data Frame Properties… and then Tab Coordinate System.

The *New value* must be within the scope of the raster (depending on Pixel Type and Pixel Depth), otherwise a warning is given when entering such a value in the *New value* edit box. E.g. a raster with PixelType "unsigned integer" and Pixeldepth "8 bit" only "0" to "255" are

valid values and a raster with PixelType "signed integer" and Pixeldepth "8 bit" only "-127" to "127" are valid values.

Pyramids may cause non-visual edits (you edit but don't see any changes) during an edit session. After zooming in or Stop Editing the edits will show correctly. This typically occurs on a raster with edits on a small scale (zoomed out). To prevent this behaviour, build pyramids with fewer levels or delete the pyramids of the base raster (use the Build Pyramids geoprocessing tool or delete the .AUX and/or .OVR file).

When using the *Vector Fields* (available from ArcGIS 10.3), *Discrete Color Renderer*, *Stretched Renderer with "Stretch Type other than None"* or *RGB Composite* for the raster edit layer, the ARIS Grid & Raster Editor Legend cannot show a proper legend and will display: "The symbology of this layer is not suitable for displaying a legend. Enter a cell value or use the color picker to select a value from the map".
These renderers are not suitable for selecting values, however, you can do edits by entering a *New Cell Value* or pick a value from the map.

Memory problems may occur when using a large raster and *Editing with Immediate Saves.* In case of expected memory problems the user will be notified with the possibility of canceling the operation. A warning is given while making a selection area of more than 200.000 cells. An edit operation can give the same warning with disabling *Undo* as well (also with possibility of canceling the operation). This will occur at about 200.000 potential processed cells in a selection area and 500.000 potential processed cells without a selection area.

Using a *New value* outside (above) the existing range of values of the raster, this value may be shown as *Other value* even if you add this value in the ArcGIS symbology tab with *Add Value*. This is a bug confirmed by ESRI and has to be fixed in a future ArcGIS version or patch.

When a new value is entered or a value is picked from the map with the value picker, the symbol may show the Warning symbol. However, you can make edits, but initially a transparent symbol might be used while drawing. Using a Stretched or RGB Composite renderer will show this behavior if the renderer is set to:
- Use of the Alpha Channel
- Stretch Type other than "None"
- Stretch Type Statistics other than "From Each Raster Dataset"
- Apply Gamma Stretch
- Use Hillshade Effect

Using a RGB Composite renderer with Pan-sharpening or using any renderer with transparency may show an incorrect edit symbol. However, the edit values are correct and as soon as the edit is made the color will show correctly in the map.

When memory limitations are encountered it may be wise to try one or more of the following:
- Run less programs on your PC while editing.
- Have less extensions installed in ArcGIS (some extensions tend to consume al lot of memory or make memory highly fragmented even if not being used).
- Use a smaller view extent of the Map (ArcGIS can use a lot of memory for the draw cache).
- Use a Selection Area with Paintcan to prevent very large areas to be filled.

Using ArcGIS 10.5.1 or older will have the following limitations (due to acknowledged bugs of ArcMap, this is solved in ArcMap 10.6):
- In File Geodatabase Raster and SDE Raster editing with a New Value of NODATA is not possible.
- In File Geodatabase Raster Undo of previously NODATA will leave the value unchanged, because writing of NODATA is not supported for File Geodatabase Raster.
- In SDE Raster editing is prohibited when NODATA is inside the edit area (to prevent loss of data).

- In SDE Raster editing can give unexpected behavior.

Changing (including Undo) cells surrounded by cells with NODATA values might not work for SDE Raster.

5. Raster formats and renderers

5.1 Supported raster formats

Most single and multi band raster formats editable by the ArcGIS Object Model are supported by the ARIS Grid & Raster Editor but may vary between ArcGIS versions. These raster formats include:

- Band interleaved by line (BIL)
- Band interleaved by pixel (BIP)
- Band sequential (BSQ)
- Bitmap (BMP)
- ENVI Raster (e.g. DAT, BIL, BIP, BSQ)
- ERDAS IMAGINE Image (IMG)
- ESRI GRID
- File Geodatabase Raster (GDB, FGDBR) *1
- Personal Geodatabase Raster (MDB, PGDB Image)
- SDE Raster (SDR) *1 *2
- Tagged Image File Format (GeoTIFF, TIFF)

    *1: NoData as New cell value (or Undo value) is only supported in File Geodatabase Raster and SDE Raster in ArcMap 10.6 and up (due to an acknowledged bug of ArcMap, this was solved in ArcMap 10.6).

    *2: SDE Raster is only supported in ArcMap 10.6 and up. Testing has only been done with a SQL Server Express Geodatabase, so extra caution might still be necessary (as always be sure to have backups).

When a raster contains (multiple) fields (like in an ESRI GRID VAT-table) and is using Unique Value or Classified Render, the renderer must be based on the VALUE-field.

The data types / pixel types as supported by ArcGIS for the above raster formats are also supported by the ARIS Grid & Raster Editor.

These raster formats have been extensively tested, but it is impossible to test all variations of raster formats, types, sizes and value distributions. It is advised to always have a backup of your data available and do some tests on your raster data before doing the real editing.

5.2 Raster formats with experimental support

Some raster formats were not tested yet or not extensively enough at the time of the release of this version of the ARIS Grid & Raster Editor, but may work as well but undocumented / experimental such as:

- SDE Raster (in ArcGIS 10.5.1 and older).
- RDBMS Geodatabase Raster
- other formats not described in this help

These raster formats are still under investigation and support for these raster formats may be included in a future version. You will get a warning at Start Editing.
If you want to use one of these formats it is strongly advised to test editing before and ensure to have a backup available at all times. Please share experiences with us.

5.3 Unsupported raster formats

Read-only raster formats in ArcGIS cannot be edited by the ARIS Grid & Raster Editor.

Some raster formats are writeable (as a complete file) but not editable by the ArcGIS Object Model. At this time these raster formats are not supported by the ARIS Grid & Raster Editor such as:

- Graphic Interchange Format (GIF)

- Joint Photographic Experts Group (JPEG, JPG)
- Portable Network Graphics (PNG)

Other unsupported raster formats are:
- Stacked raster
- Mosaic raster

Please contact us for extending the support of raster formats.

5.4 Supported renderers

Most commonly used renderers to symbolize the raster data are supported:

- Unique Values – Draw raster assigning a color to each value
- Classified – Draw raster grouping values into classes
- Stretched – Stretch values along a color ramp
- Discrete Color – Render data with a fixed set of colors
- RGB Composite – Draw raster as an RGB composite
- Colormap – Draw raster using internal colormap

The renderer being used can be obtained in ArcMap by opening the Layer Properties: tab Symbology.

5.5 Renderers with experimental support

Other renderers will be supported with experimental support, at this time, like:

- Vector Field – Draws direction and magnitude as vector symbols

Note: Experimental support also means only one band can be used even if there are more bands available. In the case of a Vector Field renderer this may mean an arbitrary band is being chosen, not distinguishing between unassigned or assigned bands to Direction or Magnitude.

6. Examples

6.1 Examples included in setup

With the ARIS Grid & Raster Editor setup examples are installed in:
<program files>\ARIS\GridRasterEditor\Example\

These examples are combined in Example.mxd to demonstrate the use of:
* Unsigned Integer raster
* Signed Integer raster
* Floating Point raster
* Multi-band raster with RGB Composite renderer
* ESRI GRID
* File Geodatabase Raster (FGDBR)
* Other rasters like TIFF and ERDAS IMAGINE Image
* Edit with transparency

Above examples are combined in four example layers and a background layer. These combinations and examples are chosen arbitrarily. All other combination could have been chosen and will work as well (e.g. Floating point in FGDBR or Signed integer in ERDAS IMAGINE IMG).

To work with these examples:
1. Preferably copy the example directory (<program files>\ARIS\GridRasterEditor\Example) to a directory of your choice e.g. C:\Test.
2. Open the example C:\Test\Example\Example.mxd.

6.2 Unsigned Integer – GRID

The use of Unsigned Integer values and an ESRI GRID is demonstrated in the layer
"LandUse" (LandUse - GRID).
This example is also used in the chapter "Using ARIS Grid & Raster Editor".

Activate the Data Frame "Integer rasters" and **activate** (highlight**)** the layer "LandUse" before
starting an edit session.
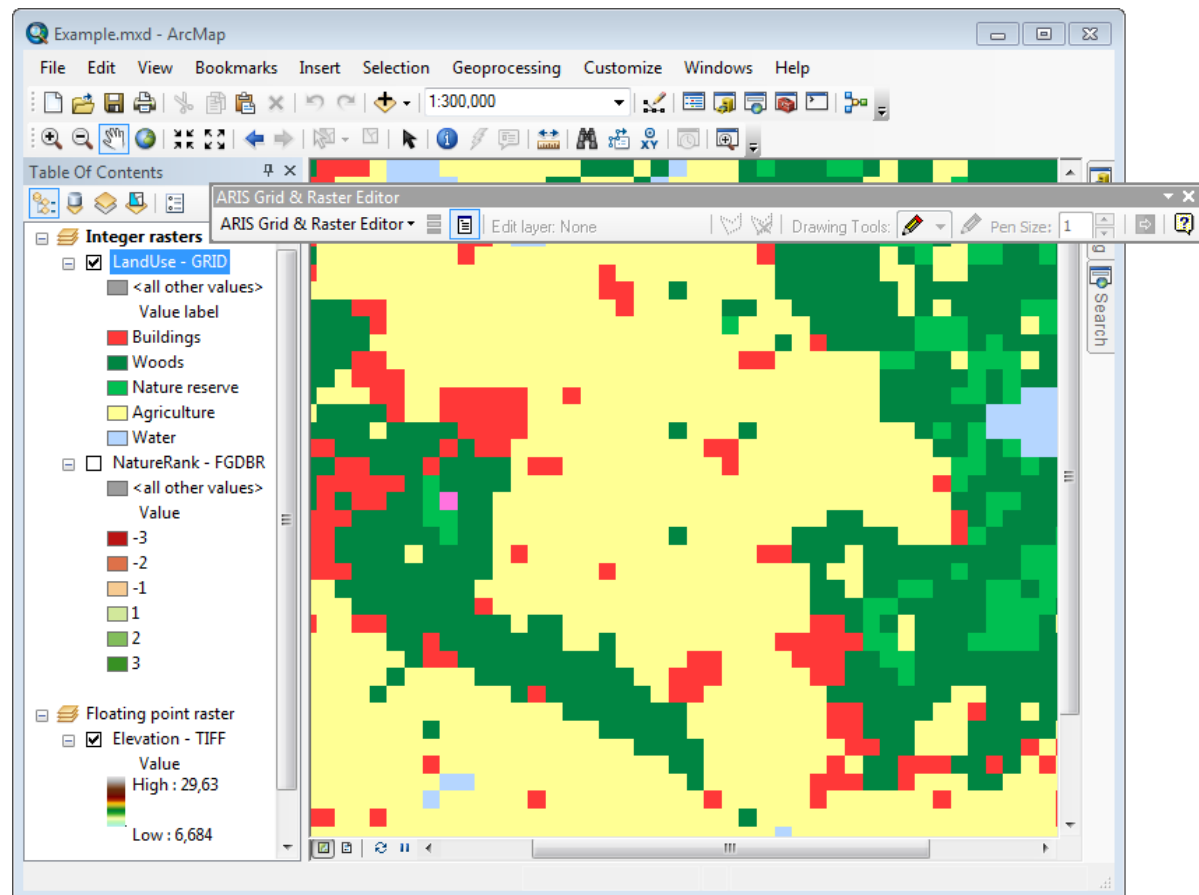
This example has only positive Integer values and in the Unique Value renderer the labels are
set to a descriptive text.

6.3 Signed Integer – FGDBR

The use of Signed Integer values and a File Geodatabase Raster is demonstrated in the layer "NatureRank" (NatureRank - FGDBR).

Activate the Data Frame "Integer Rasters", switch visibility between the layer "LandUse" and the layer "NatureRank" (or change the layer order) and **activate** (highlight**)** the layer "NatureRank".
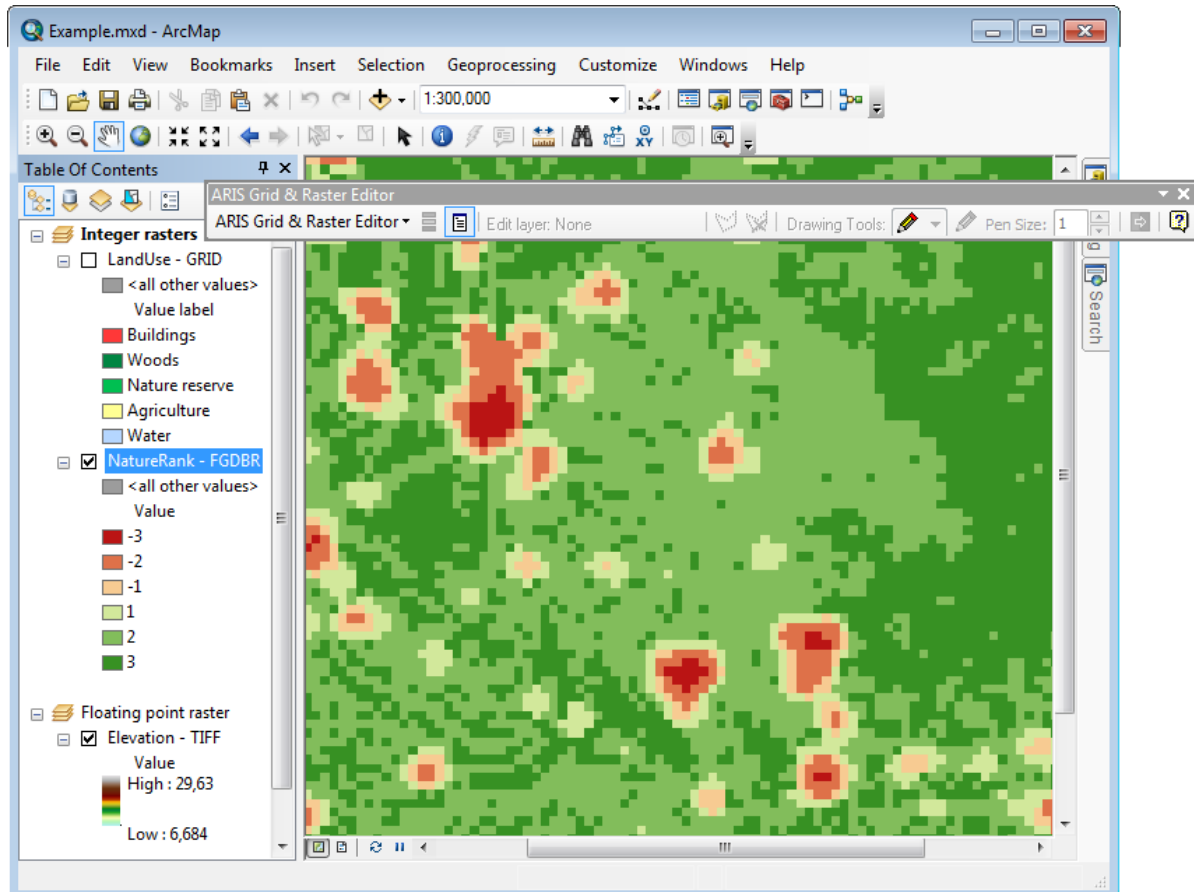
This example has positive and negative Integer values. In the legend the unique values are also used as labels.

6.4 Floating point – TIFF

The use of Floating point values and a TIFF file (as example for a Non-ESRI specific image type) is demonstrated in the layer "Elevation" (Elevation - TIFF).

Activate the Data Frame "Floating point raster" and **activate** (highlight**)** the layer "Elevation" before starting an edit session.
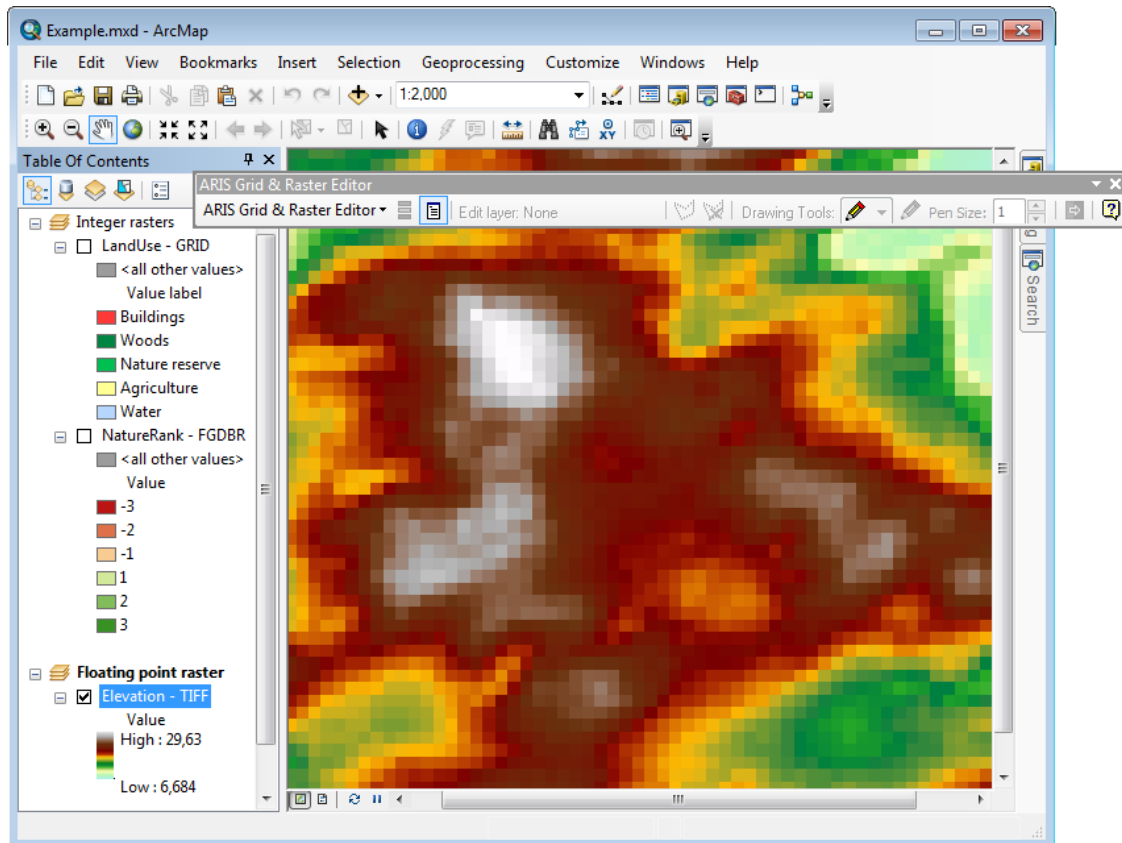
This example has Floating point values displayed as Stretched values along a Color Ramp.

6.5 Multi-band RGB – IMG

The use of a mutli-band RGB raster and an ERDAS IMAGINE Image (IMG) file is demonstrated in the layer "Satellite" (Satellite - IMG).

Activate the Data Frame "Multi-band raster" and **activate** (highlight**)** the layer "Satellite" before starting an edit session.
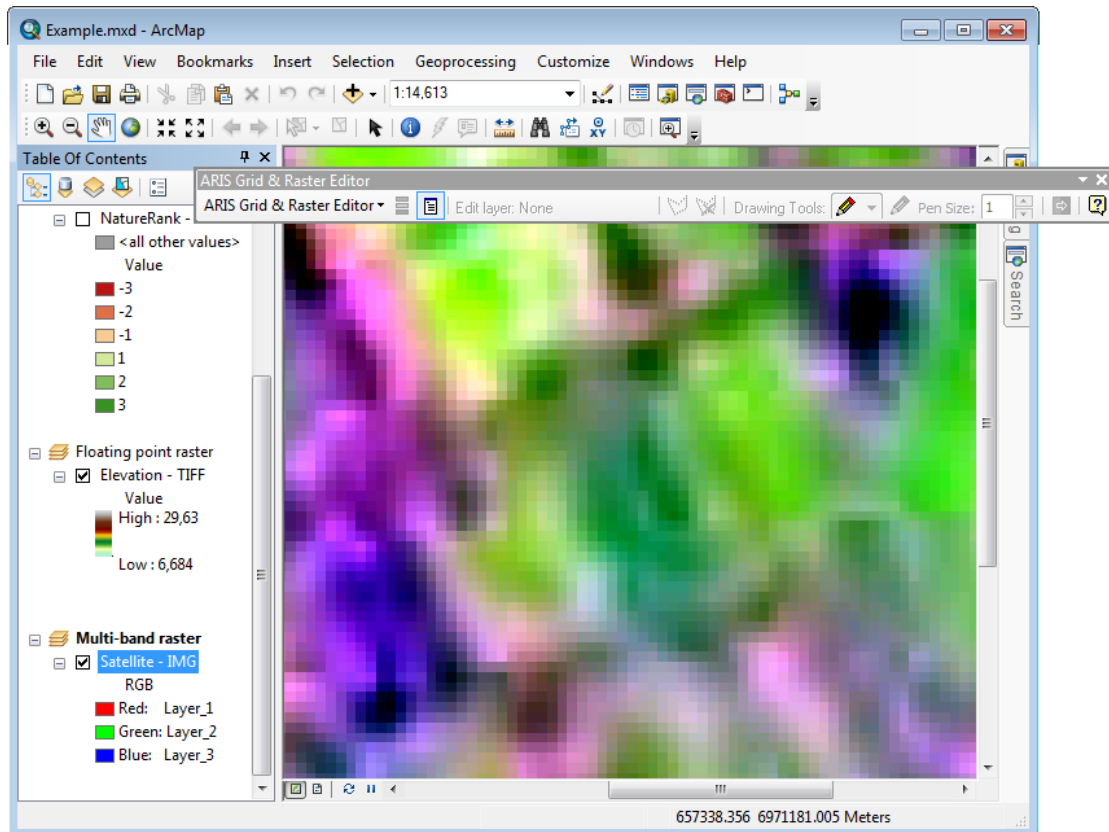
This example has RGB values displayed as RGB Composite on the Red, Green and Blue channel.
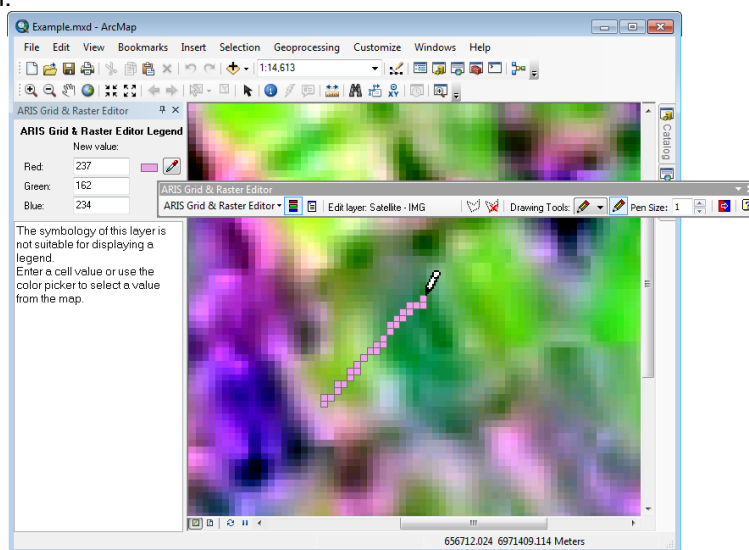
The Grid & Raster Editor Legend now has three edit boxes for the new value. All three bands (Red, Green and Blue) will be edited at once while making edits in the raster.

Turning off a channel gives the opportunity to edit only one or two of the available bands. We also set the Stretch Type to None and all other options OFF, so the drawing color can be determined by the editor, otherwise the Warning ⚠ symbol may be displayed as new color. However, also with other Stretch Types you can edit a RGB Composite layer, but the color will show after you release the pencil.
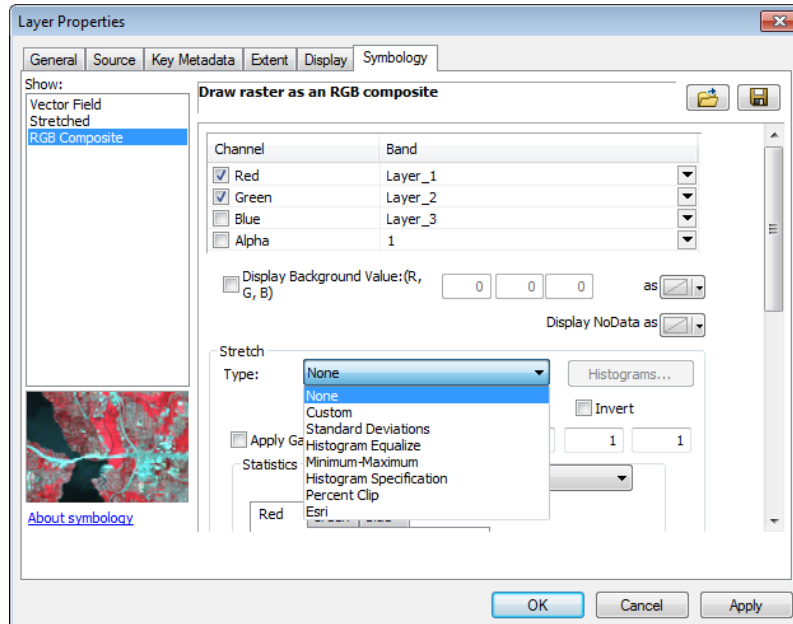
In this example the Blue Channel / Band will be grayed out in the Grid & Raster Editor Legend for New value. Only the Red and Green Bands will be edited.
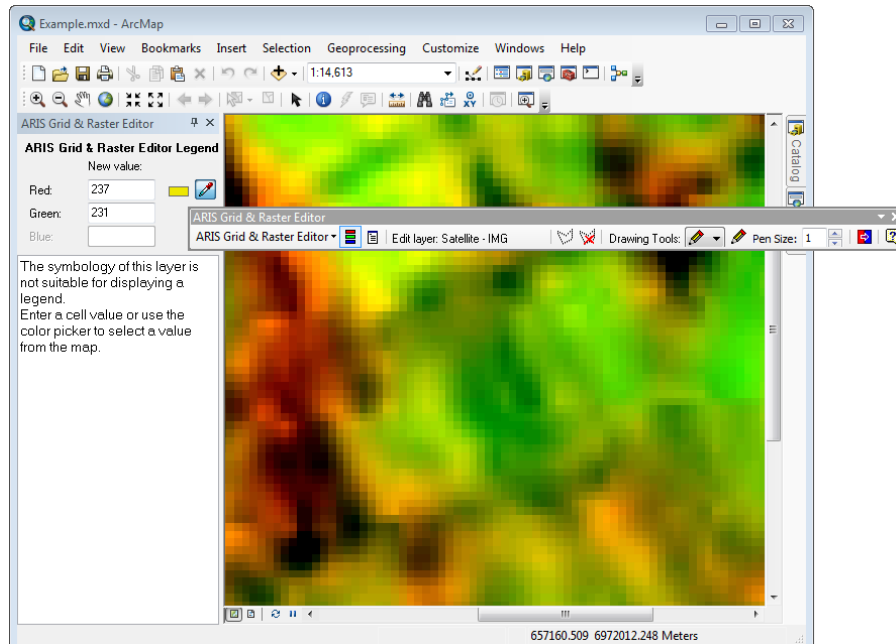
The data in this multi-band raster example was derived from USGS/NASA Landsat data.

6.6 Edit with transparency

The use of transparency to edit on top of a background layer is demonstrated with the layers "LandUse" (LandUse - GRID) and "Aerial" (Aerial – Background).

Activate the Data Frame "Integer rasters" and set the layer "Aerial" to visible.
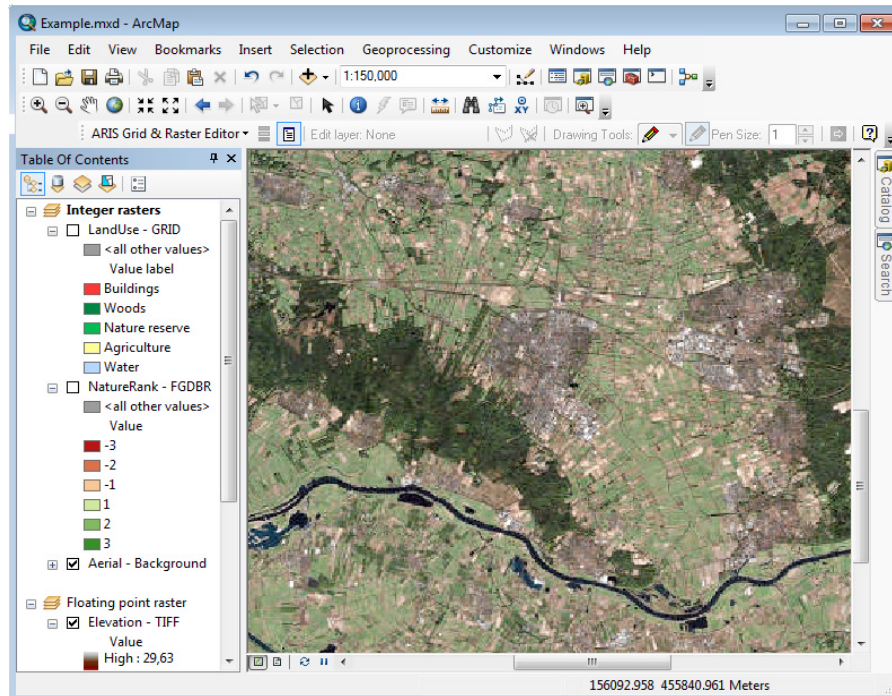
Set the "LandUse" layer to visible (and uncheck the ´NatureRank" layer if checked).
Open the "LandUse" Layer Properties and set the Transparency to e.g. 50%.
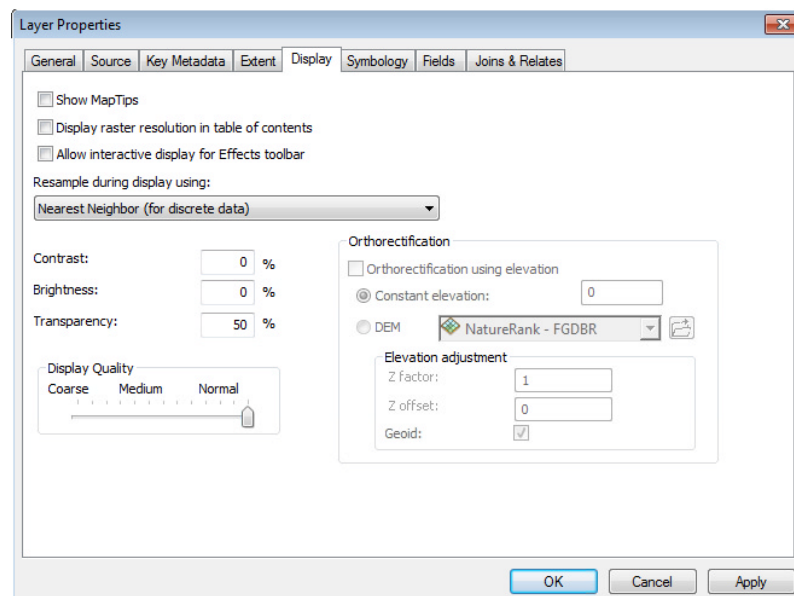
Activate (highlight**)** the layer "LandUse" before starting an edit session.
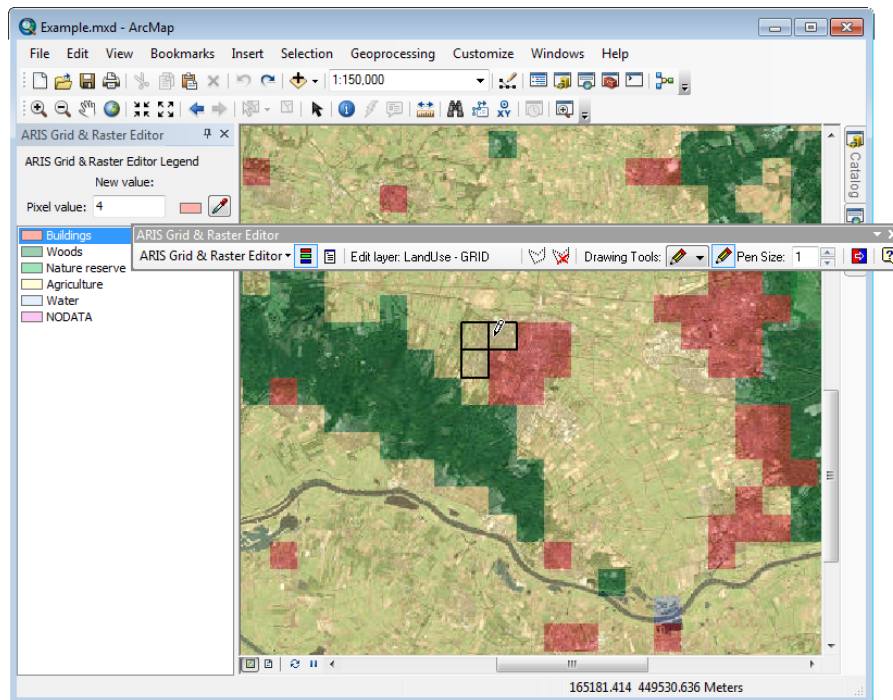
The Grid & Raster Editor Legend will show the colors in transparent mode just as in the ArcMap Table of Contents.

Editing with pencil (freehand) is now performed using a full transparent symbol, so you can still see the background while drawing. As soon as the pencil is released the cells will be drawn with the new pixel value color.

7. Version History

7.1 Version 4.0

Change of name
- The name of this ArcMap tool has been changed to ARIS Grid & Raster Editor for ArcMap.

ArcGIS compatibility
- Version 4.0 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.3/10.3.1 (and still ArcGIS 10.0 - 10.2.2).

Additional functionality
- Extended support from only ESRI GRID to most editable single band raster formats (like BIL, BIP, BSQ, BMP, ENVI, IMG, FGDBR, PGDB Image, TIFF).
- Improved validation of values depending on Pixel Type and Pixel Depth of the editable raster.
- Check whether the edit layer is in the active data frame.
- Check whether the edit layer has visible layers on top.
- New examples are included to demonstrate the use of Signed Integer, Floating Point, File Geodatabase Raster en TIFF.
- Register option in Menu to have easier access to the License Registration Form.
- Check on write permission of raster (incl. ESRI GRID).

Changed functionality
- Start Editing in Original changed to Start Editing with Immediate Saves.
- Replace values window is now resizable.

Eliminated functionality
- Start Editing in a copy has been eliminated.
- Cancel editing has been eliminated.
- Erase has been eliminated (was only used when editing in a copy).

Bug-fixes
- Fixed precision problems with floating point values.
- A Stretched renderer on an Integer raster will not generate an irrelevant legend anymore.
- Better check on existence of NoData Value defined in the raster

7.2 Version 4.0.1

Bug-fixes
- The check on the VALUE-field was too strict for the Classified Renderer. An ESRI GRID without VAT and other raster formats with only <VALUE> can now also be edited when the Classified Renderer is being used.
- A Stretched Renderer with Statistics "From Current Display Extent" could cause slow and incorrect legend build-up. Now these rasters will have legend build-up disabled so a message will be displayed in the legend area: "*The symbology of this layer is not suitable for selecting values. Enter a cell value or use the color picker to select a value from the map*".
- Using the pencil/freehand tool on a Stretched Renderer with Statistics "From Current Display Extent" now draws initially with a hollow/transparent symbol as the correct symbol can not be obtained in this situation (as all situations where legend build-up is disabled by the Grid & Raster Editor).

7.3 Version 4.0.2

Bug-fixes
- Changed the write permission check on an ESRI GRID to prevent a wrongly read only error.

7.4 Version 4.1

ArcGIS compatibility
- Version 4.1 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.4 (and still ArcGIS 10.0 - 10.3.1).

Additional functionality
- Support for Multi-band rasters such as ERDAS IMAGINE Image (IMG) files, FGDB Rasters or TIFF rasters with more than one band.
- Support for simultaneous editing of one or more bands in an RGB Composite renderer.
- New example is included to demonstrate the use of a Multi-band raster with RGB Composite renderer.
- Experimental support for some other raster formats like ArcSDE rasters.
- Experimental support for Vector Field and Colormap renderers.

Changed functionality

- The Grid & Raster Editor legend is only being build for Stretched renderers with Stretch Type None and no other options set: No legend will be build with Stretch Type other than "None", Stretch Type Statistics other than "From Each Raster Dataset", Apply Gamma Stretch and Use Hillshade Effect. However, these rasters can be edited based on the new value entered or picked with the color/value picker.
- Empty the Undo buffer as soon as the symbology/classification of the edit layer is changed by the user.
- Minor changes in warnings and messages.

Bug-fixes
- Changes in symbology/classification will now refresh the edit symbol.
- Fixed precision problems with selecting floating point values from the legend.

7.5 Version 4.1.1

ArcGIS compatibility
- Version 4.1.1 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.4.1 (and still ArcGIS 10.0 - 10.4).

Additional functionality
- Support for (internal) Colormap renderer.

Changed functionality

- The Trial message is changed to better express the limited actions in an ArcGIS session during Trial mode.

Bug-fixes

- The windows, forms, toolbar and text in the Grid & Raster Editor will now better adjust to setting text/resolution/dpi in Windows to other values then the default (like 150%).

7.6 Version 4.1.2

ArcGIS compatibility
- Version 4.1.2 of the ARIS Grid & Raster Editor for ArcMap is prepared for ArcGIS 10.5 (tested on pre-release) and will still work for ArcGIS 10.0 - 10.4.1.

Changed functionality
- To comply with Windows 8 and 10 the ARIS group/subfolder has been removed from the Start Menu so the Start Menu / All Apps will now show "ARIS Grid & Raster Editor".

Bug-fixes
- In some configurations the Editor Legend window was incomplete and might result in Access Violation errors later on in edit actions. This is resolved.

7.7 Version 4.2

ArcGIS compatibility
- Version 4.2 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.5 (and still ArcGIS 10.0 - 10.4.1).

Additional functionality
- In File Geodatabase Raster it is now possible to overwrite NoData Values. However setting New Value to NoData or Undo an edit action to a NoData value is not possible in a File Geodatabase Raster.
- Floating License is introduced as a new license type.
- License Manager for a server without ArcGIS to serve Floating Licenses.

Changed functionality
- Various warnings for potential memory problems have been changed.
- To prevent potential memory problems the warning of (potential) processed cells is changed from 1.000.000 to 500.000 for operations on the entire dataset and to 200.000 cell for operations within a selection area.
- The maximum number of Undo actions is now set to 10 (was 5).

Bug-fixes
- Editing the New Value in the Editor Legend window and Old and New Value in the Value Replacer window will now always keep focus to the field being edited.
- The tab order in the Replace Values window is now in a logical order.
- Replace Value and Paintcan now also function well when less than 3 bands are assigned in an RGB Renderer.
- Processed cells during a Paintcan operation will now revert to the previous value if the operation is cancelled due to a "large number of cells" warning (if Undo is active).
- Undo and Redo will now always use the right value, even if Edit Value has been changed in between (except for NoData in FGDBR layer).
- Using Paintcan in SDE Raster should not give unpredictable results anymore (but SDE Raster will stay a Raster format with experimental support for editing).

7.8 Version 4.2.1

ArcGIS compatibility
- Version 4.2.1 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.5.1 (and still ArcGIS 10.0 - 10.5).

Additional functionality
- When the edit layer has transparency set, the Grid & Raster Editor Legend will also show the transparent colors.
- New example is included to demonstrate the use of the edit layer with transparency and a background layer.

Changed functionality
- Drawing with pencil/freehand the drawing symbol will be transparent when the edit layer has transparency set.

Bug-fixes
- No bug-fixes.

7.9 Version 4.3.0

ArcGIS compatibility
- Version 4.3.0 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.6 (and still ArcGIS 10.0 - 10.5.1).

Additional functionality
- Editing with a New Value of NODATA is now possible for File Geodatabase Raster and SDE Raster (Only in ArcMap 10.6 and up, as a result of an ArcGIS 10.6 bug-fix).
- Better support for SDE Raster (most complete in ArcMap 10.6 and up)

Changed functionality
- Edit action will be aborted with SDE Raster in ArcGIS 10.5.1 and older when the edit area (rectangle) contains NODATA values (to prevent data loss).
- Some hints now better reflect the possibilities for edit value or edit symbol depending on having a legend available.
- Some changes in warnings and error messages.
- Code cleanup might give slightly better performance and less memory usage.

Bug-fixes
- Undo of previously NODATA will now revert correctly to NODATA for File Geodatabase Raster and SDE Raster (Only in ArcMap 10.6 and up, as a result of an ArcGIS 10.6 bug-fix).
- Editing cells with a height or width of only one cell should now work for SDE Raster.
- Better handling when the edit layer is removed from the table of contents.
- Warning when a layer does not have valid Data Source Path and/or Name.
- No unexpected behavior anymore when license server is not available or not found.

7.10 Version 4.3.1

ArcGIS compatibility
- Version 4.3.1 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.6.1 (and still ArcGIS 10.0 - 10.6).

Bug-fixes
- Using less then 3 bands in a Multi-band RGB raster will now use the right color as editing symbol.
- An even pen size (2, 4 etc.) with the line tool will now always result in the correct number of cells changed.
- Editing a rectangle of cells and using a New Value of NODATA should now also work for SDE Raster (at least in ArcGIS 10.6 and up).
- Editing one cell or a rectangle of cells and using a New Value of NODATA should now also work for File Geodatabase Raster in ArcGIS 10.6.1 (did not work because of a new bug in ArcGIS 10.6.1).

7.11 Version 4.4.0

ArcGIS compatibility
- Version 4.4.0 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.7 and 10.7.1 (and still ArcGIS 10.0 - 10.6.1).

7.12 Version 4.5.0

ArcGIS compatibility
- Version 4.5.0 of the ARIS Grid & Raster Editor for ArcMap is compatible with ArcGIS 10.8 (and still ArcGIS 10.0 - 10.7.1).

7.13 Version 4.5.1

Security
- Program files and setup are digitally signed with a Code Signing Certificate.

Appendix A. License Agreement

```
ARIS Software License Agreement for ARIS Grid & Raster Editor for ArcMap
------------------------------------------------------------------------
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as to the matter set forth herein and supersedes any previous agreements,
understandings, and arrangements between the parties relating hereto and is effective,
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