

Production Applications for eCognition
Architect 8

Using Architect Applications

DEEPER INSIGHTS
FASTER RESULTS
BETTER DECISIONS

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Imprint and Version

Document Version

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Introduction to this Module

This Module you will learn how to load, modify and execute an Architect Application.

This Module has two Lessons:

Lesson 1 Introduction to Architect Applications

Lesson 2 Loading, editing and executing a ready Application in Architect

Symbols at the side of the document

The symbols at the side of the document shall guide you through the exercises and help you to identify whether to read something or an action is needed or whether the screenshot is meant to be compared with settings in the software.

Introduction

If the side is hachured and 'Introduction' is added, this indicates that a text is giving a general introduction or methodology about the following chapter, method or exercise.

Information

If the side is hachured and 'Information' is added, this indicates that a text is giving information about the following exercise.



If this symbol is shown, you have to follow the numbered items in the text. If you just want to work through the exercises without reading the theory part, follow only this sign.

Action!



If this symbol is shown, compare the settings shown in the screenshot with the settings in the according dialog box in the software.

**Settings
Check**



If this symbol is shown check the screenshot of the Process Tree with the content of the Process Tree in the software.

**Rule Set
Check**



If this symbol is shown check the screenshot aside with the result in the software. It should look similar.

**Result
Check**

Lesson 1 Introduction to Architect Applications

This Lesson has the following chapters

→What is Definiens eCognition Architect?

→What is an Architect Application

1.1 What is Definiens eCognition Architect?

Definiens eCognition Architect enables non-technical professionals such as vegetation mapping experts, urban planners or foresters to leverage Definiens technology. Users can **easily configure**, calibrate and execute image analysis workflows created in Definiens Developer. In this Module you will learn how to use such an easy to use Architect Application.

Introduction

1.2 What is an Architect Application

Within eCognition Developer you can create so called 'Architect Applications', which is a **reduced User Interface**, where the User has the possibility to tweak and execute Rule Sets in a guided way.

Introduction

- The individual **actions** are defined step by step in the 'Analysis Builder
- the actions exchanges set values with the Rule Set behind it

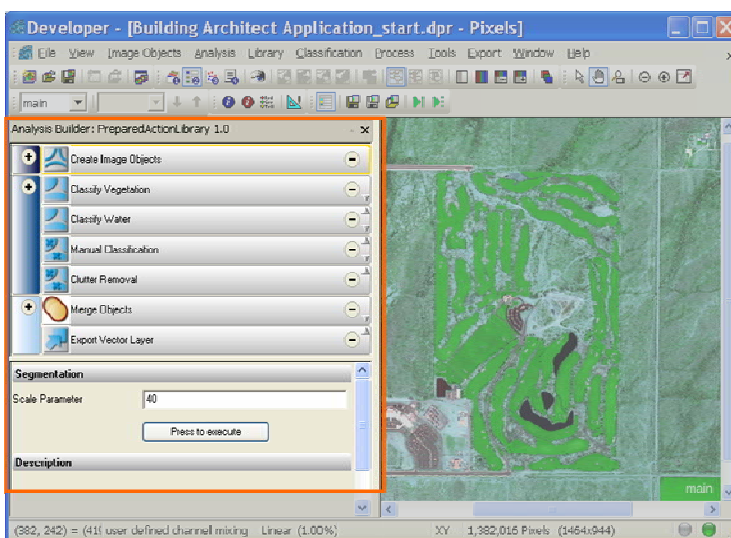


Figure 1: Analysis Builder with Actions from an Action Library loaded.

Components of an Application:

- The **Actions** of an Action Library with sliders, check-boxes and text fields
- The Algorithms and variables, responsible for the **interaction** between the User settings in the Action and the Rule Set
- The **pure Rule Set** (Segmentation and Classification)

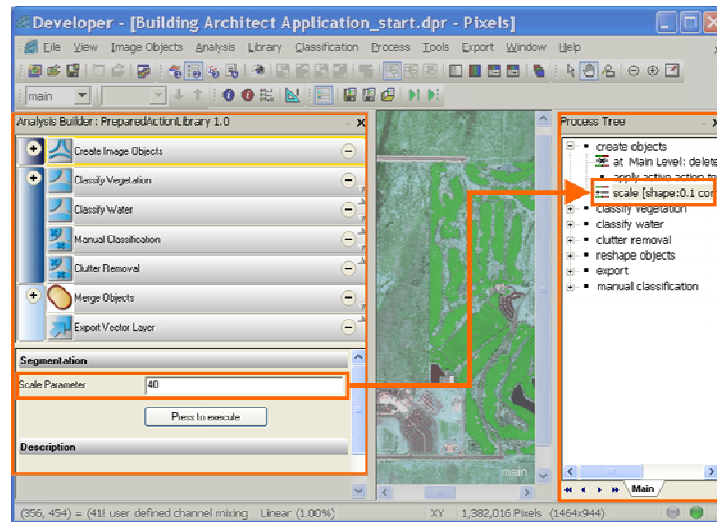


Figure 2: The value (40) set in the text box is transferred to the Rule Set using a Variable 'scale'.

Lesson 2 Loading, editing and executing a ready Application in Architect

This Lesson has the following chapters

- *Starting Architect and loading*
- *Loading an Action Library*
- *Adding Actions and sorting*
- *Configure and execute the Actions*

2.1 Starting Architect and loading the Action Library

If you want to create or use an Architect application you can start eCognition Developer and change to predefined view setting number 4 'Configure Analysis'.

If you just want to **use an Architect Application**, you can just start **eCognition Architect**. In opposite to the Developer, the Architect has no access to the Process Tree and the Class Hierarchy. Only a predefined Action Library can be loaded and executed.

In this Lesson a subset of a Quickbird scene is used. The project used in this exercise is **empty**, no Application (->Action Library) loaded. In this Lesson an existing Action Library is loaded and explored.

Per default the Quickmap application is loaded when you open the Architect. As we want to use a different Library, **the current one has to be closed**.

1. Start **Definiens eCognition Architect**.
2. Switch to predefined view setting number 2 '**Configure Analysis**'.
3. Go to the main menu '**Library**' and select '**Close Action Library...**'.
4. In the main menu 'File' choose '**Open Project...**' or click on the 'Open Project' button in the toolbar.
5. Open the project '**Exploring Architect Application.dpr**' in the folder '**...\WhatsNew_eCog8\Projects\Architect**' at the location where the training data is stored.

The project is loaded. The Analysis Builder, where the Actions will be shown later, is still empty, a message is indicating: 'No Library Loaded.'

Information



Action!



Result Check

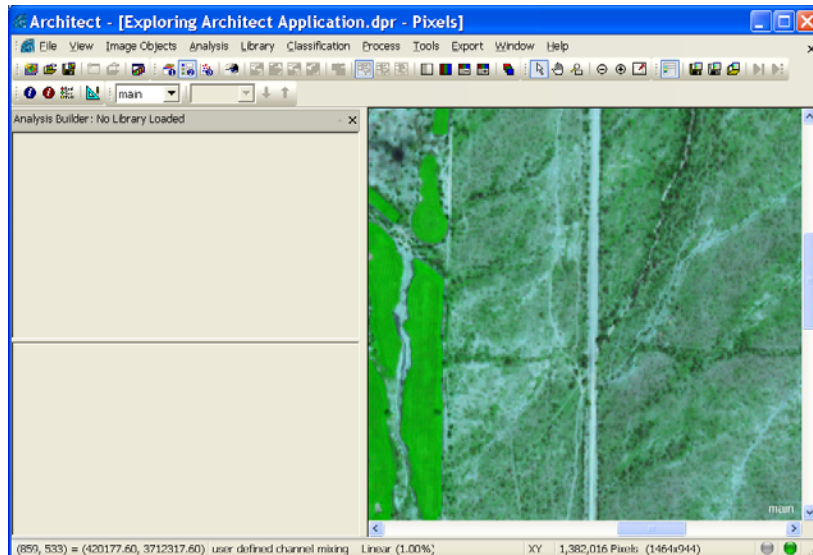


Figure 3: Loaded Project with no Action Library loaded. The Analysis Builder is empty.

2.2 Loading an Action Library

Information

An Action Library is stored in an own folder, the Library itself has the file ending ***.dlx**, the Actions belonging to the Library are stored in ***.xml** format. To load an Action Library, you only have to **point to the folder**.

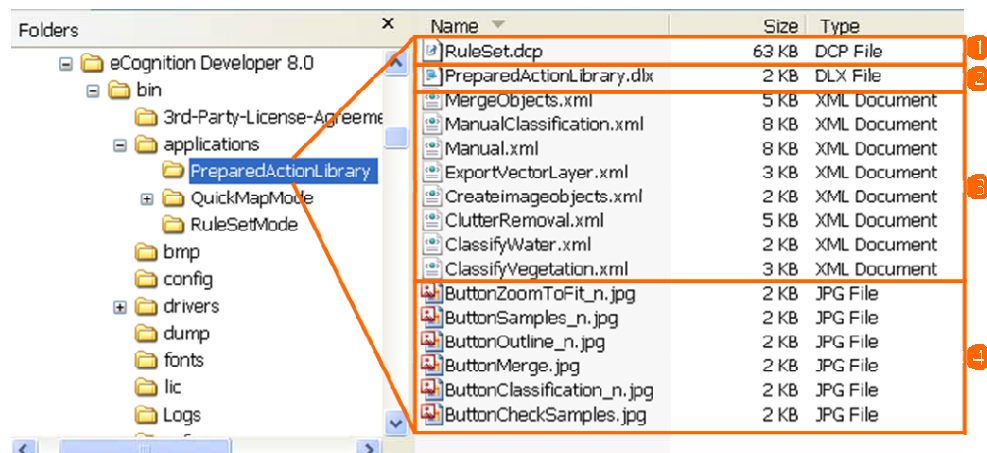


Figure 4: Files of an Action Library in the Explorer.

The following files belong to a complete Action Library:

- The **Rule Set** ①
- The **Action Library** itself ②
- The **Actions** belonging to the Action Library ③
- The **image files** for buttons ④



Action!

1. Go to the main menu '**Library**' and select '**Open Action Library...**'.
2. Browse to '**...\WhatsNew_eCog8\Projects\Architect**' at the location where the training data is stored.
3. Select the folder '**PreparedActionLibrary**' and confirm with OK.

Tip:

If a folder is not containing an Action Library, the button 'OK' in the 'Browse For Folder' dialog box is grayed out.

The Action Library '**PreparedActionLibrary**' is loaded, the Action Groups '**Add Segmentation**', '**Add Classification**' and '**Add Merge and Export**' are displayed. The individual actions are not added yet.



Result Check

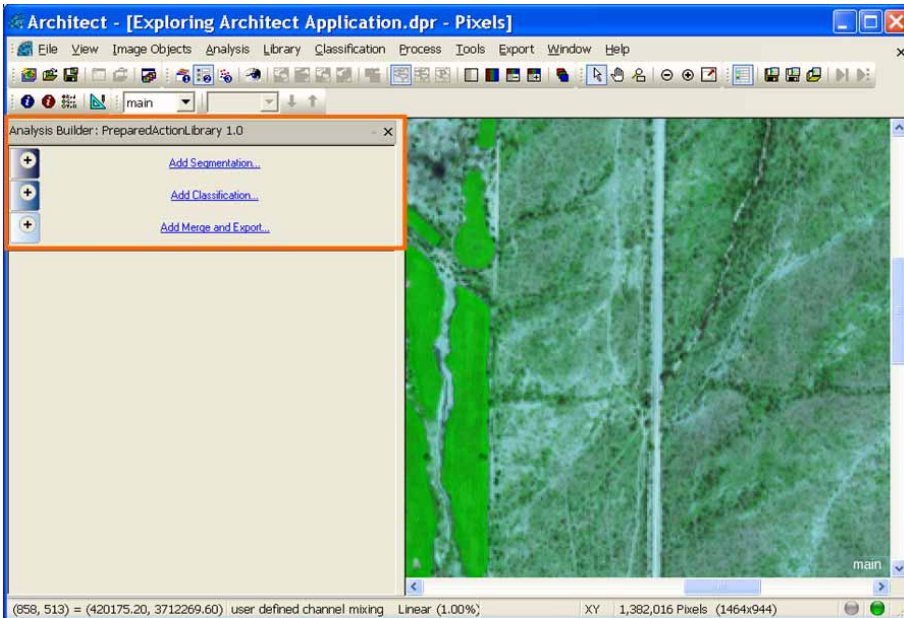


Figure 5: The Action Library is loaded; no Actions have been added to the Analysis Builder yet.

2.3 Adding Actions and sorting

This Chapter has the following Sub-Chapters

- *Adding an Action*
- *Sorting Actions*

2.3.1 Adding an Action

1. In the Analysis Builder, click on the '**Add Segmentation**' link in the first group 'Segmentation'.



Action!

The '**Add Actions**' dialog box opens. Automatically the group 'Segmentation' **1** is selected. This group has the ID <A> and contains **one Action: 'Create Image Objects'** **2**.



Result Check

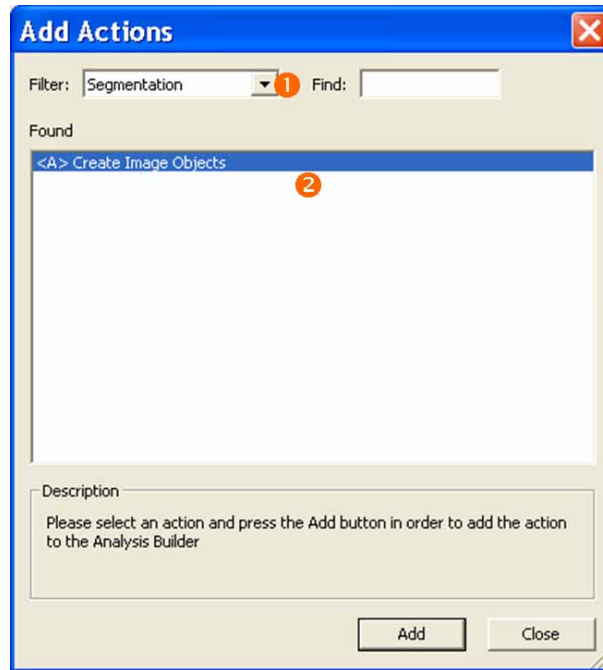


Figure 6: 'Add Actions' dialog box, showing all Actions for Action Group 'Segmentation'.

Information

In the 'Filter' drop-down list other groups can be selected.



2. Select '**Classification**' from the 'Filter' drop-down list.

Action!



Result Check

If group 'Classification' is selected, all Actions belonging to this group are displayed, here:

- 'Classify Vegetation'
- 'Classify Water'
- 'Clutter Removal'
- 'Manual Classification'

This group has the ID

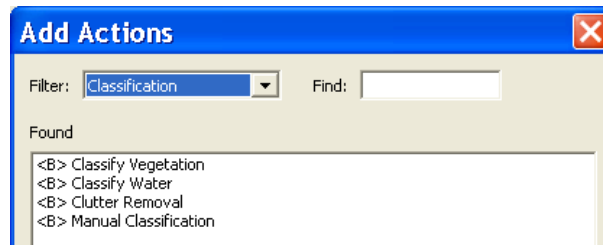


Figure 7: 'Add Actions' dialog box, showing all Actions for Action Group 'Classification'.



3. Select '**All**' from the 'Filter' drop-down list.

Action!

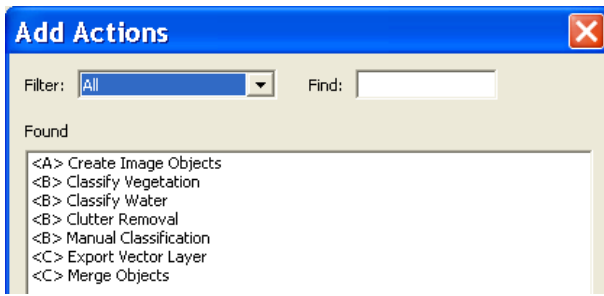


Figure 8: 'Add Actions' dialog box', showing all Actions.



If 'All' is selected, all Actions belonging to the Action Library are displayed. The Library loaded has three groups: **A=Segmentation**, **B=Classification**, **C=Merge and Export**, these groups have the following actions:

A=Segmentation

- <A> 'Create Image Objects'

B=Classification

- 'Classify Vegetation'
- 'Classify Water'
- 'Clutter Removal'
- 'Manual Classification'

C=Merge and Export

- 'Export Vector Layers'
- 'Merge Objects'

4. **Double-click** on the individual actions **to add** them to the Analysis Builder.
5. After all Actions are added to the Analysis Builder, **close** the 'Add Actions' dialog box.



Action!



Result Check

Now all Actions are added as individual bars to the Analysis Builder, grouped in **Segmentation, Classification, Merge and Export**.

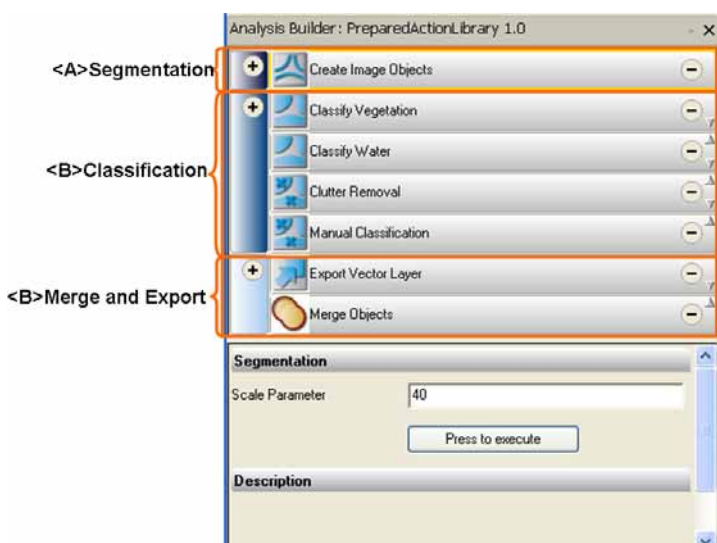
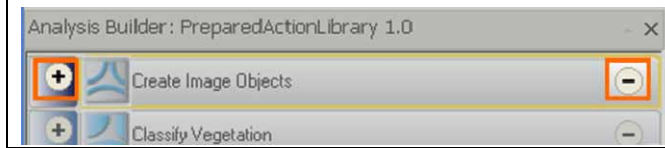


Figure 9: Action Groups of loaded Action Library in the Analysis Builder.

Tip:

If you want to add an action from the Analysis Builder directly, use the +, if you want to remove an Action, click the – next to the Action.



Information



Action!



Result Check

2.3.2 Sorting Actions

The Actions have to be in the correct order, otherwise conflicts may appear. E.g. the 'Merge Objects' Action has to be executed before the 'Export Vector Layer'.

1. Click on the '**Down**' arrow of '**Clutter Removal**' or on the 'Up' arrow of 'Manual Classification'.
2. Click on the '**Down**' arrow of '**Export Vector Layer**' or on the 'Up' arrow of 'Merge Objects'.

New sorting of the Actions:

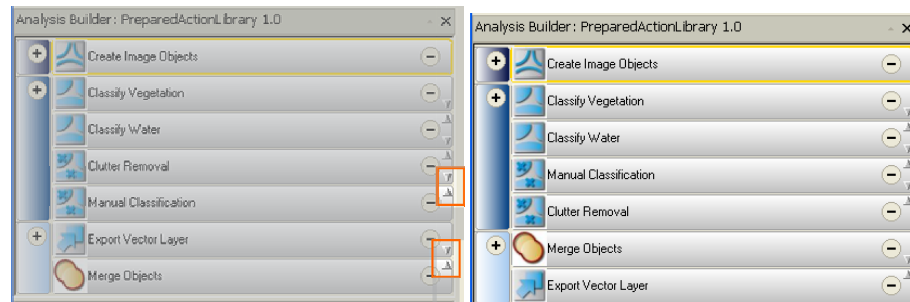


Figure 10: Left: Use the up and down arrows to sort Actions; Right: Final sorting of the Actions.

2.4 Configure and execute the Actions

This Chapter has the following Sub-Chapters

- Configure and execute 'Create Image Objects'
- Configure and execute 'Classify Vegetation' and 'Classify Water'
- Action 'Manual Classification'
- Action 'Clutter Removal'
- Configure and execute 'Merge Objects'
- Configure and execute 'Export Vector Layers'

After the Actions are loaded and sorted, they can be edited and executed.

If an Action is selected, the **individual properties (widgets)** of the Action are displayed in the lower part of the Analysis Builder. There can be several widgets, like **text boxes, buttons, drop-down lists** etc. Each property comes with a description. The Description is displayed if you hover your mouse over it.

Information

2.4.1 Configure and execute 'Create Image Objects'

The Action 'Create Image Objects' is designed to apply a Multiresolution Segmentation. The Action has two widgets: the **Scale Parameter** text box in which a value can be set and the **button 'Press to execute'** with which the Action is executed.

Information

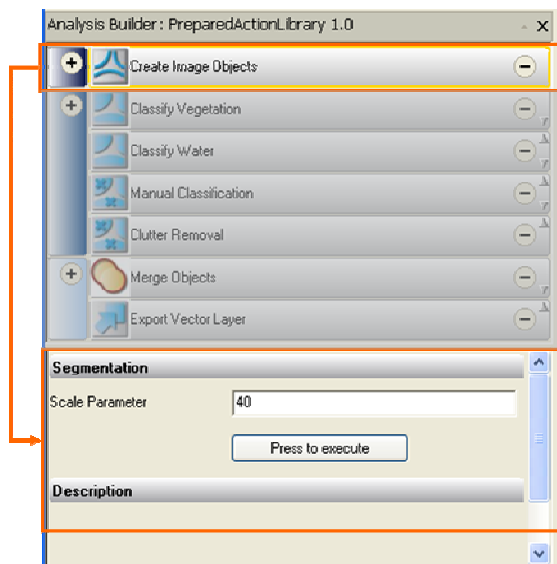


Figure 11: The Action 'Create Image Objects' with its widgets, a text field and a button.

1. Select the Action 'Create Image Objects' in the Analysis Builder.
2. Enter the value **40** in the 'Scale Parameter' field
3. Hit the 'Press to Execute' button.



Action!



**Result
Check**

The processing starts, an Image Object Level 'Main Level' is created using Scale Parameter 40.

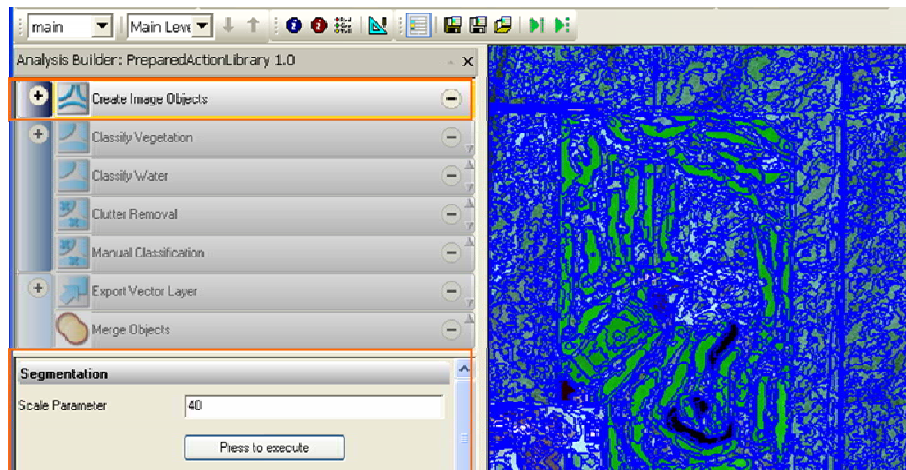


Figure 12: With Scale Parameter set to 40 and executed, a 'Main_Level' has been created.



Action!

4. Change the value to 20 in the 'Scale Parameter' field
5. Again hit the 'Press to Execute' button.



**Result
Check**

The processing starts again, an Image Object Level 'Main Level' is created using Scale Parameter 20 now.

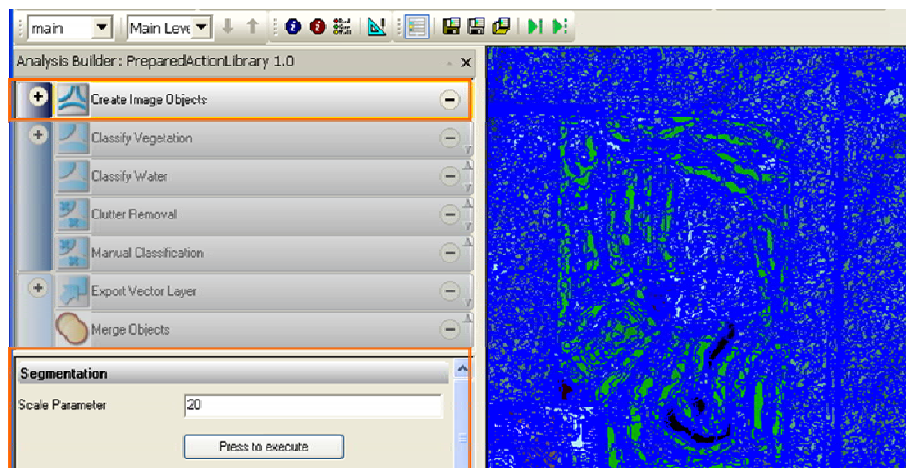


Figure 13: With Scale Parameter set to 20 and re-executed, the old 'Main_Level' has been overwritten and a new one with smaller Objects is created.

2.4.2 Configure and execute 'Classify Vegetation' and 'Classify Water'

Classify Vegetation

Information

The Action 'Classify Vegetation' is designed to classify Vegetation using the Mean of NDVI feature. The Action has two properties: a slider to set the value for the **Mean of NDVI** and the **button 'Press to execute'** with which the Action is executed.

1. Select the Action '**Classify Vegetation**' in the Analysis Builder.
2. Move the slider next to '**Mean NDVI**' to the value **0,4**.
3. Hit the '**Press to Execute**' button.



Action!



Result Check

The processing starts, the Object with mean of NDVI more than 0.4 are classified as 'Vegetation'.

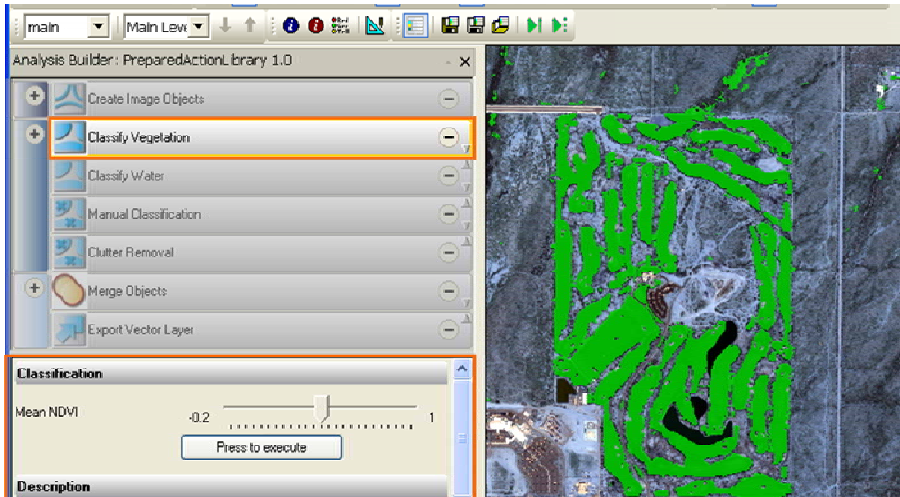


Figure 14: Action 'Classify Vegetation' with widgets. The slider is set to 0,4, the vegetation is classified accordingly.

4. Change the **NDVI** slider to **0.3**.
5. Again hit the '**Press to Execute**' button.



Action!



Result Check

The processing starts again, the Object with mean of NDVI more than 0.3 are classified as 'Vegetation'.

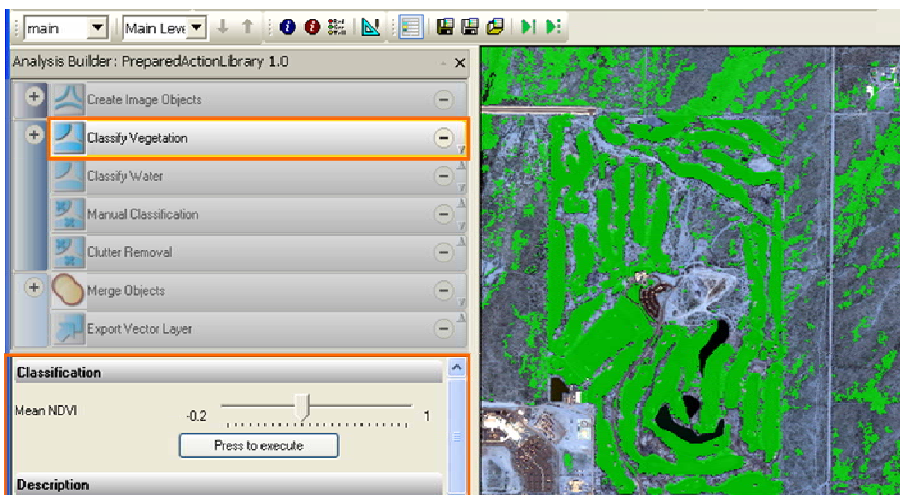


Figure 15: Action 'Classify Vegetation' with widgets. The slider is set to 0,3, more vegetation is classified.

Classify Water

The Action 'Classify Water' has two properties: again a slider, but to set the value for the **Ratio of nir** and again the **button 'Press to execute'** with which the Action is executed.

Information



Action!



Result Check

1. Select the Action '**Create Image Objects**' in the Analysis Builder.
2. Move the **slider** next to 'Ratio nir' and hit the '**Press to Execute**' button as long as you are satisfied with the classification.

With Ratio nir **less than 0.2** 'Water' is classified almost correct.

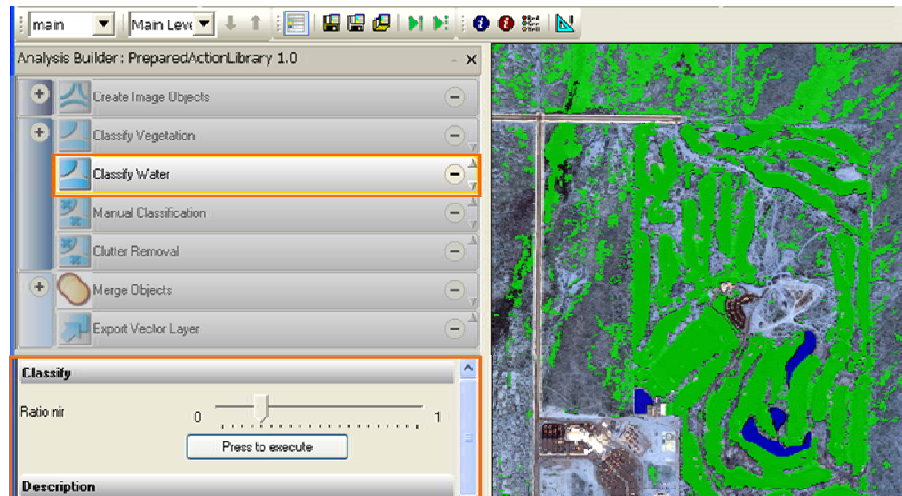


Figure 16: Action 'Classify Water' with widgets. The slider is set to 0,2, the water is classified accordingly.

2.4.3 Action 'Manual Classification'

Information

The Action '**Manual Classification**' is designed to manually correct the classifications done with the Actions before. Either 'Vegetation' or 'Water' can be classified by manually clicking on Objects.

In Opposite to the Actions before, now three Buttons are displayed in the properties of the action.

- One to classify or de-classify 'Vegetation'
- One to classify or de-classify 'Water'
- One to edit the classes

Classify manually

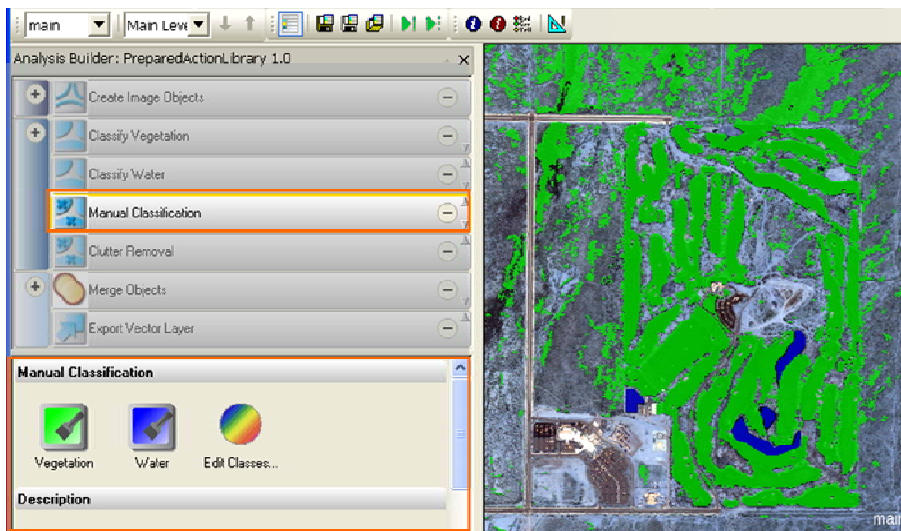


Action!

1. Select the Action '**Manual Classification**' in the Analysis Builder.
2. Click on the '**Vegetation**' button to make it active.
3. **Click** in unclassified Objects to classify them as 'Vegetation', or click on 'Vegetation' Objects to un-classify them.
4. Click on the '**Water**' button to make it active.
5. **Click** in unclassified Objects to classify them as 'Water', or click on 'Water' Objects to un-classify them.

Edit Classes

The color and naming of classes can be changed by clicking on the Edit Classes button.



✓
**Result
Check**

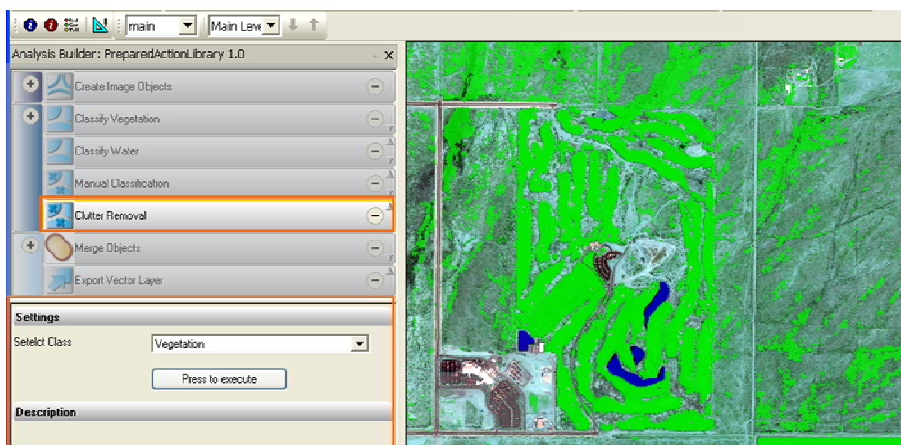
Figure 17: Action 'Manual Classification' with three buttons, one to edit the classes, the two others to manually classify.

2.4.4 Action 'Clutter Removal'

This Action, has a drop-down list, where the class can be chosen to which the clutter removal is applied. The Action removes too small Objects.

1. Select the Action '**Clutter Removal**' in the Analysis Builder.
2. Choose '**Vegetation**' from the drop-down list.
3. Hit the '**Press to Execute**' button.
4. Choose '**Water**' from the drop-down list.
5. Again hit the '**Press to Execute**' button.

Too small Objects are de-classified.



Information



Action!

✓
**Result
Check**

Figure 18: Action 'Clutter Removal' with widgets. From the drop-down list 'Vegetation' is chosen.

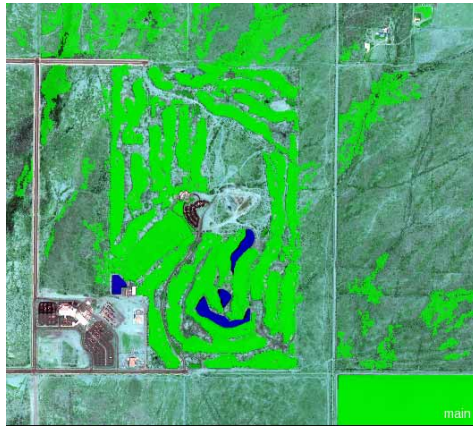


Figure 19: Classification after execution of 'Clutter Removal'.

2.4.5 Configure and execute 'Merge Objects'

Information

This Action, has a drop-down list, where the class to be merged can be chosen. The Action also contains a resizing part, where fractal outlines are smoothed, this processing is hidden and can not be tweaked in this Action.



Action!

1. Select the Action '**Merge Objects**' in the Analysis Builder.
2. Choose '**Vegetation**' from the drop-down list.
3. Hit the '**Press to Execute**' button.
4. Choose '**Water**' from the drop-down list.
5. Again hit the '**Press to Execute**' button.
6. Repeat the same for '**unclassified**'.



Result Check

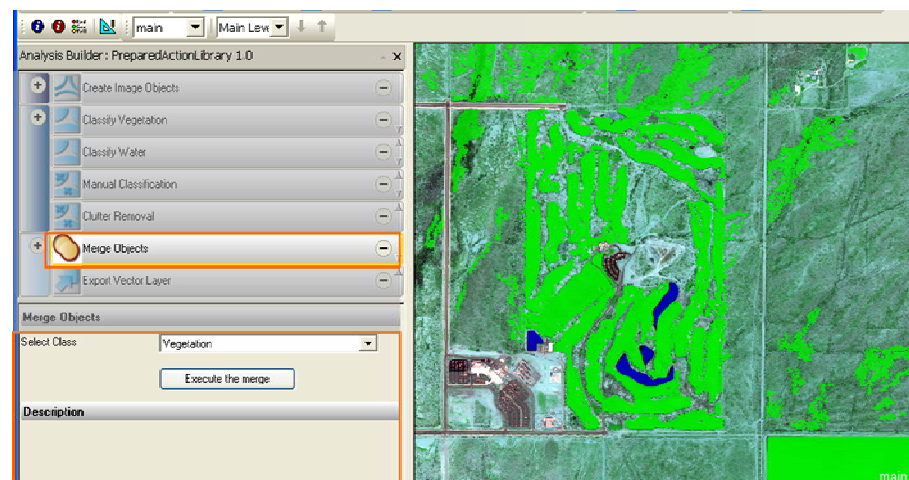


Figure 20: Action 'Merge Objects' with widgets. From the drop-down list 'Vegetation' is chosen.

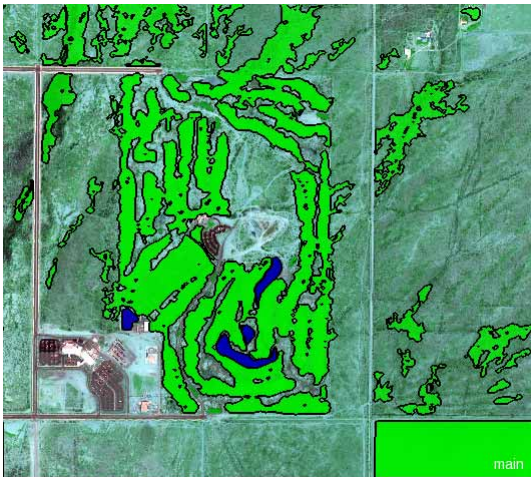


Figure 21: Object outlines after 'Merge Objects' is executed.

2.4.6 Configure and execute 'Export Vector Layers'

This Action, has a drop-down list, where the Level to be exported can be chosen. Additionally a check-box is available, where you can choose, whether the vectors shall be smoothed or not. All classes will be exported together with the feature 'Area'.

1. Select the Action '**Export Vector Layer**' in the Analysis Builder.
2. Choose '**Main Level**' from the drop-down list.
3. Check '**Smoothing**' to get smoothed vector outlines.
4. Hit the '**Press to Execute**' button.

The .shp file is stored where your image data is located.

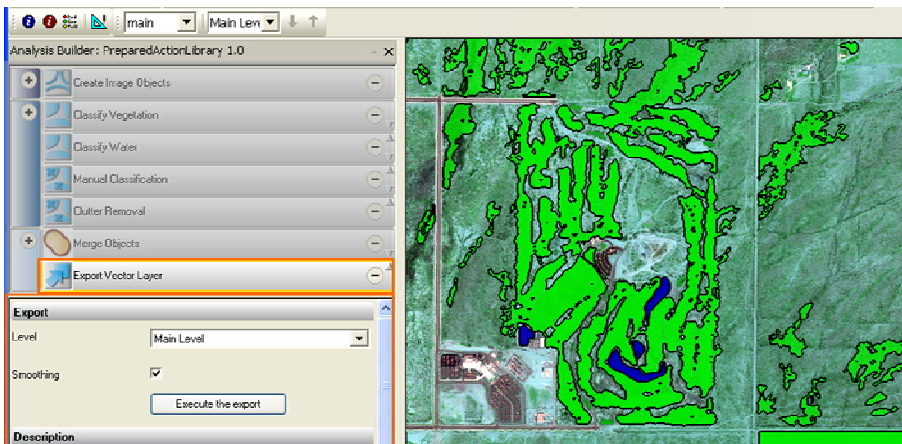


Figure 22: Action 'Export Vector Layer' with widgets. From the drop-down list 'Level' is chosen, 'Smoothing' is switched on'.

Information



Action!



Result Check