

# **GreenLand v2 application - user manual**

## 1. Menu option features

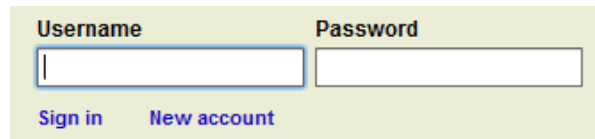
This section contains the short description of the menu bar options, provided by the GreenLand application:

- **New project:** it allows the creation of a new project. A project is one of the key concepts of the GreenLand application, that stores one or more workflows;
- **Edit project:** useful for changing the name or the description of an already existing project;
- **Delete project:** allows the user to delete an existing project. This action is triggered together with a warning popup message, just to clearly notify the user regarding this aspect;
- **All:** it could be used to check/uncheck all the expandable workflow (together with their child items) in the workflows list;
- **Add workflows:** opens a table populated with existing workflows inside the GreenLand database. Using this feature the user is able to attach a list of workflows to the current selected project;
- **Remove workflows:** in order to remove a workflow the user has to select it first. The selection is made by checking the combo box module, positioned on the left side of the workflow's name;
- **Start process:** by using this option the user triggers the Grid execution, related to the current selected project. Several pre-processing validations are performed, such as:
  - Check if the project contains at least one workflow;
  - Check if all the workflows inputs are properly specified;
  - etc.

## 2. Use case scenario 1 – Use an already existing project

The following section highlights what are the steps required for performing a valid Grid processing, using the features provided by the GreenLand application. This use case contains an already defined project, called (Istanbul\_project\_imported). In this case, the project contains two workflows: NDVI and EVI.

**Step 1:** Sign in your account



A sign-in form with two input fields: 'Username' and 'Password'. Below the fields are two links: 'Sign in' and 'New account'.

Figure 1. Sign in GreenLand application

**Step 2:** Open the project content

The process step was already completed for this project using the Grid infrastructure. Click the project name to open its content (Figure 2).

It is important to mention that you could not execute a project that has the “Executing project” status. This status is displayed just under the project name, in the projects list.

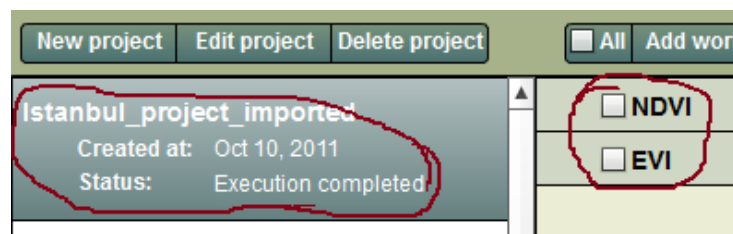


Figure 2. Identify the project and open its content

**Step 3:** Output results management

In order to handle the output results, just select the project from the project list, and use the **Execution results** option (Figure 3).

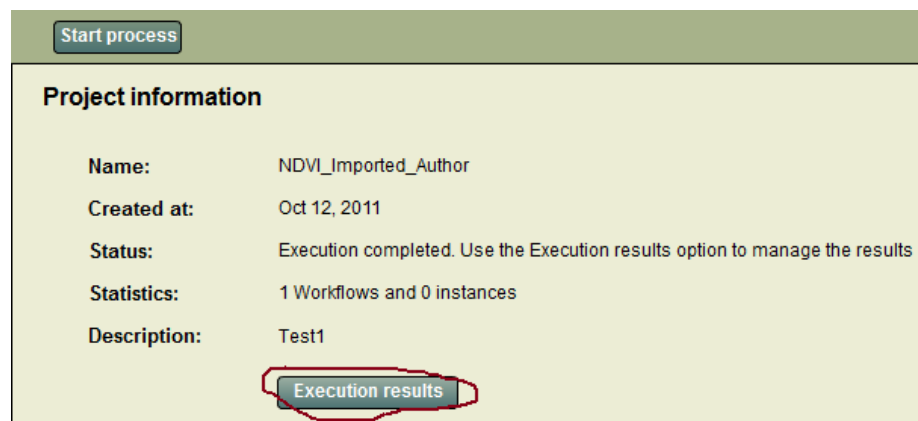


Figure 3. Visualize the process results

Once this step completes, a new table will appear that contains all the output results for the two specified workflows (NDVI and EVI). At this moment the results analysis could be performed only on the user local machine, by downloading the results, using the **Download** option (Figure 4).

**Project execution details**

Refresh table information every  ▼

Workflow name	Start time	Status	Result
NDVI	2011-10-13 10:43:50.0	Completed	5a6ac4f8-ba84-4a43-a211-Download
EVI	2011-10-13 10:43:50.0	Completed	5a6ac4f8-ba84-4a43-a211-Download
			5a6ac4f8-ba84-4a43-a211
			5a6ac4f8-ba84-4a43-a211

Figure 4. Output result management and analysis

After a project finishes its execution, the workflows list could be modified (add new items or remove some of the existing ones). Also, you could specify new inputs for the workflows, and start a new process, based on the values that you specified (follow the steps 3, 4, 5 and 6 described in section 3. *Use case scenario 2 – Create/execute your own project*).

### 3. Use case scenario 2 – Create/execute your own project

This section highlights all the necessary steps used for executing a new project that contains a list of workflows, specified by the user.

**Step 1:** Sign in your account

Username

Password

[Sign in](#)
[New account](#)

Figure 5. Sign in GreenLand application

**Step 2:** Create a new project

Use the **NewProject** menu bar option.



Figure 6. Identify the New project option

In this step both the name and the description fields are mandatory. Please take care when naming your project. All the projects in your projects list should have unique names.

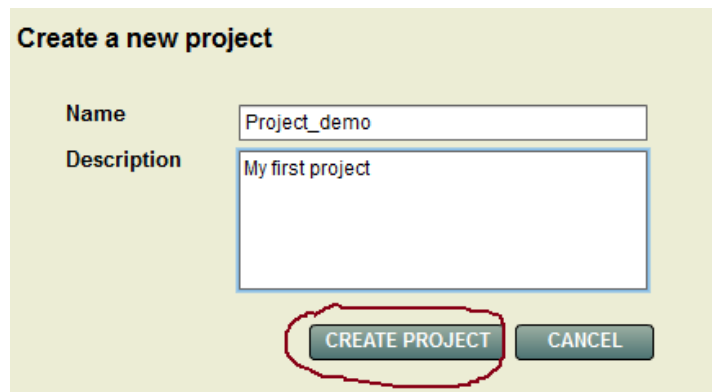
A screenshot of a form titled 'Create a new project'. The form has two input fields: 'Name' with the value 'Project\_demo' and 'Description' with the value 'My first project'. Below the fields are two buttons: 'CREATE PROJECT' and 'CANCEL'. The 'CREATE PROJECT' button is circled in red.

Figure 7. Create a new project

**Step 3:** Add new workflows to the current created project

Use the **Add workflows** menu bar option.

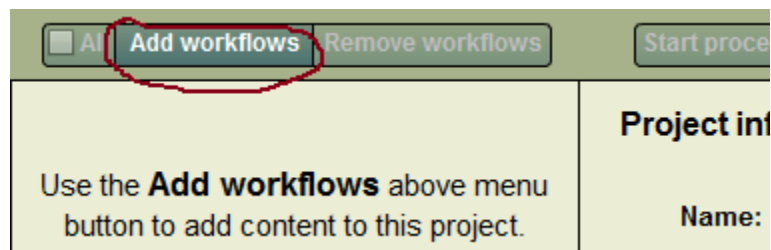
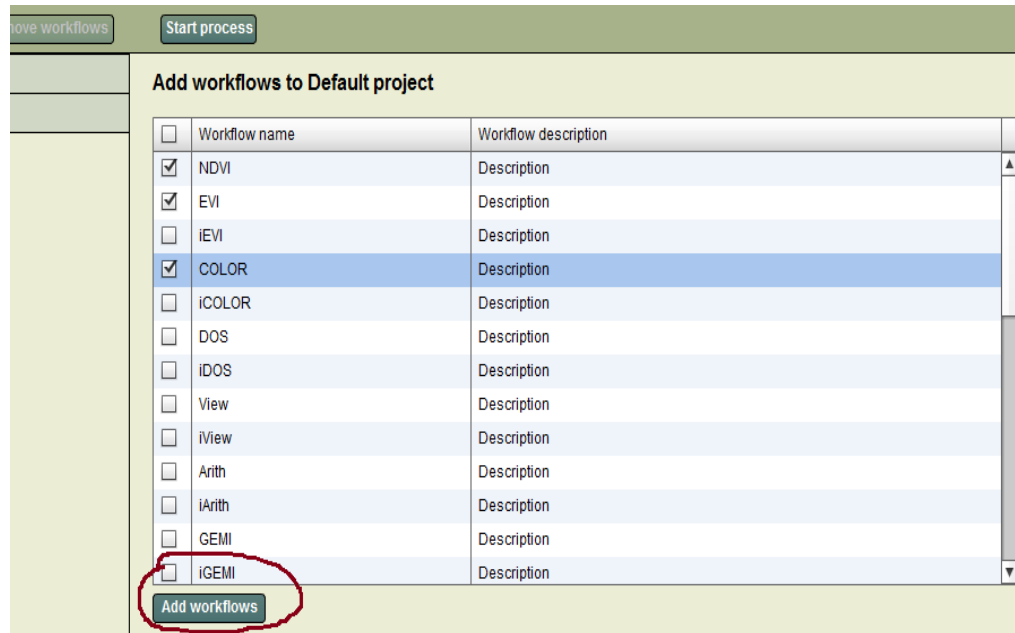


Figure 8. Identify the Add workflows option

At this time a table should appear, in the right of the workflows list, populated with all the workflows that exist in the GreenLand database, and are available for this user. In order to attach an operator to the current selected project you should first select it, by using its corresponding check box, located in the first column of the table. Multiple workflows could be selected, and after that use the **Add workflows** button under the table to finish the attachment action (Figure 9).



The screenshot shows a web interface for adding workflows to a default project. At the top, there are buttons for 'move workflows' and 'Start process'. Below them is a section titled 'Add workflows to Default project'. This section contains a table with two columns: 'Workflow name' and 'Workflow description'. The table lists several workflows, each with a checkbox in the first column. The 'COLOR' workflow is selected, and its row is highlighted in blue. The 'Add workflows' button at the bottom of the table is circled in red.

<input type="checkbox"/>	Workflow name	Workflow description
<input checked="" type="checkbox"/>	NDVI	Description
<input checked="" type="checkbox"/>	EVI	Description
<input type="checkbox"/>	iEVI	Description
<input checked="" type="checkbox"/>	COLOR	Description
<input type="checkbox"/>	iCOLOR	Description
<input type="checkbox"/>	DOS	Description
<input type="checkbox"/>	iDOS	Description
<input type="checkbox"/>	View	Description
<input type="checkbox"/>	iView	Description
<input type="checkbox"/>	Arith	Description
<input type="checkbox"/>	iArith	Description
<input type="checkbox"/>	GEMI	Description
<input type="checkbox"/>	iGEMI	Description

**Add workflows**

Figure 9. Select workflows list

It is worth to mention that the same workflow could be multiply within the same project (Figure 10), but each of its instances will have a different name (contains the workflow's name and an index, that represent the number of instances for this workflow). For example if the NDVI workflow is added, it will be inserted under the NDVI name. If a second insertion is made, then the NDVI\_1 name will be used, and so on.

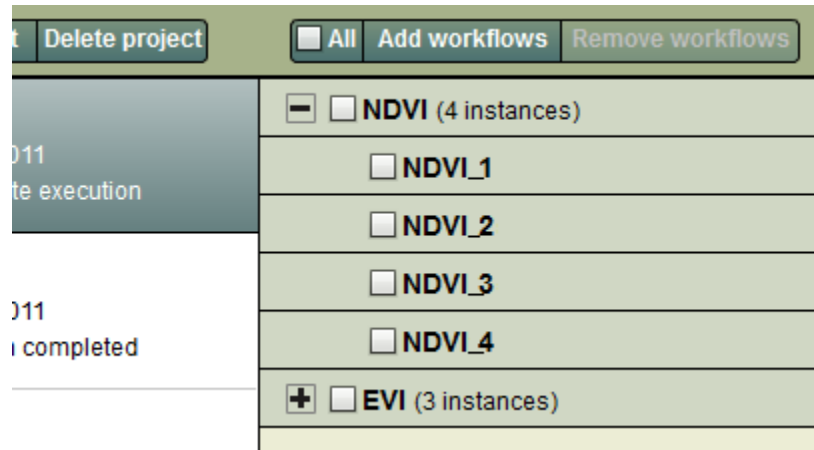


Figure 10. Create multiple instances of the same workflow

#### Step 4: Remove workflows

At any time you could add new workflows by following **Step 2**, or remove workflows from a project by using the **Remove workflows** menu bar option.

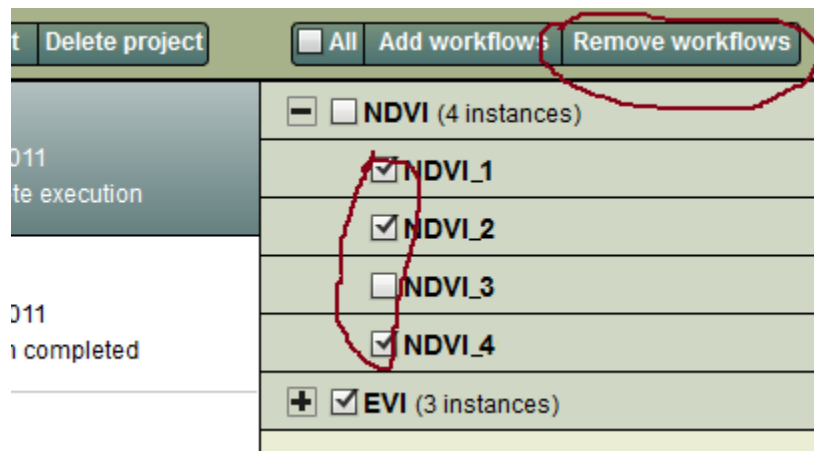


Figure 11. Remove workflows from the current selected project

#### Step 5: Specify workflow inputs.

In order to accomplish this step, simply click on a workflow. This action will display all the primary inputs of that workflow and for each input a list of possible values (e.g. satellite images) are provided to the user. The user could specify for each input a single value that will be used further on in the Grid based execution process.

Using the **Save** button all the values you specified for these inputs will be save, and there is no undo possibility. The **Resume last saved** option play the undo role, but only if it does not immediately follows after a save action (Figure 12).

The screenshot shows a software interface for specifying workflow inputs. At the top, there is a horizontal bar with four buttons: 'All' (disabled), 'Add workflows', 'Remove workflows', and 'Start process'. Below this bar, the interface is split into two main sections. The left section has a header 'NDVI' with a checkbox. The right section is titled 'Specify the workflow inputs' and contains two numbered input sections. Section 1: 'Name: NDVI.IG4', 'Type: image/tif', 'Value: Image1\_Red' (dropdown). Section 2: 'Name: NDVI.IG5', 'Type: image/tif', 'Value: Image1\_NIR' (dropdown). At the bottom right of the right section are two buttons: 'Save' and 'Resume last saved'.

Figure 12. Remove workflows from the current selected project

Also you could change the name and the description of the workflow.

#### Step 6: Start the Grid processing

After all the workflows inputs were properly specified, the execution process could begin, using the **Start process** menu bar option.

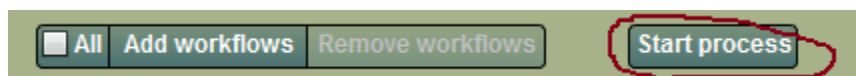


Figure 13. Identify the Start process option

After this action, a monitoring table will be display that highlights the processing progress (Figure 14).



**Project execution details**

Refresh table information every

Workflow name	Start time	Status	Result
NDVI	2011-10-13 10:43:50.0	Running	
EVI	2011-10-13 10:43:50.0	Completed	5a6ac4f8-ba84-4a43-a... <a href="#">Download</a>

Figure 14. Monitor the project execution

### Step 7: Output results management

When a workflow finishes its execution a list of results will be available, together with a download option (Figure 15). Using this option the user is able to download the result on its local machine and analyze its different aspects.

[Start process](#)

**Project execution details**

Refresh table information every

Workflow name	Start time	Status	Result
iGr1	2011-09-16 14:40:36.0	Completed	eb7ddd1d-69d8-4a07-... <a href="#">Download</a>
Test	2011-09-16 14:40:36.0	Completed	eb7ddd1d-69d8-4a07-... <a href="#">Download</a>
G1	2011-09-16 14:40:36.0	Completed	eb7ddd1d-69d8-4a07-... <a href="#">Download</a>

Figure 15. Output result management

It is worth to mention that the execution process may take some time, depending on the workflows complexity. A refresh timer (located above the monitoring table) will update the execution data, based on a 10, 85 or 100 seconds time interval (Figure 15).

## 4. Conclusions

This is the first version of the GreenLand application, and there are some things to be improved or added as new functionalities:

- Extend the GreenLand database with new workflows;
- Allow the user the possibility to create its own workflows using a WorkflowEditor module;
- Implement the online result analysis module;
- Implement the uploading data (e.g. satellite images) functionality;
- Support for the OGG services.