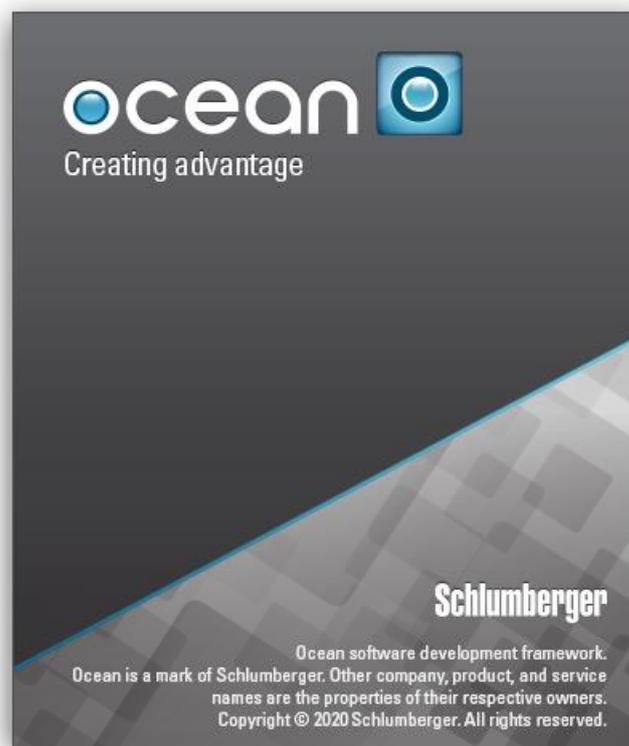


# Ocean for Petrel Wizards and Developers Tools in Visual Studio

For Geoscientists and Software Developer



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## **THE OCEAN FOR PETREL WIZARDS**

Ocean provides a Wizard to simplify the creation and installation of modules. This chapter provides an overview of the Ocean Module Wizard and its features.

## Installing the Ocean for Petrel Wizards

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The Ocean for Petrel Wizard is installed as part of the Ocean for Petrel SDK installation process. Installation of the Wizard is an option and requires some disk space. Although it is part of the typical installation, it might not have been part of your installation. If the Wizard has not been installed, you will need to install it before you can go any further.

To install the Wizard:

1. Run your Ocean SDK installation executable again.
2. Select Modify.
3. Add the Wizard using the settings in the associated boxes.



Figure 1: Installing the Ocean Wizard

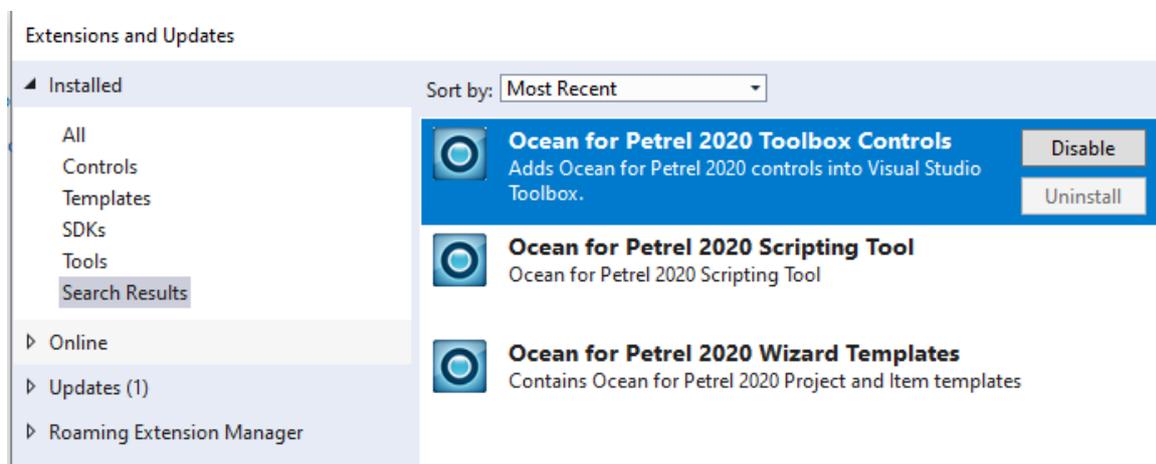
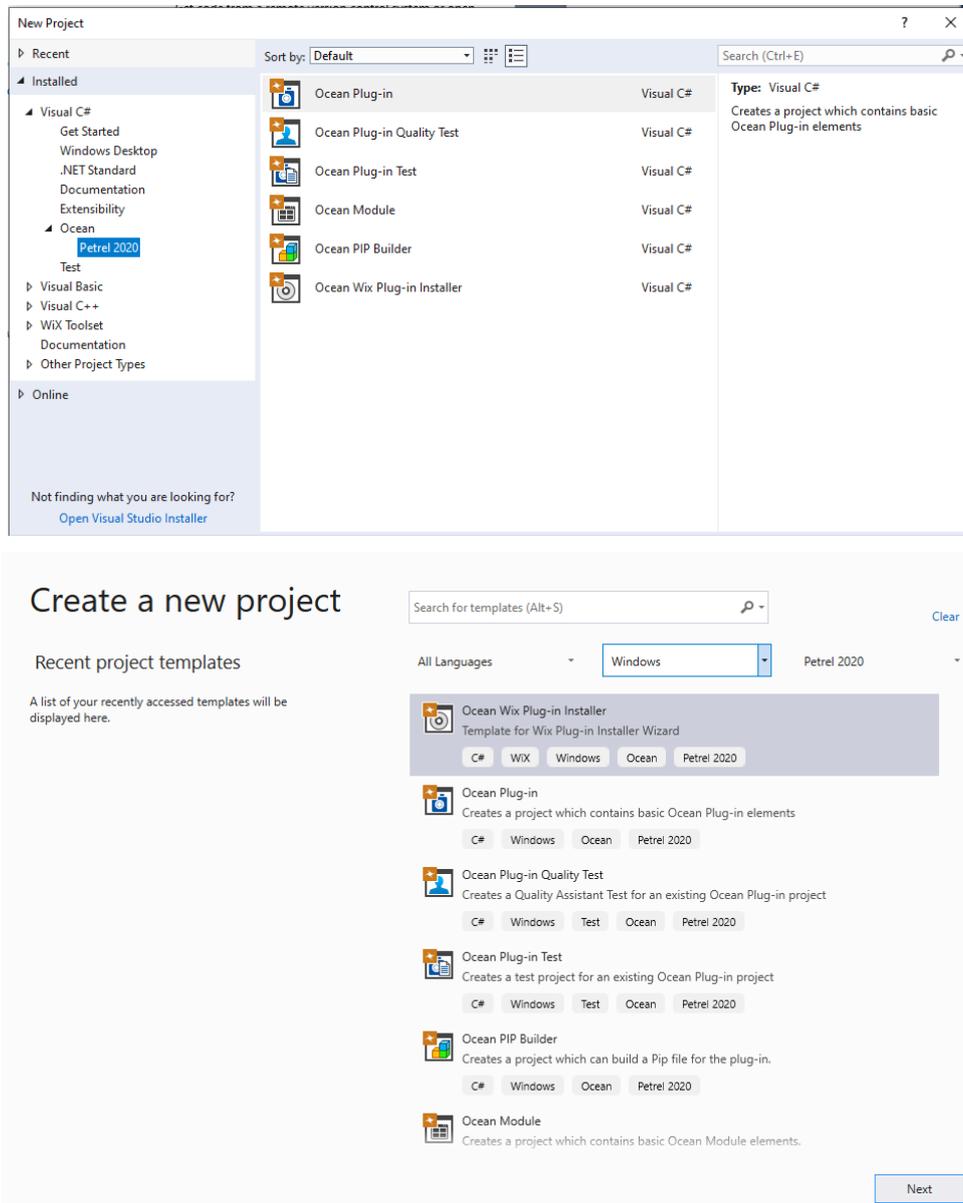


Figure 2: Ocean Wizard developer pack installed

To check whether the Ocean Wizard has been installed, run Visual Studio and select **New Project** from the **File** menu. The project dialog should show **Ocean** as an option in the list of new project types as shown in the following figure.

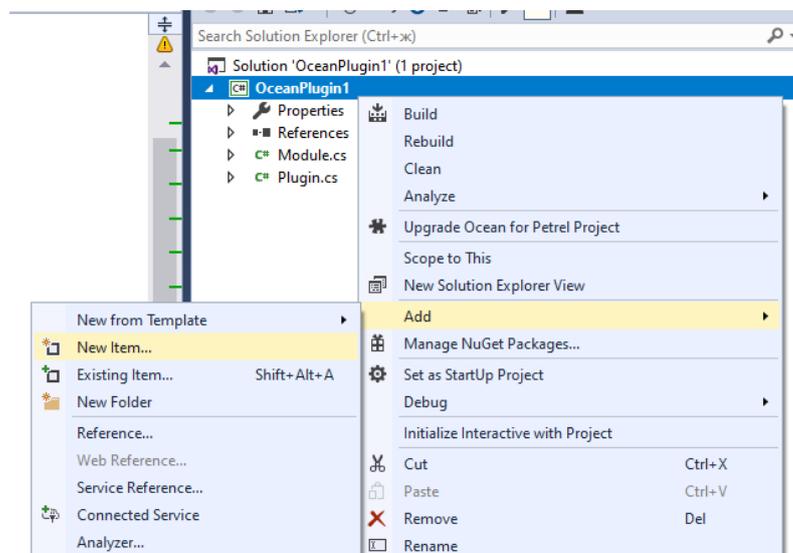
**Note:** When done using silent installation to Visual Studio 2017, the installer will by default install to Enterprise edition of Visual Studio. If Enterprise edition is not available, the installer will install to Professional edition.



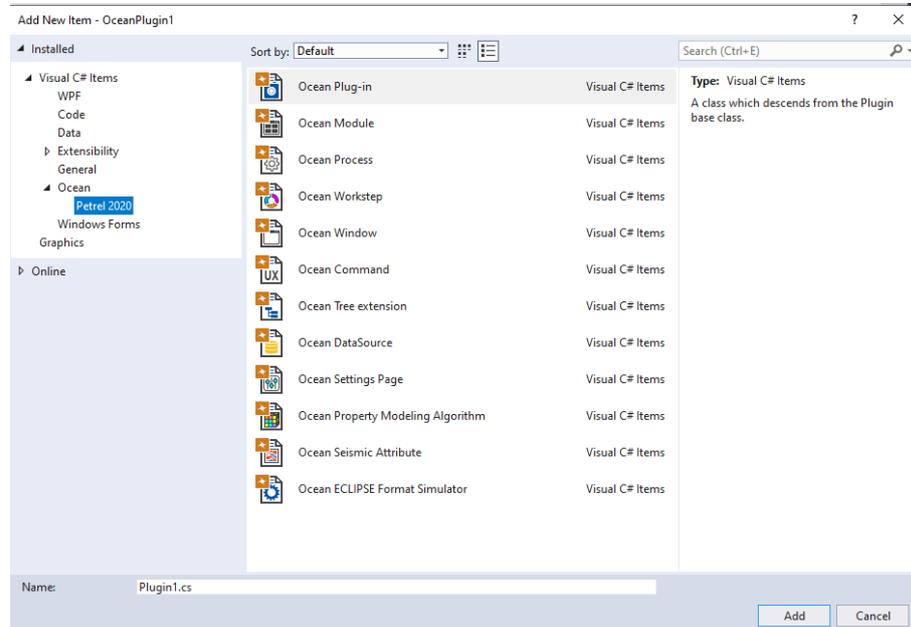
**Figure 3: New Project Dialog Showing the Ocean Wizard Options**

If these icons are not shown, run the Ocean SDK installer again and select the Wizard installation option.

If you try to add a new project item to an existing project (as shown in Figure 4), then you can see the Ocean project item types (as shown in Figure 5).



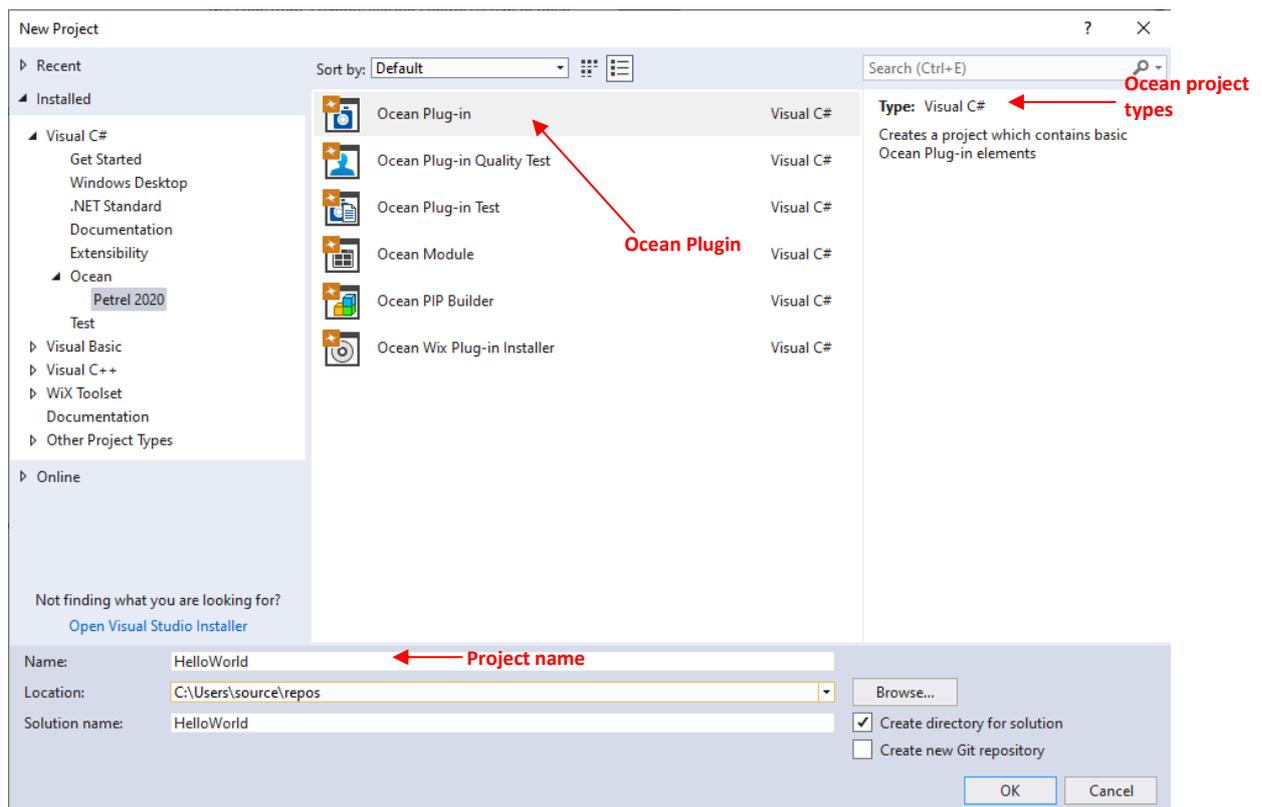
**Figure 4: Add / New Item Context Menu on the Solution Explorer**

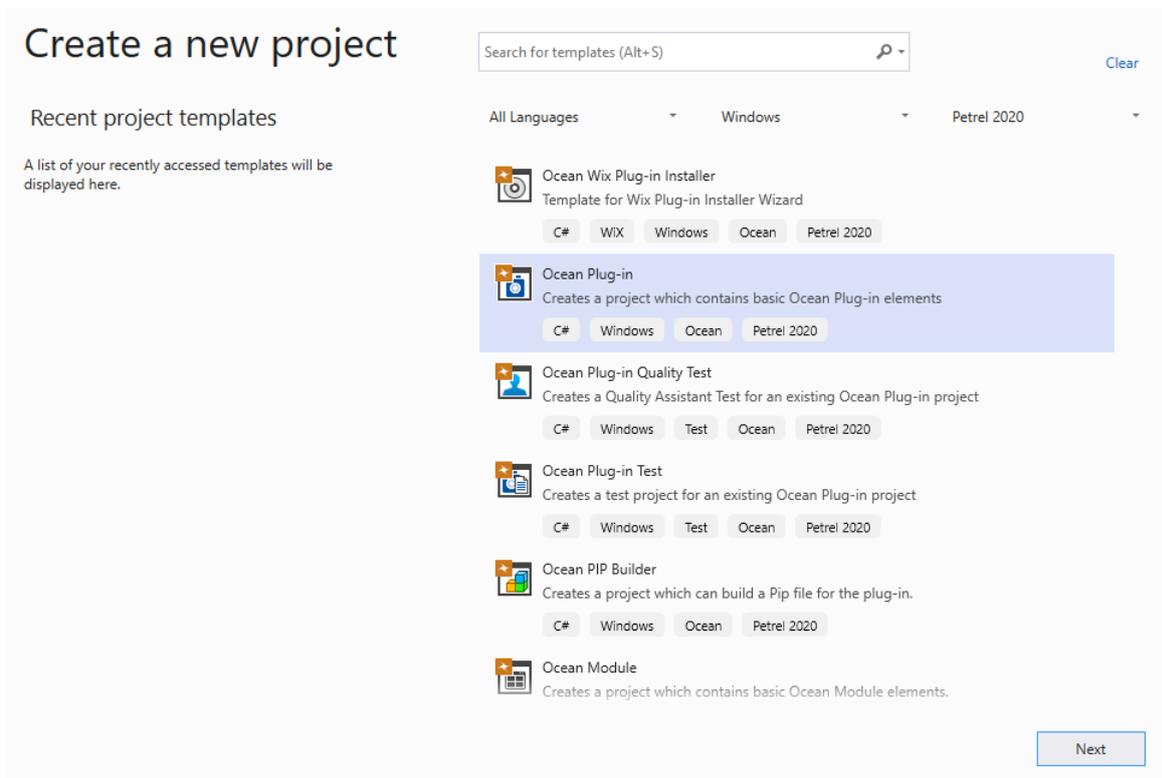


**Figure 5: New Project Item Dialog Showing the Ocean Wizard Installed Options**

## Creating an Ocean for Petrel Plug-in Project

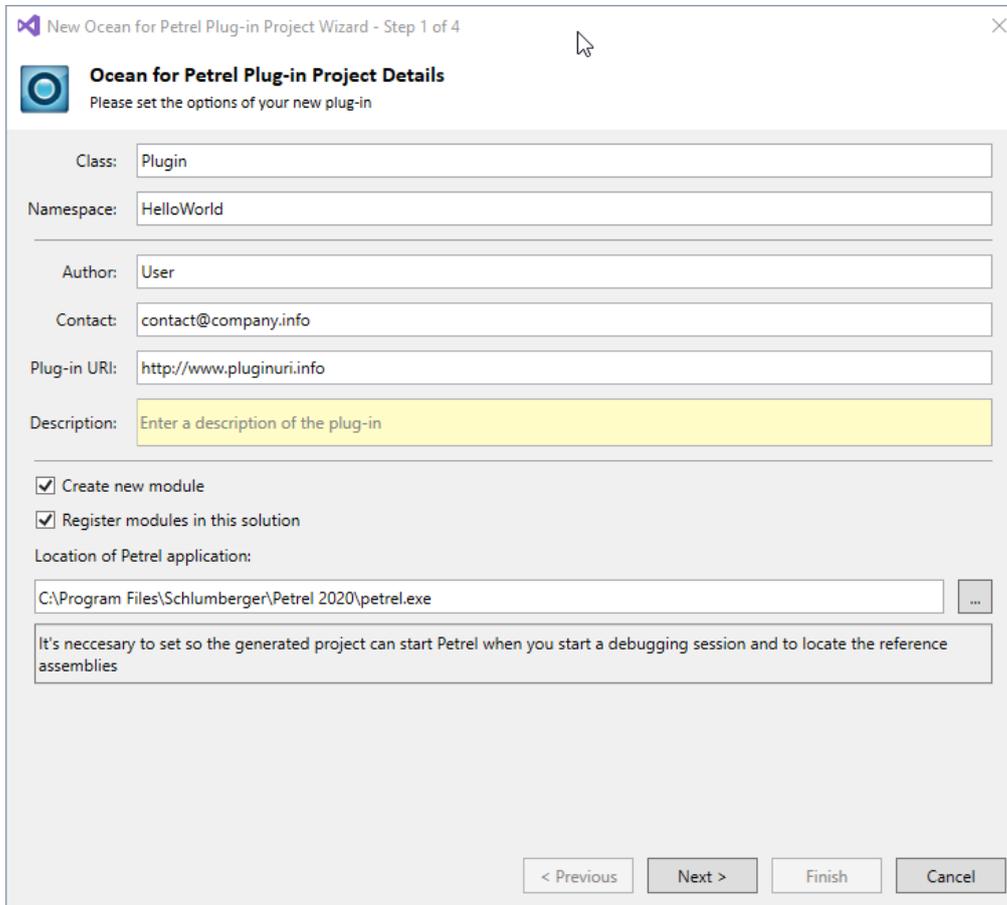
If you want to create a new plug-in project, choose **File > New Project** in Visual Studio. The following screen opens.





**Figure 6: Creation of an Ocean Plug-in Dialog**

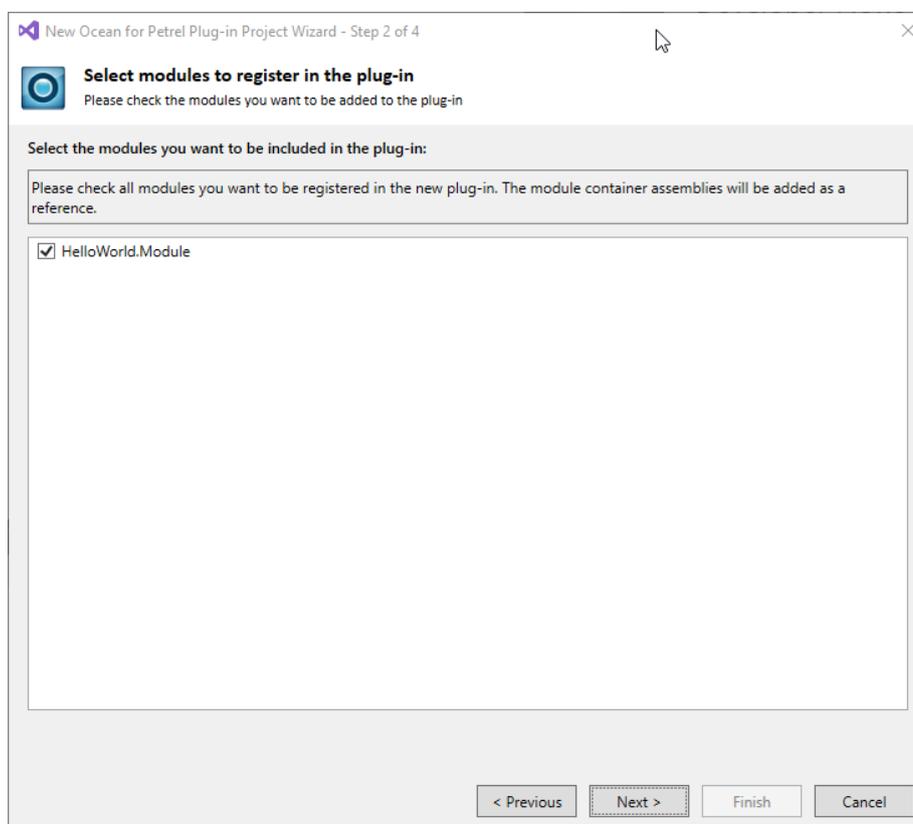
The following figure shows the Step 1 window of the plug-in project or plug-in file wizard:



**Figure 7: Step 1 of Plug-in Wizard Dialog**

In this page, you can specify the plug-in metadata information such as the author, contact information, and a small description. This information is redundant if you use the old `IModuleAppearance` on your modules, but the information given in the plug-in will be the main source.

If you check the Register existing modules in the solution checkbox, then you can select which modules want to register from the detected module list:

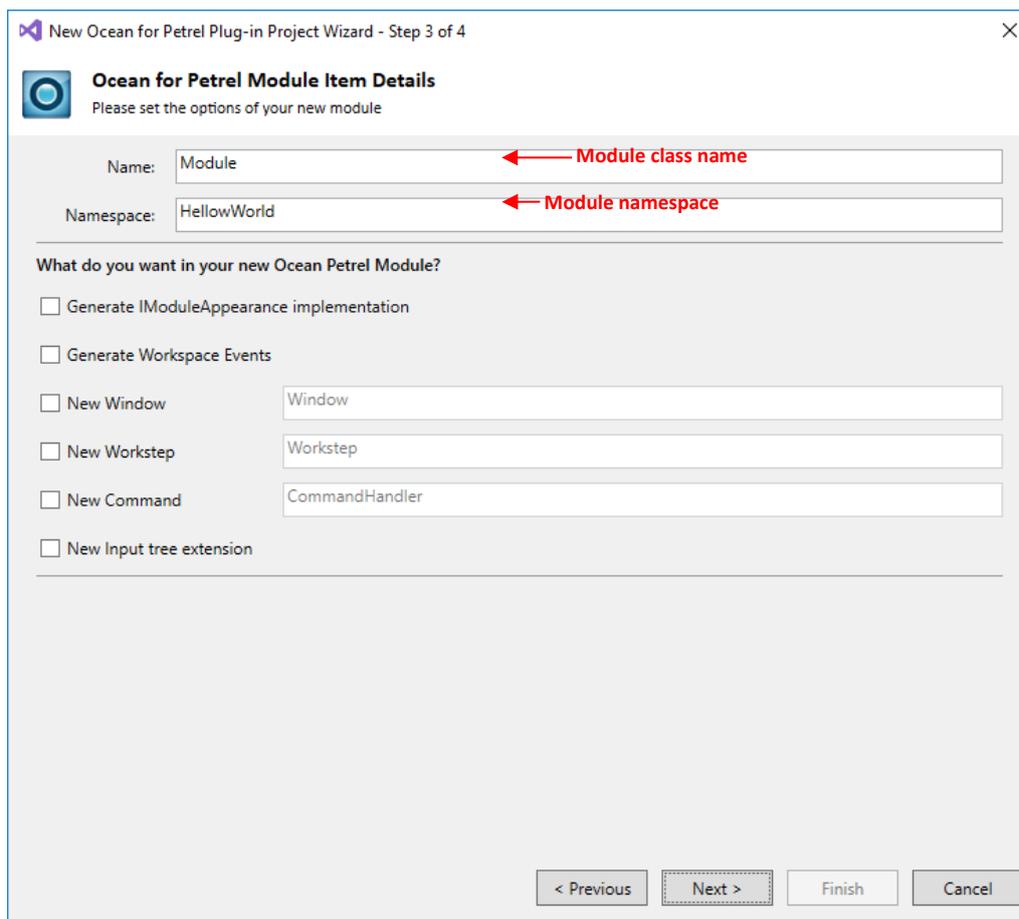


**Figure 8: Step 2 of Plug-in Wizard Dialog**

In order to use the plug-in, there must be at least one module registered in it.

You also have the option to generate a new module together with the new plug-in. If you choose to generate a new module, you will get the same module-generator wizard pages you are already familiar with.

During the building of your plug-in, as a post build event, the plug-in gets registered in Petrel, so you need to build your plug-in at least once, and after that, the plug-in is usable from Petrel.



**Figure 9: Step 1 of Module Wizard Dialog**

To begin creating your new module:

1. Specify the following options:

- Name: Enter the name of the module class. For this example, change the module name from “OceanModule1” to “Module”.
- Namespace: Define the namespace for your module project’s class. It is a common practice when defining namespaces to incorporate the company name and product name into the namespace to avoid conflict. In this example, you must change the namespace from “OceanModule1” to “Slb.Ocean.HelloWorldSample”.
- Generate IModuleAppearance implementation: Check this option to generate a class that would implement **IModuleApperance** interface. The Wizard will annotate your Module class with the **ModuleAppearance** attribute. For more information and details of **IModuleAppearance**, refer to the Ocean API documentation or the *Ocean Developers Guide*.
- Generate Workspace Events: Check this option to register for `DataManager.Workspace` events in the Initialize method of your Module class.
- Location of Petrel Application: Using the browser (...) button, provide the location of petrel.exe file. This will enable the Wizard to set the project configuration to run the Petrel application for instant debugging. Also, the necessary references will be selected relative to this path.

The following options allow you to add additional ocean items to the project.

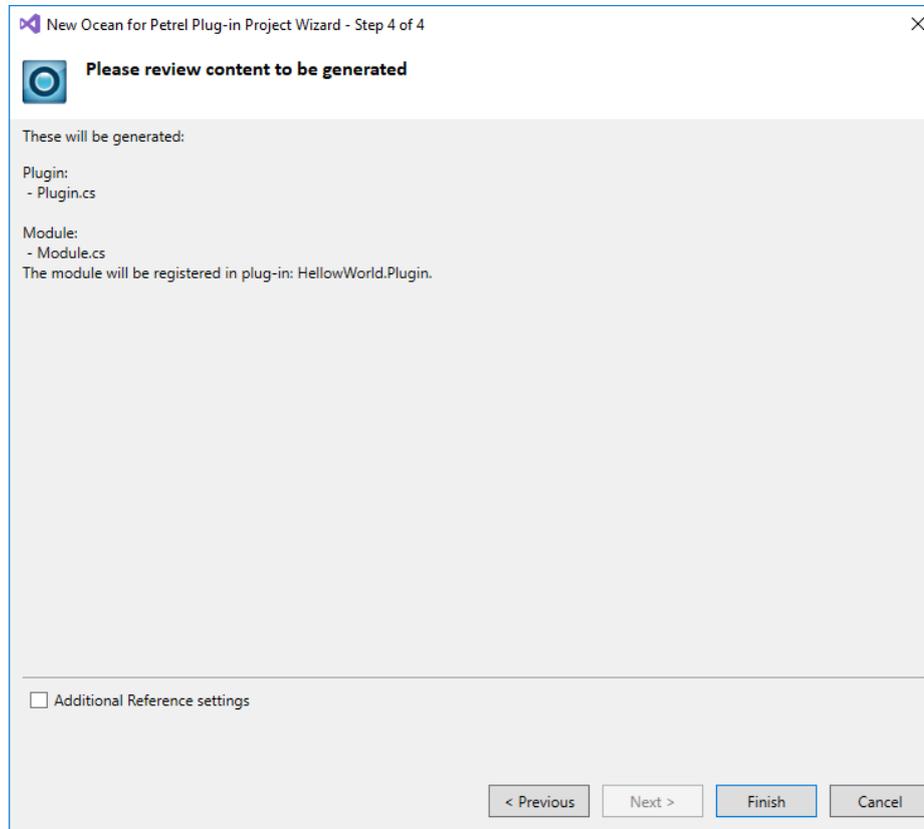
- New Window: Check this option to implement and add a custom window to your module project. For more information, refer to Adding a New Window on page 38.

- **New Workstep:** Check this option to add a new workstep to your module project. For more information, refer to Adding a New Workstep on page 40.
- **New Command:** Check this option to add a new ribbon to UX mode. For more information, refer to Adding New Command on Page 28. This option replaces New Menu Item option which is still available in Add New Item wizard. For more information, refer to on page 28.
- **Input Tree Extension:** Check this option to add a new extension to the Petrel tree data items. For more information and details, refer to
- **Adding a New Petrel Tree Extension on page 34.**

You can also add all of these items to the project later; these checkboxes are only shortcuts. They allow you to create a module with the most usual module elements at once. Their Wizard pages are exactly the same as the standalone Workstep, Menu Item, and Tree Extension Project Item Wizard pages.

2. Click **Next**.

The Step 2 screen of the Wizard dialog opens as shown in the following figure.



**Figure 10: Step 2 of the Wizard Dialog**

This step shows a list of the items that will be created. Some of the most important settings are also listed.

3. Click **Finish**.

The Ocean Wizard generates an Ocean Plug-in project with the name provided in the Name textbox (See Figure 6). Ocean Wizard also generates a file with Module class, which implements the **IModule** interface and adds this Ocean module to your new Ocean Plug-in project.

The following figure shows a preview of the Solution Explorer for the newly generated Ocean Plug-in project.

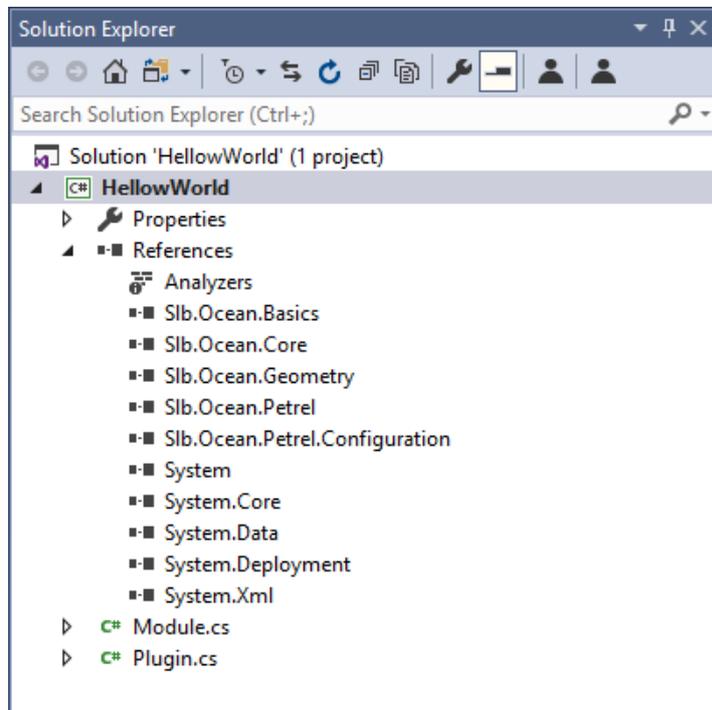


Figure 11: Solution Explorer of the Newly Created Plug-in Project

## Adding a New Process

---

If you chose **Ocean Process** in the **Add / New Item** dialog (Figure 4), then the following screen opens:

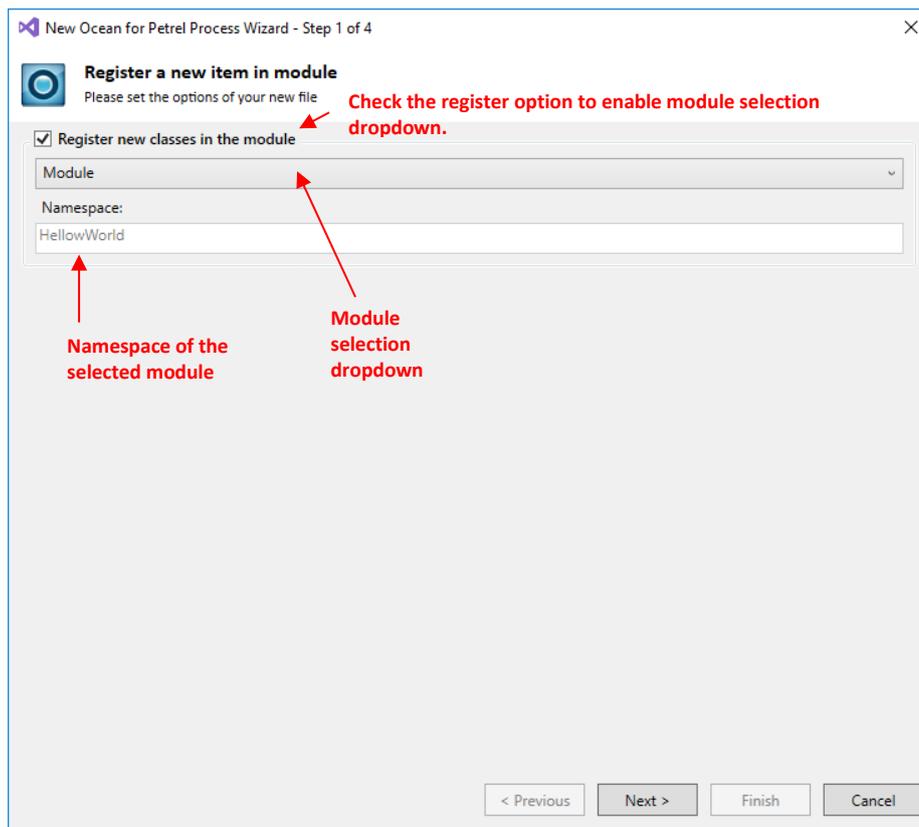


Figure 12: Register in Module Page

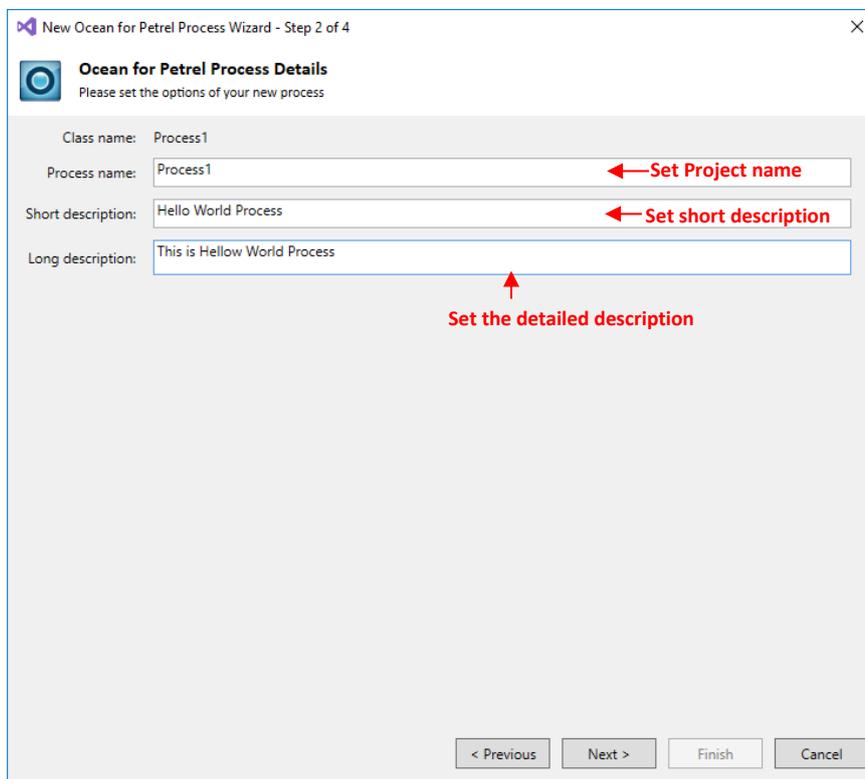
1. Specify the appropriate options.

An Ocean Plug-in assembly may contain more than one module. This page lets you decide where to register your new process or whether to register it at all. The detected modules are listed in the dropdown list.

Important: The same page appears for all Ocean project item types (except the Module itself), and its purpose is the same: to register the generated item in the selected module.

2. Click **Next**.

The following screen opens:



**Figure 13: Ocean Process Details**

3. Client Next.

The following screen opens:

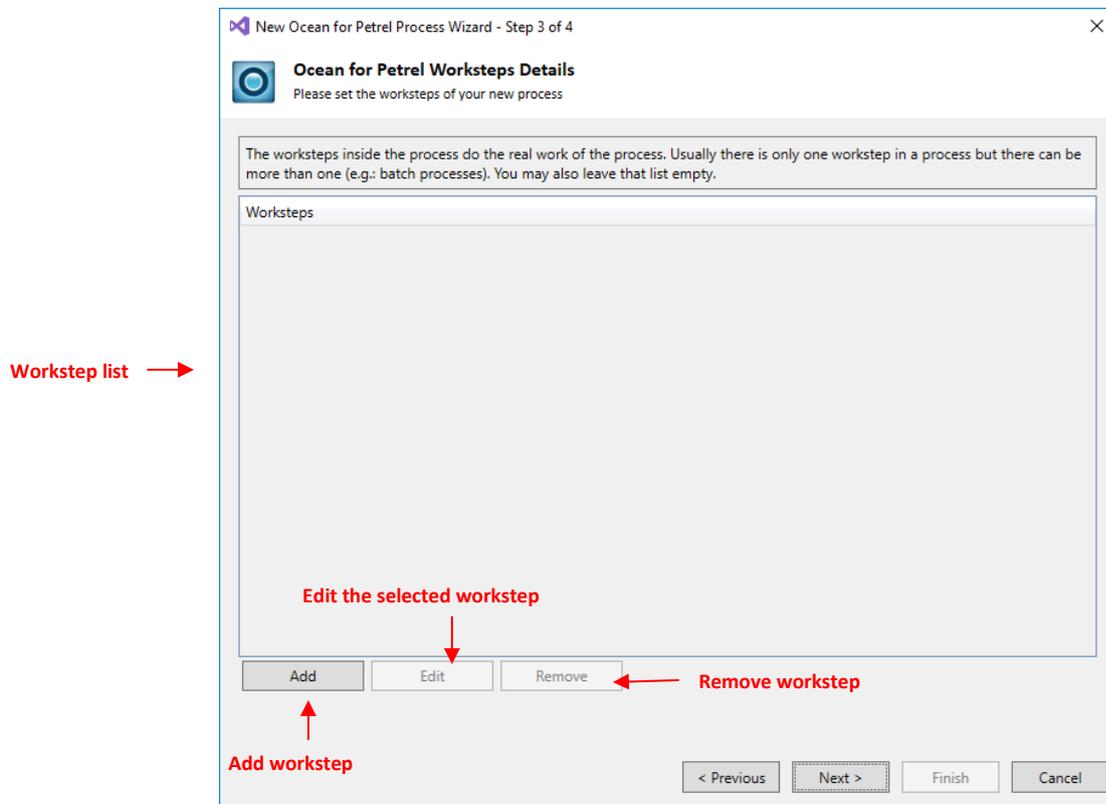


Figure 14: Ocean Workstep Generator

4. Enter the appropriate information in the following fields:
- Process name: Enter the name of the process class.
  - Short description: Enter a brief explanation of the purpose of the process.

- Long description: Provide a more detailed explanation of what a process does. Your description might include the type of data provided for each of the arguments.
5. Click **Add** to add a workstep. Click **Edit**. It will open the Workstep Generator dialog as shown in the following figure:

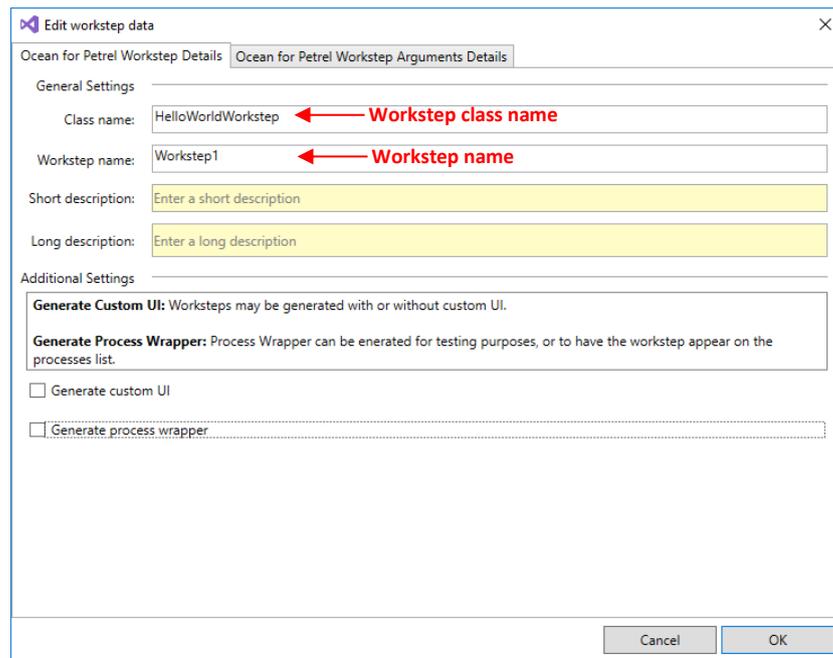


Figure 15: Ocean Workstep Generator

The Workstep Generator dialog contains the following three tabs:

- **File settings:** The worksteps are created into different files, and each workstep has its own source file. On this tab, you can set the file name and class name of the workstep. For detailed instructions, see Adding a New Workstep on page 40.

- **Workstep data:** This tab is similar to the main page of the process. You can set the name, description, and other settings. This tab is exactly the same as on the second page of the Ocean Workstep project item wizard; see Adding a New Workstep on page 40. for details.
  - **Argument data:** This tab is used for setting the arguments of the workstep. See Adding a New Workstep on page 40, because it is exactly the same as the third page of the Ocean Workstep project item wizard.
6. After you set the workstep, click **OK** to return to Ocean Process Details.

In this example, the newly created “HelloWorldWorkstep” is added to the workstep list as shown in the following figure.

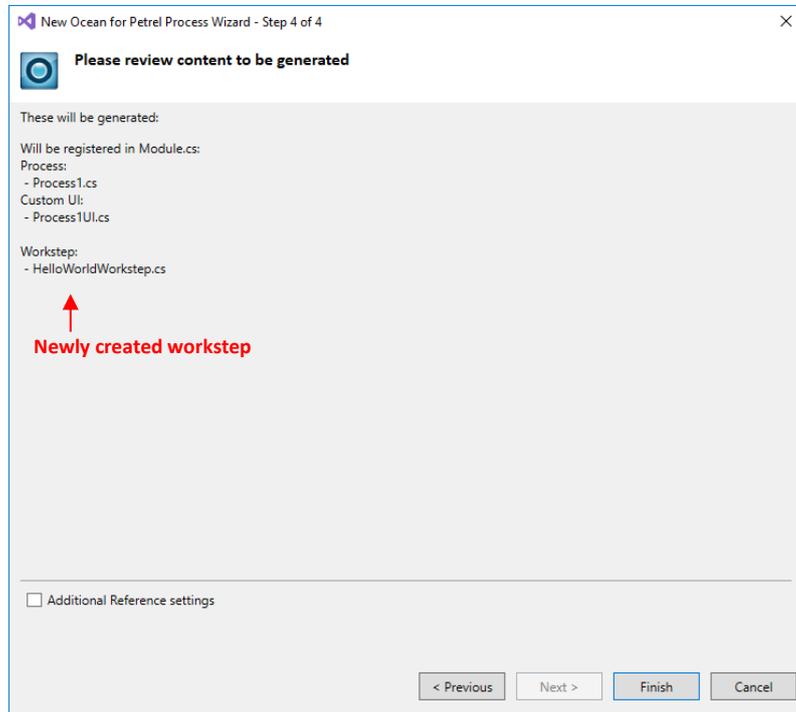


Figure 16: Creation of a New Workstep

7. Click **Next**.

The Wizard generates a file with the Process class and a file with the Workstep class and adds them to the process diagram and workflow editor respectively. The Wizard also adds the following code in the Integrate method of your Ocean module class:

```
public void Integrate()
{
    // Registrations:

    // TODO: Add Module.Integrate implementation

    // Register HelloWorldProcess
    HelloWorldProcess helloworldprocessInstance = new
    HelloWorldProcess();
    PetrelSystem.ProcessDiagram.Add(helloworldprocessInstance, "Plug-
    ins");

    // Register HelloWorldWorkstep
    HelloWorldWorkstep helloworldworkstepInstance = new
    HelloWorldWorkstep();
    PetrelSystem.WorkflowEditor.Add(helloworldworkstepInstance);
    PetrelSystem.ProcessDiagram.Add(new
    Slb.Ocean.Petrel.Workflow.WorkstepProcessWrapper(helloworldworkstepInst
    ance), "Plug-ins");
}
```

The following figure shows a preview of the process as well as the workstep files in the Ocean Plug-in project.

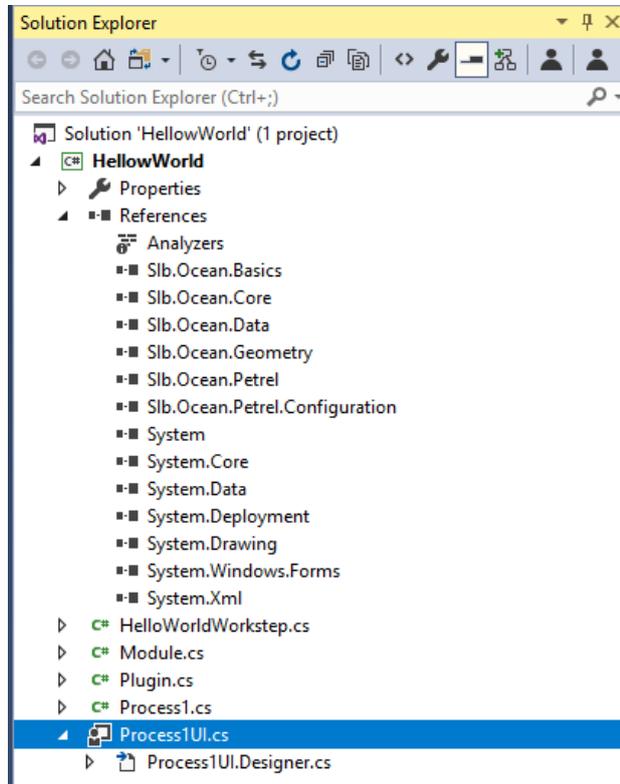


Figure 17: Preview of Solution Explorer with Process and Workstep Files

## Adding New Command

---

To add your own button to Petrel ribbon UI, chose **Ocean Command** from the **Add/New Item** option from the Visual Studio context menu, or if you checked the option to add a new command in Step 1 of the Wizard dialog, then you will see the following wizard screen:

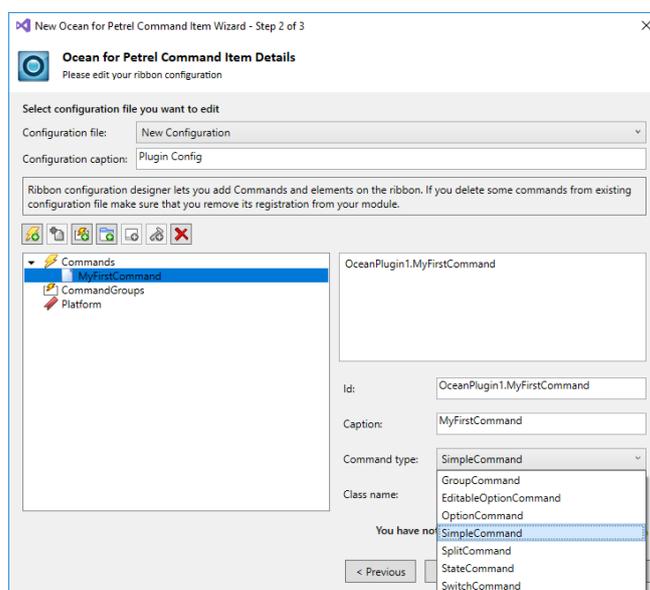


Figure 18: Preview of Solution Explorer with New Command resources

From this screen, you can add new command, create new ribbon or ribbon tab, or extend existing Petrel command group with commands. You must always select the parent item to which the new item will be added.

The types of the menu items that can be added include the following, this wizard will create basic container and register these commands to make them visible in the ribbon. For detail guide and sample on how to implement your logic for these command refer to Ocean for Petrel CHM under `Slb.Ocean.Petrel.Commands` namespace:

---

**SimpleCommand:** Simple command to perform a specific action. When added to Petrel UI it will be rendered as a basic button.

**StateCommand:** Command that indicates one of two states (e.g. "on" or "off"). When added to the Petrel UI, this will be represented by a button with an on/off state.

**TextCommand:** Command that defines an editable text option. When added to the Petrel UI, this will be represented by a Textbox.

**OptionCommand:** Command that defines several selectable options. When added to the Petrel UI, this will be represented by a drop down list.

**EditableOptionCommand:** Command that defines several selectable options with the possibility to type other texts as well. When added to the Petrel UI, this will be represented by a Dropdown list with an editable text area.

**GroupCommand:** Button with the appearance of the GroupCommand. When clicked popup menu list of sub-commands is displayed.

**SwitchCommand:** Button with the appearance of the GroupCommand. When clicked popup menu list of sub-commands is displayed.

**SplitCommand:** Split button. The primary part displays and executes the selected sub-command while the secondary part display a popup menu list of sub-commands.

To create a new command, select Commands parent item in the tree and click "Add New Command". Command id, caption and type can be change as shown in below:

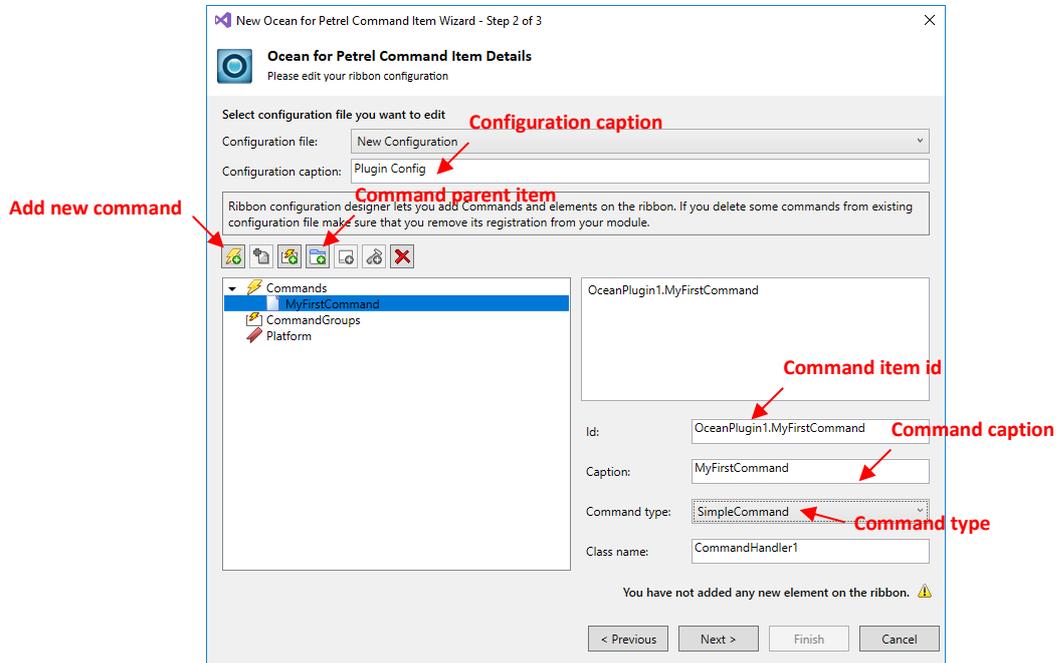


Figure 19: Wizard to add command

To include the new command you created above, select ribbon parent item and click “Add new ribbon to tab”. Then click “Add new ribbon tabgroup”. Finally to add your command to tabgroup, click “Add command to tabgroup” and your ribbon tree will appear as below:

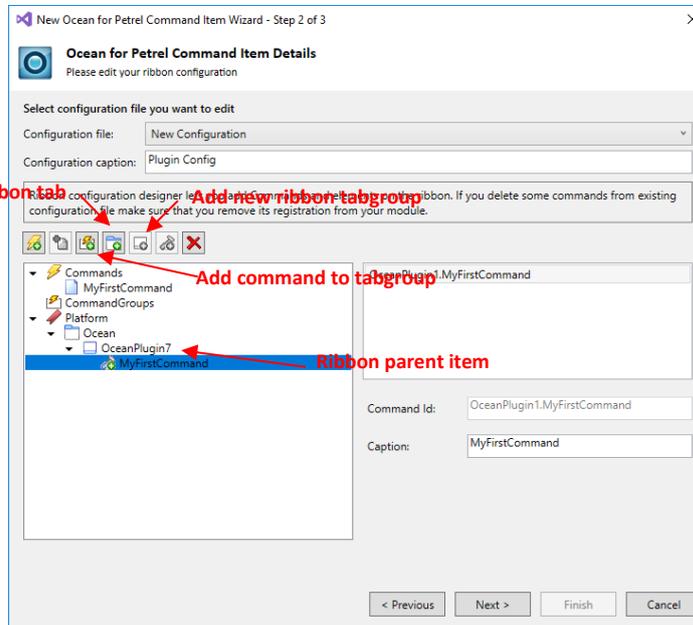


Figure 20: Wizard to add command to ribbon

Once plugin is installed, developer can also manage more advance command appearance properties and ribbon settings using configuration designer in Petrel. Launch configuration designer use CTRL + F2. Configuration designer is available with Ocean Marketing License. Refer to Quick Start for Ocean UX white paper in Ocean for Petrel CHM for detail on how to use configuration designer.

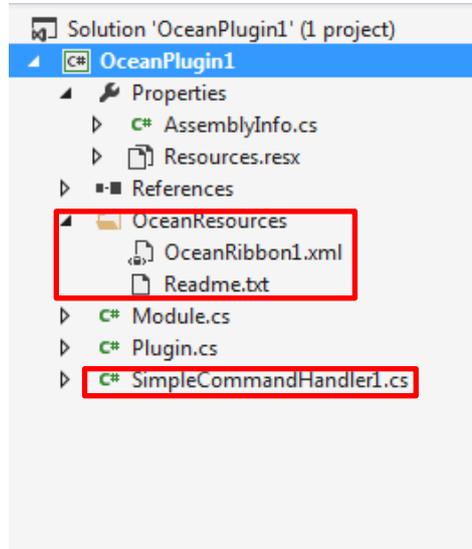


Figure 21: Preview of Solution Explorer with New Command resources

OceanResources folder which will contain OceanRibbon.xml and Readme.txt .  
OceanRibbon.xml is also registered as resources of the plugin-in project (Figure 22)

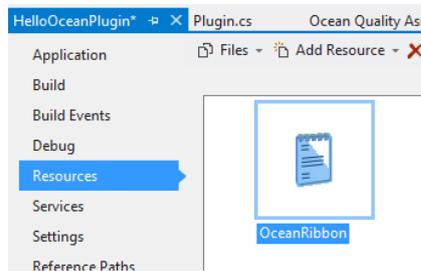


Figure 22: OceanRibbon.xml registered as plug-in project resources

- <CommandName>handler.cs implements SimpleCommandHandler. The default implementation will output to Petrel logger window when command button is clicked.

```
class MyFirstCommandHandler : SimpleCommandHandler
{
    public static string ID = "OceanPlugin7.MyFirstCommand";

    #region SimpleCommandHandler Members

    public override bool CanExecute(Slb.Ocean.Petrel.Contexts.Context context)
    {
        return true;
    }

    public override void Execute(Slb.Ocean.Petrel.Contexts.Context context)
    {
        //TODO: Add command execution logic here
        PetrelLogger.InfoOutputWindow(string.Format("{0} clicked", @"MyFirstCommand" ));
    }

    #endregion
}
```

Figure 23: Command Handler implementation.

Output in Petrel will be ribbon labelled Ocean, ribbon tab and a command. Note: In this example the command created is a simple command

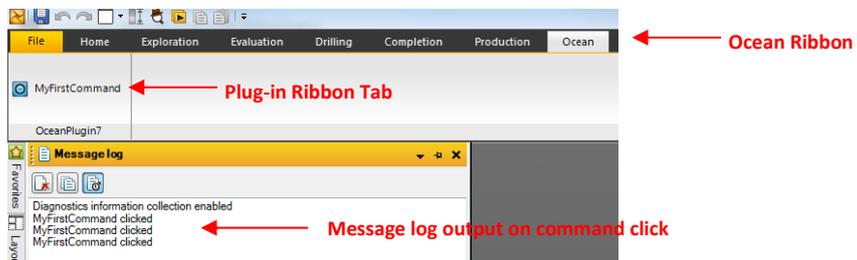


Figure 24: OceanRibbon.xml registered as plug-in project resources

## Adding a New Petrel Tree Extension

If you chose **Ocean Tree extension** from the **Add/New Item** option from the Visual Studio context menu (Figure 4), or if you checked the **Input tree extension** option in Step 1 of the Wizard dialog (Figure 22), then you will see the following Wizard screen:

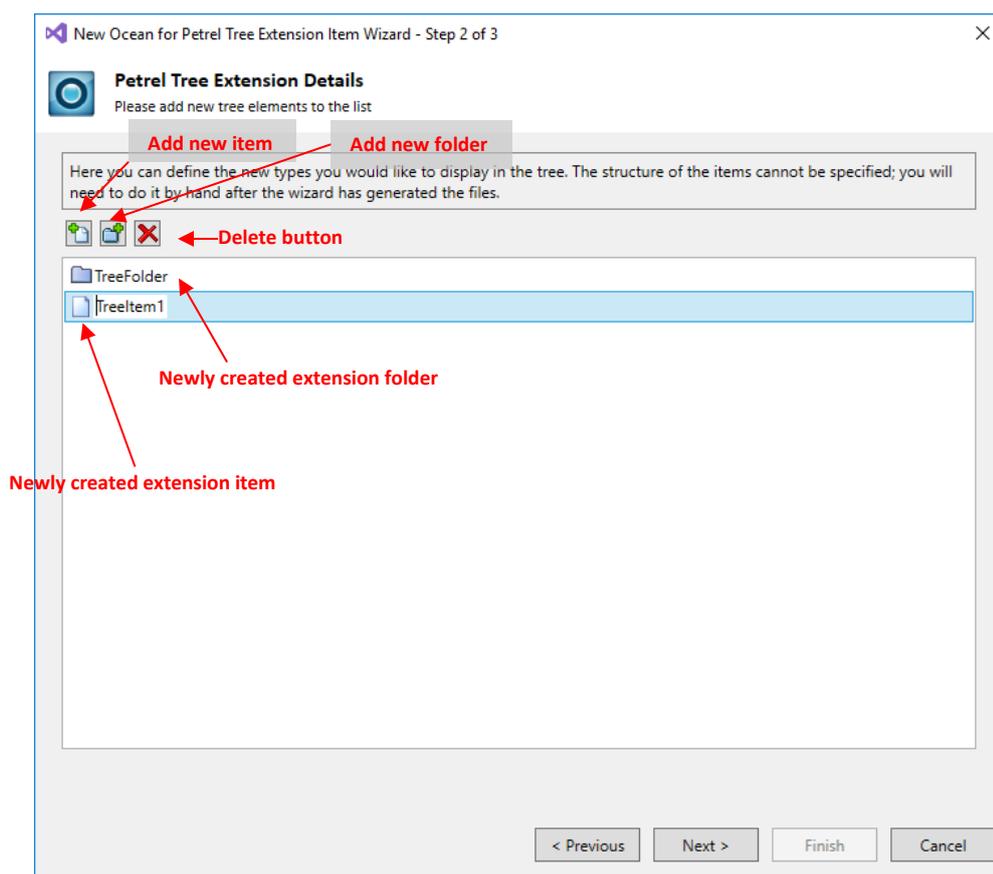


Figure 25: Ocean Tree Extension Details

1. Click the Add Extension button or Add Extension Folder button.
2. Enter the appropriate information.

For every tree extension, the Wizard generates a file with the tree item class and a file with tree item factory class, files with name and info classes. In this example, the Wizard will generate the following files:

- WorldTreeitem.cs
- TreeitemFactory.cs
- TreeitemImageInfo.cs
- TreeitemNameInfo.cs

For every tree extension folder, the Wizard generates a file with tree folder class, a file with factory class, and two files with image and name info classes. In this example, the Wizard will generate the following files:

- TreeFolder.cs
- TreeFolderFactory.cs
- TreeFolderImageInfo.cs
- TreeFolderNameInfo.cs

3. Click **Next**.

The following figure shows a preview of files created by the Wizard in Solution Explorer.

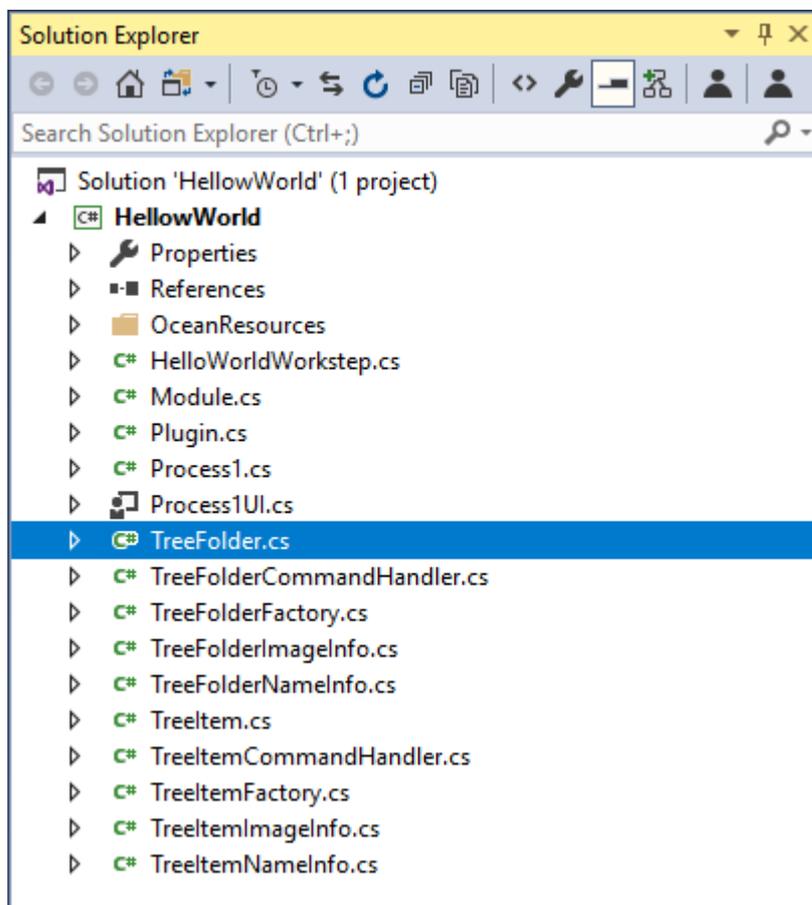


Figure 26: Tree Extension Files in Solution Explorer

In the module file, the **Integrate** method will be extended with the following lines:

```
public void Integrate()
{
    // Registrations:
```

```
// Register Treeitem

CoreSystem.Services.AddService(typeof(HellowWorld.TreeFolder),
    typeof(Slb.Ocean.Petrel.UI.INameInfoFactory),
    HellowWorld.TreeFolderFactory.Instance);

CoreSystem.Services.AddService(typeof(HellowWorld.TreeFolder),
    typeof(Slb.Ocean.Petrel.UI.IImageInfoFactory),
    HellowWorld.TreeFolderFactory.Instance);

CoreSystem.Services.AddService(typeof(HellowWorld.TreeItem),
    typeof(Slb.Ocean.Petrel.UI.INameInfoFactory),
    HellowWorld.TreeItemFactory.Instance);

CoreSystem.Services.AddService(typeof(HellowWorld.TreeItem),
    typeof(Slb.Ocean.Petrel.UI.IImageInfoFactory),
    HellowWorld.TreeItemFactory.Instance);

PetrelSystem.CommandManager.CreateCommand(HellowWorld.TreeFolderCommand
    Handler.ID, new HellowWorld.TreeFolderCommandHandler());

PetrelSystem.CommandManager.CreateCommand(HellowWorld.TreeItemCommandHa
    ndler.ID, new HellowWorld.TreeItemCommandHandler());
```

## Adding a New Window

---

If you chose **Ocean Window** from the **Add/New Item** option from the Visual Studio context menu (Figure 4), or if you checked the option to add a window in Step 1 the Wizard dialog (Figure 22), then the Wizard generates a file with Window class. In addition to the class file, Ocean Wizard also generates a default UserControl with the same name as the Window field (Figure 22) and appended by 'UI' as the class name.

In this example, you entered "HelloWorldWindow" in the "New Window" field (Figure 22), and the wizard generated the following files:

- HelloWorldWindow.cs: contains the Window class which implements IImageInfoSource, INameInfoSource interfaces and inherits from ToggleWindow base class.
- HelloWorldWindowImageInfo.cs: contains ImageInfo class.
- HelloWorldWindowNameInfo.cs: contains NameInfo class.
- HelloWorldWindowUI.cs: contains UserControl class.

The following figure shows a preview of files created by the Wizard in Solution Explorer.

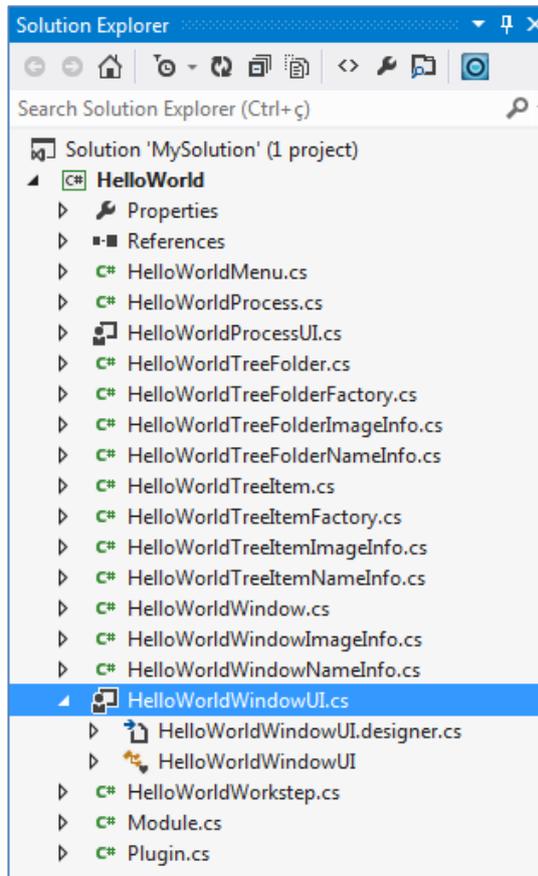


Figure 27: Preview of Solution Explorer Containing Window Class Files

## Adding a New Workstep

---

If you chose **Ocean Workstep** from the **Add/New Item** option from the Visual Studio context menu (Figure 4), or if you checked the option to add a window in Step 1 of the Wizard dialog (Figure 22), then you will see the following Wizard page.

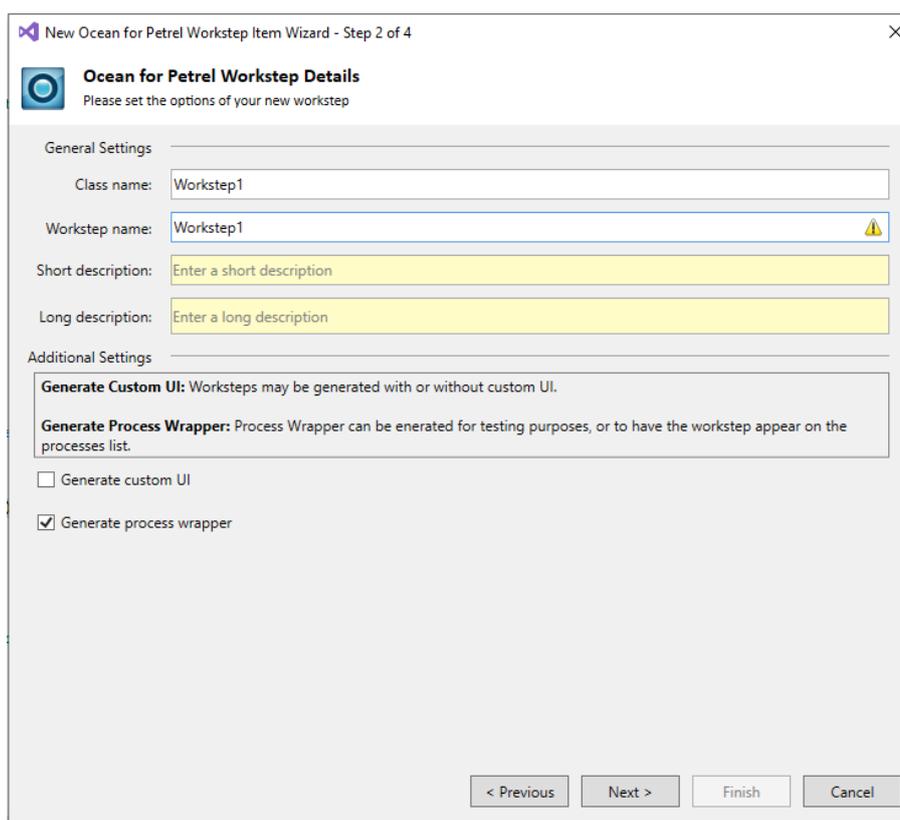


Figure 28: Second Page of the Ocean Workstep Wizard

This page is similar to the general settings page of the Ocean process (see Page 20).

1. Enter the appropriate information.  
The name will be displayed in the process tree of Petrel, and the descriptions will be displayed on the default process UI.
2. Click Next.
3. On the next page (shown below), set the arguments of the workstep. These arguments are input and output variables that will be used by the workstep during its work.

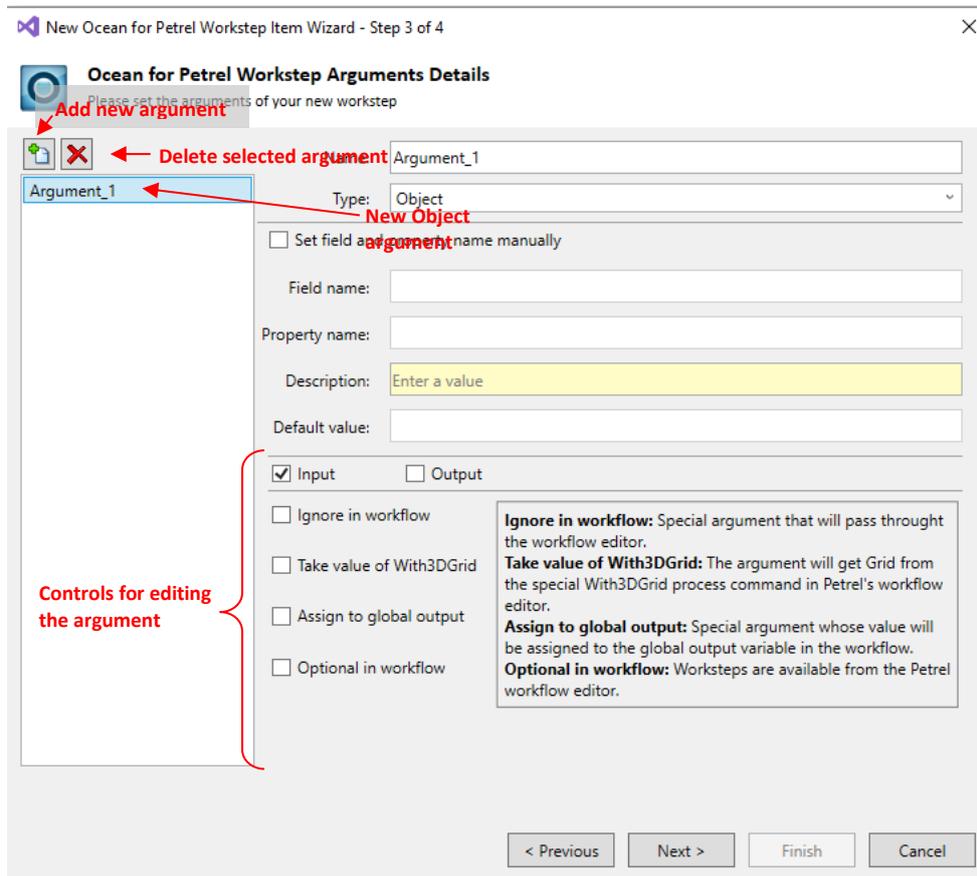


Figure 29: Workstep Argument Setting Page of the Wizard

The Wizard adds the following code in the **Integrate** method of the selected module class:

```
public void Integrate()
{
    // Registrations:

    // TODO: Add Module.Integrate implementation

    // Register HelloWorldWorkstep
    HelloWorldWorkstep helloworldworkstepInstance = new
HelloWorldWorkstep();
    PetrelSystem.WorkflowEditor.Add(helloworldworkstepInstance);
    PetrelSystem.ProcessDiagram.Add(new
Slb.Ocean.Petrel.Workflow.WorkstepProcessWrapper(helloworldworkstepInst
ance), "Plug-ins");
}
```

## Adding an Ocean Settings Page

You can use the Wizard to generate custom Settings Pages by choosing **Ocean Settings Page** on the **Add New Item** dialog of Visual Studio (Figure 5). After completing the Wizard steps, you will see the following files:

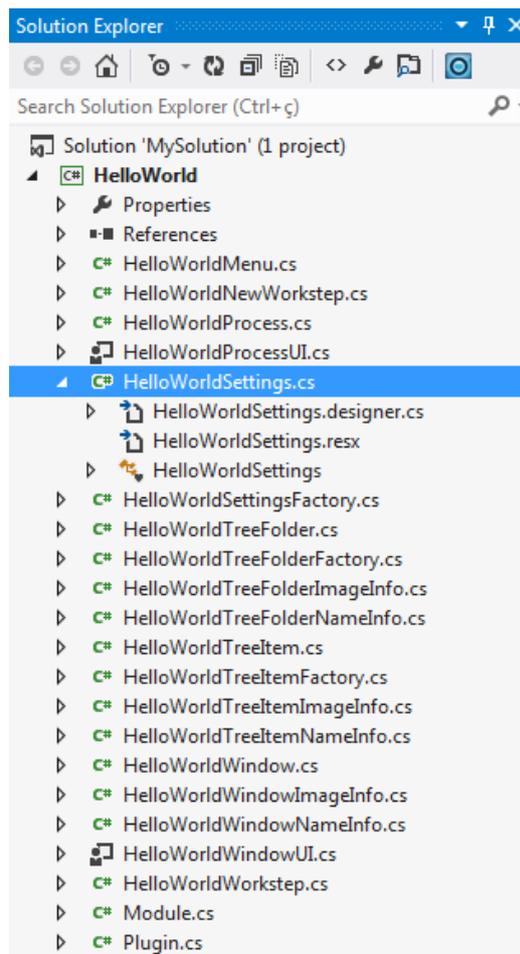


Figure 30: Ocean Settings Page in the Solution Explorer

The Wizard generates a **UserControl**, which will be the `SettingPage` class, and a `SettingPageFactory` class.

In this example, you provided the default “`DialogPage1`” as the name in the Visual Studio Item dialog, and the Wizard generated the following files:

- `HelloWorldDialogPage.cs`
- `HelloWorldDialogPageFactory.cs`

If you checked the **Register new classes in module** option in the Visual Studio Item dialog (Figure 12), then the Wizard adds the following code in the **`IntegratePresentation`** method of the selected module class.

```
public void IntegratePresentation()
{
    // Registrations:

    // TODO: Add Module.IntegratePresentation implementation
    PetrelSystem.DialogBuilder.AddFactory(new
HelloWorldDialogPageFactory());
}
```

## Adding Ocean Data Sources

The Ocean Wizard allows you to add custom data sources or the recommended structured archived data source only to existing Ocean module projects. (See Figure 4 and Figure 5.). Refer to the *Ocean Developers Guide* and *CHM* documentation on *Managed Persistence*.

The first option to add framework to handle structured archive data source with option to create custom domain object.

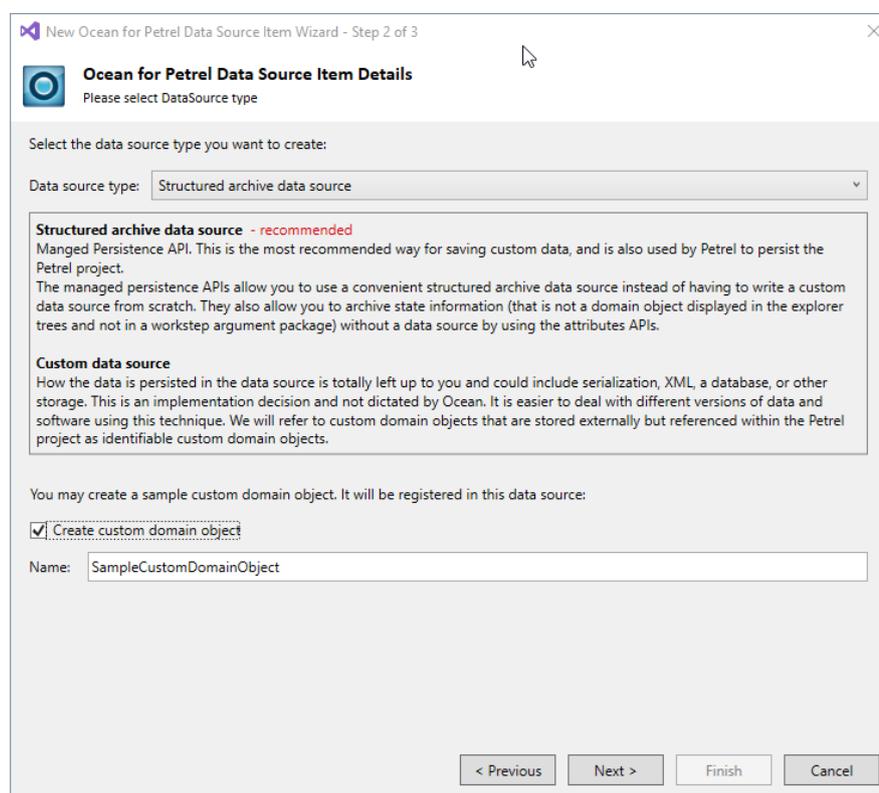


Figure 31: Adding structured archive data source

The following figure shows a preview of the Solution Explorer with the generated data structure archive data source class file and sample custom domain object class file.

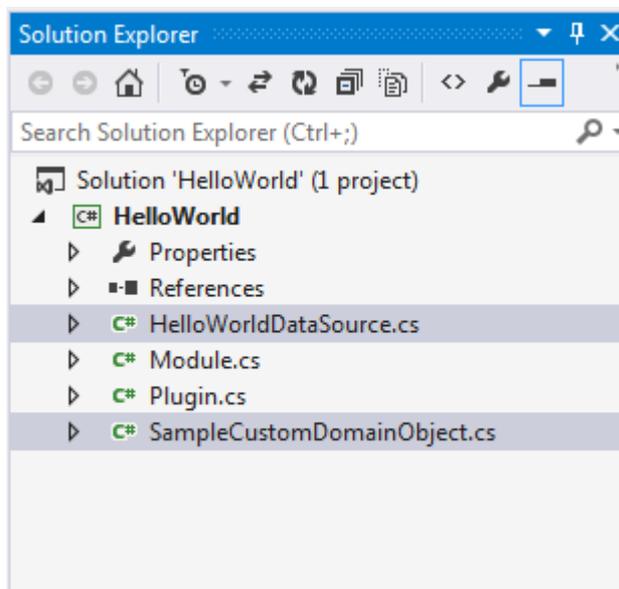


Figure 32: The Solution Explorer showing structure archive data source class file and custom domain object class file

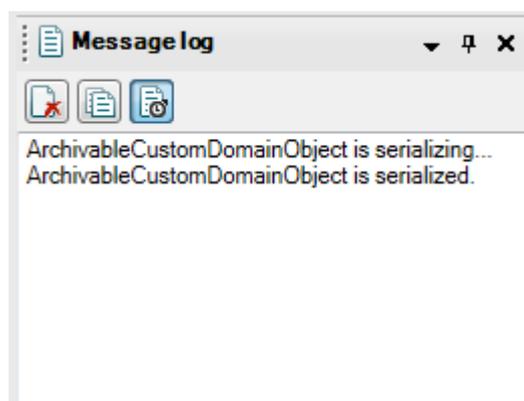
To simulate a custom domain object that will save to Petrel project using structured archive data source, the simplest implementation would be to implement a command that will create a new instance of custom domain object to input pane.

```
public override void Execute(Slb.Ocean.Petrel.Contexts.Context context)
{
    createDomainObject1_ = new SampleCustomDomainObject1("New
    CDO",DataSource1Factory.Get(DataManager.DataSourceManager));
}
```

```
PetrelProject.Inputs.Add(createDomainObject1_);  
}
```

**Figure 33: Simple command execute method to create sample custom domain object in input pane and will save to structured archive data source**

Lastly, the generated structured archive data source framework code will output to message log pane as the custom domain object is being save to data source.



**Figure 34: Output from OnSerialized event in custom domain object generated code**

The second option only adds the framework to handle a data source. For additional details on adding data sources, refer to the *Ocean Developers Guide*.

The following figure shows a preview of the Solution Explorer with the generated data source class file.

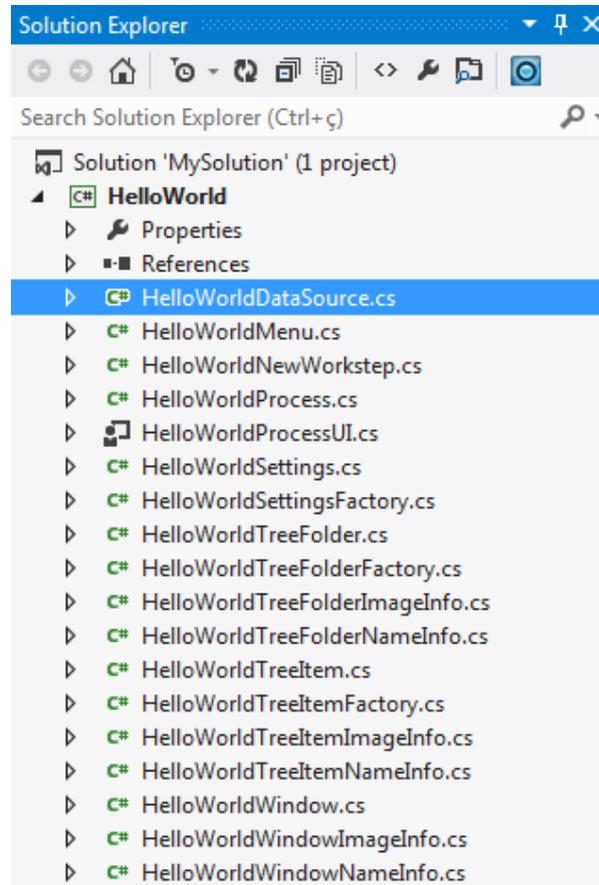


Figure 35: The Solution Explorer showing the New Data Source Class File

If you checked the **Register new classes in module** option in the Visual Studio Item dialog (Figure 12), then the Wizard adds the following code in the **Integrate** method of the selected module class.

```
public void Integrate()
{
    // Registrations:

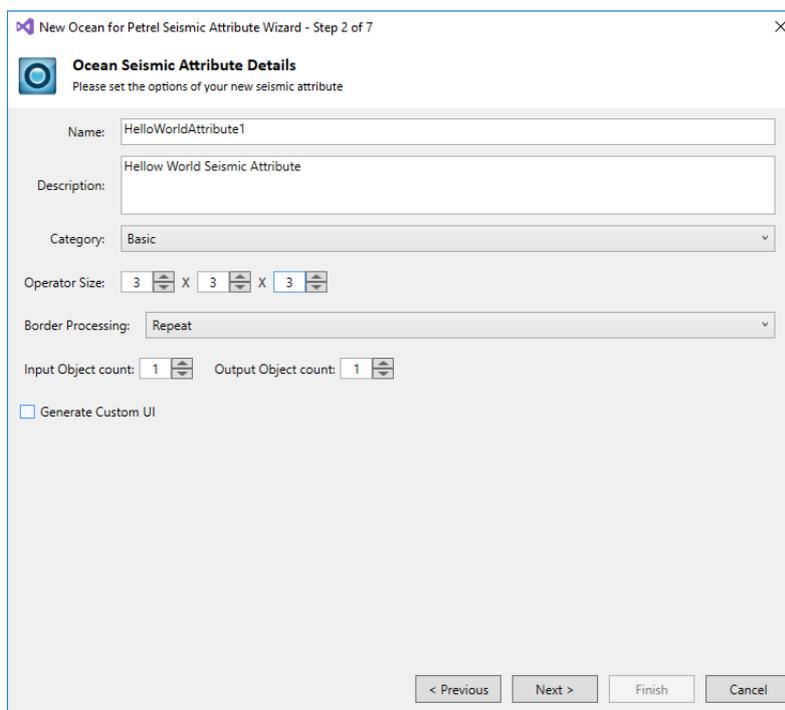
    // TODO: Add Module.Integrate implementation

    PetrelSystem.AddDataSourceFactory>HelloWorldDataSourceFactory.Instance)
;
}
```

## Adding an Ocean Seismic Attribute

---

If you chose **Ocean Process** in the **Add/New Item** dialog (Figure 4), then the following screen opens:



**Figure 36: Ocean Seismic Attribute Wizard Page**

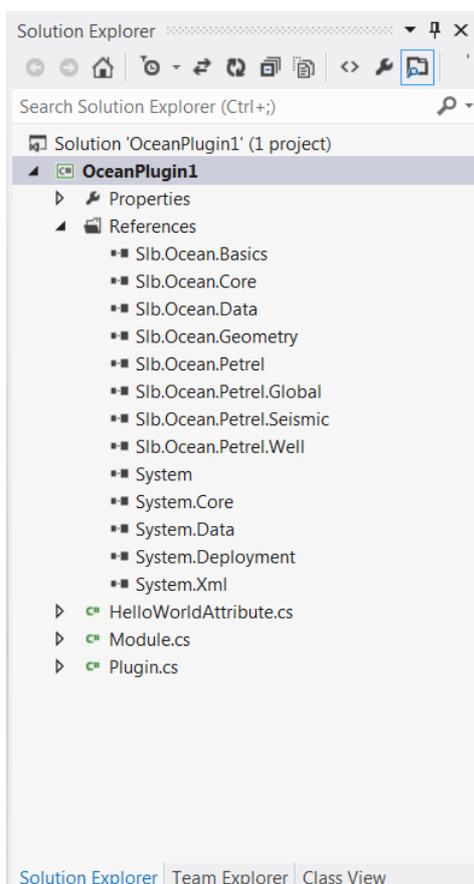
1. Enter the appropriate information.

Open the Geophysics / Volume attributes in Petrel to find the Petrel equivalents of the Ocean Seismic attributes. You can add your own attribute to that process's attributes. The name, description, and category of the attribute are self-explanatory.

The Ocean Seismic attribute represents an operator that completes calculations on a seismic cube. The operator size represents how many data samples the operator needs around the actual cell from the 3D data space. The attribute may have multiple input seismic cubes too.

2. Click **Next**.

The following figure shows a preview of the Solution Explorer with the generated seismic attribute class file:



**Figure 37: Custom Seismic Attribute in the Solution Explorer**

The following source lines are added to the **Integrate** method of the module if the register option is enabled on the first page of the Wizard:

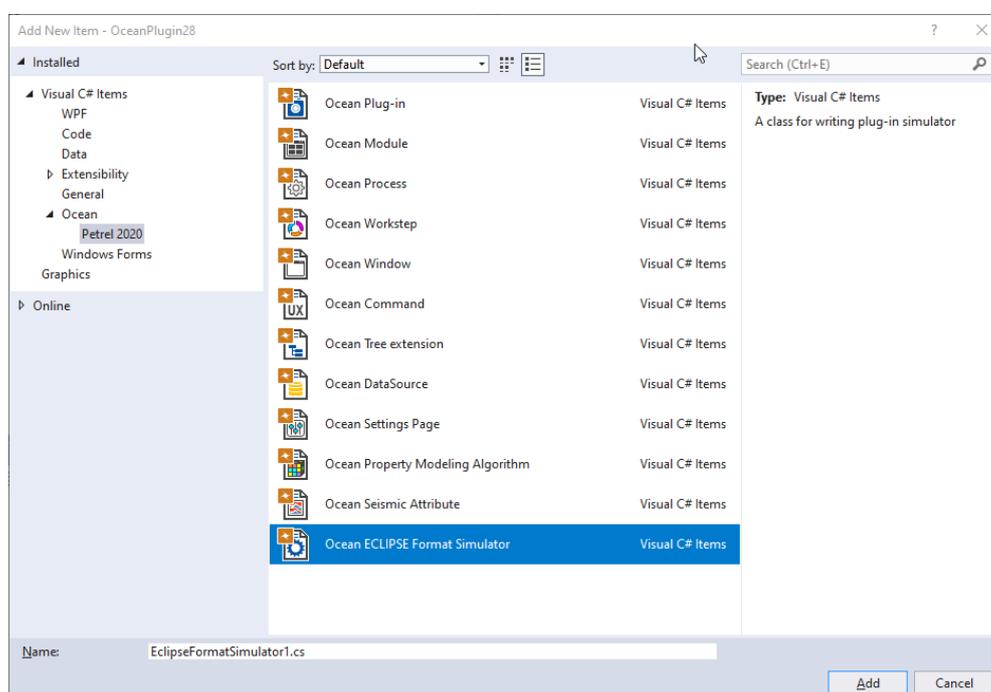
```
public void Integrate()
{
    // Registrations:

    // TODO: Add Module.Integrate implementation
    if (PetrelSystem.SeismicAttributeService == null)
        throw new LifecycleException("Required AttributeService is not
available.");
    PetrelSystem.SeismicAttributeService.AddSeismicAttribute(new
HelloWorldAttribute());
}
```

## Adding an ECLIPSE Format Simulator Plug-in

This Ocean Wizard allows you to generate an **ECLIPSE Format Simulator plug-in** into your Ocean module. All files generated via this Wizard will be located under the **SimulatorPlugin** folder in your project.

1. Enter your plug-in simulator file name in the **Add New Item** dialog box (Figure 38). Note that if you use an existing file name, the old file will be overwritten by the new one. Click **Add** to proceed.



**Figure 38: Ocean ECLIPSE Format Simulator template in Add New Item dialog box**

2. In this step, you can decide whether to register your plug-in to the Ocean module or not.

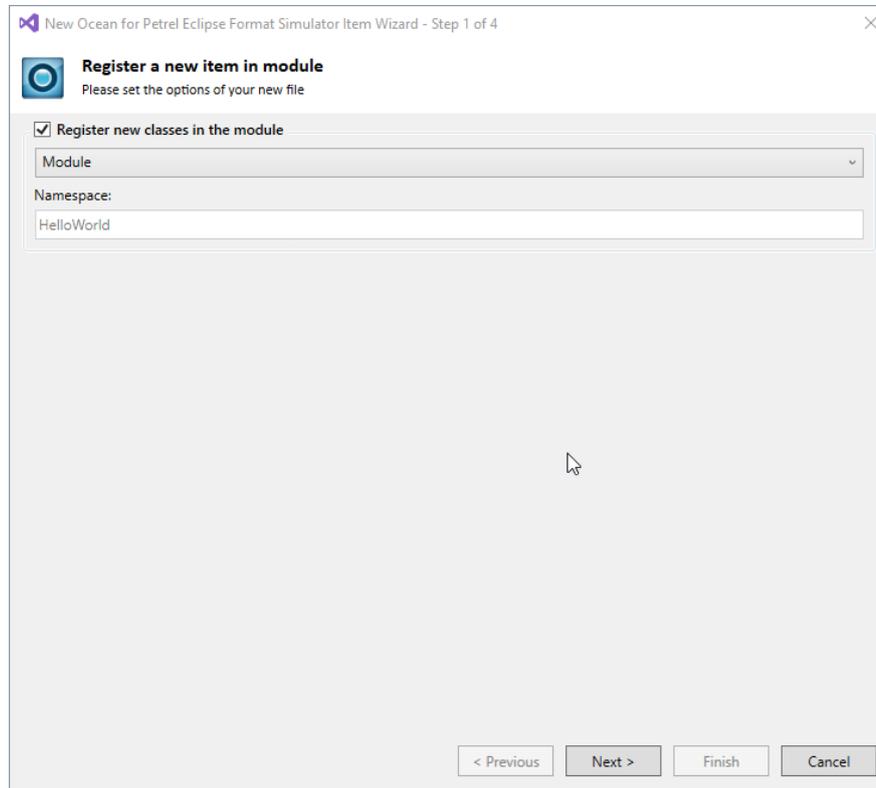


Figure 39: Ocean File Add dialog box

3. In this wizard page (Figure 40), you can choose the **ECLIPSE deck type** and whether you want to export keywords or not. Click **Next** to proceed or click **Cancel** to quit the wizard.

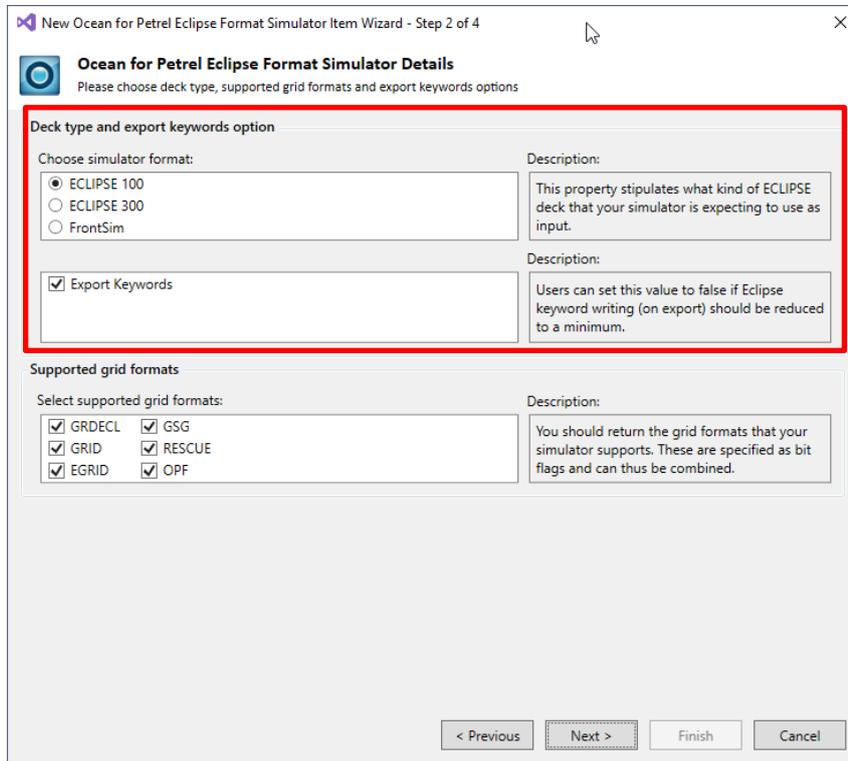


Figure 40: Deck Type and Export Keywords Option dialog box

4. All Grid Formats are supported by default. You can change the **supported grid formats** here (Figure 41).

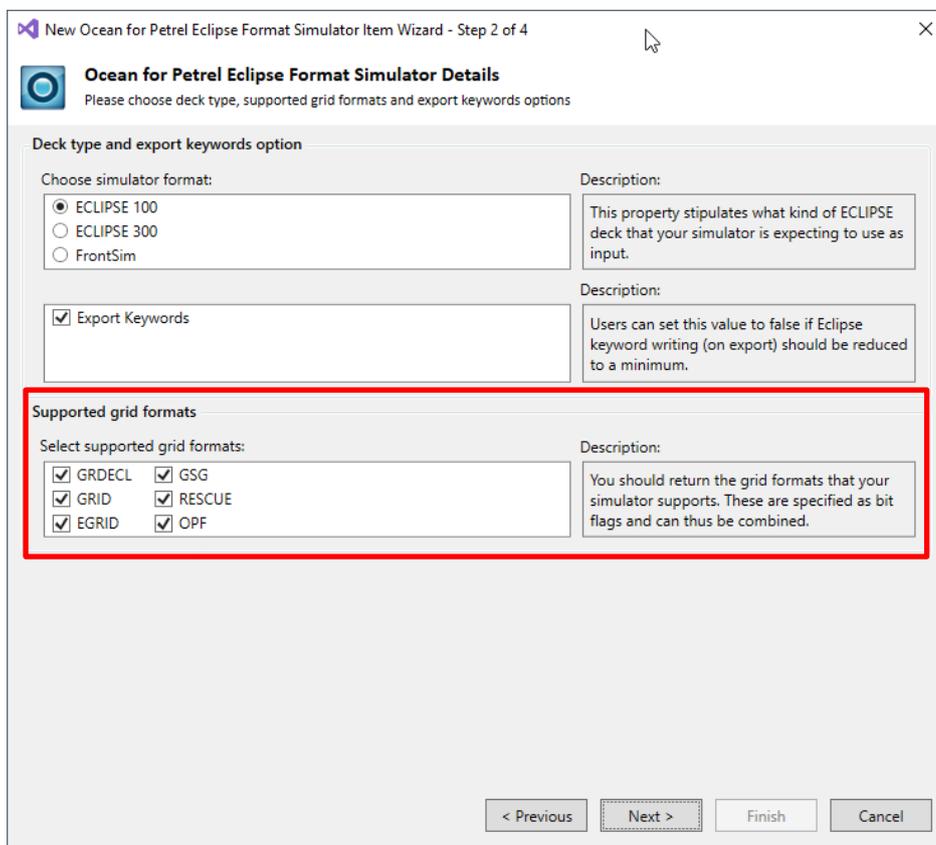


Figure 41: Supported Grid Formats dialog box

5. From the **Custom Tab Option** dialog box , you can set an option whether to create a custom tab or not. This custom tab will appear in the Petrel 'Define Simulation Case' dialog when your simulator is selected. You can input the class and tab names but the added custom tab will use a default icon image. This icon can be changed by overriding the ***Appearance::Image*** property once the wizard has finished.

If the check box is ticked then the following files will be generated (where Xxx is your class name) and added along with the EclipseFormatSimulator1.cs file:

- XxxTabArguments.cs,
- XxxTabControl.cs,
- XxxTabLogic.cs
- XxxTabUIFactory.cs

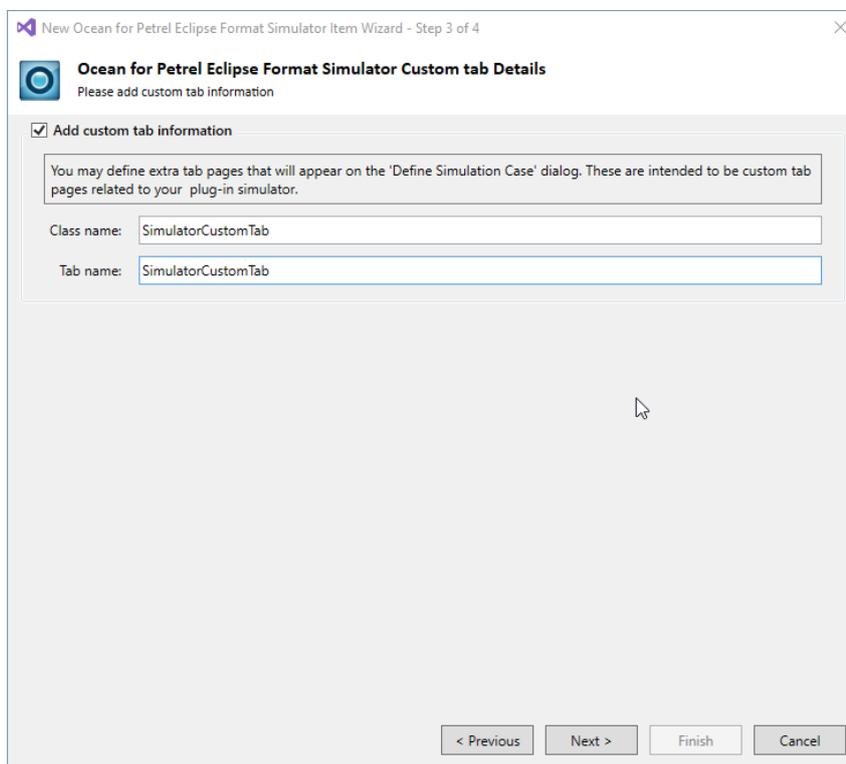


Figure 42: Custom Tab Option dialog box

6. The last step of the Wizard (Figure 43) shows a summary of the files which will be added to the project. In this example, only one file named EclipseFormatSimulator1.cs has been added (since the custom tab option was not ticked). If you tick the custom tab option, the appropriate files mentioned in step 4 will be also added to the **SimulatorPlugin** folder. You can also add additional references (assemblies) by ticking the **Additional Reference settings** check box.

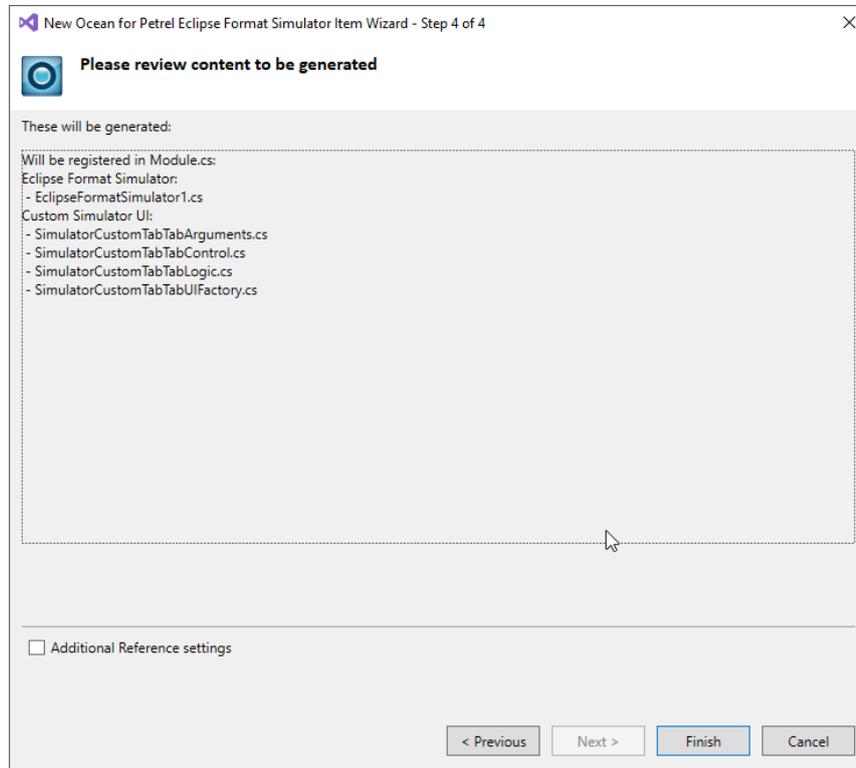


Figure 43: Completing settings dialog box

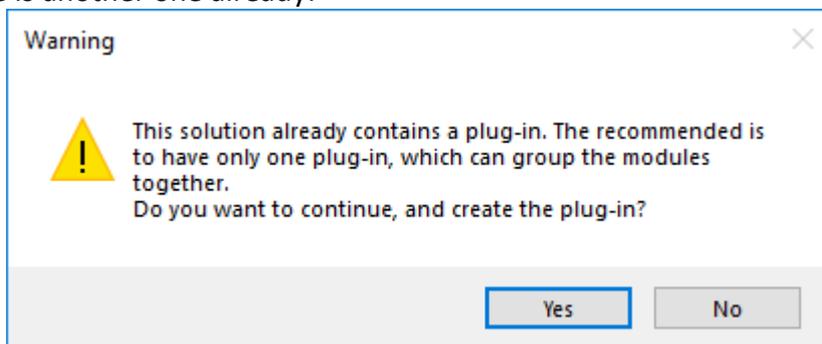
## Adding a Plug-in project

---

More than one plug-in project can be added to the same solution. The plug-in project allows you to generate a basic plug-in implementation with additional project settings to help developing the plug-in. Basically, a plug-in groups multiple modules together, and lets you set up dependency between plug-ins.

There are some rules and recommendations using the plug-ins. These are checked by Wizard:

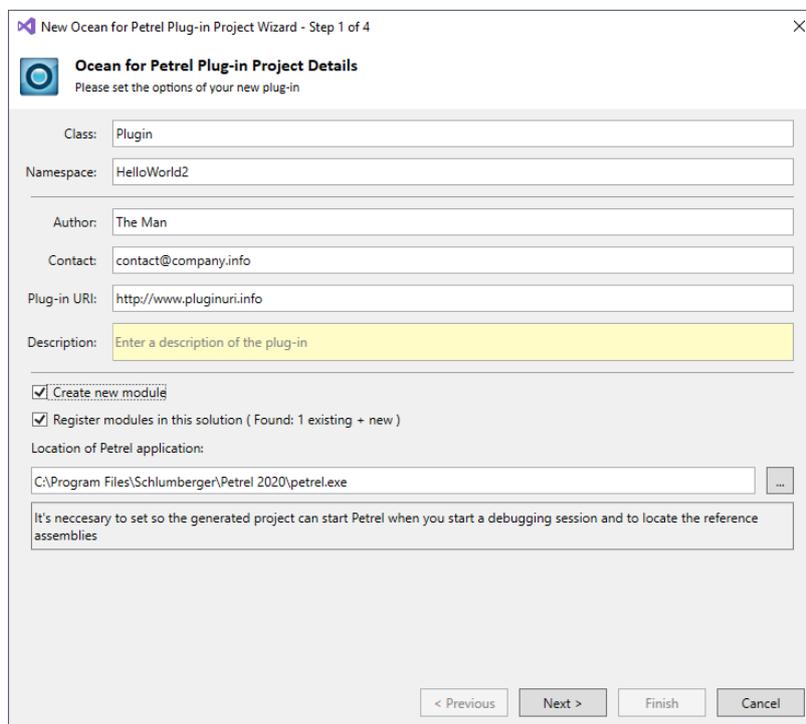
- In a solution there should be only one plug-in. If there are 2 or more, then they should contain only different modules. One module must belong to only one plug-in. The wizard warns you when you try to create a new plug-in when there is another one already:



**Figure 44: Warning message. Another plug-in is detected in the solution.**

- In one project there has to be one (and only one) plug-in. This is a very strict rule; do not create more than one plug-in class into a project. The wizard lets you do it, but we warn you, that the registration of such a plug-in will fail; you will not be able to use any of those plug-ins.

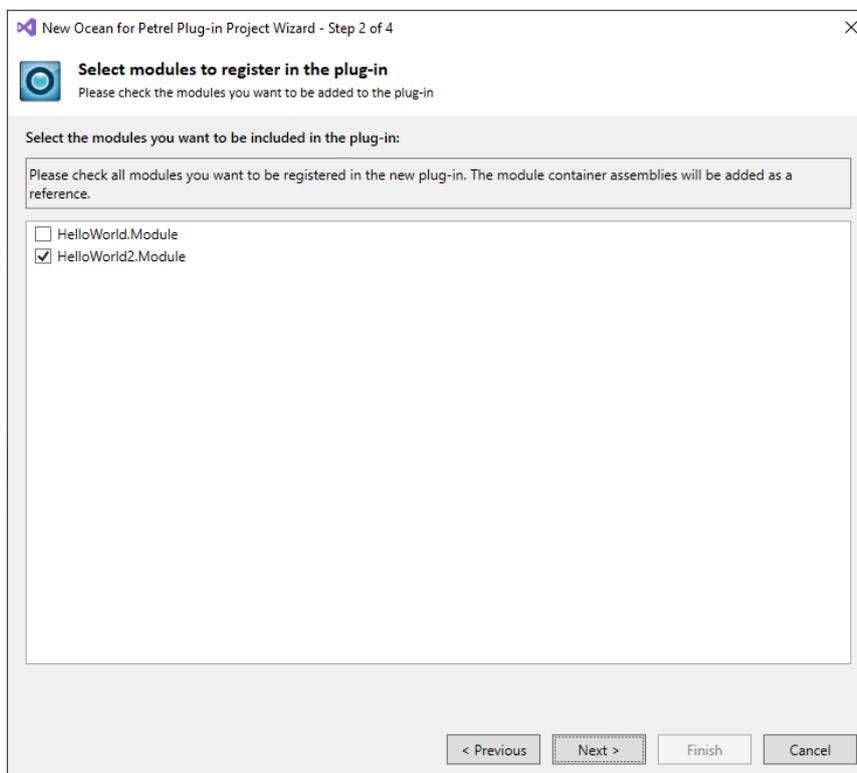
Generating a plug-in project or file:



**Figure 45: Plug-in wizard, 1st page.**

In this page, you can specify the plug-in metadata information such as the author, contact information and a description. This information is redundant if you use the old `IModuleAppearance` on your modules, but the information given in the plug-in will be the main source.

If you check the Register existing modules in the solution checkbox, then you can select which modules want to register from the detected module list:



**Figure 46: Plug-in wizard, 2nd page.**

In order to use the plug-in, there must be at least one module registered in it.

You also have the option to generate a new module together with the new plug-in. If you choose to generate a new module, you will get the same module-generator wizard pages you are already familiar with.

During the building of your plug-in, as a post build event, the plug-in gets registered in Petrel, so you need to build your plug-in at least once, and after that, the plug-in is usable from Petrel.

## Adding a New Property Modeling Algorithm

---

If you chose **Ocean Property Modeling algorithm** in the **Add / New Item** dialog then you will see the following Wizard page.

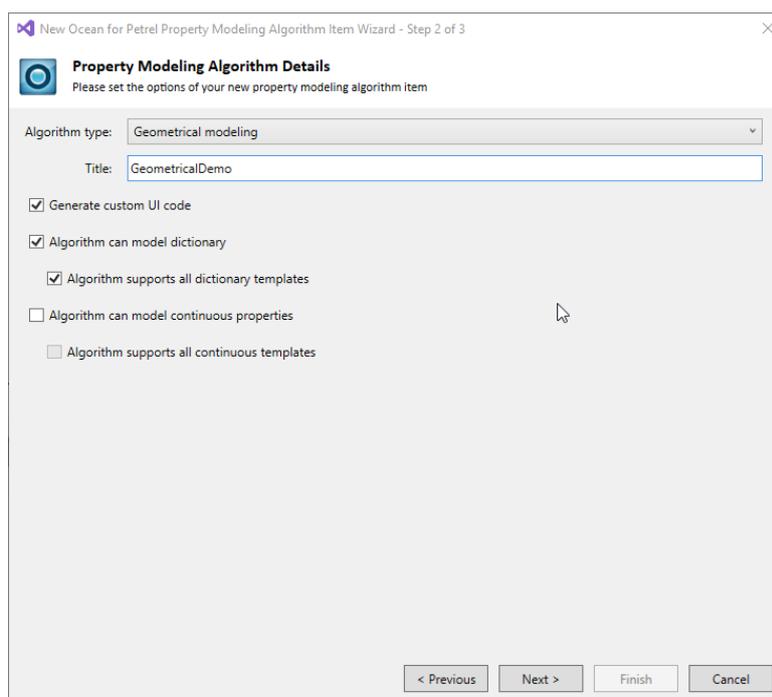


Figure 47: Second page of Property Modeling wizard

### Geometrical modeling algorithm

For adding a new geometrical modeling algorithm select “Geometrical modeling” algorithm type (Figure 47). Specify the following options:

- Title: Enter the title of the algorithm. This text will be displayed on the Geometrical modeling process dialog.
- Generate custom UI: If selected wizard will generate an empty UserControl and the necessary UI registration code

- 'Algorithm can model dictionary properties': If selected generated algorithm will be present in Geometrical modeling if a dictionary property is selected.
- 'Algorithm supports all dictionary templates': Generated code will return all dictionary templates, otherwise SupportedDictionaryTemplates method needs to be filled with supported templates.
- 'Algorithm can model continuous properties': If selected generated algorithm will be present in Geometrical modeling if a continuous property is selected.
- 'Algorithm supports all continuous templates': Generated code will return all continuous templates, otherwise SupportedTemplates method needs to be filled with supported templates.

After building the project and starting Petrel start geometrical modeling process. You will see the algorithm in the geometrical modeling UI (Figure 48). It can be executed but will do nothing. //TODO sections in the code must be filled to get a meaningful algorithm.

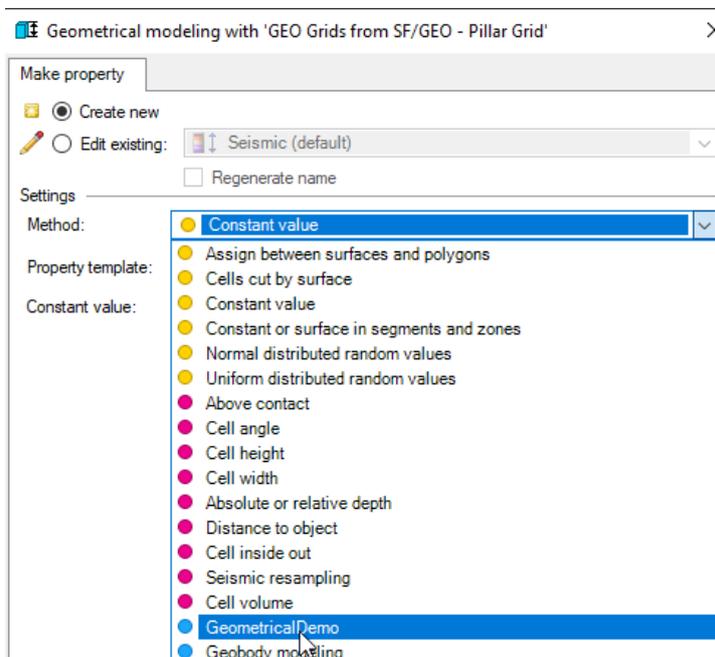
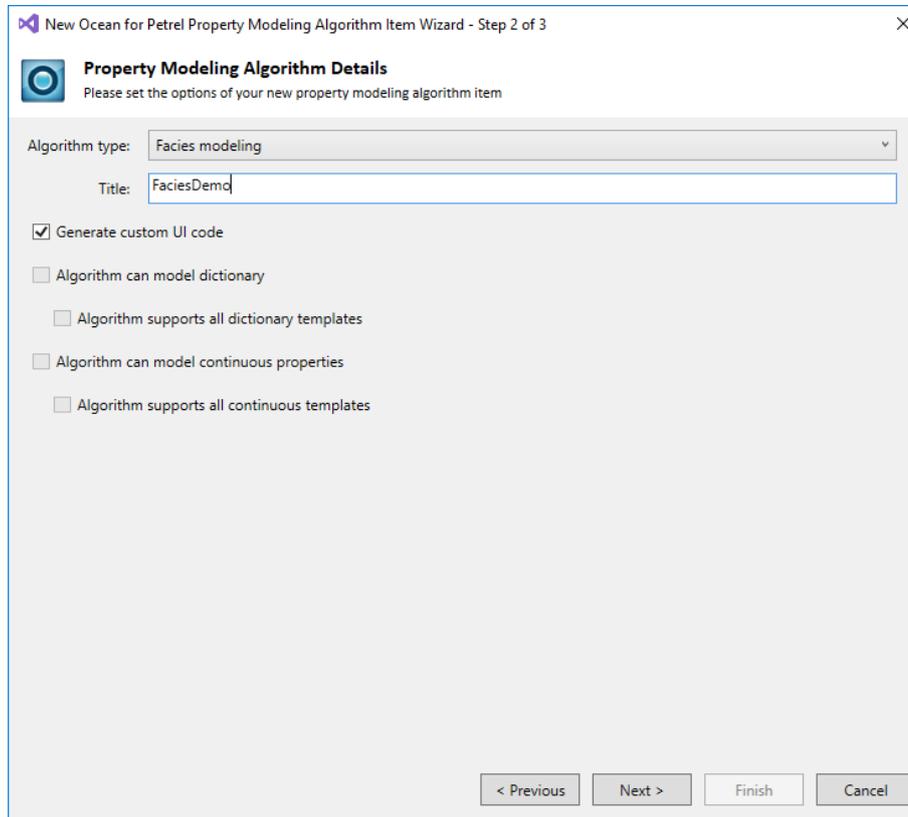


Figure 48: Geometrical modeling algorithm in Petrel

## Facies modeling algorithm

For adding a new facies modeling algorithm select “Facies modeling” algorithm type. (Figure 49)



**Figure 49: Facies modeling algorithm**

Specify the following options:

- Title: Enter the title of the algorithm. This text will be displayed on the Facies modeling process dialog.
- Generate custom UI: If selected wizard will generate an empty UserControl and the necessary UI registration code

After building the project and starting Petrel start facies modeling process. You will see the algorithm in the facies modeling UI (Figure 50). It can be executed but will do nothing. //TODO sections in the code must be filled to get a meaningful algorithm.

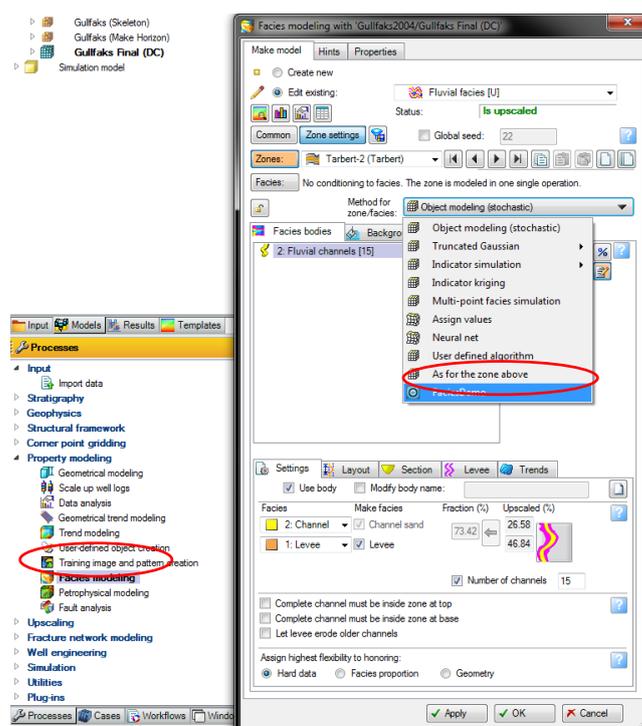


Figure 50: Facies modeling algorithm in Petrel

## Petrophysical modeling algorithm

Identical to facies modeling.

## Adding a PIP Project

---

This project type generates an installation package, what the Petrel application can consume. Instead of using the operating system to install and manage extensions, let Petrel do the work, and manage its extensions by itself. This is the way to deploy modules and plug-ins. However, the PIP package cannot cover special use cases such as pre/post installation steps, custom actions, installation of 3<sup>rd</sup> party prerequisites, etc. In case your plug-in package needs such installation steps, please see the Ocean Plug-in Installer project.

Prerequisite: the solution has to contain at least one plug-in project (project with a plug-in class).

## The Ocean for Petrel Wizards

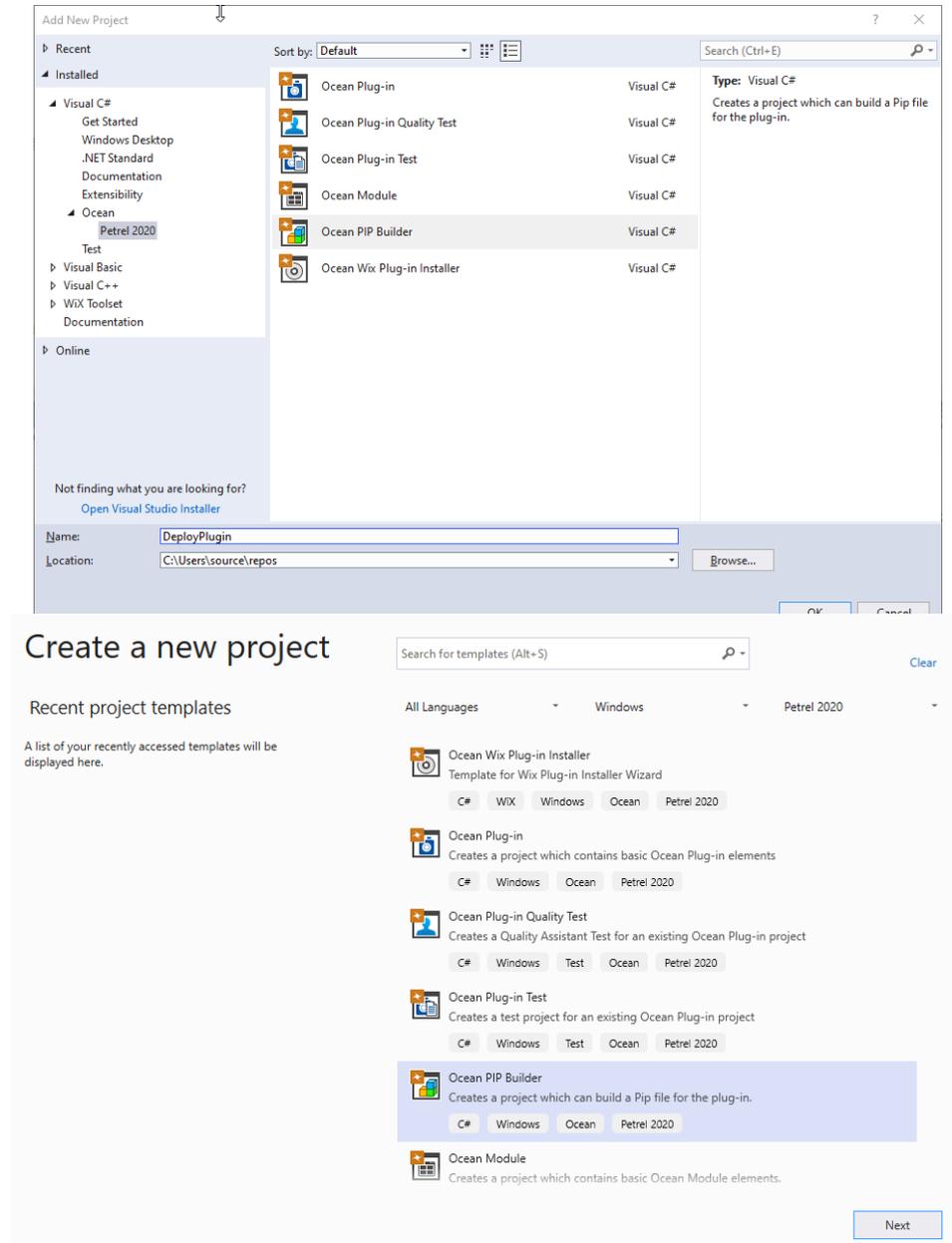
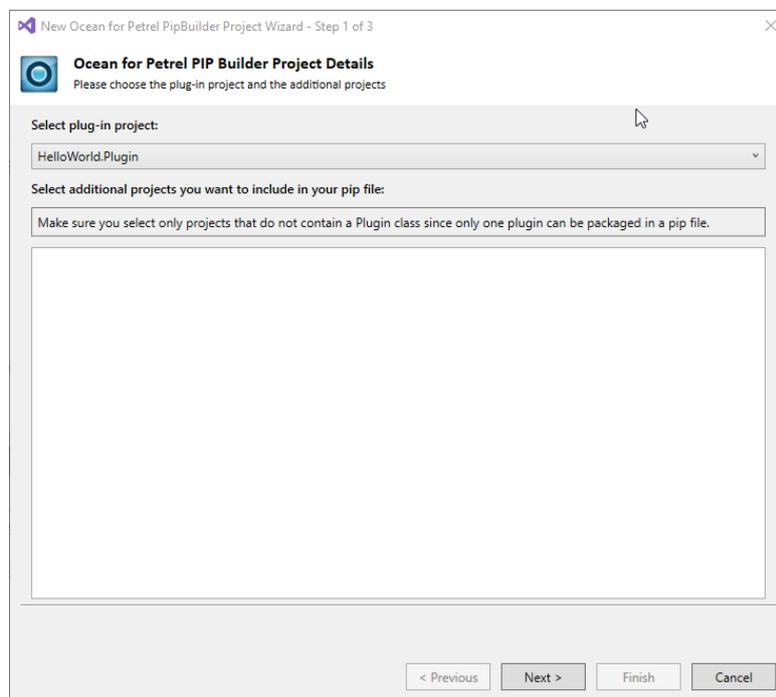


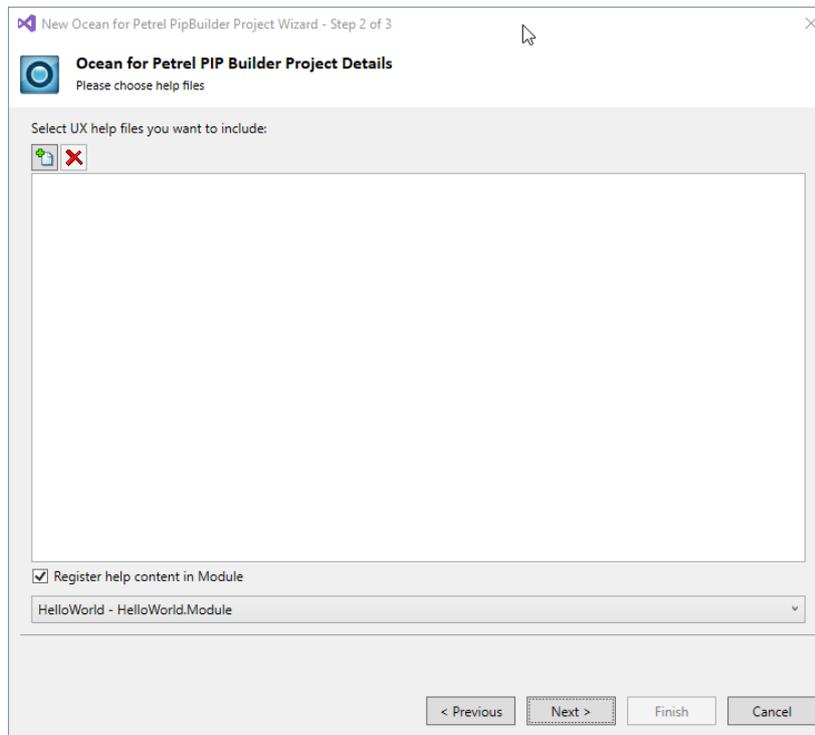
Figure 51: PipBuilder project



**Figure 52: PipBuilder project wizard**

In the wizard page, you can specify the main plug-in for this PIP file. The PIP file must have one and only one plug-in in it, this plug-in will be detected by the PluginPackager, and it will be registered into the PluginManager during the installation of the PIP. In the checklistbox, you can add additional projects from the actual solution. The output of the selected projects will be added to the PIP file together with the plug-in container assembly.

Note: currently the wizard does not support dependency detection for the plug-in assembly. It means, that in case the plug-in assembly (or any other assembly selected in the checklistbox) has a dependency to another project, then it will not be added to the PIP file automatically. You have to add all of the required dependencies.



**Figure 53: PipBuilder project wizard**

In step 2 of the wizard page, you can add help file for classic and UX mode for your plug-in. You can drag and drop help files from Windows Explorer into this wizard.

## Editing the DeployList.xml

---

The DeployList.xml describes the internal structure of the PIP file. This XML is loaded during the build of the project, and the DeployCopier command line tool (placed to the project directory by the Wizard) will copy all the files and project outputs registered in this xml to a temporary folder. It also keeps their folder hierarchy settings. From this temporary folder, the PluginPackager tool (deployed by the Petrel installer to the petrel root folder) will pack them to the target folder of the PIP project. (By default: bin\debug and bin\release)

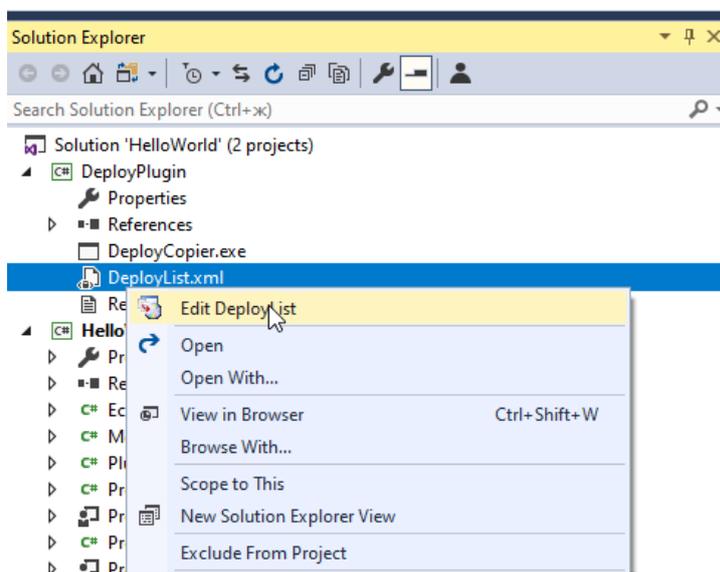
The temporary folder can be changed by editing the Pre and PostBuild events of this project, and changing the paths containing the “copytemp” folder.

Deploylist.xml can contain files and project outputs

The files are normal files, they can be resources (pictures, sounds, videos, databases, etc). They will not be processed, only copied and packed.

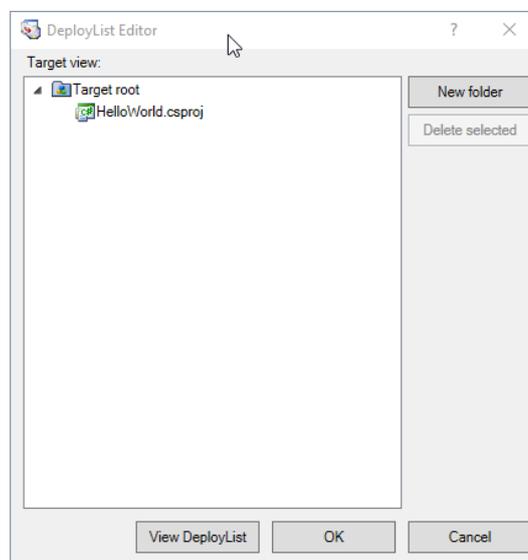
The project outputs are project files, preferably from the same solution as the PIP builder project itself. The project files will be processed by the DeployCopier tool, the output path and compiled binary file name will be retrieved using the actual platform and configuration settings. At the end the project output will be copied to the temporary folder.

The OceanSDK installs a new context menu item into Visual Studio. It can be reached by right clicking on the DeployList.xml file in the Solution Explorer:



**Figure 54: Edit DeployList context menu item**

Clicking on this menu item, a small editor appears:



**Figure 55: DeployList editor dialog**

In the tree view on the left side contains the folders and files of the Pip file in the same hierarchy it will be installed on the target machine. Use drag and drop from either the Solution Explorer, or Windows Explorer to add new files to it.

If you want to add a project output from the existing solution, just drag that project from the Solution Explorer. The editor detects if the dragged item is a project, and it automatically adds Project dependencies to that project, so building the Pip file will build that project also.

You can rename the files and folders with F2 key or with clicking on the item again. These settings will be applied to the target name; it will not change the actual name of the file.

## Adding Ocean Wix Plug-in Installer Project

---

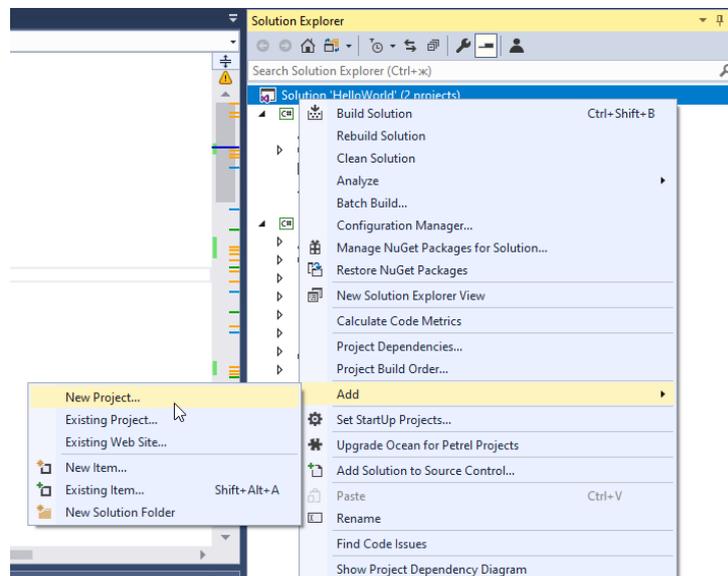
This project can be used when a simple PIP file installation with PluginManager does not meet the needs. The result of this project template is an MSI installer project that can be further customized by adding extra installer actions. It is also possible to combine more than one plug-ins (PIP files) into one MSI installer as Plug-in bundle. Please note however plug-ins installed together as bundle cannot be uninstalled individually.

We recommend using the Ocean Wix Plug-in Installer in case you have a special need which the PIP project cannot handle, e.g.: custom actions, pre/post installation steps, installation of 3<sup>rd</sup> party prerequisites, etc.

The recommended way of using this Ocean Wix Plug-in Installer template is to first add one or more Ocean Plug-in project(s) to the solution then add a PIP Builder project for each plug-in, compile the PIP builder project(s) then add this Ocean Plug-in Installer project for the PIP file(s).

To add a new Ocean Wix Plug-in Installer to the project:

1. Once you have Ocean Plug-in and PIP Builder project in the solution, compile the PIP builder project and make the selections shown in the following figure.



**Figure 56: Visual Studio Context Menu to Add a New Project**

2. Choose the Ocean Wix Plug-in Installer on the displayed project dialog. Remember to set the Project Name. (See Figure 4.)
3. Click **Next**.

The Step 2 window opens:

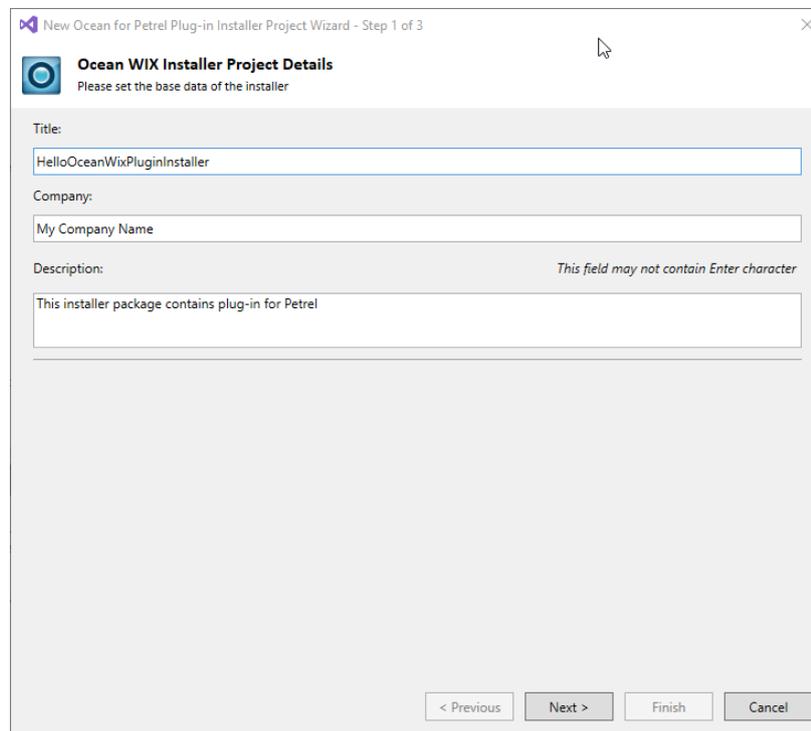
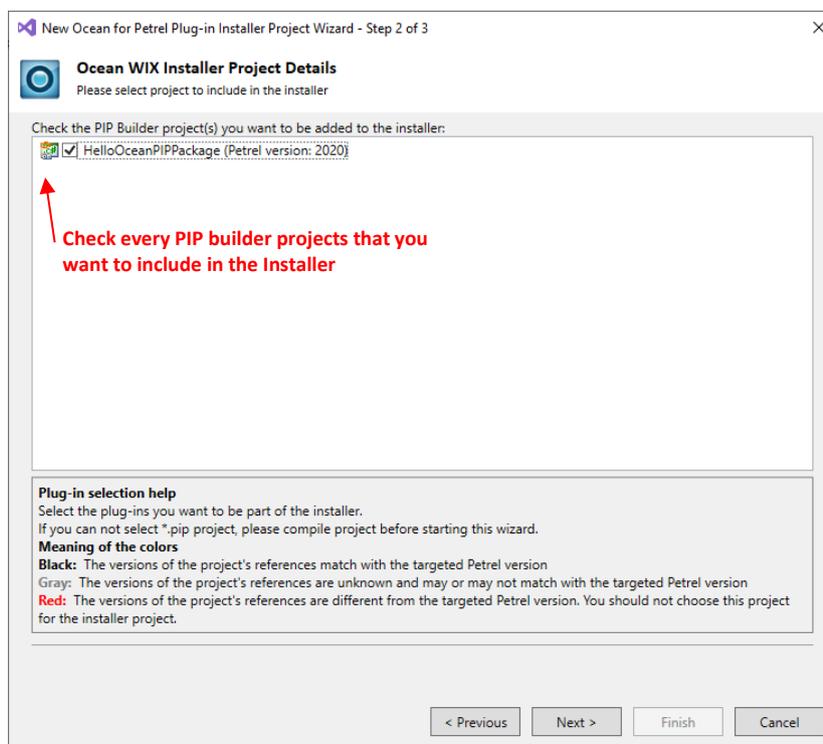


Figure 57: Step 2, Setting Title, Company and Description

4. Enter the appropriate information as follows:
  - **Title:** The text entered here is displayed on the title bar of the installation kit. In this example, enter "HelloOceanWixPluginInstaller". This will be displayed in the installed programs list at Control Panel -> Add Remove Programs.
  - **Company:** The text typed here is added to the properties of the MSI kit. This information can be viewed in the summary tab under the properties of install kit.
  - **Description:** The text typed here is added to the properties of the MSI kit. This information can be viewed in the comments section under the properties of the install kit.

5. Click **Next**.

The Wizard opens the Step 3 window as shown in the following figure.



**Figure 58: Step 3, Setting the Included PIP Builder projects**

This dialog lists all of the PIP projects available under the current solution. This Installer project needs the PIP files (the outputs) of PIP Builder projects. Select those you want to be included in the installer MSI file. You may add other PIP files manually (not located in this solution) later.

You can decide whether the plug-in should be installed for the current user (eventually running the installer) or for all users on the target computer.

6. Click **Next**.

The Wizard displays the summary page with the information what will be installed.

In this example it is:

“Plug-ins to install:

HelloOceanPIPPackage.pip” – that contains the HelloOceanPlugin

7. Click **Finish**.

Note: From 2015.1 onwards, wizard will automatically update all version number to ensure clean uninstall in scenario where plugin is being update.

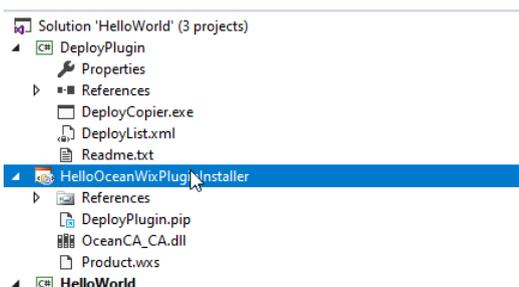


Figure 59: Preview of Installer Files in Solution Explorer

The “HelloOceanWixPluginInstaller” project has been created and ready to compile. Its output is a HelloOceanWixPluginInstaller.msi that can be shipped to the users (or upload to Ocean Store). There is no “Primary project output” in the installer project instead, the PIP files are added to the project that you selected in the wizard. MSI installer will call PluginManager to install these PIP files.

## Creating an Ocean Plug-in Test Project

---

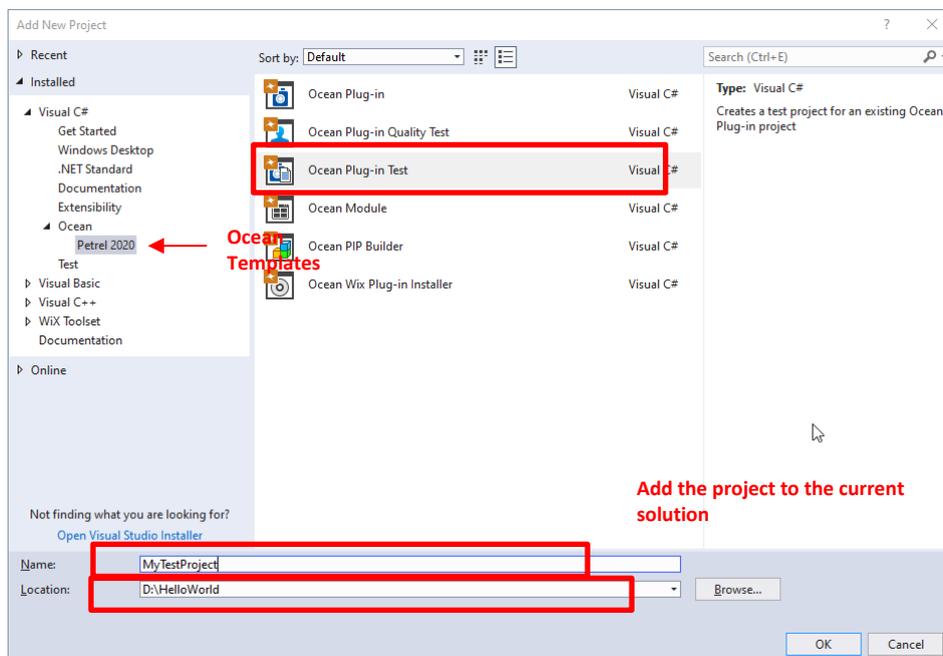
The Plug-in Test Project is used for unit testing an existing Ocean Plug-in through the Ocean Testing Framework. Before starting to write the unit tests, Ocean Testing Framework demands several configuration steps in order to create a test project, as follows:

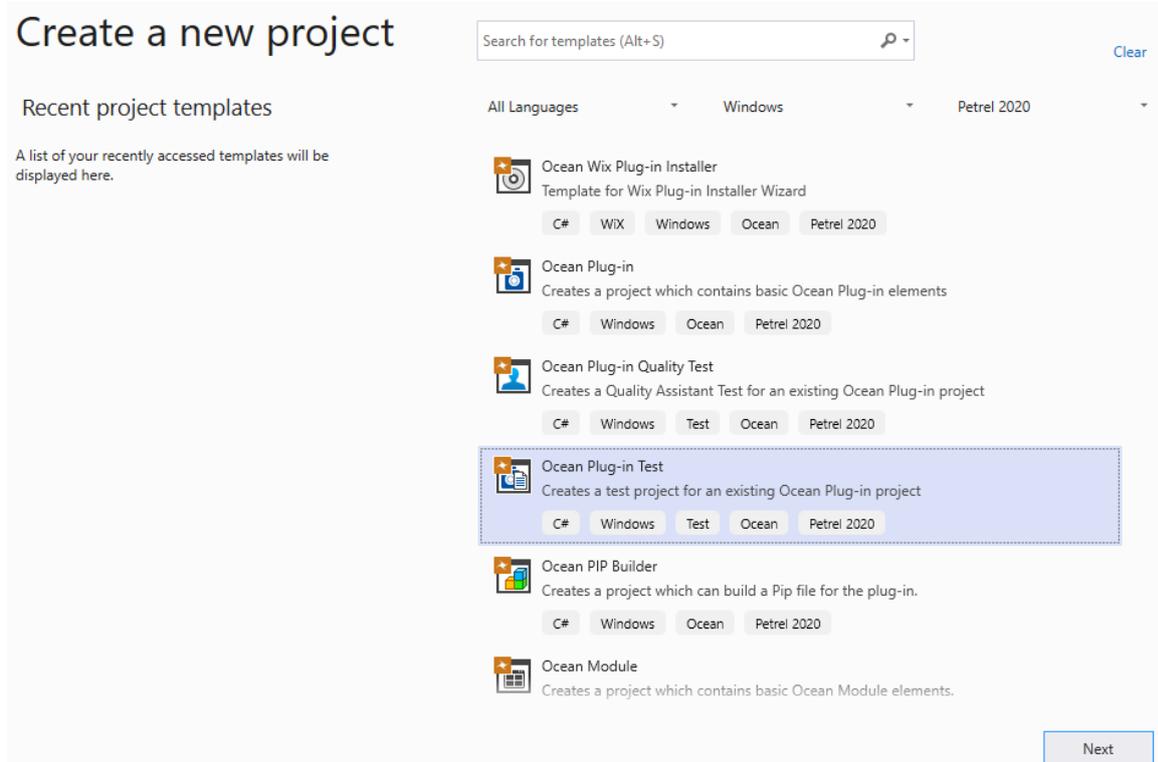
- The test project has to contain a reference to the assembly of the plug-in to be tested;
- The test project assembly has to be named with the same assembly name of the plug-in to be tested plus the suffix **.Test**. Example: if the assembly name of the plug-in to be tested is `MyCompany.MyPlugin`, then the test assembly name must be `MyCompany.MyPlugin.Test`;
- The test project output path (destination where assembly and compilation artifacts are stored) must be set to Petrel installation folder;
- Reference paths must be pointed to Petrel installation and Public (`PETREL_HOME/Public`) folders as well as to any additional required folder;
- A reference to the Ocean Testing Framework assembly (`Slb.Ocean.Petrel.Testing.dll`) must be added to the test project;
- The Petrel configuration file (`petrel.exe.config`) must be copied into test project, renamed with the same test project assembly name (Ex.: `MyCompany.MyPlugin.Test.dll.config`), and have its property *Copy to Output Directory* to *Copy always*;
- Add references to assemblies of the used unit testing framework (NUnit).

**Note:** Due Petrel implementation restrictions, the Ocean Testing Framework supports only NUnit as test framework.

There is clearly a big time consuming and manual effort only for configuring a test project. To overcome such overhead and to boost the developer productivity, the Ocean Plug-in Test Project wizard wraps up all of the above steps in a few clicks. In a solution containing the plug-in project to be tested:

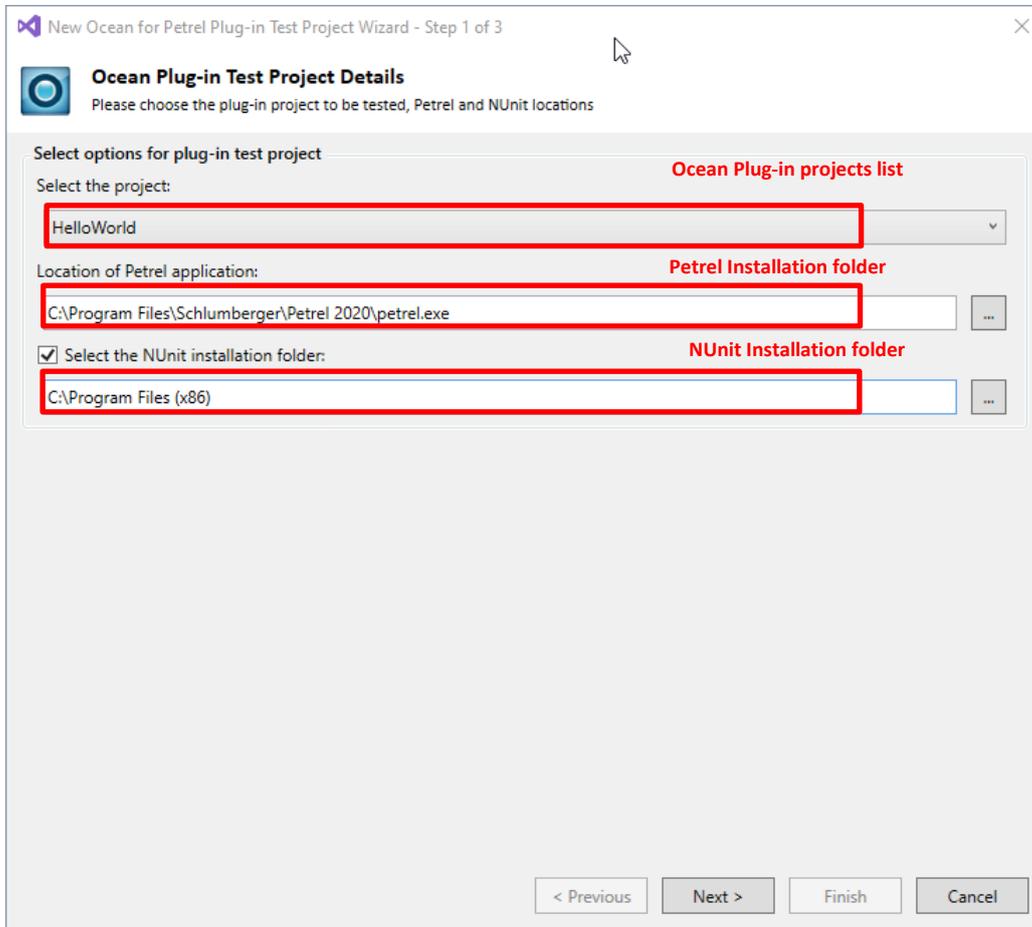
1. Click on File > New... > Project...;
2. Under Ocean templates, select Ocean Plug-in Test, provide a project name and mark the option Add to solution;





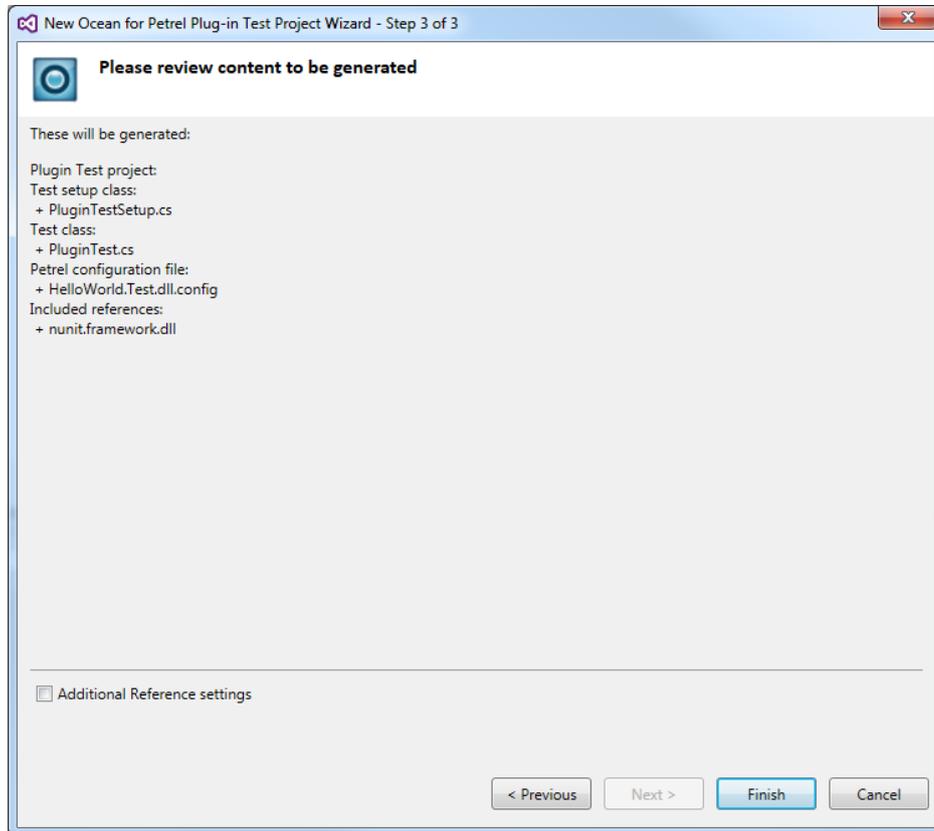
**Figure 60: New Plug-in Test Project wizard launch**

3. Click on OK button;
4. In the next screen, select which project will be tested as well as the NUnit installation folder. Note that only Ocean Plug-in projects are listed in the combo box;



**Figure 61: Plug-in Test Project configuration**

5. Click on Next button;
6. In the next screen, review the test project settings and click on Finish button.



**Figure 62: Plug-in Test Project settings review page**

7. A new Plug-in Test Project is created, including all of its required configuration, a test setup class and a test template class.

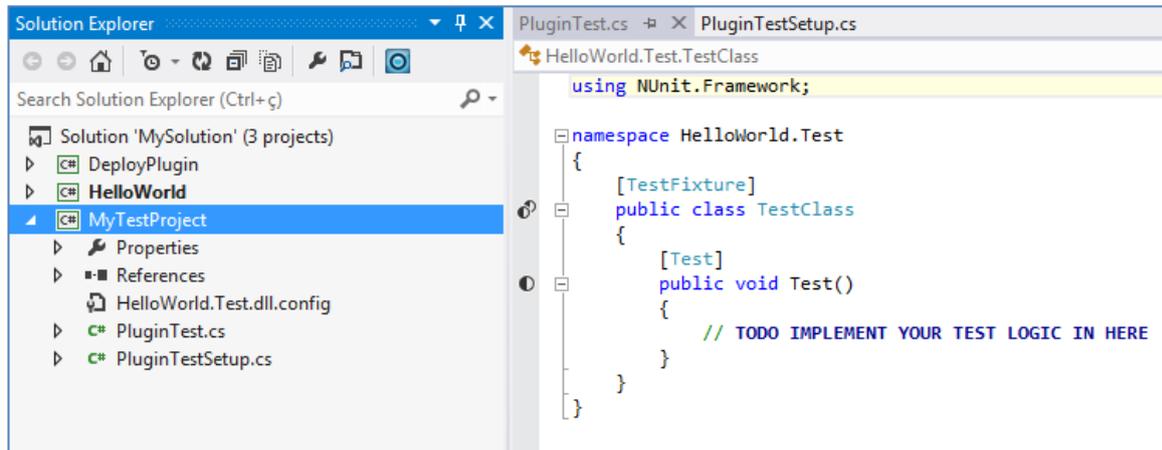


Figure 63: Plug-in Test Project review settings page

8. After the project files have been created, the developer can start coding his unit test against the plug-in to be tested.

## **THE OCEAN DEVELOPERS TOOLS**

Ocean provides a set of tools in Visual Studio to simplify the development, quality control, the testing process, and the upgrade of Ocean Plug-ins. This chapter provides an overview of the Ocean Developers Tools in Visual Studio features.

## Scripting Tool

---

Ocean Scripting Tool allow developer to write code to execute Ocean for Petrel API in a Petrel instantaneously.

### Accessing Scripting Tool

In Visual Studio, Ocean Scriping Tool can be accessed through VS main menu > Ocean > Petrel Scripting Tool > Scripting Tool 2020.

Ocean for Petrel installation automatically install Scripting Tool plug-in in Petrel. This plug-in is required to pair Scripting Tool with Petrel. To verify that this plugin exists, look for ScriptingPlugin in Petrel > File > Option > Plug-in Manager > Your Installed Plug-ins.

Note: If ScriptingPlugin is not installed, upon launching Scripting Tool, user will be asked to restart Petrel to allow Ocean for Petrel SDK to reinstall this plug-in in Petrel

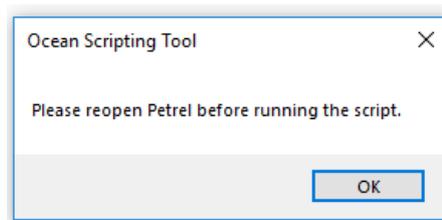


Figure 64: Scripting tool will ask to restart Petrel to install ScriptingPlugin in Petrel

### Managing library reference

Click on setting  add references to Ocean for Petrel libraries or .Net libraries that you wish to use in your code.

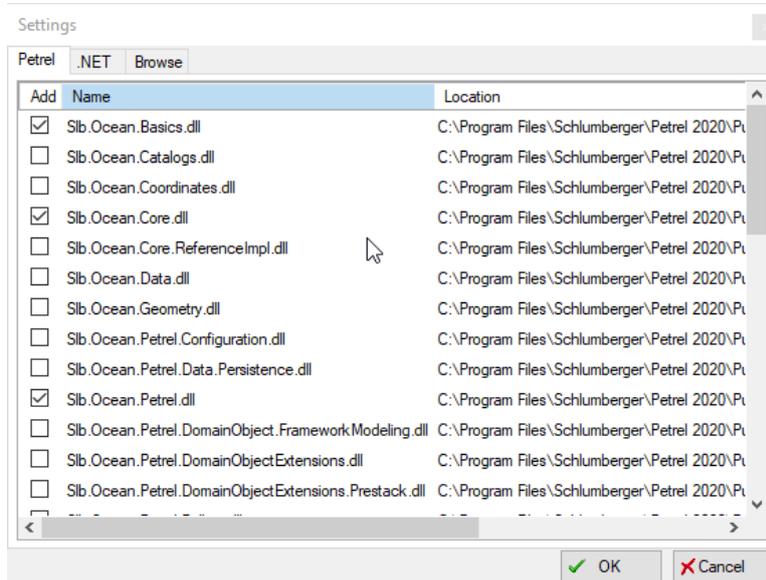


Figure 65: Managing reference

Note: In this example to write to Petrel Message log, only Slb.Ocean.Core.dll and Slb.Ocean.Petrel.dll is required.

## Writing and running a script

Writing a script is like writing C# code. To execute the code click run .

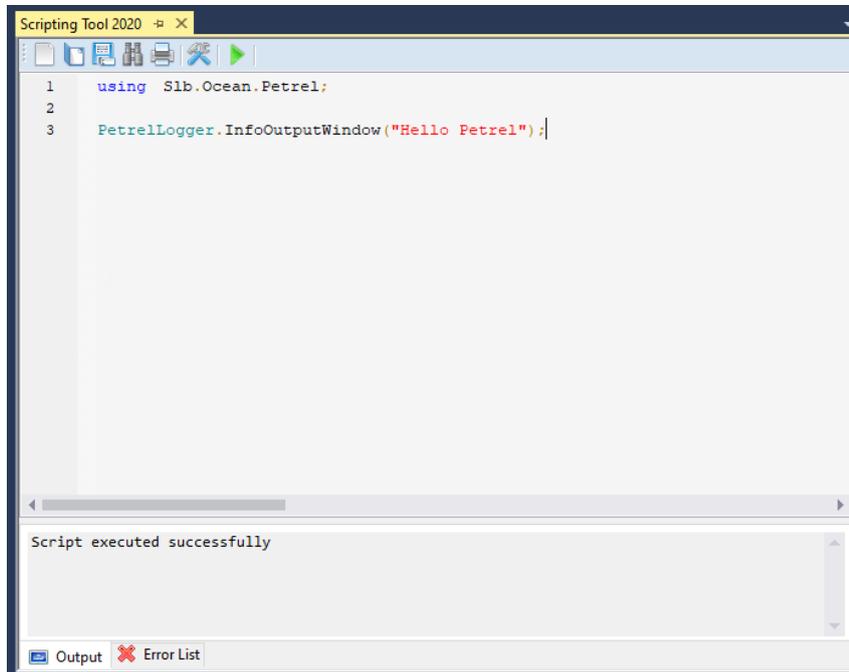


Figure 66: Writing and running script

Result of the script will be visible in Petrel.

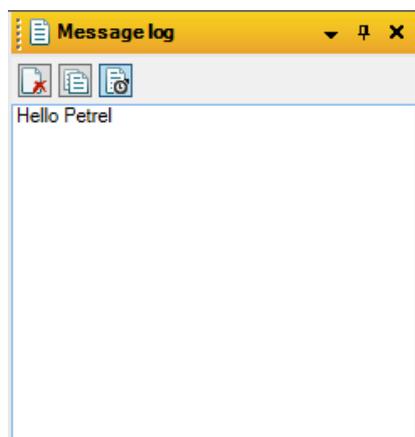


Figure 67: Result in Petrel

## Ocean Quality Assistant

---

Ocean Quality Assistant is a Visual Studio extension that offers 3 main features,

- Run Automated Acceptance Tests;
- Manage Manual Acceptance Tests;
- Run the fixed set of Sanity Unit Tests.

Acceptance rules are updated for every release as per rules from Ocean Store acceptance criteria. Updated version of the rules is available from Ocean Portal (click on link from Ocean Quality Assistant to Ocean Portal to download latest acceptance criteria check list)

Ocean Quality Assistant will be deployed by OceanSDK installer.

### Accessing Ocean Quality Assistant

In Visual Studio, Ocean Quality Assistant can be accessed through,

- VS main menu > Ocean > Ocean Quality Assistant
- Solution Explorer > 

Note: It is not mandatory to have an opened VS solution to access Ocean Quality Assistant.

Note: It is not mandatory to have an opened VS solution to access Ocean Quality Assistant.

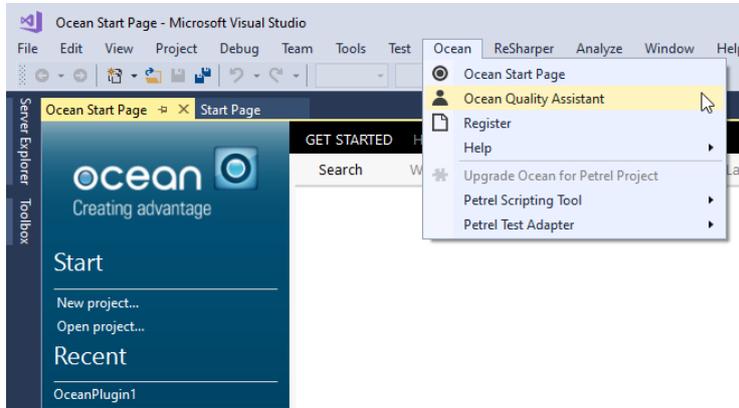


Figure 68: Access Ocean Quality Assistant from the main menu

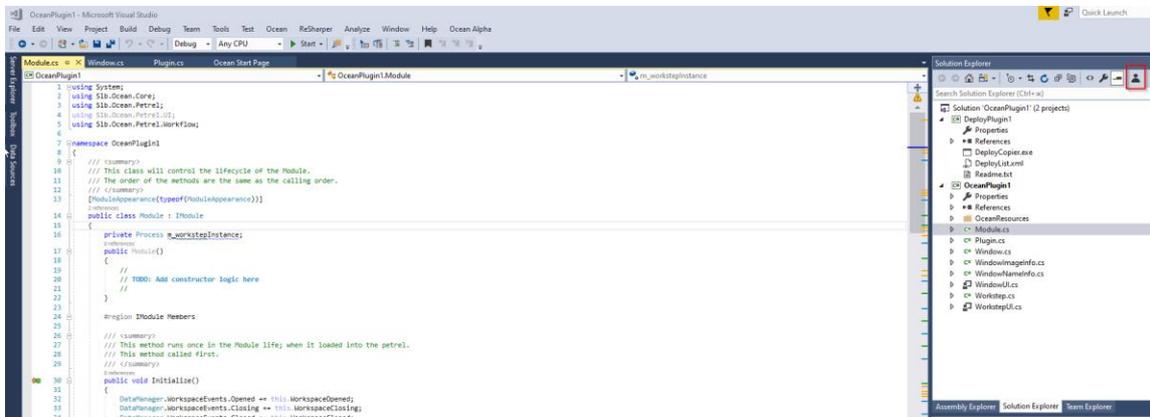


Figure 69: Access Ocean Quality Assistant from Solution Explorer window

## Accessing Ocean Quality Assistant Summary

In Application Details tab the execution status of Automated Acceptance Tests, Manual Acceptance Tests, and Sanity Unit Tests are displayed.

## Run all tests

From Application Details tab it is possible to run Automated Acceptance Tests, and fixed Sanity Unit Tests with a single click. The results displayed in the Summary are updated accordingly.

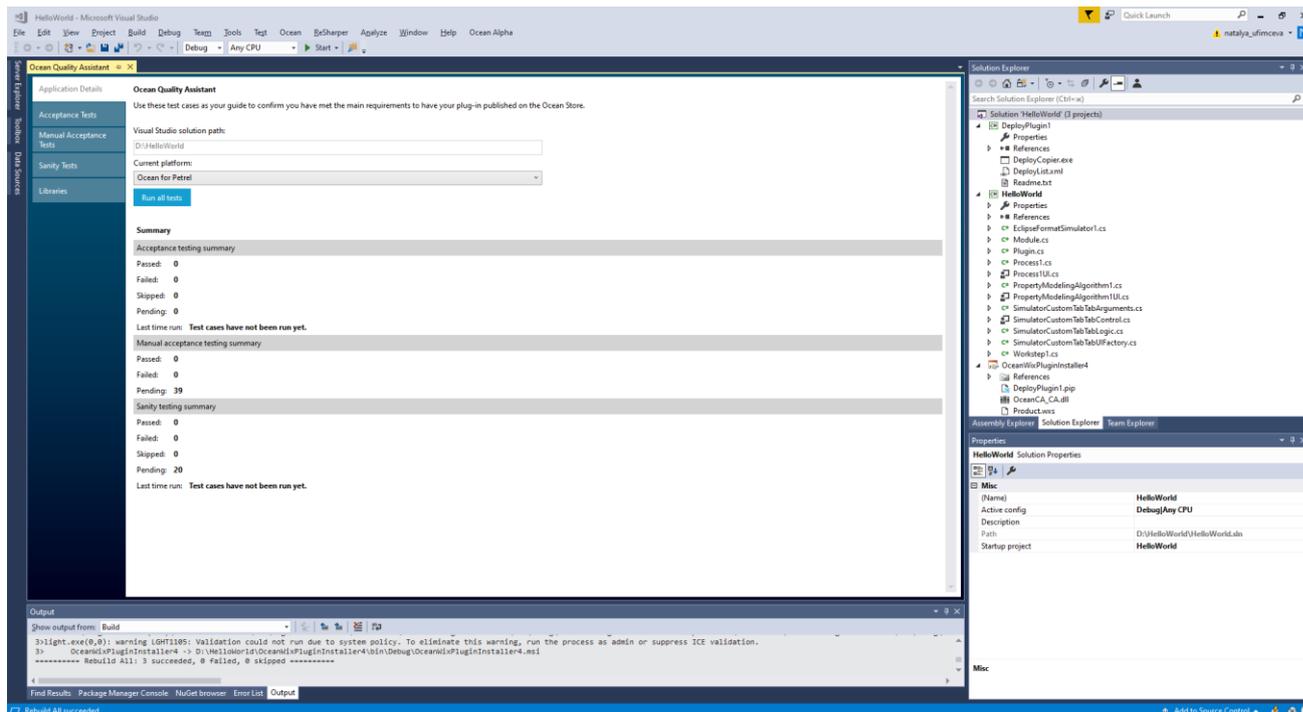


Figure 70: Application Details view

## Running Automated Acceptance Tests

From Acceptance Tests tab it is possible to run a subset of tests that were originally performed only by the Ocean Acceptance Team.

Now plug-in developers can save time running this subset of tests before submitting the plug-in to Ocean Store.

Setup:

1. Select the \*.pip or \*.msi file of your plug-in;
2. [Optional] Select a temporary folder where the \*.pip or \*.msi will be extracted during the tests. Otherwise the default temporary system folder will be used;
3. Click Run tests.

After the tests are run the result of each test is updated in the table, and a summary is shown below the Run tests button.

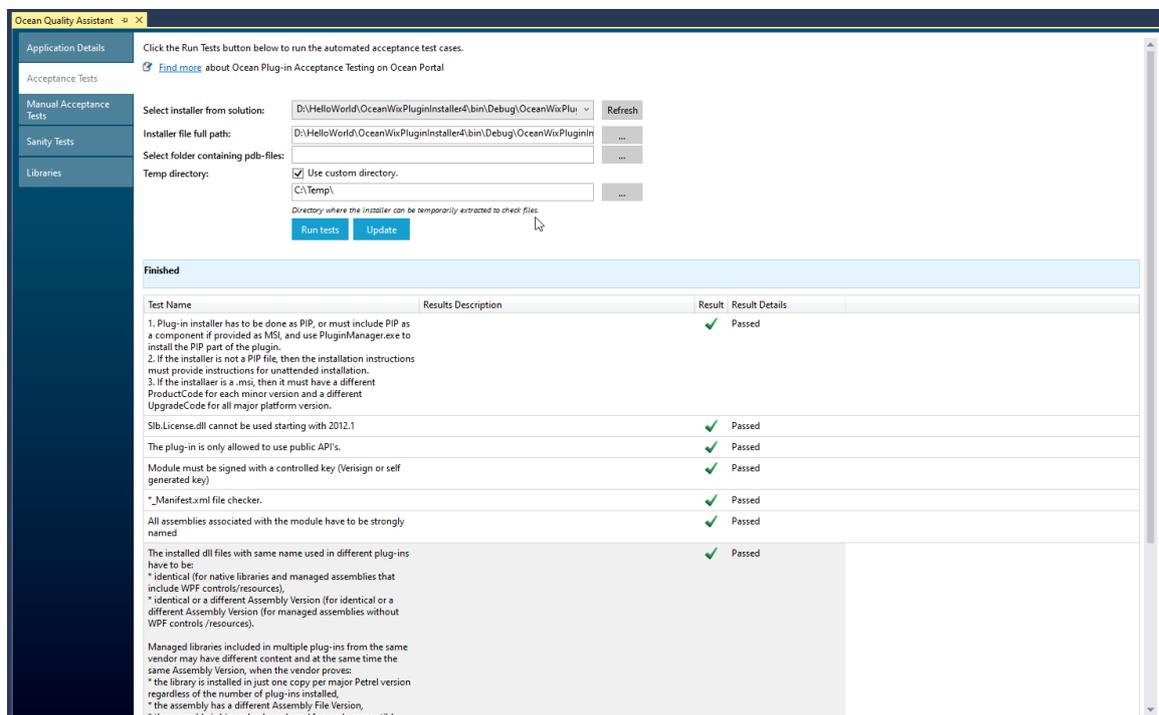


Figure 71 Acceptance Tests view after running complete

## Managing Manual Acceptance Tests

From Manual Acceptance Tests tab one can,

- Visit the list of acceptance criteria that have not been automated;
- Mark criteria as Pending, Passed, or Failed;
- Save and retrieve the results of the analysis of acceptance criteria;

Note: As the recorded result is persisted in text/xml file, it is easy to share and use version control on these results.

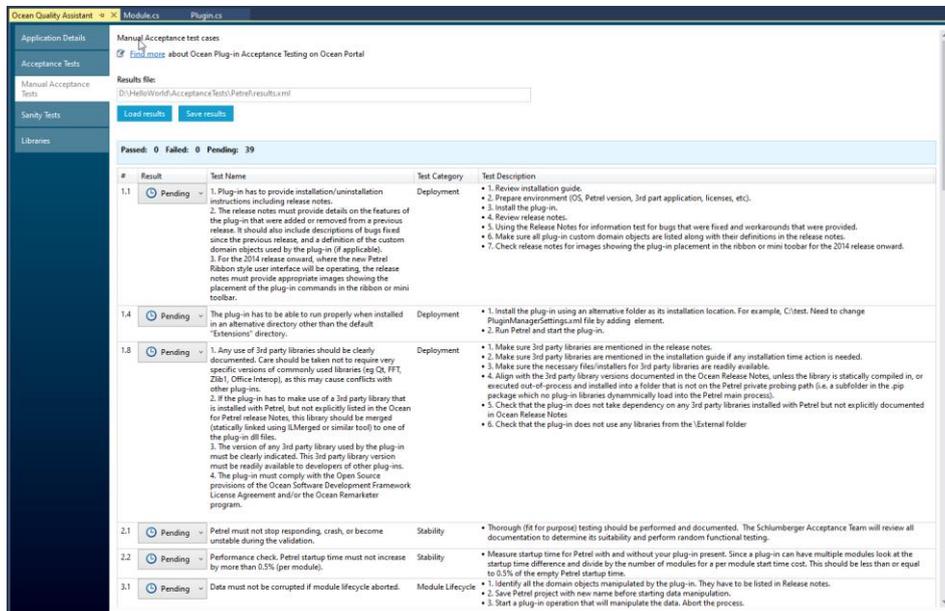


Figure 72 Manual Acceptance Tests view

#	Result	Test Name	Test Category	Test Description
1.1	Passed	1. Plug-in has to provide installation/uninstallation instructions including release notes. 2. The release notes must provide details on the features of the plug-in that were added or removed from a previous release. It should also include descriptions of bugs fixed since the previous release, and a definition of the custom domain objects used by the plug-in (if applicable). 3. For the 2014 release onward, where the new Petrel Ribbon style user interface will be operating, the release notes must provide appropriate images showing the placement of the plug-in commands in the ribbon or mini toolbar.	Deployment	<ul style="list-style-type: none"> <li>1. Review installation guide.</li> <li>2. Prepare environment (OS, Petrel version, 3rd part application, licenses, etc).</li> <li>3. Install the plug-in.</li> <li>4. Review release notes.</li> <li>5. Using the Release Notes for information test for bugs that were fixed and workarounds that were provided.</li> <li>6. Make sure all plug-in custom domain objects are listed along with their definitions in the release notes.</li> <li>7. Check release notes for images showing the plug-in placement in the ribbon or mini toolbar for the 2014 release onward.</li> </ul>
1.4	Failed	The plug-in has to be able to run properly when installed in an alternative directory other than the default "Extensions" directory.	Deployment	<ul style="list-style-type: none"> <li>1. Install the plug-in using an alternative folder as its installation location. For example, C:\test. Need to change PluginManagerSettings.xml file by adding element.</li> <li>2. Run Petrel and start the plug-in.</li> </ul>
1.8	Passed	1. Any use of 3rd party libraries should be clearly documented. Care should be taken not to require very specific versions of commonly used libraries (eg Qt, FFT, Zlib), Office Interop), as this may cause conflicts with other plug-ins. 2. If the plug-in has to make use of a 3rd party library that is installed with Petrel, but not explicitly listed in the Ocean For Petrel release Notes, this library should be merged (statically linked using ILMerge or similar tool) to one of the plug-in dll files. 3. The version of any 3rd party library used by the plug-in must be clearly indicated. This 3rd party library version must be readily available to developers of other plug-ins. 4. The plug-in must comply with the Open Source provisions of the Ocean Software Development Framework License Agreement and/or the Ocean Remarketer program.	Deployment	<ul style="list-style-type: none"> <li>1. Make sure 3rd party libraries are mentioned in the release notes.</li> <li>2. Make sure 3rd party libraries are mentioned in the installation guide if any installation time action is needed.</li> <li>3. Make sure the necessary files/installers for 3rd party libraries are readily available.</li> <li>4. Align with the 3rd party library versions documented in the Ocean Release Notes, unless the library is statically compiled in, or executed out-of-process and installed into a folder that is not on the Petrel private probing path (i.e. a subfolder in the zip package which no plug-in libraries dynamically load into the Petrel main process).</li> <li>5. Check that the plug-in does not take dependency on any 3rd party libraries installed with Petrel but not explicitly documented in Ocean Release Notes.</li> <li>6. Check that the plug-in does not use any libraries from the \External folder</li> </ul>
2.1	Pending	Petrel must not stop responding, crash, or become unstable during the validation.	Stability	<ul style="list-style-type: none"> <li>Thorough (fit for purpose) testing should be performed and documented. The Schlumberger Acceptance Team will review all documentation to determine its suitability and perform random functional testing.</li> </ul>
2.2	Passed	Performance check, Petrel startup time must not increase by more than 0.5% (per module).	Stability	<ul style="list-style-type: none"> <li>Measure startup time for Petrel with and without your plug-in present. Since a plug-in can have multiple modules look at the startup time difference and divide by the number of modules for a per module start time cost. This should be less than or equal to 0.5% of the empty Petrel startup time.</li> </ul>
3.1	Pending	Data must not be corrupted if module lifecycle aborted.	Module Lifecycle	<ul style="list-style-type: none"> <li>1. Identify all the domain objects manipulated by the plug-in. They have to be listed in Release notes.</li> <li>2. Save Petrel project with new name before starting data manipulation.</li> <li>3. Start a plug-in operation that will manipulate the data. Abort the process.</li> </ul>

Figure 73 Manual Acceptance Tests view after saving edited results

## Running fixed set of Sanity Unit Tests

From Sanity Tests one can run the fixed set of tests defined in `Slb.Ocean.Petrel.Testing.SanityTest.dll` (see Ocean for Petrel CHM > References > Walkthroughs > Sanity Unit Testing)

Setup:

1. Select a Petrel version;
2. Enter your plug-in namespace;
3. Select a Petrel project that includes the test target objects (custom domain objects, toggle windows, file formats, custom data sources etc.);
4. Click Run tests.

Note 1: Only installed Petrel and supported versions will be listed in Petrel version combobox.

Note 2: All test target objects have to be resolvable in the test project, and all corresponding plug-ins have to be registered.

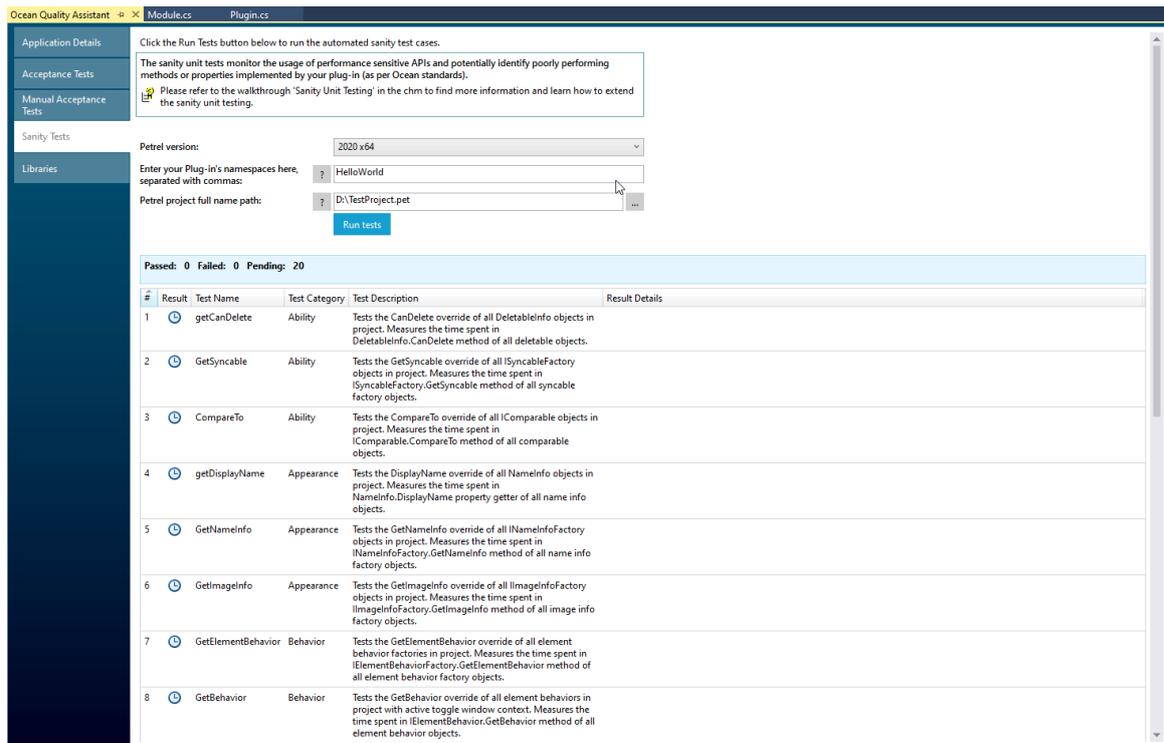


Figure 74 Sanity Tests view

During the execution of the tests, a status message is show below the Run tests button, and the log is displayed in the Output window.

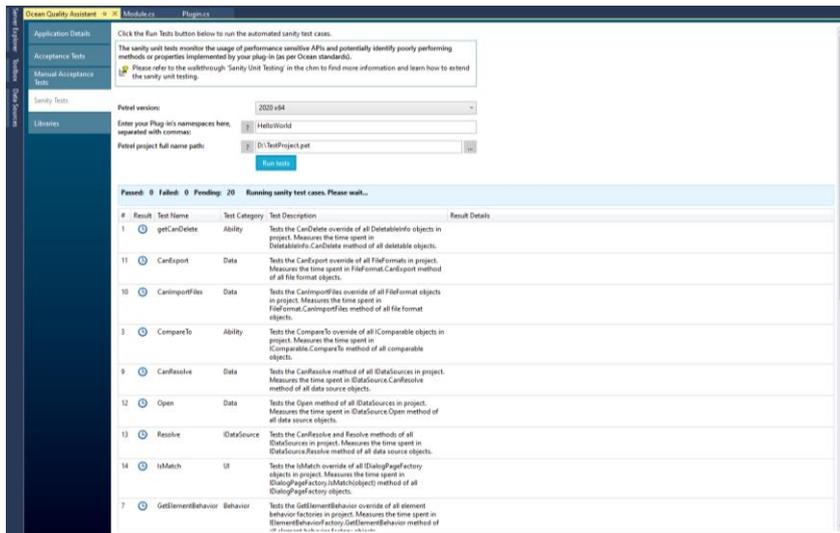


Figure 75: Sanity Tests view while executing test cases

After the tests are run the result of each test is updated in the table, and a summary is shown below the Run tests button.

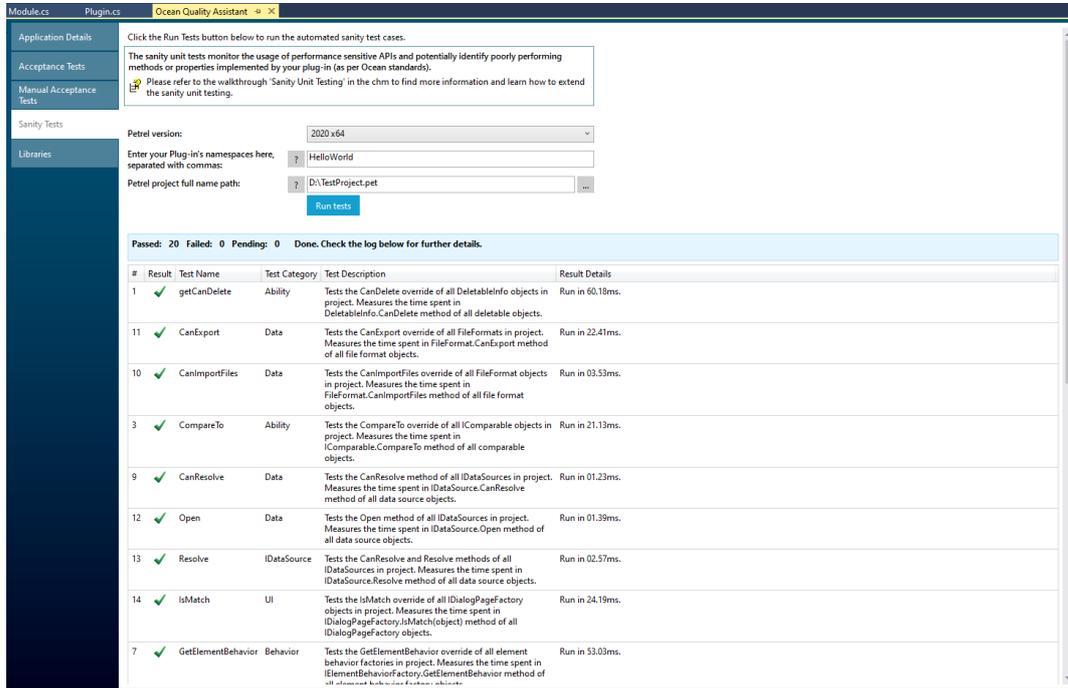


Figure 76 Sanity Tests view after finished execution

## Viewing full library list

List of all third-party library and library that have been change from the last version distributed with Petrel. Plug-in are advised to use the same library version and reference the library available in Petrel installation folder to ensure runtime compatibility.

## The Ocean Developers Tools

Ocean Quality Assistant

Application Details: Petrel version: 2020.1

Acceptance Tests: Full Modified Find next

Manual Acceptance Tests

Sanity Tests

Libraries

Petrel 2020.1 Preview 3rd Party Components

Product Version: 20.1.0.5368

Name	Vendor	Version	Mode	Status	R		
Accord.NET	http://accord-framework.net/	3.0.2	Dynamic library in process	3: Final version in baseline	2i		
Library	Product	Assembly	File	Path	Category	Platform	SHA1
Accord.dll	3.0.2.0	3.0.2.0	3.0.2.5339	.\Extensions\Schlumberger\Predictions	Managed	AnyCPU	ed184549d2c4dfb13a2751dd2f2d28b69f5ec2de
Accord.Math.dll	3.0.2.0	3.0.2.0	3.0.2.5339	.\Extensions\Schlumberger\Predictions	Managed	AnyCPU	b625101f88ef997206a65927123d071868a1f138
Accord.Neuro.dll	3.0.2.0	3.0.2.0	3.0.2.5339	.\Extensions\Schlumberger\Predictions	Managed	AnyCPU	3241f14e2d91a793c9c6a5425a7c6b3967a9bc
AvalonEdit	Open Source: http://avalonedit.net/	5.0.3.0	Dynamic library in process	3: Final version in baseline	2i		
Library	Product	Assembly	File	Path	Category	Platform	SHA1
ICSharpCode.AvalonEdit.dll	5.0.3.0	5.0.3.0	5.0.3.0	.\Extensions\Schlumberger\INTERSECT\IX2019.1	Managed	AnyCPU	bcc1d959786ba4253491b67d448f97cf5ad709ed
ICSharpCode.AvalonEdit.dll	5.0.3.0	5.0.3.0	5.0.3.0	.\Extensions\Schlumberger\INTERSECT\IX2019.2	Managed	AnyCPU	bcc1d959786ba4253491b67d448f97cf5ad709ed
ICSharpCode.AvalonEdit.dll	5.0.3.0	5.0.3.0	5.0.3.0	.\Extensions\Schlumberger\INTERSECT\IX2019.3	Managed	AnyCPU	bcc1d959786ba4253491b67d448f97cf5ad709ed
boost	Boost Community (www.boost.org)	1.71	Dynamic library in process	3: Final version in baseline	2i		
Library	Product	Assembly	File	Path	Category	Platform	SHA1
boost_chrono-vc142-mt-x64-1_71.dll	0.0.0.0	0.0.0.0	0.0.0.0	.	Unmanaged	X64	dd27f5d0394af6268558cc509da49dd5af0962e0
boost_date_time-vc142-mt-x64-1_71.dll	0.0.0.0	0.0.0.0	0.0.0.0	.	Unmanaged	X64	f687530c438eea30702d427c1bbed378b4865185
boost_filesystem-vc142-mt-x64-1_71.dll	0.0.0.0	0.0.0.0	0.0.0.0	.	Unmanaged	X64	e802621315abb2e2e68779f9fbacc80263dfa37b
boost_program_options-vc142-mt-x64-1_71.dll	0.0.0.0	0.0.0.0	0.0.0.0	.	Unmanaged	X64	31f1f95ba8ed9a767c5da13f4ed64e74131d6968e

Figure 77 Full library list

Ocean Quality Assistant

Application Details: Petrel version: 2020.1

Acceptance Tests: Full Modified Find next

Manual Acceptance Tests

Sanity Tests

Libraries

Petrel 2019.1 - 2020.1 Preview 3rd Party Components comparison

Product Version: 19.1.5.6453-20.1.0.5368

▼ Added components

Name	Vendor	Version	Mode	Status	Release
▶ CppRest	https://www.nuget.org/packages/cpprestsdk.v140.win desktop.msvcstl.dyn.rt-dyn/	140.2.9	Dynamic library in process	3: Final version in baseline	2020.1
▶ ICU - International Components for Unicode	Unicode Inc	58.2	Dynamic library in process	3: Final version in baseline	2020.1
▶ Intel Fortran (for PIPESIM)	Intel	18.0.3	Dynamic library in process	3: Final version in baseline	2020.1
▶ IconSubTypes		1.2.0	Dynamic library in process	3: Final version in baseline	2020.1
▶ MaterialDesignColors	http://materialdesigninxml.net/	1.2.1	Dynamic library in process	3: Final version in baseline	2020.1
▶ MaterialDesignThemes	http://materialdesigninxml.net/	3.0.0	Dynamic library in process	3: Final version in baseline	2020.1
▶ Microsoft SQL Server Compact (PIPESIM)	Microsoft	4.0.8482.1	Dynamic library in process	3: Final version in baseline	2020.1
▶ MS VC++ redistributable library (SRE47)	Microsoft	11.0	Out of process	3: Final version in baseline	2020.1
▶ MultiFlash Flash Package (PIPESIM)	Infocchem	4.3.6.0	Out of process	3: Final version in baseline	2020.1
▶ OpenSSL		1.0.2.15	Dynamic library in process	3: Final version in baseline	2020.1
▶ QuickGraph	Microsoft Public License (Ms-PL)	3.6	Dynamic library in process	3: Final version in baseline	2020.1
RestSharpSigned	RestSharp.dll RestSharp.xml	105.2.3	Dynamic library in process	3: Final version in baseline	2020.1

▼ Modified components

Name	Vendor	Version	Mode	Status	Release
▶ Accord.NET	http://accord-framework.net/	3.0.2	Dynamic library in process	3: Final version in baseline	2020.1
▶ AvalonEdit	Open Source: http://avalonedit.net/	5.0.3.0	Dynamic library in process	3: Final version in baseline	2020.1
▶ boost	Boost Community (www.boost.org)	Old: 1.61 New: 1.71	Dynamic library in process	3: Final version in baseline	2020.1
boost (Petrosys)	See entry for in-process usage.	Old: 1.59.0b New: 1.84.0	Out of process	3: Final version in baseline	2020.1
▶ CefSharp	The CefSharp Community	Old: 57.0.0 New: 73.1.130	Dynamic library in process	3: Final version in baseline	2020.1
▶ DevExpress WPF Controls and Libraries	Dev-Express	15.2.4	Dynamic library in process	3: Final version in baseline	2020.1
▶ dotConnect for SQLite	http://www.devart.com	Old: 5.2.135.0 New: 5.14.1504	Dynamic library in process	3: Final version in baseline	2020.1
Fesapi	https://f2i-consulting.com/	0.8	Dynamic library in process	Old: 3: Final version in baseline New: 0.	2020.1

Figure 78 Modified library list

## Ocean NUnit Test Adapter

---

Ocean NUnit Test Adapter for Visual Studio 2017 (VS2017) and Visual Studio 2019 (VS2019) is a test adapter that enables Ocean developers to seamlessly run integration tests using Ocean Testing Framework in Visual Studio.

This test adapter can be install separately after Ocean for Petrel SDK installation. Get the installer from `\\Program Files\Common Files\Schlumberger\Ocean\Petrel\Common components\Visual Studio Extensions\Slb.OceanSdk.Petrel.TestAdapter.vsix`.

In the following sections we will present the adapter's usage and the steps necessary to have these tests executed.

For further information about how to use Ocean NUnit Test Adapter in Team Foundation Server 2012 (TFS 2012) see "White papers > Testing Framework" in Ocean Help.

### Creating a Test Project

First you will need a plug-in and a test project that will be used as example to show the features of the Ocean NUnit Test Adapter. These projects can be generated using the Ocean Wizards in Visual Studio 2017/2019.

In the following steps, we will use two projects as example: OceanPlugin and OceanPlugin.Tests, an Ocean plug-in and a test project respectively.

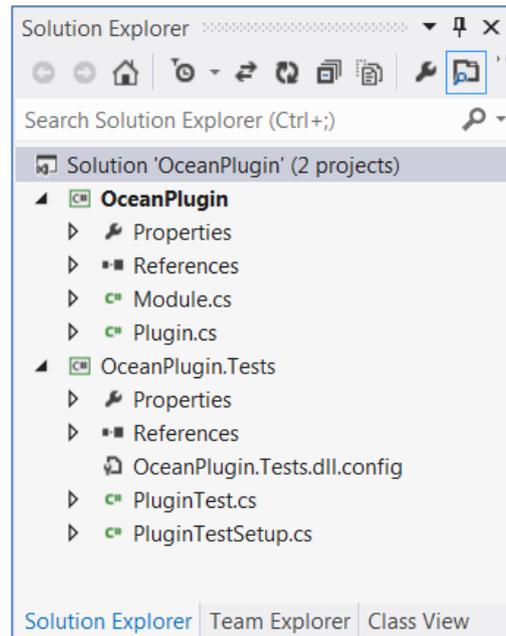


Figure 79 Solution with an Ocean plug-in and its test project.

## Test Explorer

With your test project created, the next step is to open the Test Explorer window in VS2017/VS2019. This can be accomplished by selecting the menu TEST > Windows > Test Explorer. As result, a window will be displayed and it will be responsible to manage your tests.

After you build the projects, the tests should be displayed in the Test Explorer as depicted in Figure 80.

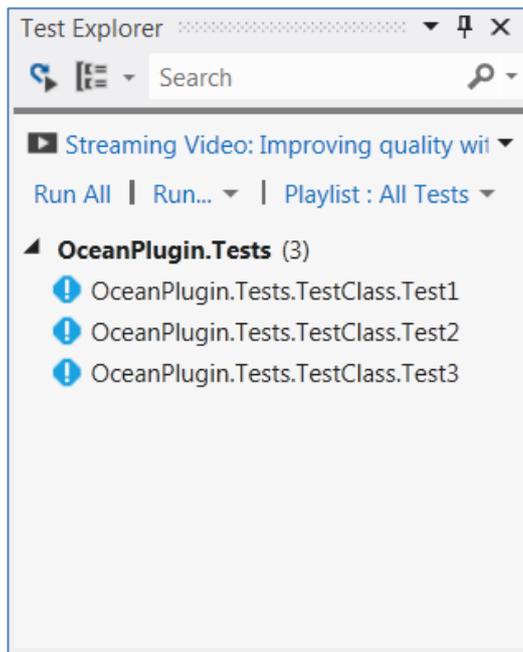


Figure 80 Tests displayed in the Test Explorer window

Note that this is a native VS2017 window and there are several run options and filters like Run failed tests, Run Not Run tests, and others.

## Selecting Petrel Version

Before running the tests, it is important to select the correct Petrel version and platform (Figure 81), because the test adapter needs to be aware of which Petrel will be used in order to infer the correct Petrel installation path.

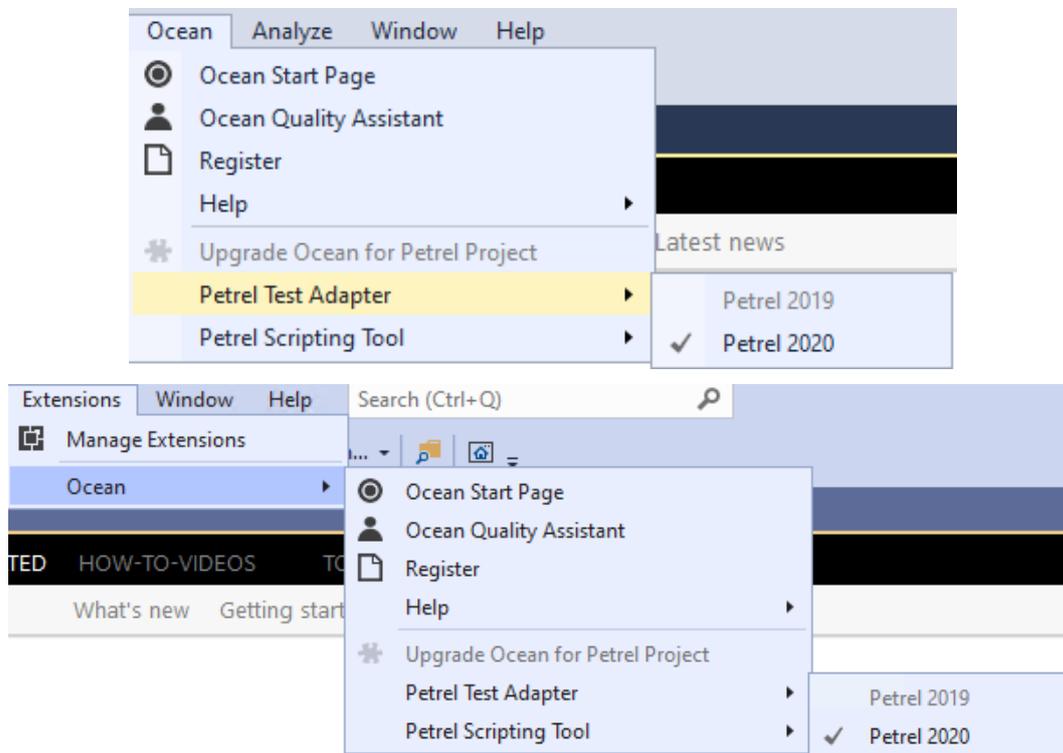


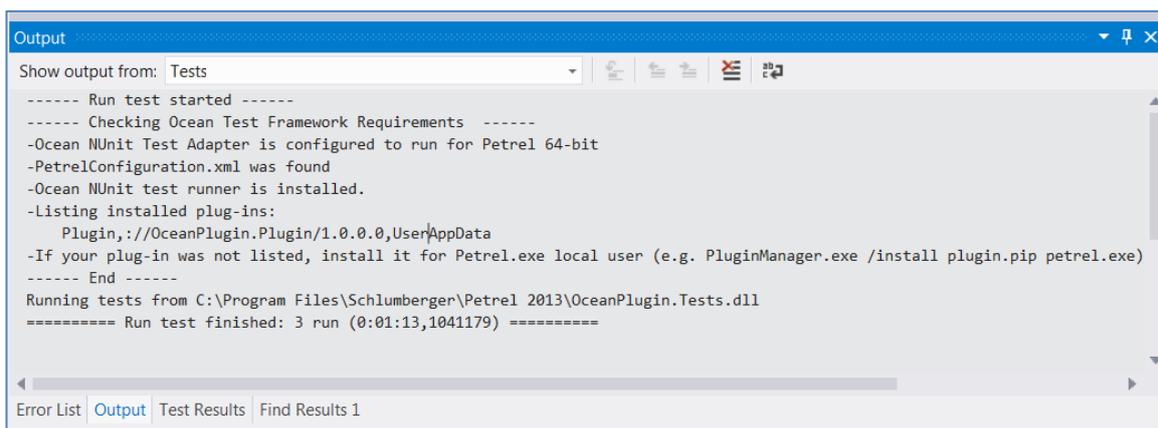
Figure 81 Selecting the Petrel version and platform

Ocean NUnit Test Adapter requires the test assembly to be located inside the Petrel's root folder in order to resolve the dependencies. For this reason, besides selecting the correct Petrel version and platform, it is necessary to set the projects' outputs to Petrel's root folder.

## Running the tests

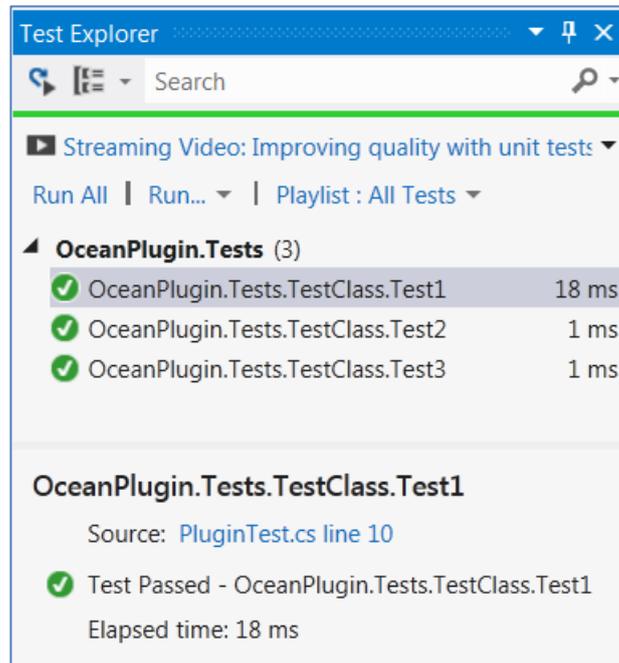
After configuring the test project and the test adapter, the user should be able to run the tests by using the Test Explorer window commands (i.e. Run All and Run...) and this will trigger the test execution. The test adapter's output can be visualized in the Output window when the option "Tests" is selected in the "Show output from:" combo box.

Figure 82 depicts an example of test output. The first section of the output just verifies if the requirements to use the Ocean Testing framework are met. This will include the verification of the existence of the PetrelConfiguration.xml file, list the installed plug-ins, and others.



**Figure 82 Tests output**

It is important to watch this output, because if anything goes wrong, it will give some advice on how to execute the tests properly or explain why the Ocean Testing Framework could not be ran.

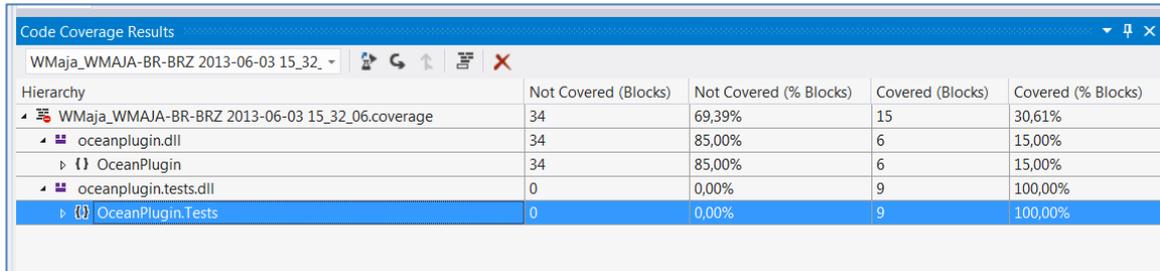


**Figure 83 Test Explorer with the tests results**

After the test execution finishes, the tests are updated in the Test Explorer with the details of each test case (Figure 83).

## Code coverage

Test Explorer also supports code coverage analysis. This can be accessed by running the commands “Analyze Code Coverage for All Tests” or “Analyze Code Coverage for Selected Tests” in the window. The result will be displayed as depicted in Figure 84.



Hierarchy	Not Covered (Blocks)	Not Covered (% Blocks)	Covered (Blocks)	Covered (% Blocks)
WMaja_WMAJA-BR-BRZ 2013-06-03 15_32_06.coverage	34	69,39%	15	30,61%
oceanplugin.dll	34	85,00%	6	15,00%
OceanPlugin	34	85,00%	6	15,00%
oceanplugin.tests.dll	0	0,00%	9	100,00%
OceanPlugin.Tests	0	0,00%	9	100,00%

**Figure 84 Code Coverage result**

The source code will also be colored with respect to the coverage results.

## Ocean Plug-in Upgrade Tool

---

Ocean Plug-in Upgrade Tool is a Visual Studio Extension that upgrades assembly references to the current version given a C# Plug-in project.

### Running the Upgrade Tool

In Visual Studio, Ocean Plug-in Upgrade Tool can be accessed through, either

- VS main menu > Ocean > Upgrade Ocean for Petrel Project(s), or
- Solution Explorer > Right click one **Solution** > Upgrade Ocean for Petrel Project(s), or
- Solution Explorer > Right click one **Project** > Upgrade Ocean for Petrel Project(s), or
- Solution Explorer > Right click **multiple Projects** > Upgrade Ocean for Petrel Project(s)

When the Ocean Upgrade Tool is accessed through Ocean Menu or Solution context menu **all loaded projects under the opened solution** will be upgraded.

Otherwise, only the selected project(s) will be affected.

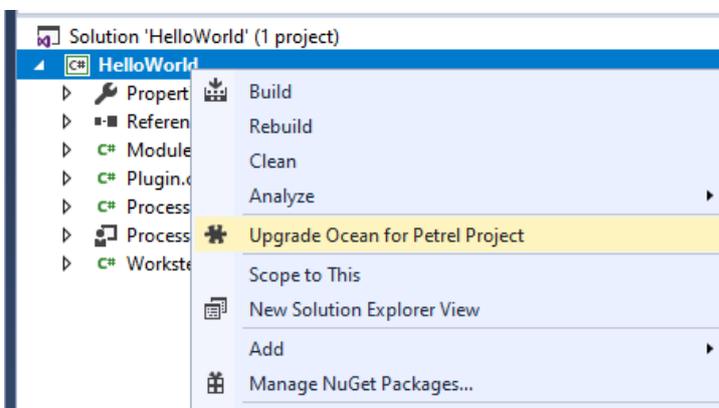


Figure 85: Accessing Ocean Plug-in Upgrade Tool through Visual Studio Project context menu

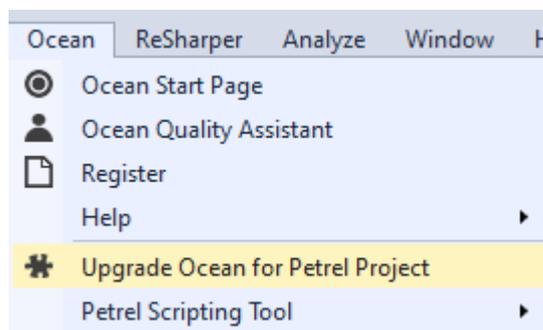


Figure 86 Ocean Plug-in Upgrade Tool is also available in the OCEAN Menu

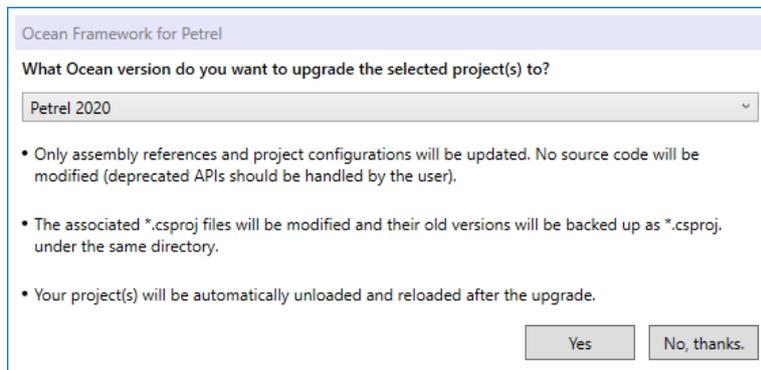
## What to expect

- After selecting the “Upgrade Project(s) to Ocean 202x.1” a confirmation dialog will be shown;
- After selecting “Yes” in the confirmation dialog, the upgrade process will be started over the selected project(s) or solution;
- A processing dialog will be displayed while the necessary changes are being made;

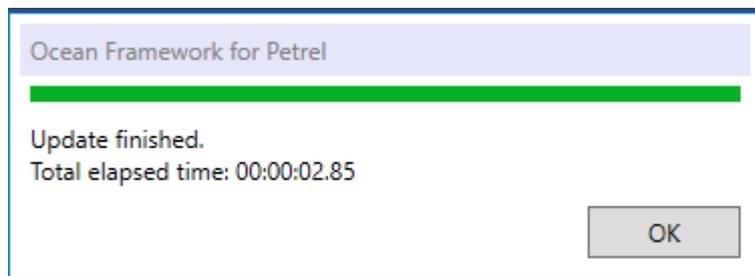
- The \*.CSPROJ and \*.CSPROJ.USER files will be backed up under the same directory of their originals;
- Log messages will be shown in Visual Studio Output window.

Remarks:

1. During the last phase of the upgrade the projects will be reloaded;
2. The Upgrade Tool will affect only Ocean and Open Inventor assembly references;
3. No source code is modified;
4. The user might remove obsolete API calls manually.



**Figure 87 Confirmation dialog**

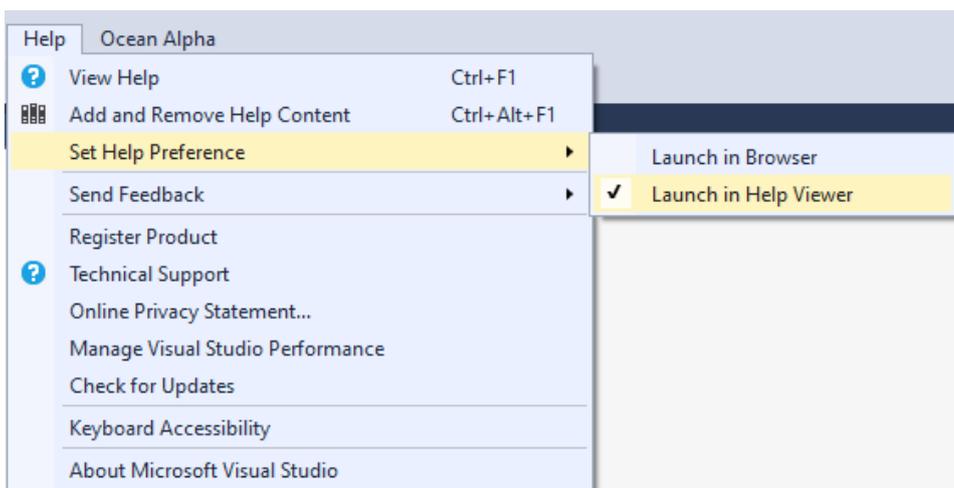


**Figure 88 Processing dialog and log messages**

## Ocean for Petrel API Documentation in Help Viewer

---

Ocean API documentation is accessible in Microsoft Help Viewer. Ocean API documentation content in Help Viewer is consistent with Ocean for Petrel CHM. To enable API documentation access code, set help preference to launch in help viewer as below:



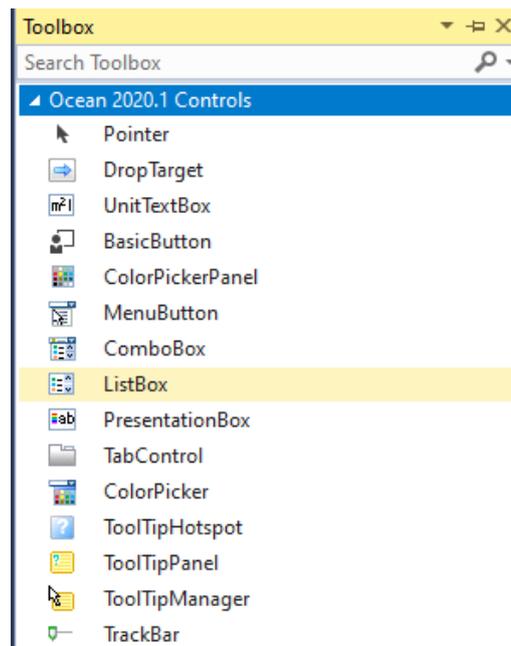
**Figure 89** Setting help preference

This will enable access to any API documentation from code editor by placing cursor on the API member and pressing F1 key.

## Ocean Controls

---

Ocean controls are available in Slb.Ocean.Petrel.UI.Controls.dll from Petrel installation folder. Add them to your Toolbox using Choose Toolbox Items dialog.



**Figure 90 Ocean Controls**