

# living planet symposium

BONN  
23–27 May  
2022

TAKING THE PULSE  
OF OUR PLANET FROM SPACE



# SNAP Community Contributions

Oana Hogoiu, CS GROUP – ROMANIA

26/05/2022

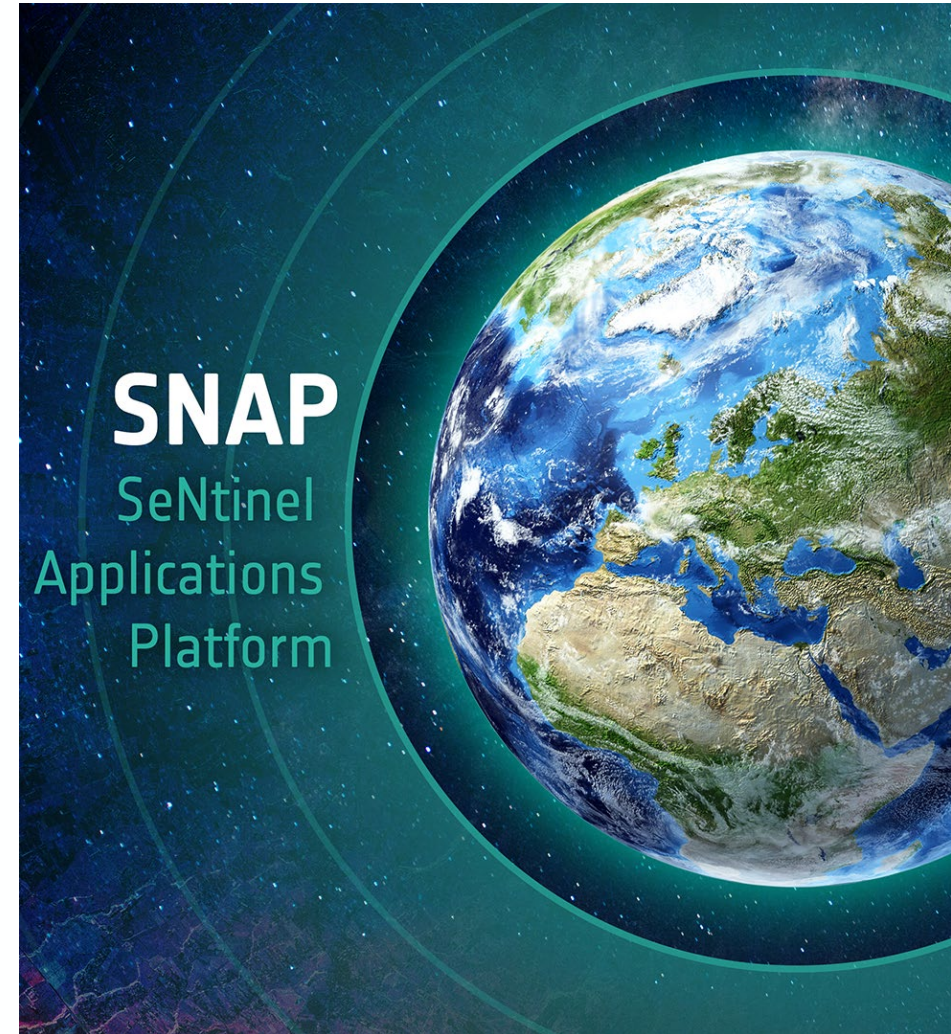


We (ESA & SNAP team) are proud of SNAP User Community that has grown under our eyes.

We are happy to invite all SNAP users that developed specific plugins for their needs (or for their company needs) to share them (if possible) with the entire SNAP users community.

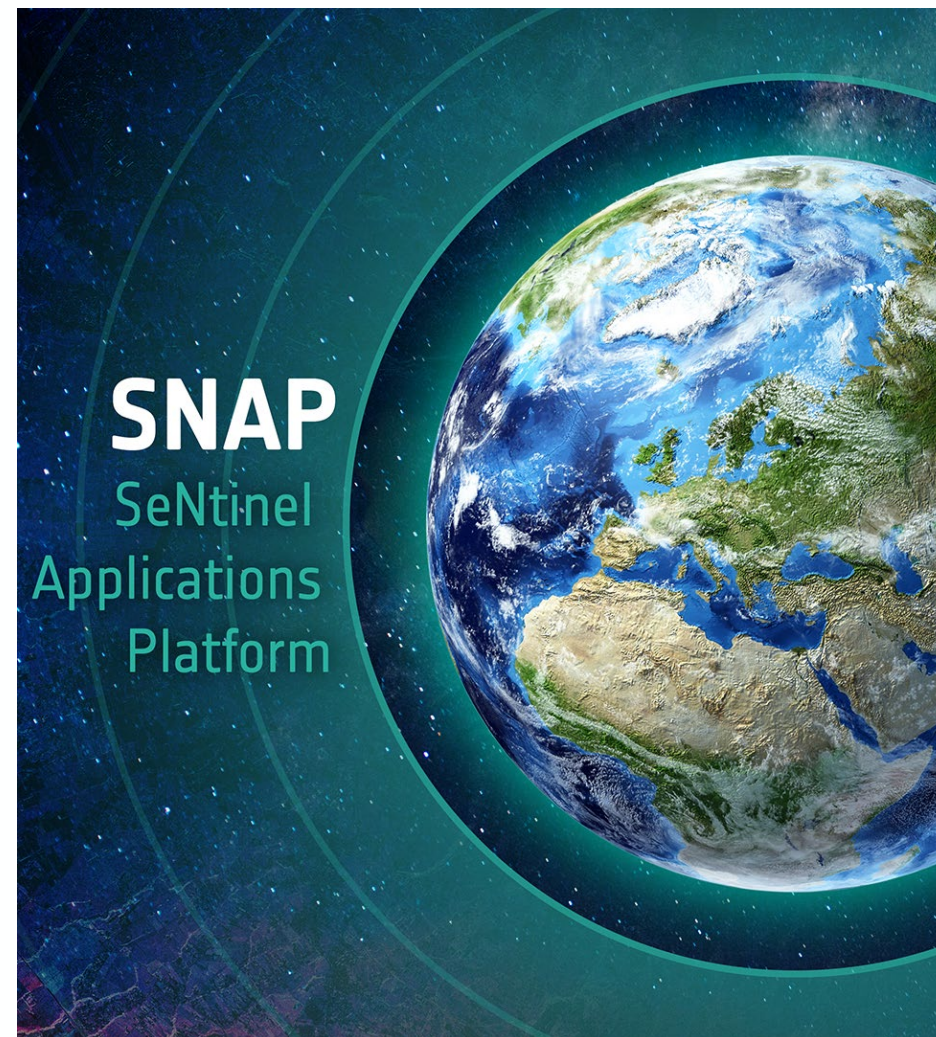
We are always at your service on STEP Forum (<https://forum.step.esa.int/>) with any kind of user support you may need.

Thank you to share with us all the good & bad about your experience with SNAP!





- How to create a new SNAP module using SNAP maven archetypes
- How to submit the plugin on STEP website
- How to benefit from the plugin in SNAP



# How to create a new SNAP module using SNAP maven archetypes

- SNAP source code

The source code is divided into several maven projects (SNAP core & main GUI plus additional toolboxes). Their github locations are below:

<https://github.com/senbox-org/snap-engine>

<https://github.com/senbox-org/snap-desktop>

<https://github.com/senbox-org/s1tbx>

<https://github.com/senbox-org/s2tbx>

<https://github.com/senbox-org/s3tbx>

<https://github.com/senbox-org/probavbox>

<https://github.com/senbox-org/smos-box>

- Requirements (for starting creating a new SNAP plugin module)

- build SNAP from sources (SNAP core & main GUI plus additional toolboxes that are needed)

On SNAP Wiki ("How to build SNAP from sources") there are detailed guidelines:

<https://senbox.atlassian.net/wiki/spaces/SNAP/pages/10879039/How+to+build+SNAP+from+sources>

- build the SNAP Archetypes source code, found under

<https://github.com/senbox-org/snap-archetypes>

Please check readme for detailed guidelines:

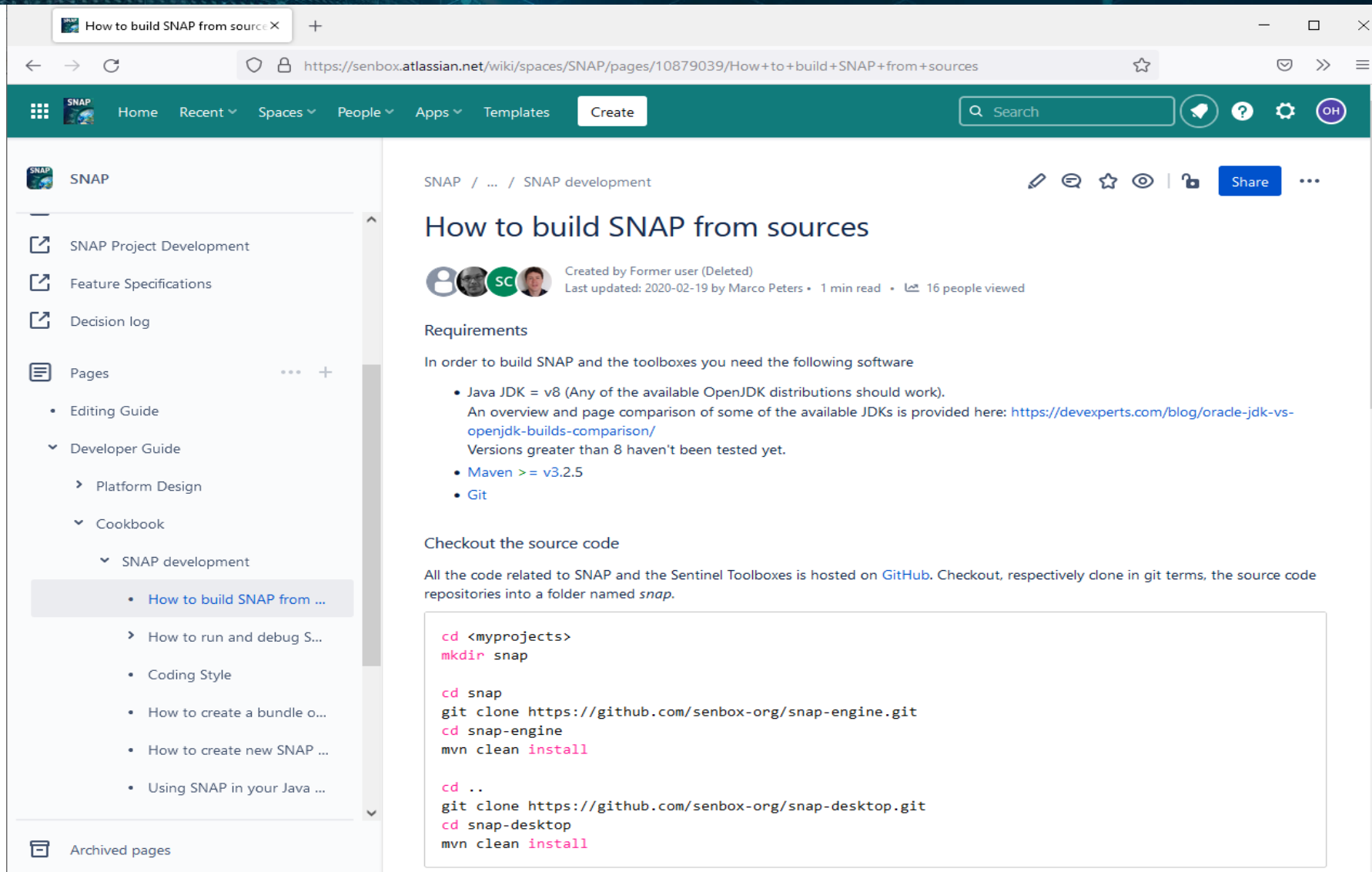
<https://github.com/senbox-org/snap-archetypes#readme>

- Setting up IntelliJ IDEA

Please check SNAP Wiki ("How to create new SNAP modules using SNAP maven archetypes") for guidelines:

<https://senbox.atlassian.net/wiki/spaces/SNAP/pages/1797160961/How+to+create+new+SNAP+modules+using+SNAP+maven+archetypes>

# How to build SNAP from sources



The screenshot shows a web browser window displaying a Confluence page. The browser's address bar shows the URL: `https://senbox.atlassian.net/wiki/spaces/SNAP/pages/10879039/How+to+build+SNAP+from+sources`. The page title is "How to build SNAP from sources". The page content includes a "Requirements" section with a list of software needed: Java JDK = v8, Maven >= v3.2.5, and Git. It also includes a "Checkout the source code" section with terminal commands for cloning the source code from GitHub. The left sidebar shows a navigation menu with categories like "SNAP Project Development", "Feature Specifications", "Decision log", "Pages", and "SNAP development".

SNAP / ... / SNAP development

## How to build SNAP from sources

Created by Former user (Deleted)  
Last updated: 2020-02-19 by Marco Peters • 1 min read • 16 people viewed

### Requirements

In order to build SNAP and the toolboxes you need the following software

- Java JDK = v8 (Any of the available OpenJDK distributions should work).  
An overview and page comparison of some of the available JDKs is provided here: <https://devexperts.com/blog/oracle-jdk-vs-openjdk-builds-comparison/>  
Versions greater than 8 haven't been tested yet.
- Maven >= v3.2.5
- Git

### Checkout the source code

All the code related to SNAP and the Sentinel Toolboxes is hosted on [GitHub](#). Checkout, respectively clone in git terms, the source code repositories into a folder named `snap`.

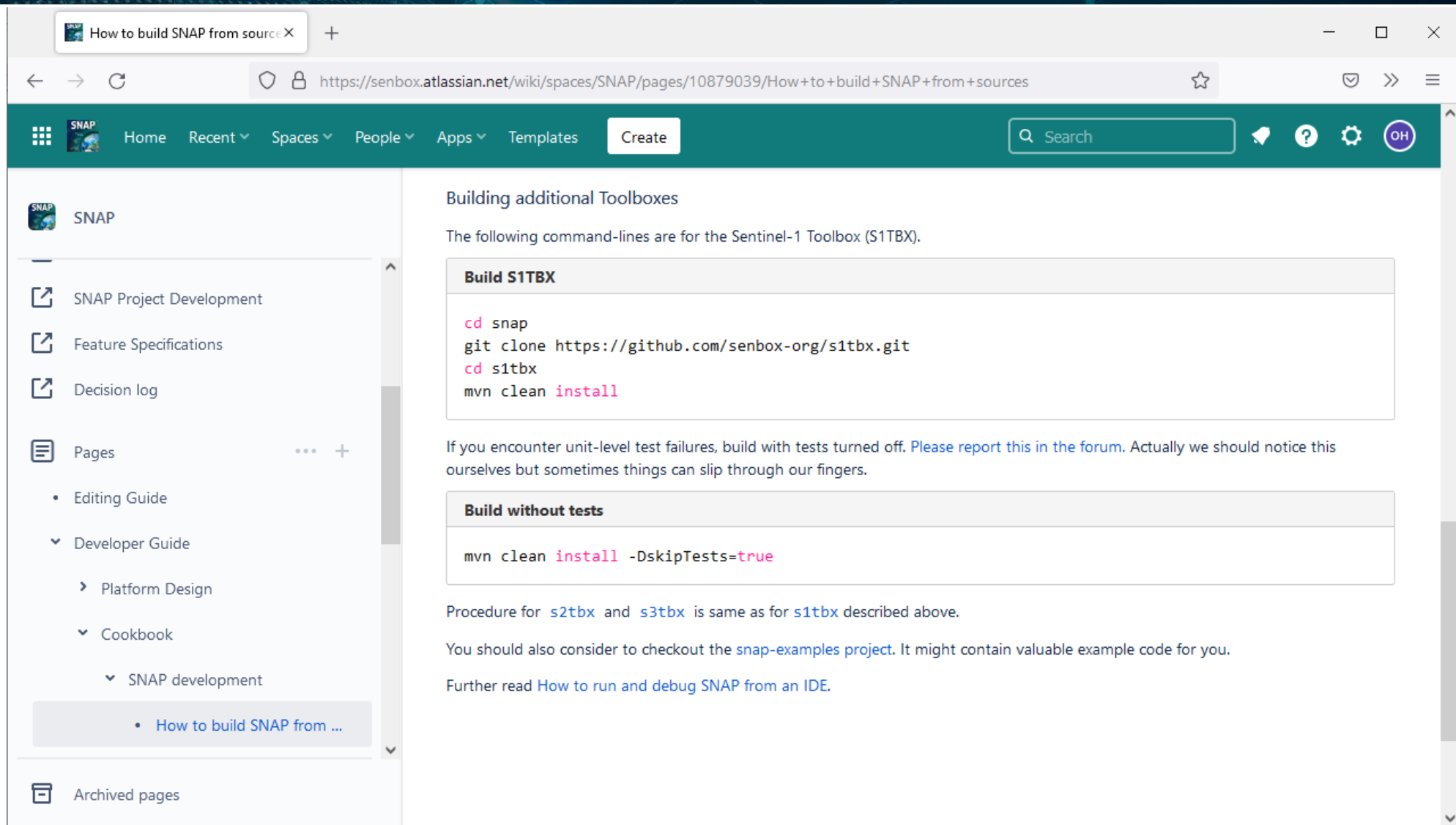
```
cd <myprojects>
mkdir snap

cd snap
git clone https://github.com/senbox-org/snap-engine.git
cd snap-engine
mvn clean install

cd ..
git clone https://github.com/senbox-org/snap-desktop.git
cd snap-desktop
mvn clean install
```



# How to build SNAP from sources



The screenshot shows a web browser window with the URL `https://senbox.atlassian.net/wiki/spaces/SNAP/pages/10879039/How+to+build+SNAP+from+sources`. The page is part of the SNAP project on Atlassian Confluence. The left sidebar shows a navigation menu with 'SNAP' at the top, followed by 'SNAP Project Development', 'Feature Specifications', 'Decision log', 'Pages' (with a sub-menu including 'Editing Guide', 'Developer Guide', 'Platform Design', 'Cookbook', and 'SNAP development'), and 'Archived pages'. The main content area is titled 'Building additional Toolboxes' and contains the following text:

The following command-lines are for the Sentinel-1 Toolbox (S1TBX).

```
Build S1TBX

cd snap
git clone https://github.com/senbox-org/s1tbx.git
cd s1tbx
mvn clean install
```

If you encounter unit-level test failures, build with tests turned off. [Please report this in the forum](#). Actually we should notice this ourselves but sometimes things can slip through our fingers.

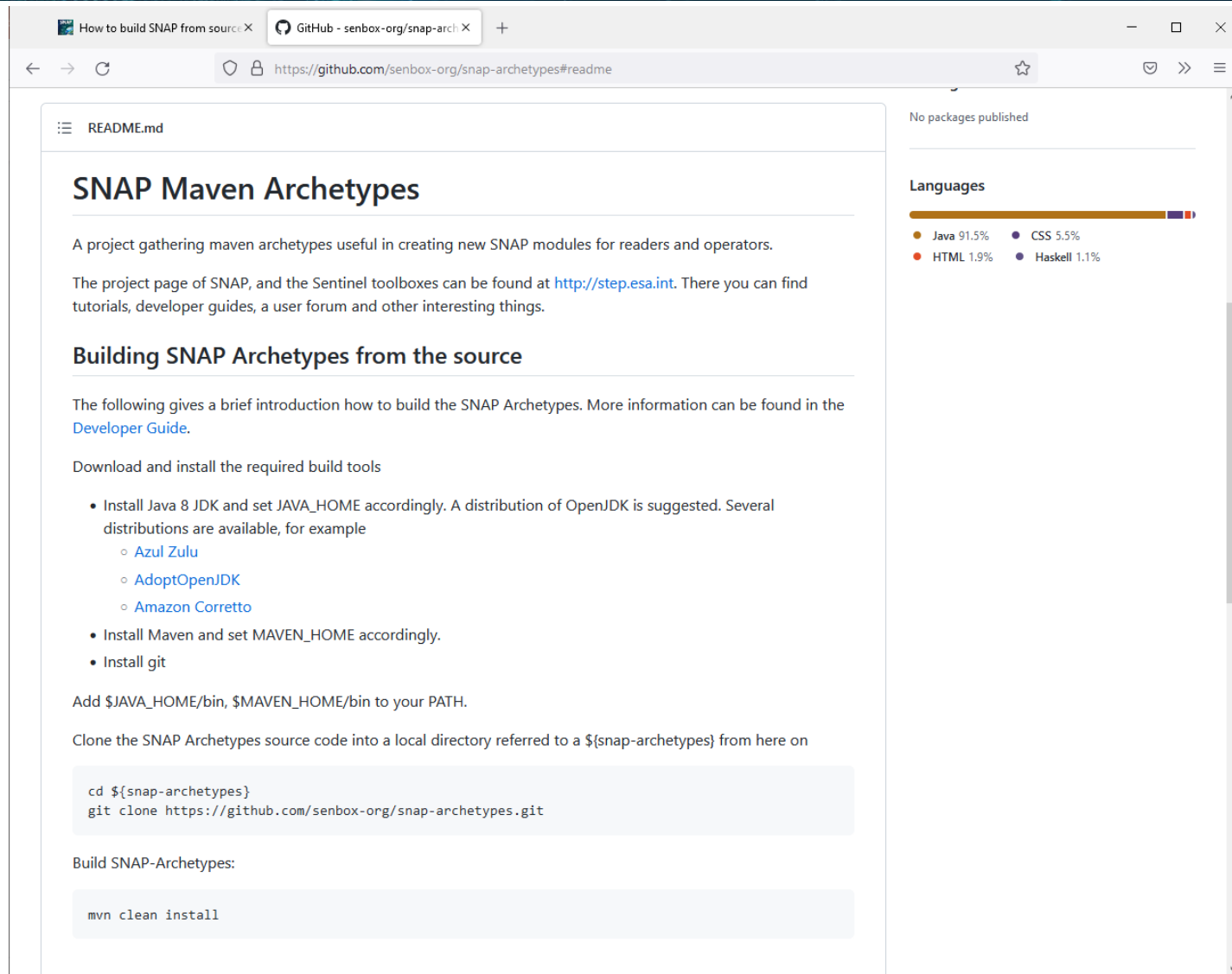
```
Build without tests

mvn clean install -DskipTests=true
```

Procedure for `s2tbx` and `s3tbx` is same as for `s1tbx` described above.

You should also consider to checkout the [snap-examples](#) project. It might contain valuable example code for you.

Further read [How to run and debug SNAP from an IDE](#).



How to build SNAP from source x GitHub - senbox-org/snap-archetypes x +

← → ↻ 🔒 https://github.com/senbox-org/snap-archetypes#readme ☆ 🔔 >> ☰

☰ README.md

## SNAP Maven Archetypes

A project gathering maven archetypes useful in creating new SNAP modules for readers and operators.

The project page of SNAP, and the Sentinel toolboxes can be found at <http://step.esa.int>. There you can find tutorials, developer guides, a user forum and other interesting things.

### Building SNAP Archetypes from the source

The following gives a brief introduction how to build the SNAP Archetypes. More information can be found in the [Developer Guide](#).

Download and install the required build tools

- Install Java 8 JDK and set JAVA\_HOME accordingly. A distribution of OpenJDK is suggested. Several distributions are available, for example
  - [Azul Zulu](#)
  - [AdoptOpenJDK](#)
  - [Amazon Corretto](#)
- Install Maven and set MAVEN\_HOME accordingly.
- Install git

Add \$JAVA\_HOME/bin, \$MAVEN\_HOME/bin to your PATH.

Clone the SNAP Archetypes source code into a local directory referred to a \${snap-archetypes} from here on


```
cd ${snap-archetypes}
git clone https://github.com/senbox-org/snap-archetypes.git
```

Build SNAP-Archetypes:

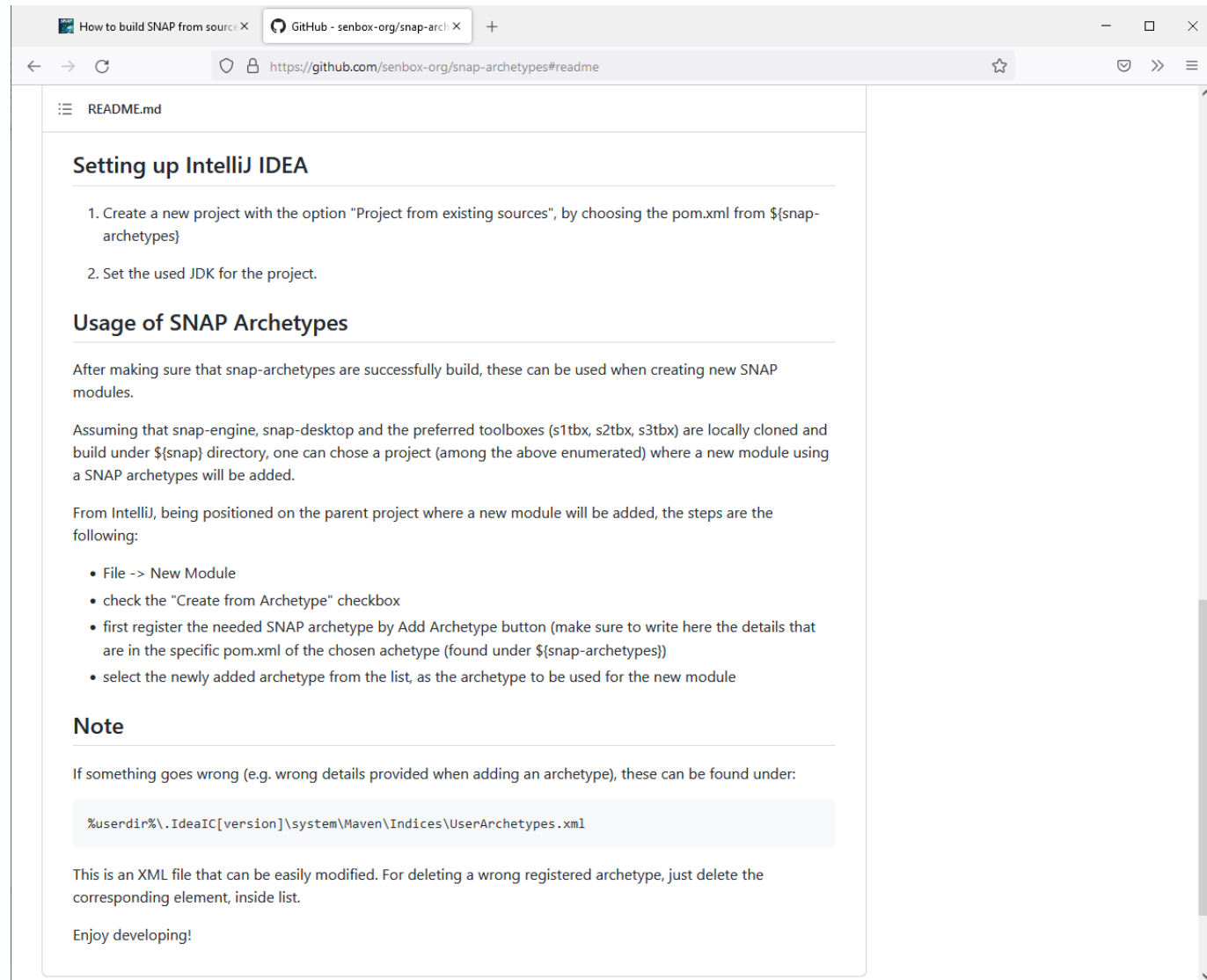
```
mvn clean install
```

No packages published

#### Languages



Language	Percentage
Java	91.5%
HTML	1.9%
CSS	5.5%
Haskell	1.1%



How to build SNAP from source x GitHub - senbox-org/snap-arch x +

← → ↻ 🔒 https://github.com/senbox-org/snap-archetypes#readme ☆ 🔔 >> ☰

☰ README.md

## Setting up IntelliJ IDEA

1. Create a new project with the option "Project from existing sources", by choosing the pom.xml from `$(snap-archetypes)`
2. Set the used JDK for the project.

## Usage of SNAP Archetypes

After making sure that snap-archetypes are successfully build, these can be used when creating new SNAP modules.

Assuming that snap-engine, snap-desktop and the preferred toolboxes (s1tbx, s2tbx, s3tbx) are locally cloned and build under `$(snap)` directory, one can chose a project (among the above enumerated) where a new module using a SNAP archetypes will be added.

From IntelliJ, being positioned on the parent project where a new module will be added, the steps are the following:

- File -> New Module
- check the "Create from Archetype" checkbox
- first register the needed SNAP archetype by Add Archetype button (make sure to write here the details that are in the specific pom.xml of the chosen archetype (found under `$(snap-archetypes)`)
- select the newly added archetype from the list, as the archetype to be used for the new module

## Note

If something goes wrong (e.g. wrong details provided when adding an archetype), these can be found under:

```
%userdir%\..IdeaIC[version]\system\Maven\Indices\UserArchetypes.xml
```

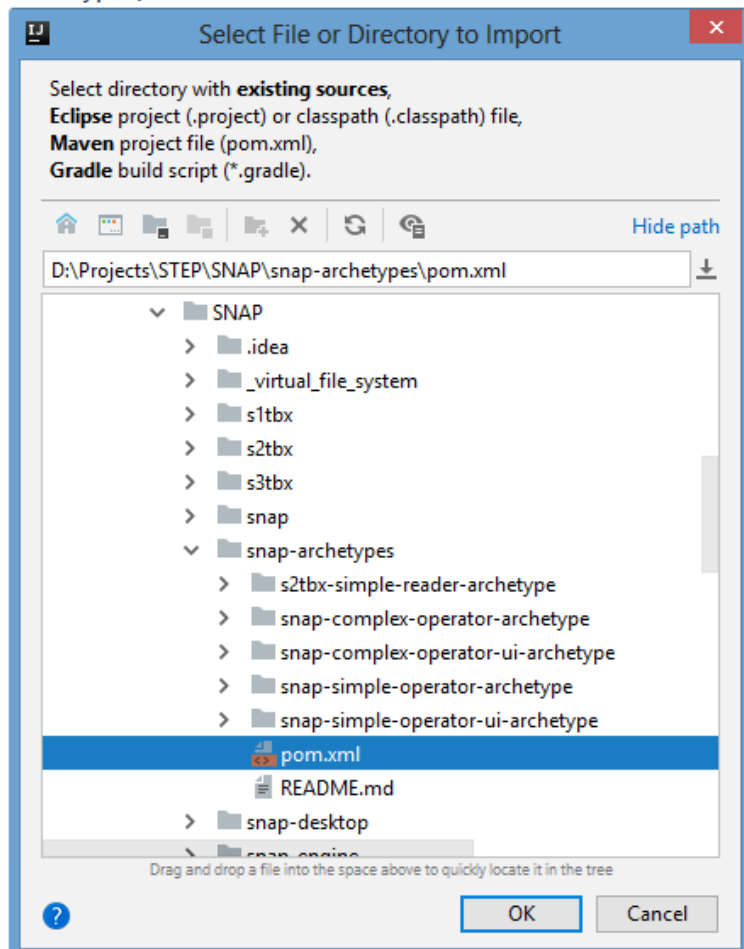
This is an XML file that can be easily modified. For deleting a wrong registered archetype, just delete the corresponding element, inside list.

Enjoy developing!

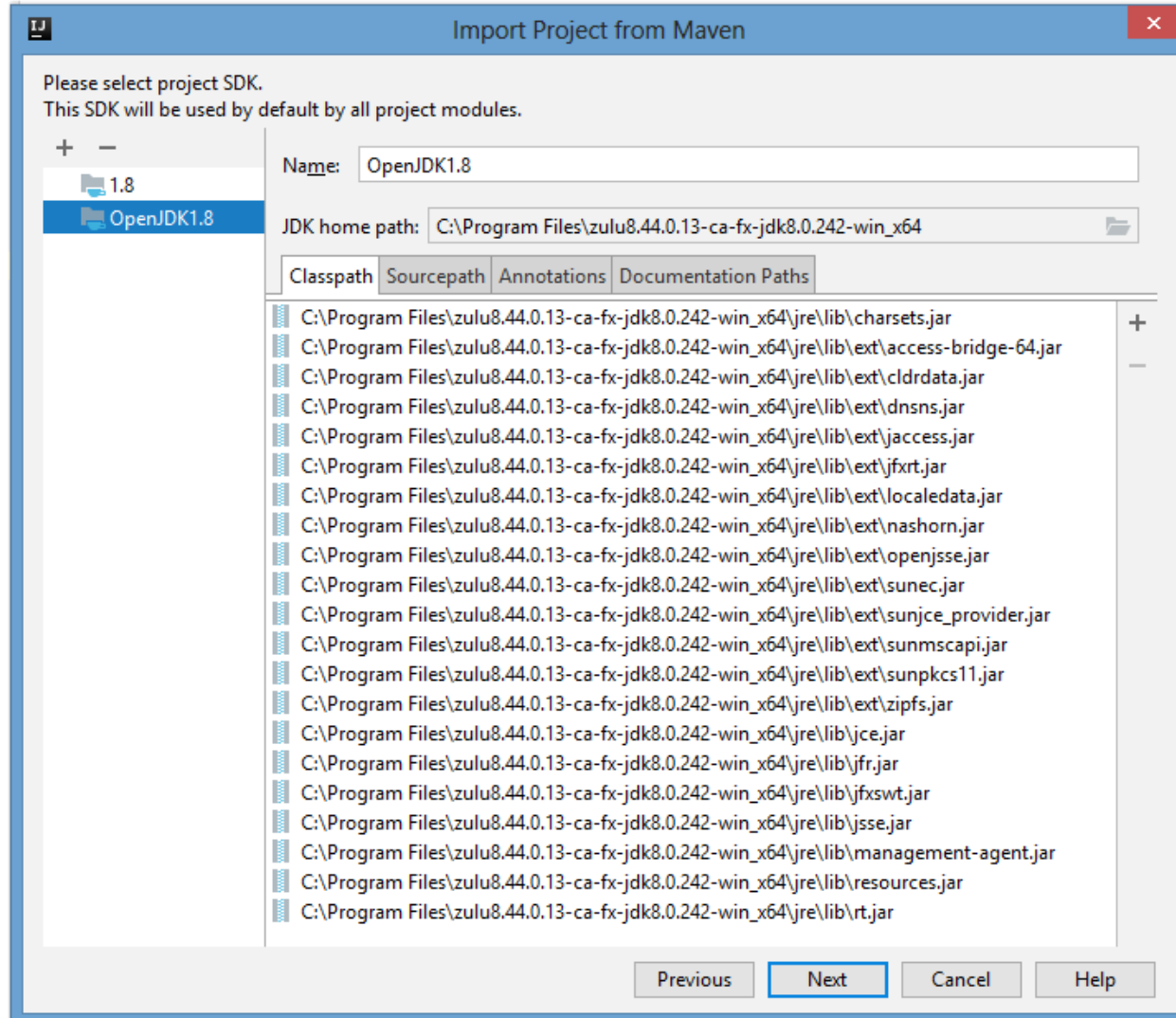


## Setting up the IntelliJ IDEA

1. Create a new project with the option "Project from existing sources", by choosing the pom.xml from \${snap-archetypes}



## 2. Set the used JDK for the project.





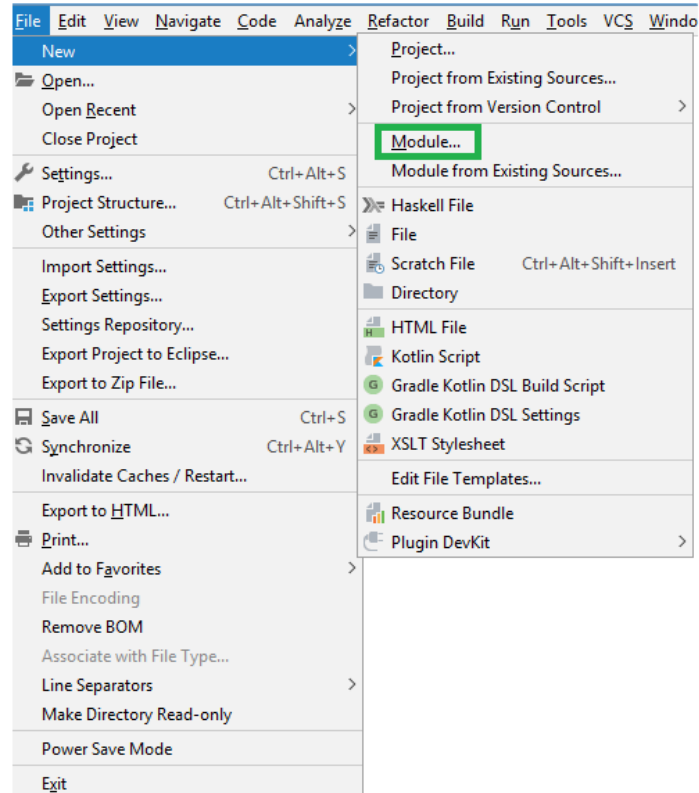
## Usage of SNAP Archetypes

After making sure that snap-archetypes are successfully build, these can be used when creating new SNAP modules.

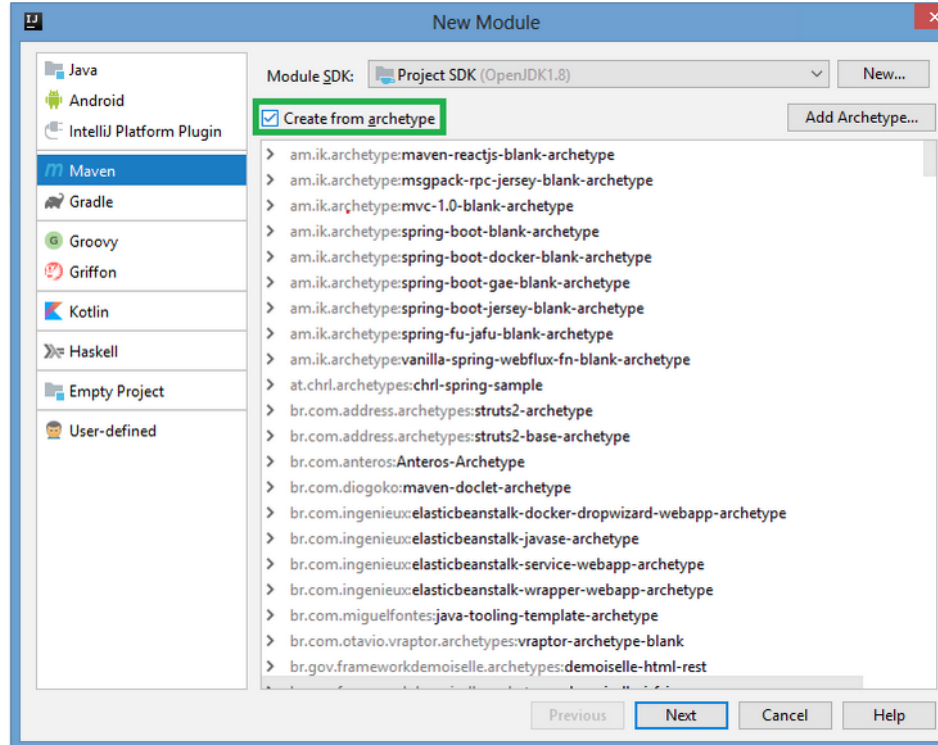
Assuming that snap-engine, snap-desktop and the preferred toolboxes (s1tbx, s2tbx, s3tbx) are locally cloned and build under  $\{\text{snap}\}$  directory, one can chose a project (among the above enumerated) where a new module using a SNAP archetypes will be added.

From IntelliJ, being positioned on the parent project where a new module will be added, the steps are the following:

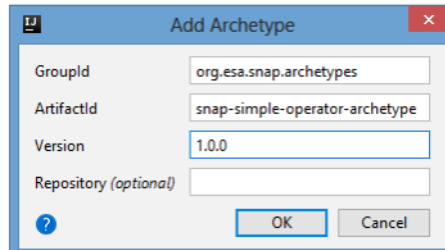
- File -> New Module



- check the "Create from Archetype" checkbox



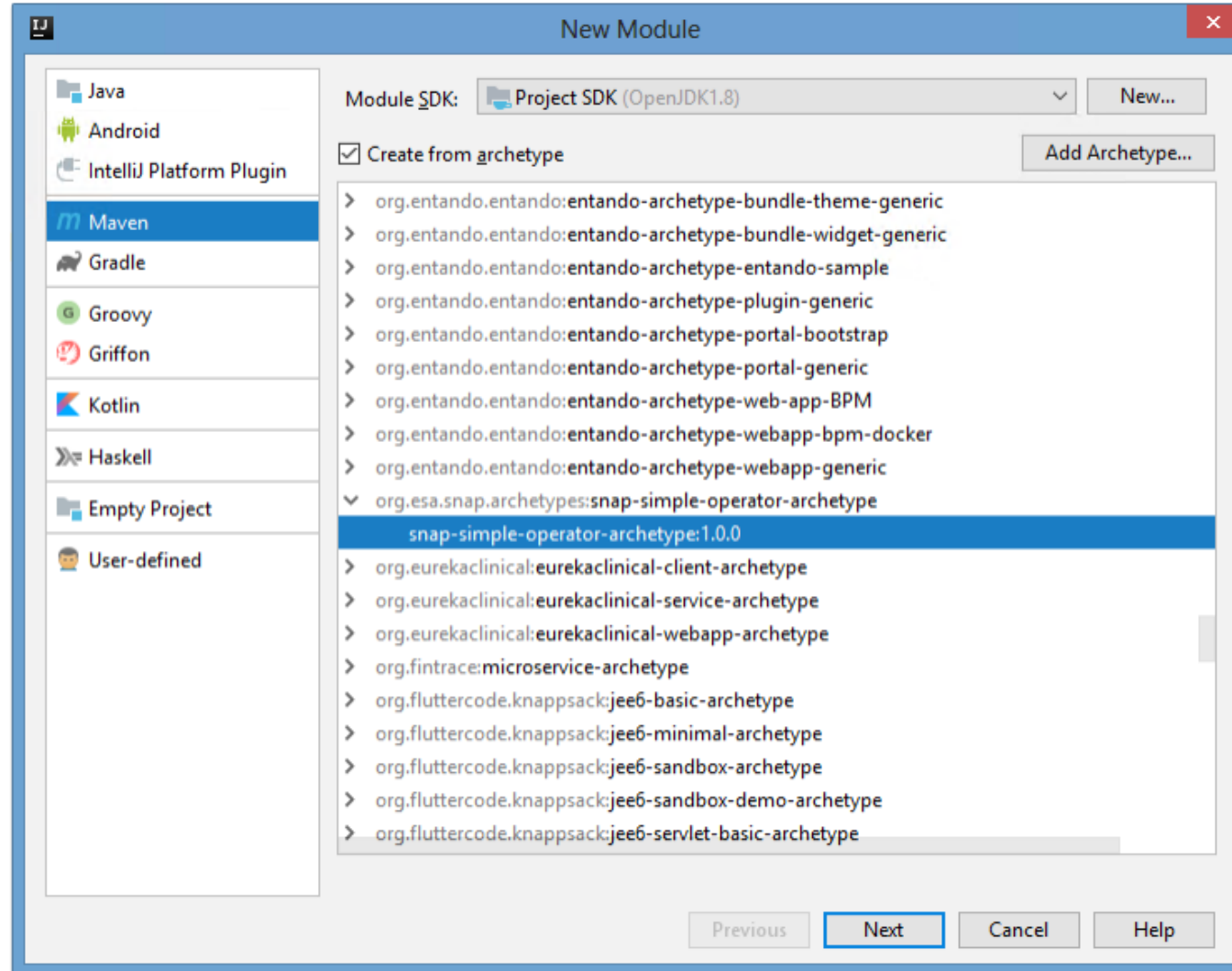
- first register the needed SNAP archetype by Add Archetype button (make sure to write here the details that are in the specific pom.xml of the chosen archetype (found under \${snap-archetypes}))





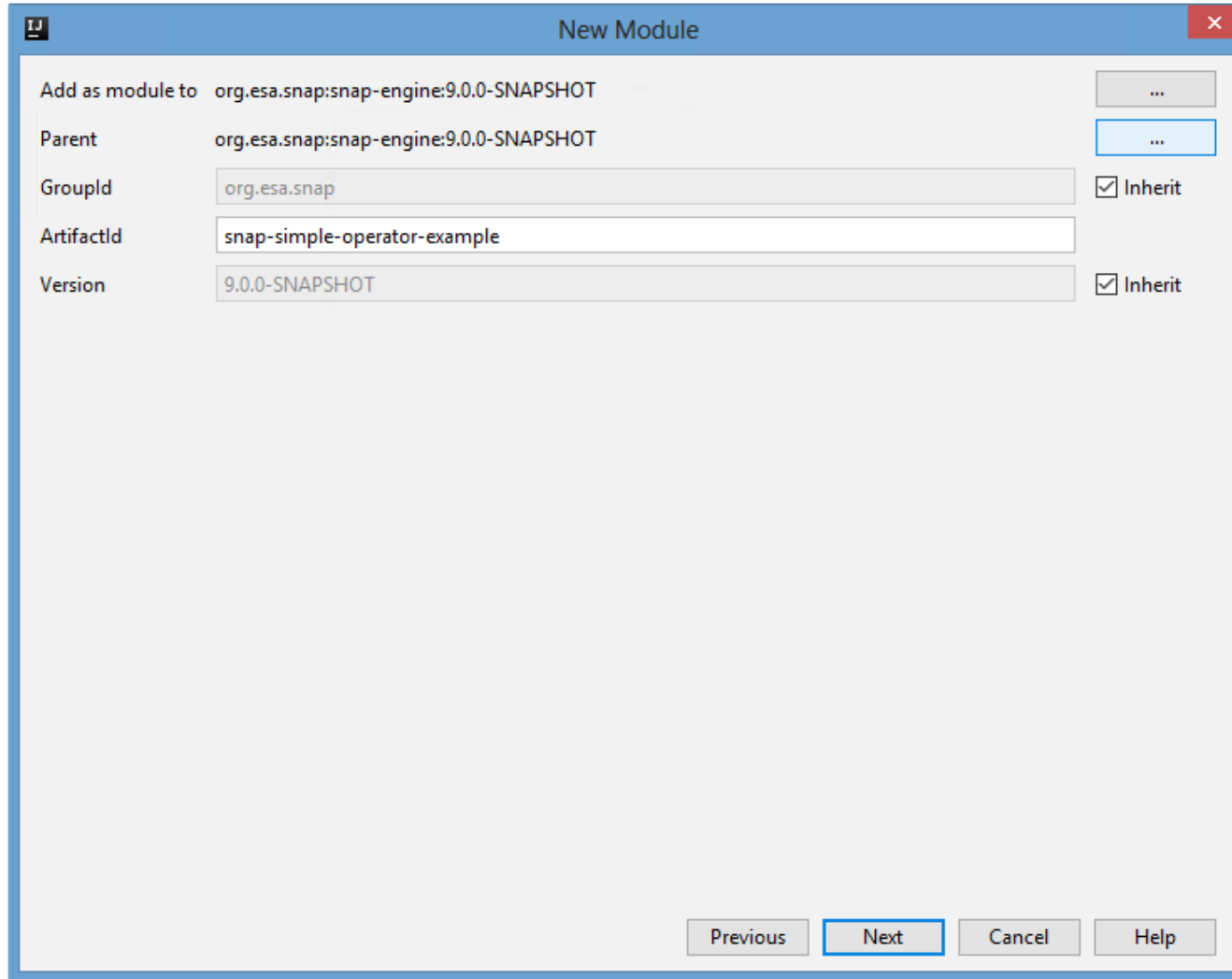
# Setting up IntelliJ IDEA

- select the newly added archetype from the list, as the archetype to be used for the new module



# Setting up IntelliJ IDEA

- enter the artifactId for the new module



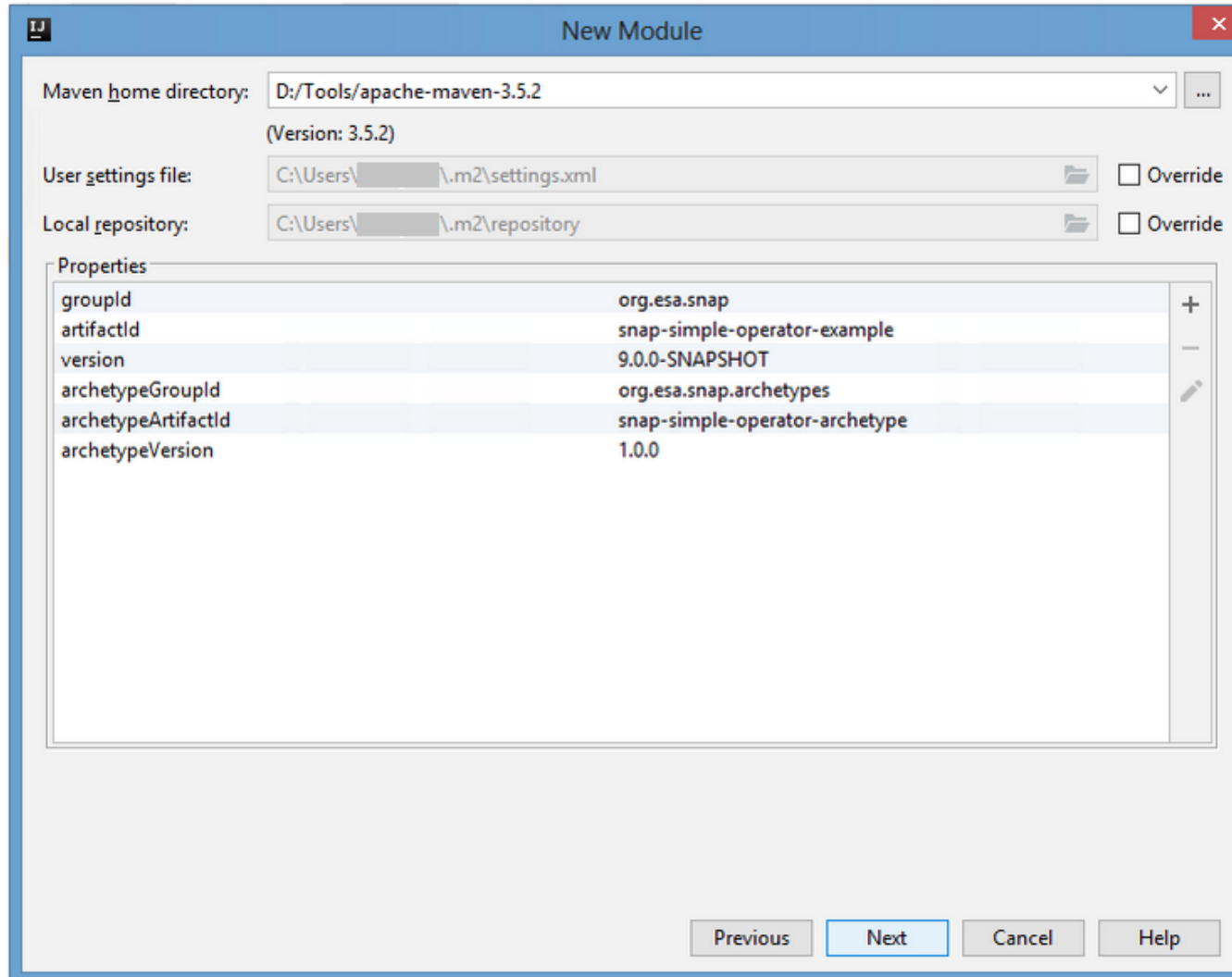
The 'New Module' dialog box in IntelliJ IDEA is shown. It contains the following fields and options:

Add as module to	org.esa.snap:snap-engine:9.0.0-SNAPSHOT	...
Parent	org.esa.snap:snap-engine:9.0.0-SNAPSHOT	...
GroupId	org.esa.snap	<input checked="" type="checkbox"/> Inherit
ArtifactId	snap-simple-operator-example	
Version	9.0.0-SNAPSHOT	<input checked="" type="checkbox"/> Inherit

At the bottom of the dialog, there are four buttons: 'Previous', 'Next', 'Cancel', and 'Help'. The 'Next' button is highlighted.

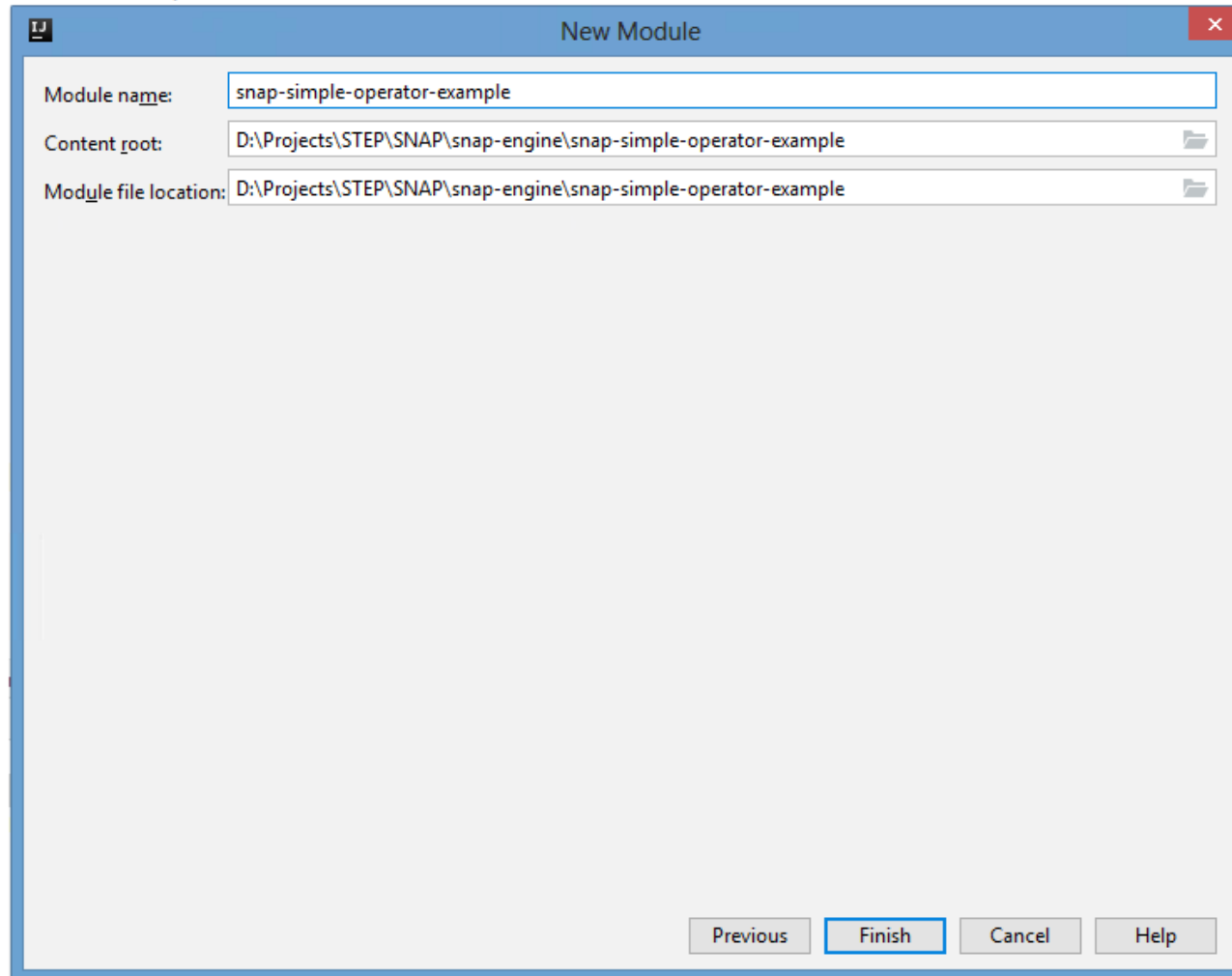


- confirm the properties for the new module (here extra properties can be added when needed)



# Setting up IntelliJ IDEA

- finish the setup



- check the log of IntelliJ IDEA to check if the new module was successfully created.

```
Messages: Maven Goal
[INFO] Scanning for projects...
[INFO] -----
[INFO] Building Maven Stub Project (No POM) 1
[INFO] -----
[INFO] >>> mvn archetype-plugin:3.2.0:generate (default-cli) > generate-sources @ standalone-pom >>>
[INFO] <<< mvn archetype-plugin:3.2.0:generate (default-cli) < generate-sources @ standalone-pom <<<
[INFO] -----
[INFO] --- mvn archetype-plugin:3.2.0:generate (default-cli) @ standalone-pom ---
[INFO] Generating project in Batch mode
[INFO] Archetype repository not defined. Using the one from [org.esa.snap.archetype:snap-simple-operator-archetype:1.0.0] found in catalog local
[INFO] -----
[INFO] Using following parameters for creating project from Archetype: snap-simple-operator-archetype:1.0.0
[INFO] -----
[INFO] Parameter: groupId, Value: org.esa.snap
[INFO] Parameter: artifactId, Value: snap-simple-operator-example
[INFO] Parameter: version, Value: 9.0.0-SNAPSHOT
[INFO] Parameter: package, Value: org.esa.snap
[INFO] Parameter: packageInPathFormat, Value: org/esa/snap
[INFO] Parameter: package, Value: org.esa.snap
[INFO] Parameter: version, Value: 9.0.0-SNAPSHOT
[INFO] Parameter: groupId, Value: org.esa.snap
[INFO] Parameter: artifactId, Value: snap-simple-operator-example
[INFO] Project created from Archetype in dir: C:\Users\adraghici\AppData\Local\Temp\archetypeexp\snap-simple-operator-example
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 6.219 s
[INFO] Finished at: 2021-03-17T13:24:00+02:00
[INFO] Final Memory: 14M/210M
[INFO] -----
[INFO] Maven execution finished
```

- build the newly created module to check if correctly integrated with parent module

```
Run: snap-simple-operator-example [clean...]
[INFO] --- mvn:install-plugin:3.0.0-M1:install (default-install) @ snap-simple-operator-example ---
[INFO] Installing D:\Projects\STEP\SNAP\engine\snap-simple-operator-example\target\snap-simple-operator-example-9.0.0-SNAPSHOT.jar to C:\Users\adraghici\.m2\repository\org/esa/snap/snap-simple-operator-example/9.0.0-SNAPSHOT/snap-simple-operator-example-9.0.0-SNAPSHOT.jar
[INFO] Installing D:\Projects\STEP\SNAP\engine\snap-simple-operator-example\target\snap-simple-operator-example-9.0.0-SNAPSHOT.pom to C:\Users\adraghici\.m2\repository\org/esa/snap/snap-simple-operator-example/9.0.0-SNAPSHOT/snap-simple-operator-example-9.0.0-SNAPSHOT.pom
[INFO] Installing D:\Projects\STEP\SNAP\engine\snap-simple-operator-example\target\snap-simple-operator-example-9.0.0-SNAPSHOT-tests.jar to C:\Users\adraghici\.m2\repository\org/esa/snap/snap-simple-operator-example/9.0.0-SNAPSHOT/snap-simple-operator-example-9.0.0-SNAPSHOT-tests.jar
[INFO] Installing D:\Projects\STEP\SNAP\engine\snap-simple-operator-example\target\snap-simple-operator-example-9.0.0-SNAPSHOT-sources.jar to C:\Users\adraghici\.m2\repository\org/esa/snap/snap-simple-operator-example/9.0.0-SNAPSHOT/snap-simple-operator-example-9.0.0-SNAPSHOT-sources.jar
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 26.752 s
[INFO] Finished at: 2021-03-17T13:28:15+02:00
[INFO] Final Memory: 48M/445M
[INFO] -----
Process finished with exit code 0
```



# Implement your own logic into the new module

- Study other similar modules from SNAP
- Always consult SNAP Cookbook (<https://senbox.atlassian.net/wiki/spaces/SNAP/pages/24051769/Cookbook>) within SNAP Wiki, where you can find guidelines for coding style, how to create new readers & operators, how to create a product writer, how to add help to a module, etc (see the complete guidelines list on the right)
- Add custom implementation to the new module, according to your needs
- Test your module
- Build the module in order to obtain the final nbm file

- SNAP development
  - How to build SNAP from sources
  - How to run and debug SNAP from an IDE
    - IntelliJ IDEA
    - NetBeans
      - NetBeans Development Introduction
    - Visual Studio Code
  - Coding Style
  - How to create a bundle of SNAP jars for the usage on the classpath
  - How to create new SNAP modules using SNAP maven archetypes
  - Using SNAP in your Java program
- Using SNAP in your Python programs
  - Configure Python to use the SNAP-Python (snappy) interface
  - How to use the SNAP API from Python
    - Jython Approach
- SNAP Engine extension development
  - How to develop an extension module
    - How to add help to a module
    - How to create a Toolbox for SNAP
    - How to layout your modules
  - How to create a new product reader
    - How to develop a multi-level source image
    - How to specify RGB-profiles for a product type
    - How to run and create a Reader Test
  - How to create a product writer
  - How to create a new operator
    - Operator Implementation Guidelines
    - How to integrate an operator
    - What to consider when writing an Operator in Python
    - Using OTB Python API inside SNAP Operator
  - How to integrate an external tool in SNAP
  - Adding an external module cluster to SNAP
  - How to add an operator to the benchmark list
- SNAP Desktop extension development
  - How to add an Action
  - How to add a new Layer Type
  - How to add a Preference Page
  - How to develop a tool window
  - How to report progress from long-running tasks
  - How to hook into start-up and shutdown phase

# How to submit the plugin on STEP website

- On STEP website (<https://step.esa.int/main/>) there is a dedicated menu entry for SNAP Community Plugins
- Many thanks to the users that already contributed and submitted SNAP plugins!

STEP

- Toolboxes
  - SNAP
  - Sentinel-1 Toolbox
  - Sentinel-2 Toolbox
  - Sentinel-3 Toolbox
  - SMOS Toolbox
  - Proba-V Toolbox
  - PolSARpro
- Download
  - SNAP
  - PolSARpro
- Gallery
- Documentation
  - Tutorials
  - FAQ
  - Developer Guide
- Community
  - Forum
  - Blog
  - Developers
  - Issue Reporting
- SNAP Supported Plugins
  - Sen2Cor
  - Sen2Three
  - Sen2Res
  - SNAPHU
- SNAP Community Plugins

Science Toolbox Exploitation Platform

## SNAP Community Plugins

SNAP Community plugins are not implemented by SNAP team, therefore you can use them at your own risk.  
The plugins are not verified, tested or supported by the SNAP team or ESA.  
The plugins are provided as-is, without any express or implied warranty, nor fitness for a particular purpose.  
The information presented is responsibility of the submitter.  
The reviews presented express the views of the authors.

+ ADD YOUR PLUGIN

search

Showing 0 - 4 of 8

**NovaSAR Product Reader**  
Dec 15th 2020  
Author: Marco Peters  
License: GPLv3  
★★★★★ 0.0 / 2  
DETAILS  
Enables SNAP to read NovaSAR data products.

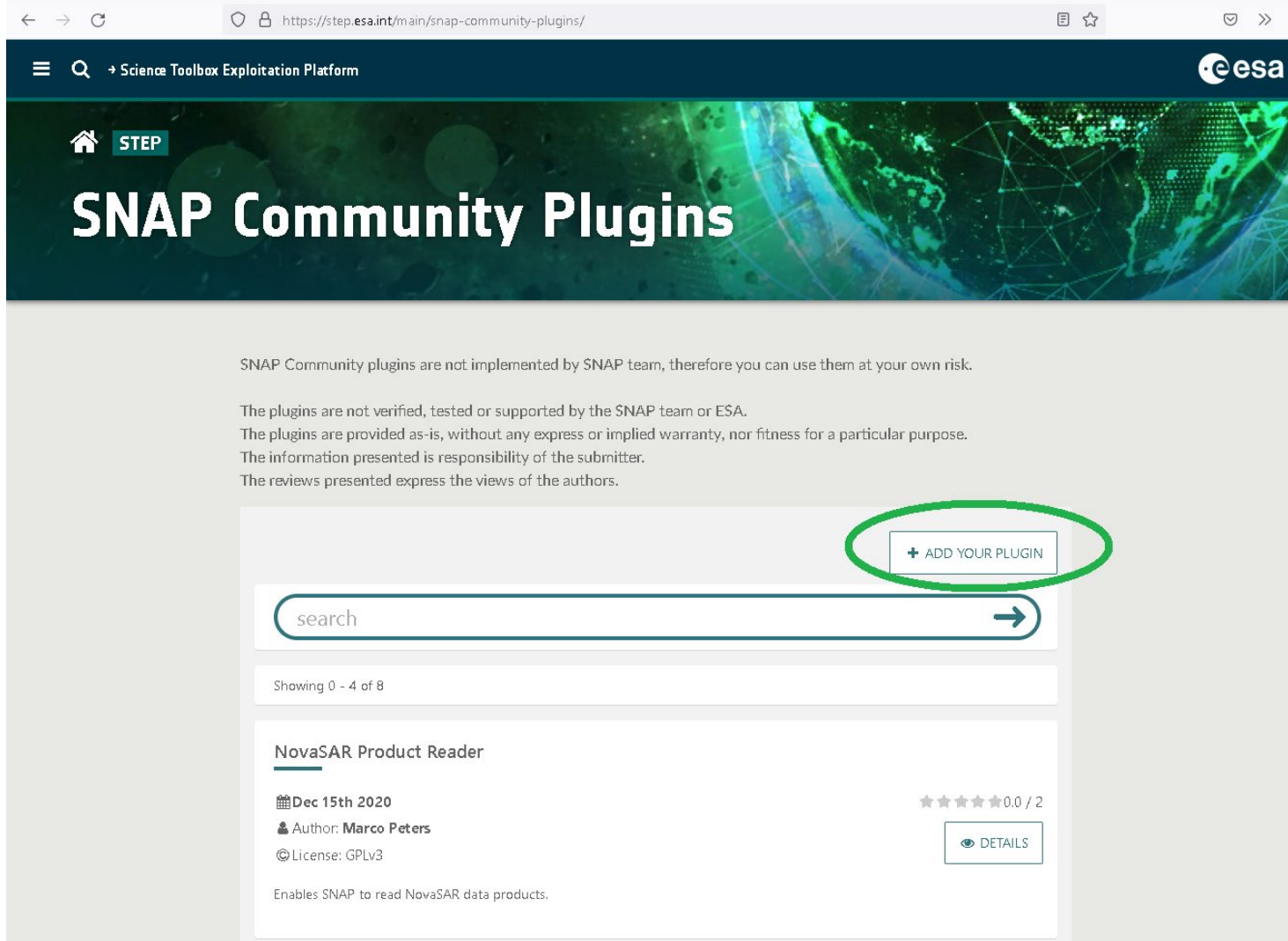
**S2GM SNAP Plugins**  
Dec 15th 2020  
Author: Marco Peters  
License: MIT  
★★★★★ 0.0 / 0  
DETAILS  
Plugins allowing to open the Sentinel-2 Global Mosaic Data.

**S2 Radiometric Uncertainty Tool**  
Dec 15th 2020  
Author: Marco Peters  
License: GPLv3  
★★★★★ 0.0 / 0  
DETAILS  
Radiometric uncertainty propagation for optical Sentinel-2 L1C MSI radiance data.

**DasTool plugin**  
Dec 23rd 2020  
Author: Corina Vaduva  
License: GNU GPL v3  
★★★★★ 0.0 / 0  
DETAILS  
This plugin extends the semantic annotation functionalities of SNAP and provides new means for S2 visualization.

1 2 >

# How to submit the plugin on STEP website



Science Toolbox Exploitation Platform

## SNAP Community Plugins

SNAP Community plugins are not implemented by SNAP team, therefore you can use them at your own risk.

The plugins are not verified, tested or supported by the SNAP team or ESA.  
The plugins are provided as-is, without any express or implied warranty, nor fitness for a particular purpose.  
The information presented is responsibility of the submitter.  
The reviews presented express the views of the authors.

[+ ADD YOUR PLUGIN](#)

search

Showing 0 - 4 of 8

**NovaSAR Product Reader**

Dec 15th 2020

Author: **Marco Peters**

License: GPLv3

★★★★★ 0.0 / 2

[DETAILS](#)

Enables SNAP to read NovaSAR data products.

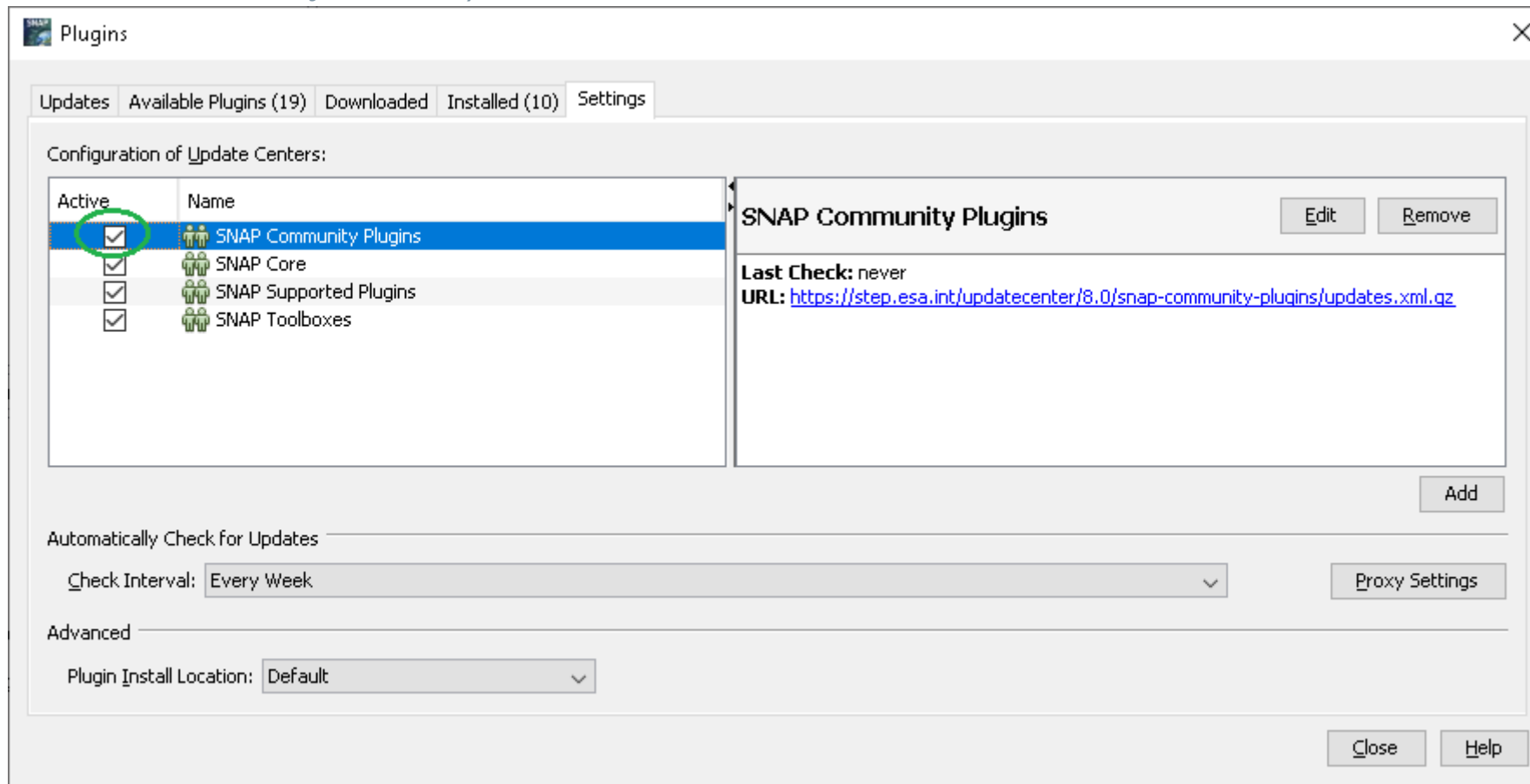
- The “ADD YOUR PLUGIN” button will open a wizard where details about the author (name, email address) must be filled together with the upload of the plugin nbm file
- Once a plugin is submitted, an email is sent to STEP Administrator for review and deployment



# How to benefit from the plugin in SNAP

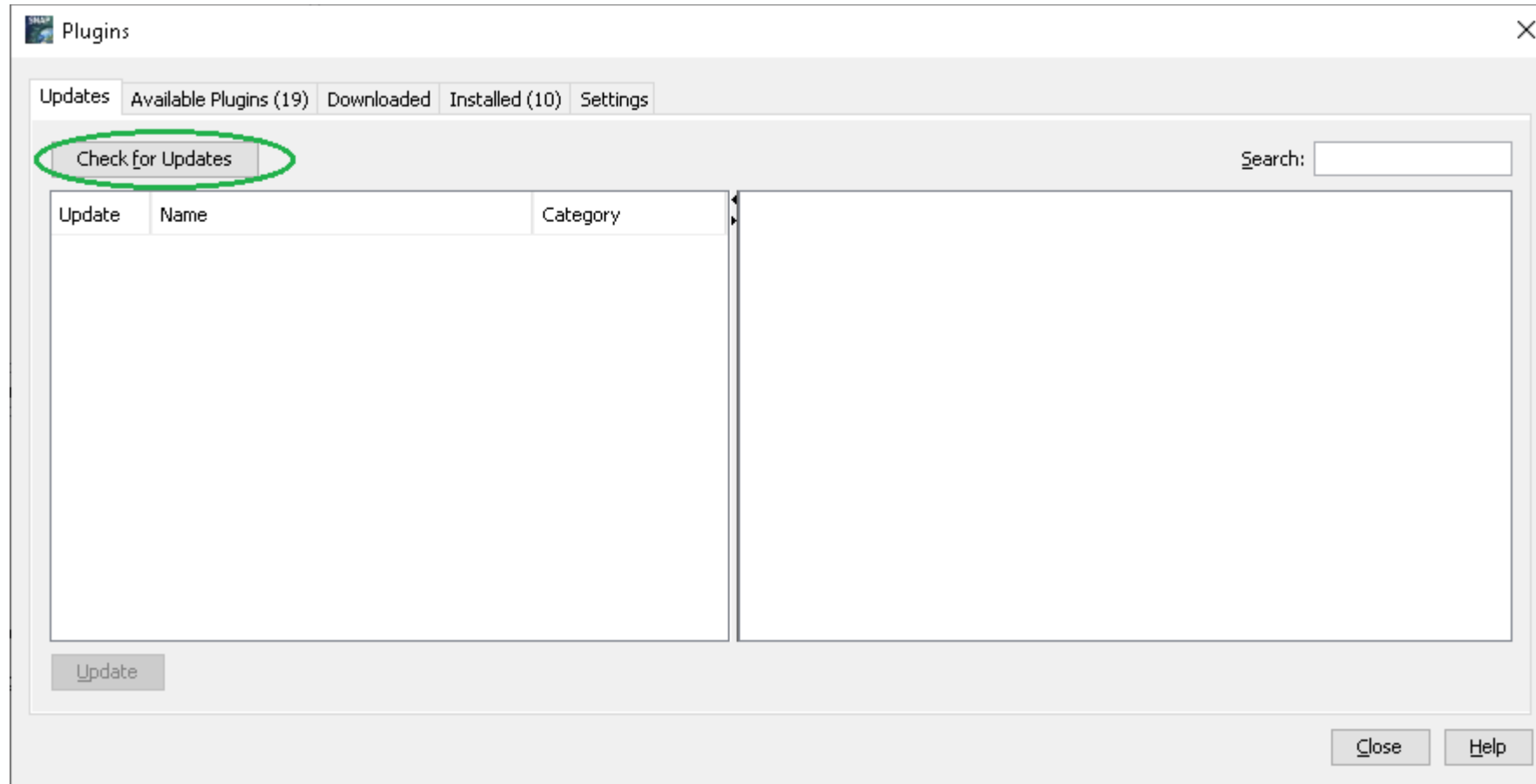
After the deployment made by the administrator, the plugin will appear on STEP website.

From SNAP GUI, go to Tools -> Plugins -> Settings and enable the “SNAP Community Plugins” Update Center (which is disabled by default)



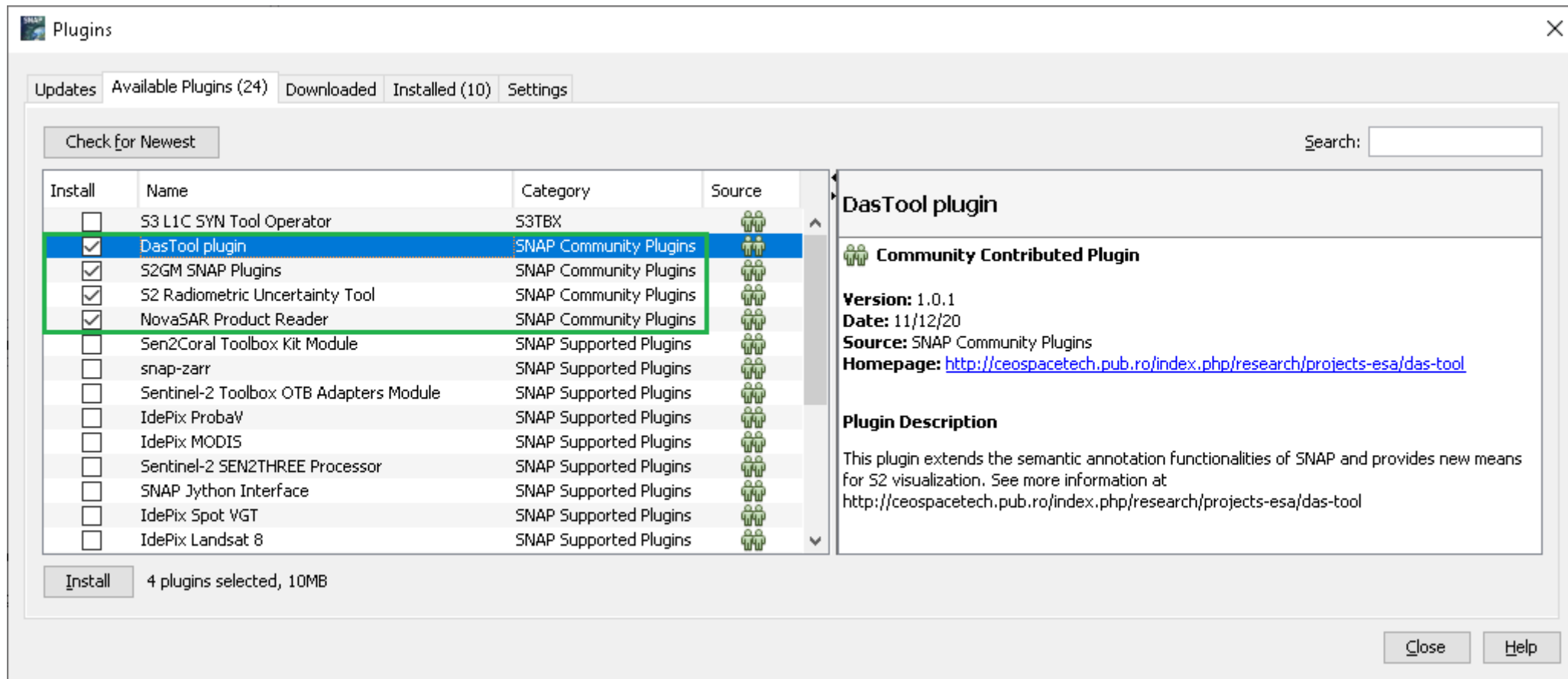
# How to benefit from the plugin in SNAP

Then go to Plugins -> Updates and click “Check for Updates” button:



# How to benefit from the plugin in SNAP















The SNAP Community Plugins will appear in Plugins -> Available Plugins, from where the desired plugins can be installed.



Plugins


Updates Available Plugins (24) Downloaded Installed (10) Settings

Check for Newest Search:

Install	Name	Category	Source
<input type="checkbox"/>	S3 L1C SYN Tool Operator	S3TBX	
<input checked="" type="checkbox"/>	DasTool plugin	SNAP Community Plugins	
<input checked="" type="checkbox"/>	S2GM SNAP Plugins	SNAP Community Plugins	
<input checked="" type="checkbox"/>	S2 Radiometric Uncertainty Tool	SNAP Community Plugins	
<input checked="" type="checkbox"/>	NovaSAR Product Reader	SNAP Community Plugins	
<input type="checkbox"/>	Sen2Coral Toolbox Kit Module	SNAP Supported Plugins	
<input type="checkbox"/>	snap-zarr	SNAP Supported Plugins	
<input type="checkbox"/>	Sentinel-2 Toolbox OTB Adapters Module	SNAP Supported Plugins	
<input type="checkbox"/>	IdePix ProbaV	SNAP Supported Plugins	
<input type="checkbox"/>	IdePix MODIS	SNAP Supported Plugins	
<input type="checkbox"/>	Sentinel-2 SEN2THREE Processor	SNAP Supported Plugins	
<input type="checkbox"/>	SNAP Jython Interface	SNAP Supported Plugins	
<input type="checkbox"/>	IdePix Spot VGT	SNAP Supported Plugins	
<input type="checkbox"/>	IdePix Landsat 8	SNAP Supported Plugins	

Install 4 plugins selected, 10MB

**DasTool plugin**

 **Community Contributed Plugin**

**Version:** 1.0.1  
**Date:** 11/12/20  
**Source:** SNAP Community Plugins  
**Homepage:** <http://ceospacetechnology.com/index.php/research/projects-esa/das-tool>

**Plugin Description**

This plugin extends the semantic annotation functionalities of SNAP and provides new means for S2 visualization. See more information at <http://ceospacetechnology.com/index.php/research/projects-esa/das-tool>

Close Help



THANK YOU! 😊

# living planet symposium

**BONN**  
23–27 May  
**2022**



TAKING THE PULSE  
OF OUR PLANET FROM SPACE



EUMETSAT

ECMWF



## SNAP User Survey

We would love to have your feedback on SNAP.  
Please scan the QR code and take the survey,  
or alternatively type the link <https://bit.ly/3MRAh9d>

Thank you!