

# IMAGINE NoClouds

## Cloudless Sentinel-2 mosaics - fully automated



The European Copernicus program offers free Sentinel satellite images for a broad range of applications like change detection and vegetation analysis. Depending on the season or region, clouds are a common phenomenon that hampers the interpretation of Sentinel-2 images. The software *IMAGINE NoClouds*, an add-in module for ERDAS *IMAGINE*®, tackles this problem. This product automatically generates high-precision cloud masks and produces cloudless Sentinel-2 mosaics.

### What is *IMAGINE NoClouds* doing?

#### 1. Calculating cloud masks

*IMAGINE NoClouds* creates high-precision cloud masks on Sentinel-2 images for all types of clouds, from dense cumulus to thin clouds and haze. Even cloud shadows that are difficult to classify are reliably recognized in most cases.<sup>1</sup>

#### 2. Generating cloudless images

Using a stack of images of different dates, *IMAGINE NoClouds* generates a cloud-free mosaic. It considers the computed cloud and cloud shadow masks of each image and utilizes an advanced algorithm for the rebuild of clouded areas. The result is a cloud-free image, that we call „time mosaic“. A „time mosaic“ is a sophisticated mosaic of the cloud-free parts of a time-series of images (up to 8).

#### 3. Stitching together of mosaics

In addition to the „time mosaic“, *IMAGINE NoClouds* also produces - optionally - a „space-time mosaic“ by stitching together several cloud-free „time mosaics“. The result are cloud-free mosaics for large areas (e.g. counties or countries).

### Why should I use *IMAGINE NoClouds*?

#### + Get homogeneous images

Due to the advanced algorithms, *IMAGINE NoClouds* needs scenes from a very short period of time (one to two months) only to create a high-quality, cloud-free mosaic. The user gets cloud-free mosaics over a homogeneous phenological phase.

#### + Save time and energy

The process runs fully automatic and without interruption. There is no need to pre-select the data or sort it. *IMAGINE NoClouds* automatically creates correctly named output folders and does the sorting of the UTM tiles from the list of downloaded Sentinel manifest files. All models and algorithms for cloud mask calculation and mosaicking are linked together through intelligent process control, including the management of intermediate results.

#### + Easy to use

Apart from the selection of input data and output directories, the user has actually nothing else to set in *IMAGINE NoClouds*. By pressing a button, the process starts and runs automatically.

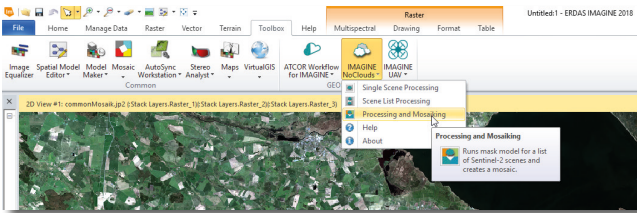
<sup>1</sup> The inventor of the cloud masks and the mosaic algorithm, Dr. Ute Gangkofner, has successfully participated at a ESA Round Robin study. In this study a previous version of the cloud masks was used together with Proba-V data.

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## + Pixel history layer

*IMAGINE NoClouds* provides a pixel history layer for each „time mosaic”, which allows tracking back the images, each pixel is taken from. This is especially useful when deriving further image information from the „time mosaic“.



ERDAS IMAGINE with *IMAGINE NoClouds* in ribbon interface.

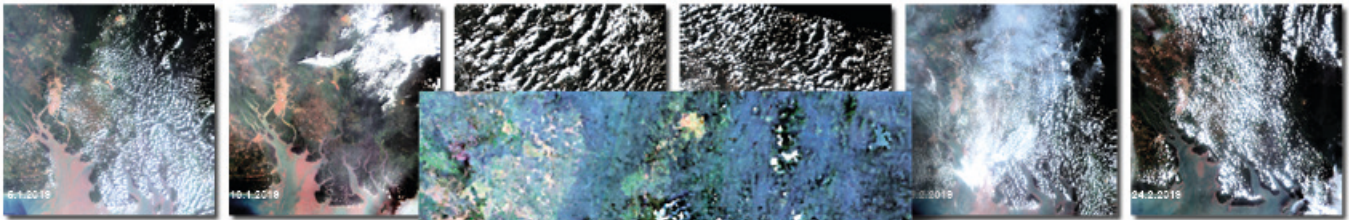
## Some technical information

### Integrated in ERDAS IMAGINE

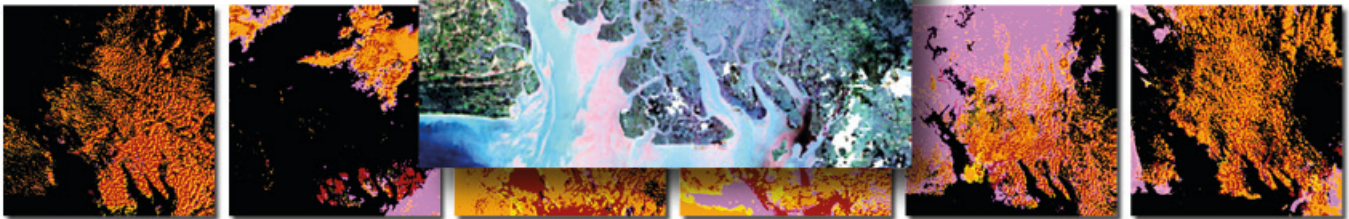
- *IMAGINE NoClouds* is realized as a Spatial Model within ERDAS IMAGINE and requires at least IMAGINE Essentials as basic license. IMAGINE Advantage with the MosaicPro tool is needed to calculate the large „space-time mosaic“.

### Complete solution

- In combination with *Sentinel Made Simple* (automatic Sentinel data download) and *ATCOR Workflow for IMAGINE* (atmospheric and topographic correction), *IMAGINE NoClouds* becomes a complete cloud masking and data mosaic solution.



6 Sentinel-2 images of the Cross River Delta, Nigeria, taken between 5-Jan and 24-Feb 2019.



6 cloud masks with classified clouds, haze and cloud shadows.

Final product: The cloudless mosaic

More information: [www.geosystems.de/imagine-noclouds](http://www.geosystems.de/imagine-noclouds)



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