

AGLgis: A QGIS Plugin for Accessing and Visualizing Processed Sentinel-1 SAR Data

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DOI: [10.xxxxxx/draft](https://doi.org/10.xxxxxx/draft)

Software

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Editor: [↗](#)

Submitted: 17 September 2025

Published: unpublished

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Summary

AGLgis is an open-source QGIS plugin (QGIS Development Team, 2025) designed to simplify the processing and analysis of Sentinel-1 Synthetic Aperture Radar (SAR) Backscatter data (ESA, 2025) using Google Earth Engine (GEE) (Gorelick et al., 2017). The plugin provides a graphical interface for configuring and running the `ee-s1-ard` package (Silva, 2025), which implements the data processing workflow described by Mullissa et al. (2021) (Mullissa et al., 2021), enabling users to process SAR data without writing code. Key features include area selection, date range configuration, border noise correction, terrain flattening, speckle filtering, and export of analysis-ready results. AGLgis aims to make advanced SAR data workflows accessible to a broader geospatial community, supporting research and operational applications in remote sensing.

Statement of Need

Remote sensing is the acquisition of information about the Earth's surface through sensors mounted on airborne or spaceborne platforms, without direct physical contact with the observed area (Pinto da Silva et al., 2024), having its useful use both for visualization and for training autonomous models (Silva et al., 2025). Being cloud prone, one of the most interesting data types is SAR, which requires pre-processing. Pre-processing SAR data may require multiple processing steps and familiarity with tools like Google Earth Engine's Code Editor (Gorelick et al., 2017), which can be a barrier for users without programming experience. AGLgis bridges this gap by integrating the `ee-s1-ard` package into QGIS (QGIS Development Team, 2025), offering a graphical interface that enables non-programmers and researchers to access SAR processing workflows. This approach streamlines data pre-processing, lowers the barrier to entry, and supports reproducible research in geospatial science.

Features and Demonstration

The main capabilities and results include:

- Selection of area of interest and date range
- Automated border noise correction, terrain flattening, and speckle filtering
- RGB composites within QGIS, where the red, green, and blue channels are mapped respectively as:
 - VV**: vertical transmit, vertical receive polarization
 - VH**: vertical transmit, horizontal receive polarization
 - VV/VH**: ratio between VV and VH backscatter values
- Interactive visualization of VV/VH time series
- Direct and batch download of processed bands clipped to area of interest

40 All major processing parameters such as geometry, temporal range, polarization, and correction
41 options are accessible via the plugin's interface. The figures below illustrate the plugin's
42 interface and typical results.

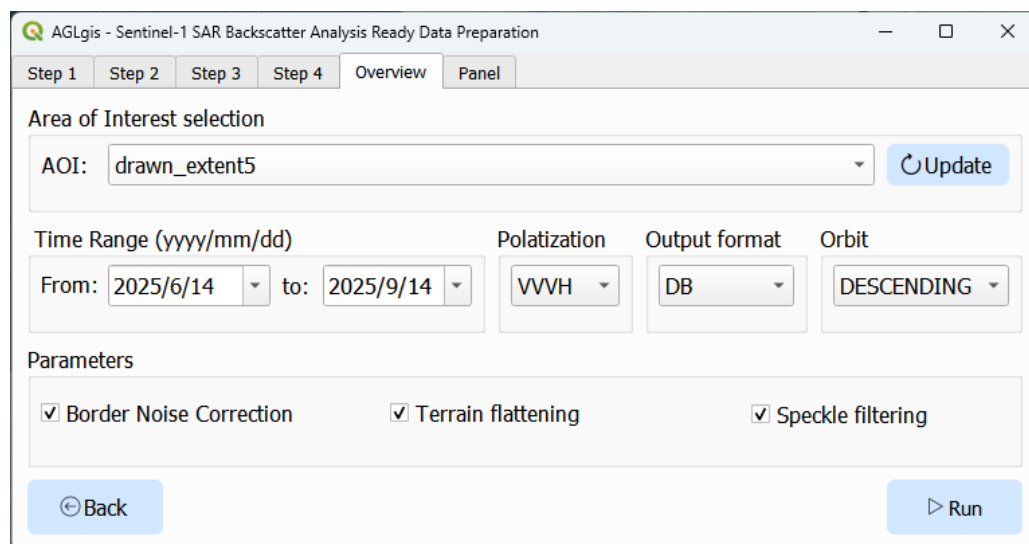


Figure 1: Overview tab for setting selection



Figure 2: Demonstration of AGLgis results: time series visualization and RGB view

43 Implementation

44 AGLgis is implemented in Python and leverages QGIS's PyQt framework for the user interface
45 (Riverbank Computing, 2025). The plugin communicates with Google Earth Engine (Gorelick
46 et al., 2017) (which requires authentication and a Google Cloud Project) and applies the
47 ee-s1-ard package, handling data selection, and processing.

48 Availability

49 Users can install the plugin in QGIS through the official repository.

- 50 ▪ Source code: <https://github.com/caioarantes/AGLgis>
- 51 ▪ Documentation: Online at [GitHub Pages](#)
- 52 ▪ License: GNU General Public License v2 or later

53 **Acknowledgements**

54 We thank the QGIS and Google Earth Engine communities for their support and open-source
55 contributions. The authors would like to thank Serrapilheira Institute (grant R-2011-37776),
56 Institute of Artificial and Computational Intelligence (IDATA), National Council for Scientific
57 and Technological Development (CNPq) - process number 141203/2025-0, National Laboratory
58 for Scientific Computing (LNCC/MCTIC) for providing HPC resources of the SDumont
59 supercomputer, Brazilian Institute of Geography and Statistics (IBGE/MPO), and Brazilian
60 Federal Agency for Support and Evaluation of Graduate Education (CAPES) for their support
61 for this research.

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