

Experiences from Early Adopters in EOSC RELIANCE Open challenge for Sustainable Development

Optimizing management, sharing and preservation of scientific outputs using RoHub

6th December 2022 – online

<https://webinar22.eoscfuture.eu/registration/>



Optimizing management, sharing and preservation of scientific outputs using RoHub



Consiglio Nazionale delle Ricerche



Istituto di Ricerca per la Protezione Idrogeologica

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Plenary meeting 6th December 2022

Main activities carried out with the RELIANCE Services

- **RoHub** was used as a mean to organise, collect and make available collections of outputs related to a research activity.
- There was no previous experience in the Reliance software/platforms stack.
- **Basic** and **Data-centric** research object have been created to test the systems with the most “classic” types of resources.
- First steps were carried out to work also with **Executable** and **Workflow-centric** objects.

The screenshot shows a RoHub resource page for a QGIS plugin. At the top, there are tabs for 'PRIVATE', 'MANUAL', 'LIVE', 'BASIC RESEARCH OBJECT', and 'PAPER'. The title is 'GEOMORPHOLOGY Mapping Susceptibility With Open-Source Tools: A New Plugin for QGIS' by Giacomo Titti, Alessandro Sarretta. Below the title is a navigation bar with tabs: Overview, Content, Completeness, Enrichment, Activity, Life cycle, Relations, and Impact. The main content area features a flowchart titled 'SZ plugin/SZ k tool' which details the workflow from data preparation to final susceptibility maps. To the right of the flowchart is a statistics panel showing 0 downloads and 4 views, along with a list of resources (4), annotations (23), events (43), forks (0), snapshots (0), and archives (0). Below this is an 'AGENTS' section for Alessandro Sarretta, a 'COMPLETENESS' progress bar at 50%, and a 'TOOLBOX' with various icons. The 'CONTENT' section lists the software (CNR-IRPI-Padova/SZ: SZ plugin (v1.0), Zenodo; Susceptibility Zoning plugin (SZ)), a paper, and a step-by-step flowchart.

PRIVATE MANUAL LIVE BASIC RESEARCH OBJECT PAPER

GEOMORPHOLOGY
Mapping Susceptibility With Open-Source Tools: A New Plugin for QGIS
Giacomo Titti, Alessandro Sarretta

Overview Content Completeness Enrichment Activity Life cycle Relations Impact

A collection of resources related to the paper Titti G, Sarretta A, Lombardo L, Crema S, Pasuto A and Borgatti L (2022) Mapping Susceptibility With Open-Source Tools: A New Plugin for QGIS. Front. Earth Sci. 10:842425. doi: 10.3389/feart.2022.842425

☆ 0.00 / 5 0 0 0

0 Downloads 4 Views
Hide more details

Resources	4
Annotations	23
Events	43
Forks	0
Snapshots	0
Archives	0
Size	8.65 KB

AGENTS
Alessandro Sarretta
Creator

COMPLETENESS 50%

DISCOVERED METADATA: 0
Refresh discovered metadata

TOOLBOX

SHARE

CITE AS
Giacomo Titti, and Alessandro Sarretta. "Mapping Susceptibility With Open-Source Tools: A New Plugin for QGIS." RoHub. May 12, 2022. <https://w3id.org/ro-id/r85a58d9-802c-4ebf-aaf8-1fa433753d9a>.

LICENSE
CC-BY-4.0

LOCATION: [dropdown]
CONTENT [dropdown]

Software

- CNR-IRPI-Padova/SZ: SZ plugin (v1.0), Zenodo
- Susceptibility Zoning plugin (SZ)
- Paper "Mapping Susceptibility With Open-Source Tools: A New ..."
- Step by step flowchart of the functions used form the SZ plu...

RESEARCH OUTCOMES

- Various resource related to a research activity were described and made accessible in RoHub through a **Research Object**

- Scientific article
- GitHub software repository
- Zenodo data and code
- Graphic summary of the research
- Jupiter notebook



Mapping Susceptibility With Open-Source Tools: A New Plugin for QGIS

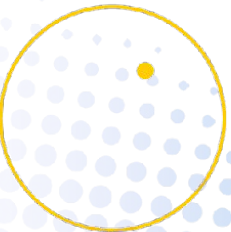
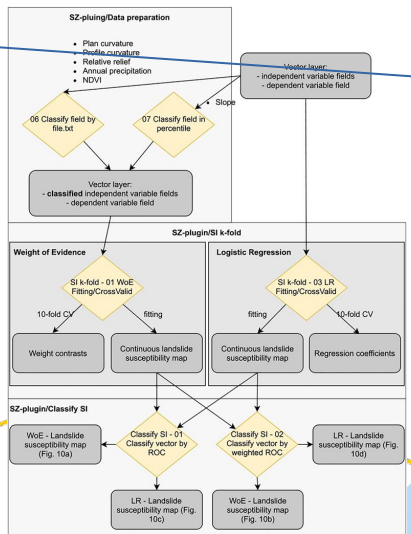
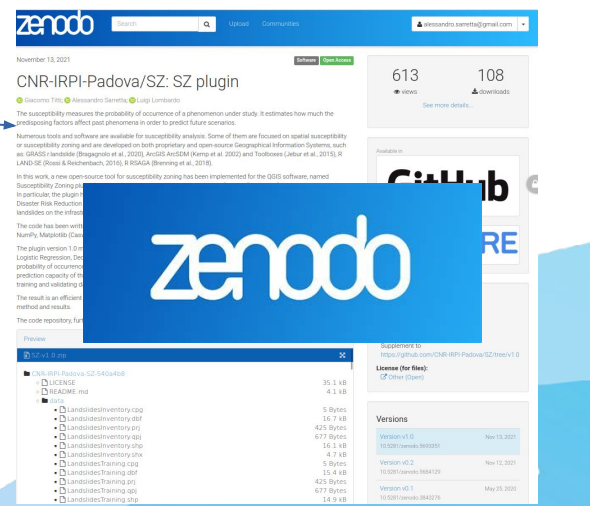
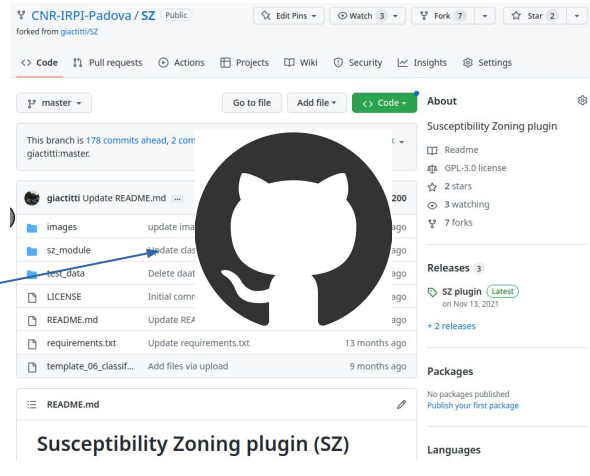
Giuseppe Tosi^{1,2*}, Alessandro Saretta¹, Luigi Lombardo³, Stefano Crema⁴, Alessandro Padoa⁵ and Lisa Borgatti^{1,2}

In this study, a new tool for quantitative, data-driven susceptibility zoning (SZ) is presented. The SZ plugin has been implemented as a QGIS plugin to maximize its operational use within the geoscientific community. QGIS is in fact a commonly used open-source geographic information system. We have scripted the plugin in Python, and developed it as a collection of functions that allow one to pre-process the input data, calculate the susceptibility, and then estimate the quality of the classification results. The susceptibility zoning can be carried out via a number of classifiers including weights of evidence, frequency ratio, logistic regression, random forest, support vector machine, and decision tree. The plugin allows one to use any kind of mapping units, to fit the model, to test it via a k-fold cross-validation, and to visualize the relative receiving operating characteristic (ROC) curves. Moreover, a new classification method of the susceptibility index (SI) has been implemented in the SZ plugin. A typical workflow of the SZ plugin is described, and its application for landslide susceptibility zoning in Northeast India is reported. The data of the predisposing factors used are open, and the plugin has been carried out using a logistic regression and weight of evidence (WoE). The corresponding area under the curve of the relative ROC curves reflects an optimal model prediction capacity. The user-friendly graphical interface of the plugin has allowed us to perform the analysis efficiently in few steps.

OPEN ACCESS
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Keywords: SZ plugin, susceptibility, Northeast India, QGIS, landslide

1 INTRODUCTION
The measure of how much a specific area is prone to natural hazards is called susceptibility. It does not evaluate when or how often the given hazard may occur (Guzzetti et al., 2016), but it provides the expected locations where such processes may take place in the future. Mathematically, the susceptibility is the estimation of spatial occurrence of natural hazard evaluated on the basis of terrain and environmental conditions (Finihi, 1993). In most cases, this likelihood can be obtained via regression probabilistic models, although other tools are also able to convey similar information without relying on complex multivariate statistics (e.g., Clague et al., 2017; Lombardo



FINAL CONSIDERATIONS AND REMARKS

- The *Research Object* is not a totally new concept for organizing research output, but the implementation and the RoHub graphic interface adds **simplicity** and **standardization** to the process
- The use of **DOIs** to ROs is a good, standard and transparent way to “bundle” and make available research “building blocks” that are usually placed in different (and not so related) places.
- The use of the RoHub system in this perspective also depends on strengthening certain available features, e.g. data storage, computing power, flexibility in the use of software packages, plus continuous integration with the evolving research and open science environment (e.g. GEE, open peer-review, ...)



Thank you for your attention!

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