1. Dataset Title: Dataset for article - The analysis of lava flow path using remote sensing and geo-morphological techniques: the case of volcano eruptions in Afar region of Ethiopia

2. Name and contact information of PI:

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3. (Repeat 2a-e if needed for each co-PI)

4. Funding source (Agency, Grant Number) if applicable

5. Project summary, description or abstract:

The lava from volcanic eruptions rapidly moves on the Earth surface and affects both natural and man-made features. The objective of this study is to develop a workflow for determining the optimal ground sample distance of a digital elevation model to delineate the lava flow paths using object-based image analysis and geomorphologic analysis. For the experiment, the satellite images and digital elevation model of Afar region of Ethiopia was used. The satellite images of the affected areas were segmented using large-scale mean shift image segmentation to find the lava objects. The main centerline of the lava object from the 2008 ASTER image and the flow paths from the 2000 SRTM digital elevation model with varying ground sample distance were used to find the optimal ground sample distance. In the result, the optimal resolution for delineating lava flow was found to be 35m with 146.89m RMSE of minimum distances. The result was further compared using the 2017 case with Landsat image and 2016 ASTER DEM. The study using free and open source geospatial technologies is expected to contribute to the lava flow analysis efforts by organizations with limited funding.

6. Brief description of collection and processing of data:

The DEM data are driven from 2000 SRTM DEM and 2016 ASTER DEMs. Lava flow paths were delineated using this DEM by the workflow developed as described in the article. Satellite images (ASTER and Landsat 8) were used to find the lava polygon area. These are data associated with a paper - The analysis of lava flow path using remote sensing techniques and geomorphological techniques: the case of volcano eruptions in Afar region of Ethiopia.

7. Description of files (names, or if too numerous, number of files, file type(s):

84 files with GIS ready vector or raster, and associated files.

3 csv files

1 README file

8. Definition of acronyms, codes, and abbreviations:

N/A

9. Description or definition any other unique information that would help others use your data:

GSD can be found by adding 30 to \* from the names - afar\*.shp or verify\_a\*.shp .

10. Descriptions of parameters/variables

a. Temporal (beginning and end dates of data collection): N/A

b. Instruments used and units of measurements: Meter

c. Column headings of data files (for tabular data):

d. Location/GIS Coverage (if applicable to data):

Afar region, Ethiopia

e. Symbol used for missing data: N/A

11. Special software required to use data:

QGIS

12. Publications that cite or use this data: To be provided when it is published.

13. Was data derived from another data source? If so, what source?

The DEM files were derived from the SRTM DEM and ASTER DEM.

2008 Lava polygon data was derived from ASTER image.

2019 Lava polygon data was derived from Landsat8 image.

OPTIONAL Fields

If these pertain to your data, consider including them to facilitate use of your data in the future:

1. Uncertainty, precision, and accuracy of measurements, if known:

2. Quality assurance and quality control that have been applied:

3. Known problems that limit data use (quality control, sampling issues, etc.):

4. Related datasets outside of this dataset:

5. Example records for each data file or file type:

6. Description of relationship between files and/or any file dependencies:

7. Information about other files (names, locations) and documents (such as field notes, publications, etc.) that would be helpful to a person using your data.