Metadata Report

Note: This is a suggested template for descriptive metadata for datasets uploaded to the OpenTopography Community Dataspace. Information below is optional, but please fill in fields as appropriate. The goal of this document is to enable data reuse, so please provide as much information as possible.

Project Name

Yasur Volcano, Vanuatu, Crater DEM

Summary

DEM of the crater of Yasur Volcano, Vanuatu

Personnel

- PI(s)

Chris Gomez, Ben Kennedy, Rebecca Fitzgerald

- Field staff

Matt Cockcroft, Nick Key, Adrian Teissier

- Additional team members

Thomas Wilson, Graham Leonard, Art Jolly, Alex Iezzi, Robin Matoza, David Fee, Allison Austin, Geoff Kilgour, Richard Johnson, Janvion Cevuard, Athanase Worwor, Julius Mala, Bruce Christenson, Esline Garaebiti, Sandrine Cevuard.

Site Information

- Site description

Volcanic pyroclastic cone

- Site objective

Map the volcanic ballistic distribution from Yasur Volcano, model the volcanic plume, and account for topographic effects on the radiation pattern of infrasound.

- Site location (GPS cords and/or map)

19°31'44.80"S 169°26'51.44"E

- Site conditions

Unvegetated, scoriaceous cone surface. The presence of a plume hampered visibility in some areas and meant that some areas were lower in resolution.

- Date/time spent at each site

17 – 19 October 2016

Survey Results

- Equipment used

DJI Phantom 3 and Trimble R8 RTK GNSS

- GPS solutions

Coordinates in degrees WGS84 and altitude above ellipsoid in meters.

Latitude	Longitude	Ellipsoid (m)
-19.53376	169.45138	362.652
-19.53496	169.45104	357.764
-19.53335	169.45064	364.604
-19.53371	169.4503	360.749
-19.53319	169.45017	368.456
-19.53271	169.45026	379.056
-19.53262	169.45062	375.123
-19.53278	169.45109	366.487
-19.5327	169.4514	354.913
-19.5327	169.45227	346.322
-19.53221	169.45209	348.013
-19.53226	169.45181	350.382
-19.53226	169.45041	388.236
-19.53197	169.45003	404.262
-19.53174	169.44975	408.032
-19.53211	169.44957	409.694
-19.53225	169.44914	405.422
-19.53129	169.44994	410.464
-19.53382	169.44991	363.381
-19.5342	169.44963	357.77
-19.53512	169.44948	346.505
-19.53439	169.45053	359.427
-19.53432	169.44992	358.255
-19.53126	169.45145	363.73
-19.53103	169.45082	380.187
-19.52949	169.45171	348.049

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-19.52962	169.45273	340.043
-19.53037	169.45194	347.915
-19.53147	169.4519	358.137
-19.53163	169.4529	351.675
-19.53104	169.45311	341.255
-19.5306	169.45363	338.515
-19.53019	169.45294	341.891
-19.53289	169.44931	388.012
-19.53388	169.44835	350.142
-19.53396	169.44908	352.183
-19.5335	169.44958	366.585
-19.53258	169.45055	381.898
-19.53236	169.4504	390.413
-19.53246	169.45054	384.681
-19.5322	169.45043	393.576
-19.53222	169.45029	397.702
-19.53204	169.45025	402.129
-19.53208	169.45011	405.978
-19.53193	169.44993	410.856
-19.53191	169.45007	408.507
-19.53186	169.44982	412.594
-19.53199	169.44963	414.452
-19.53216	169.44948	413.824
-19.53235	169.44896	408.123
-19.53216	169.44917	410.707
-19.5316	169.44991	412.498
-19.53127	169.44998	415.067
-19.53108	169.44998	417.421
-19.53085	169.45004	419.651
-19.52968	169.45172	347.975
-19.52942	169.45173	347.502
-19.52895	169.4518	345.746
-19.52897	169.4524	338.071
-19.52868	169.4534	334.878
-19.52948	169.45372	335.444
-19.52937	169.45269	338.918
-19.53519	169.447	330.466

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-19.53616     169.4476      326.794
-19.53561     169.44863     334.675
-19.53413     169.44823     347.609
-19.53385     169.45155     370.458
-19.53387     169.45156     365.347
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- Errors

N/A

- Alignments

N/A

- Collection methods

Ground control points were taken on ground targets spread over the surveyed area that were visible on the volcanic flank images captured by the UAV. However, GCPs were not taken in the crater area due to risk to life. Map Pilot app was used to capture UAV images so that enough overlap was captured in each image to use SfM software.

Products

- Date of dataset collection

17 – 19 October 2016

- Coordinate system of datasets

GCS_WGS_1984 (origin: 169.445, -19.5273)

- Spatial resolution

10 cm (resampled from original 8.6 cm calculated horizontal resolution)

- Horizontal Accuracy

10 cm resolution and accuracy at control points.

- Vertical Accuracy

> 0.5 m vertical accuracy

- Data formats

GeoTif with twf spatial data encoding.

- Data processing methods

Structure from Motion Multiple View Stereophotogrammetry in PhotoScanPro (Agisoft®), with (1) Ground control points marking using the GNSS RTK collected points, (2) sparse point-cloud reconstruction, (3) Dense point-cloud construction, (4) Wrapping with a mesh, (5) Mapping of

the photographs over the mesh using adaptative orthophotographs; (6) DEM and orthophotographs construction and export.

Misc Notes

There is no monument available at the top of the volcanic structure, and its activity would modify the exact position of any monument, therefore the personnel suggests using the dataset in absolute sub-meter accuracy (GNSS RTK data), but suggest caution in term of sub-meter absolute accuracy.

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