J-Rapid

Investigation on Volcanic Activity and Sector Collapse Inducing The Sunda Strait Tsunami in Indonesia

Topic 4a

Evaluation of possibility of future collapse by topographic survey using long-range UAV

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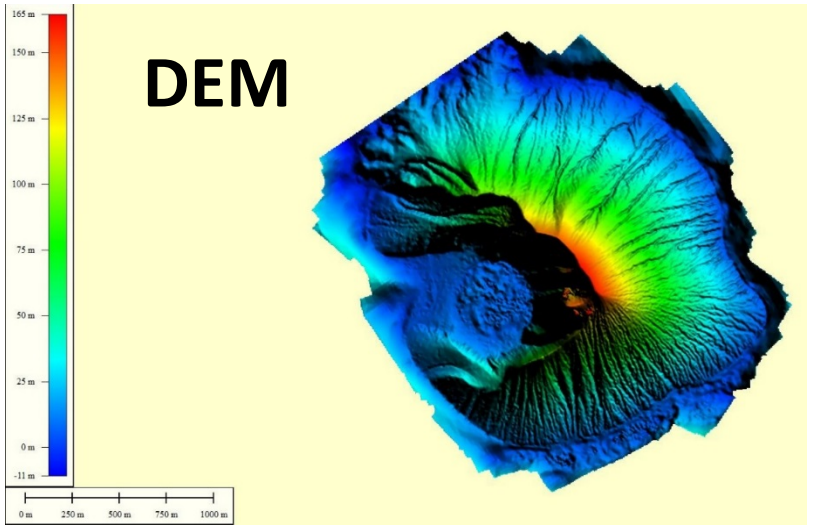
Drone Mapping in March 2019 by CVGHM

Aerial Photo Survey in March 2019 (before J-Rapid)



By
CVGHM

Wilfridus et al.(2019) Bul. Guningapi Edisi II

Frequent monitoring is desired to evaluate future activities, but drone survey on the island is time consuming, costly (6MRp for 2 days boat) and unsafe.

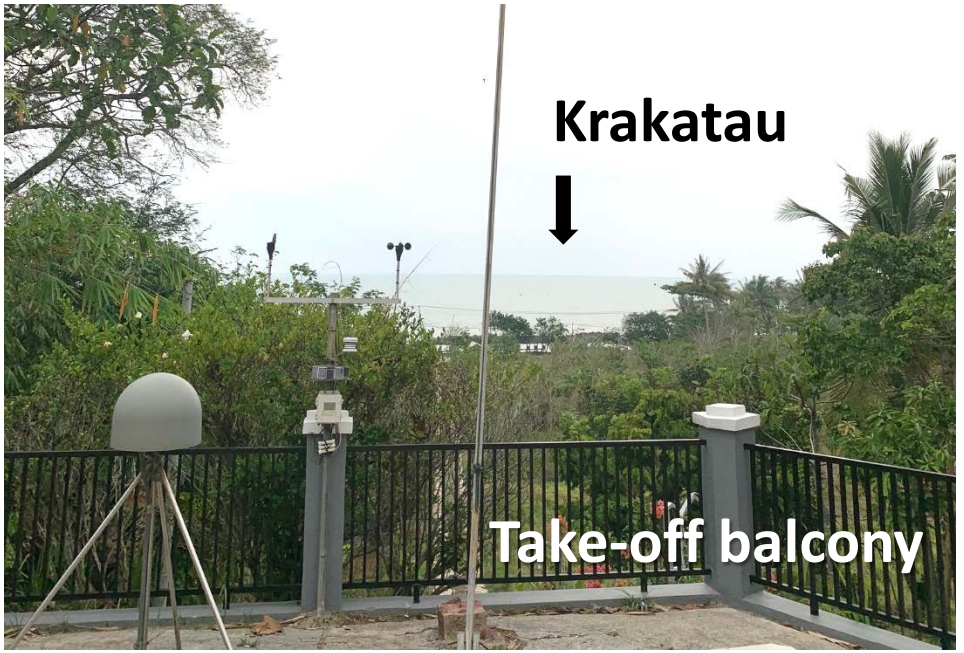
10 MRp Long-Range Fixed-wing UAV

Tested Maximum Range: **145 km** by Lithium Polymar battery

(To be extended to **180 km** by Lithium-Ion battery)


100 km round trip to Anak Krakatau
セルトゥン島
Pulau Sertung
クラカトア
Krakatoa
クラカタウ島
Krakatau
10 km
40.00 km
60.00 km
30.00 km
70.00 km
46 km
20.00 km
80.00 km
46 km
10.00 km
90.00 km
102.32 km
CVGHM
Station
Pasauran
enables more
frequent mapping
Total Flight Range: 102 km


CVGHM Station Pasauran
Warung Nasi Pasauran
300.00 m
200.00 m
102.10 km
100.00 m
102.20 km
102.27 km
Pos Pengamatan
Gunungapi Krakatau...
Take-off
and Land
Aat Property's
Jl. Raya Anyer-Sirih


Krakatau
Take-off balcony

However

The flight permission of the Long-Range UAV has not been given by Directorate General of Civil Aviation (DGCA).

Rescheduling

1st plan: Jun 2019 survey was canceled due to coordination delay and flight permission delay

2nd plan: November 2019 survey was changed to drone (DJI Phantom) survey due to flight permission delay.

Preliminary Drone Survey on the island in November 25-26

1016 Aerial Photos were taken (Pix4D autopilot)


Nov25 (408).JPG


Nov25 (409).JPG


Nov25 (410).JPG


Nov25 (411).JPG


Nov25 (412).JPG


Nov25 (413).JPG


Nov25 (414).JPG


Nov25 (415).JPG

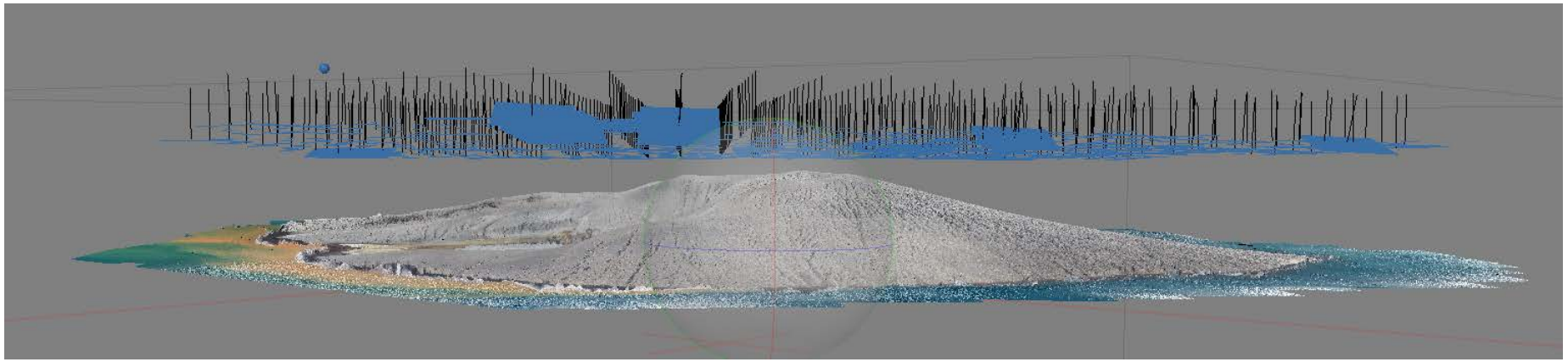

Nov25 (416).JPG

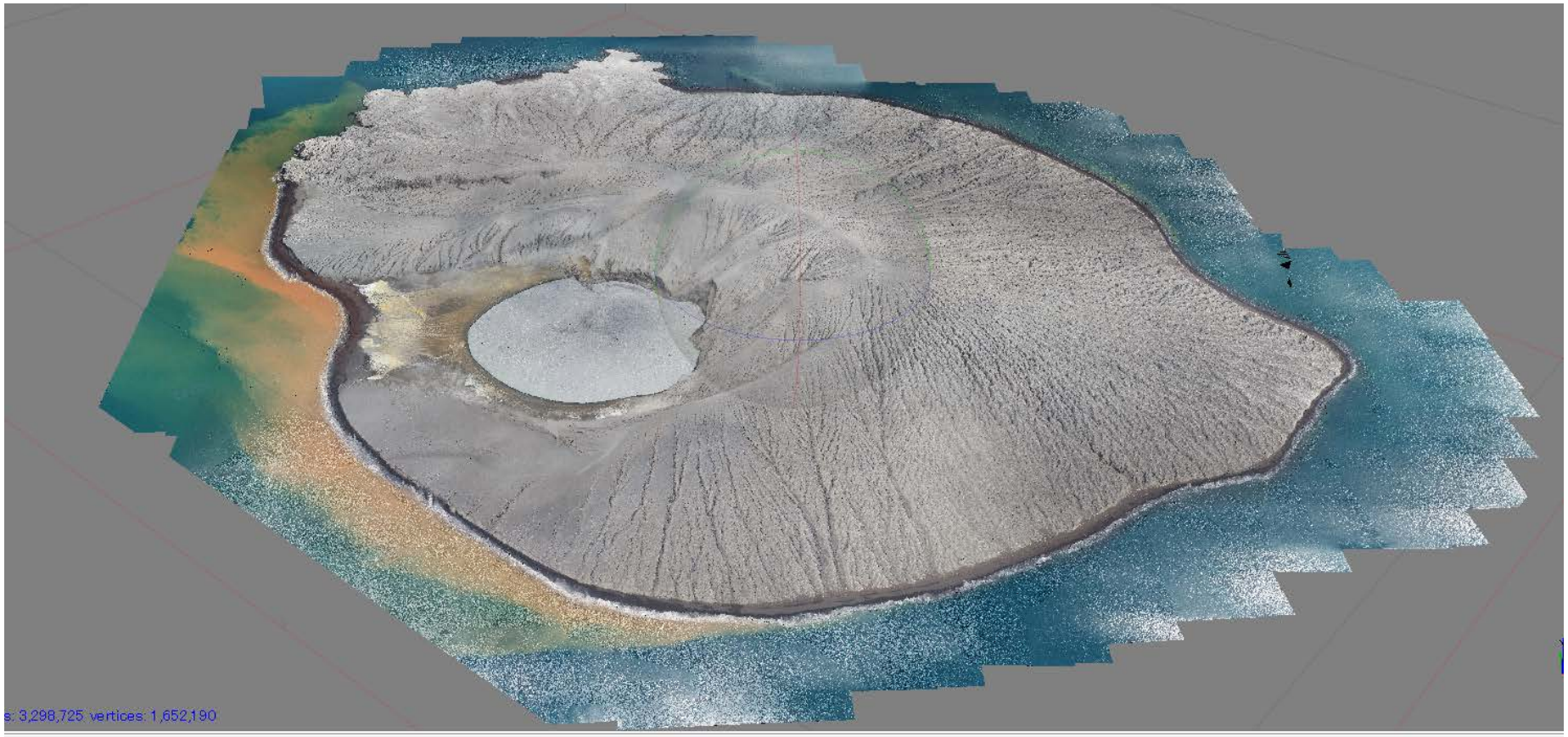

Nov25 (417).JPG


Nov25 (418).JPG


Nov25 (419).JPG

Preliminary DEM of Nov.2019 from 371 Photos





March 2019

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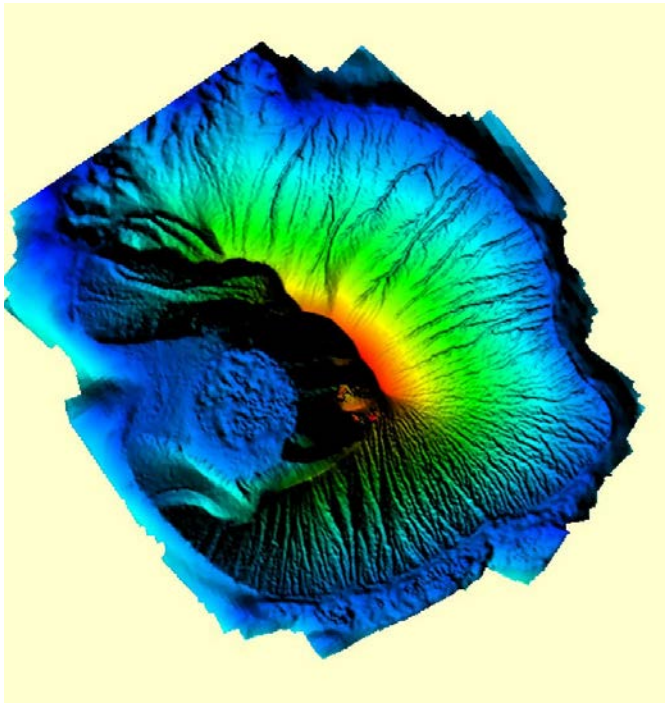
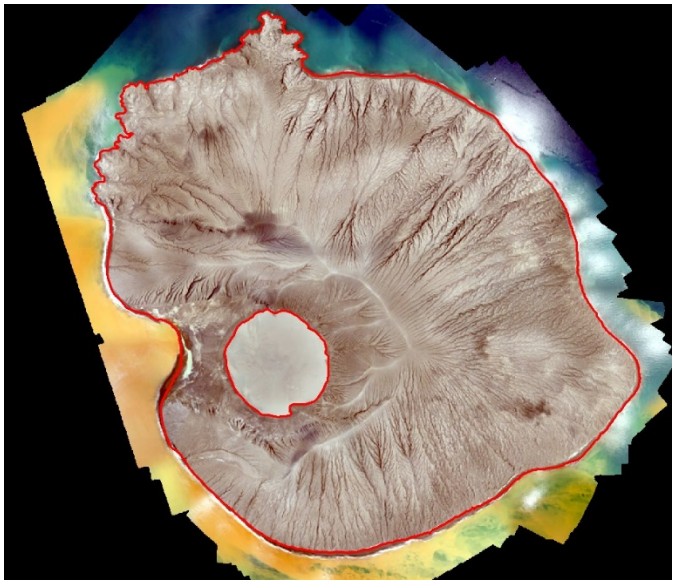
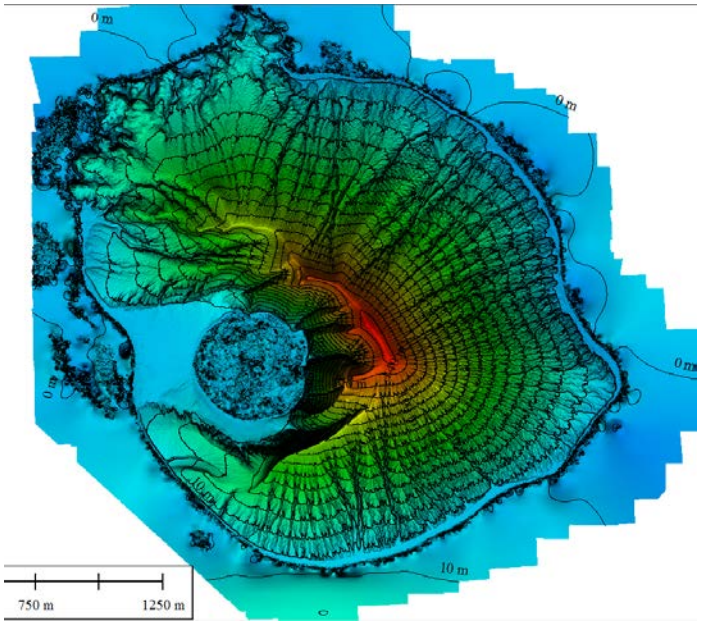
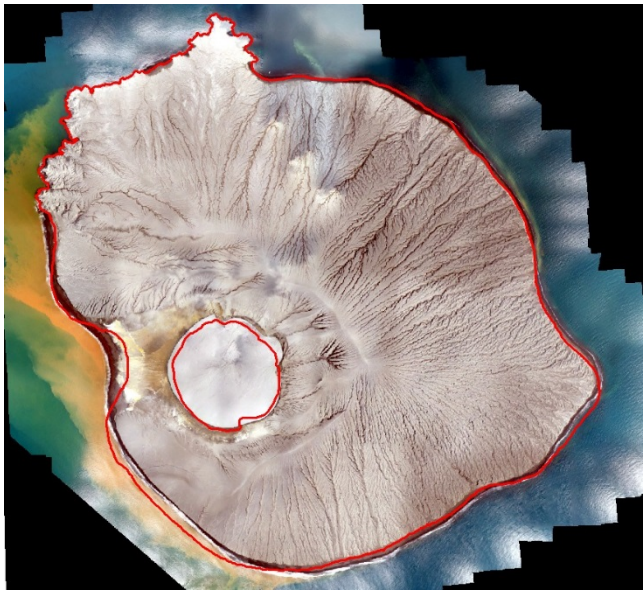
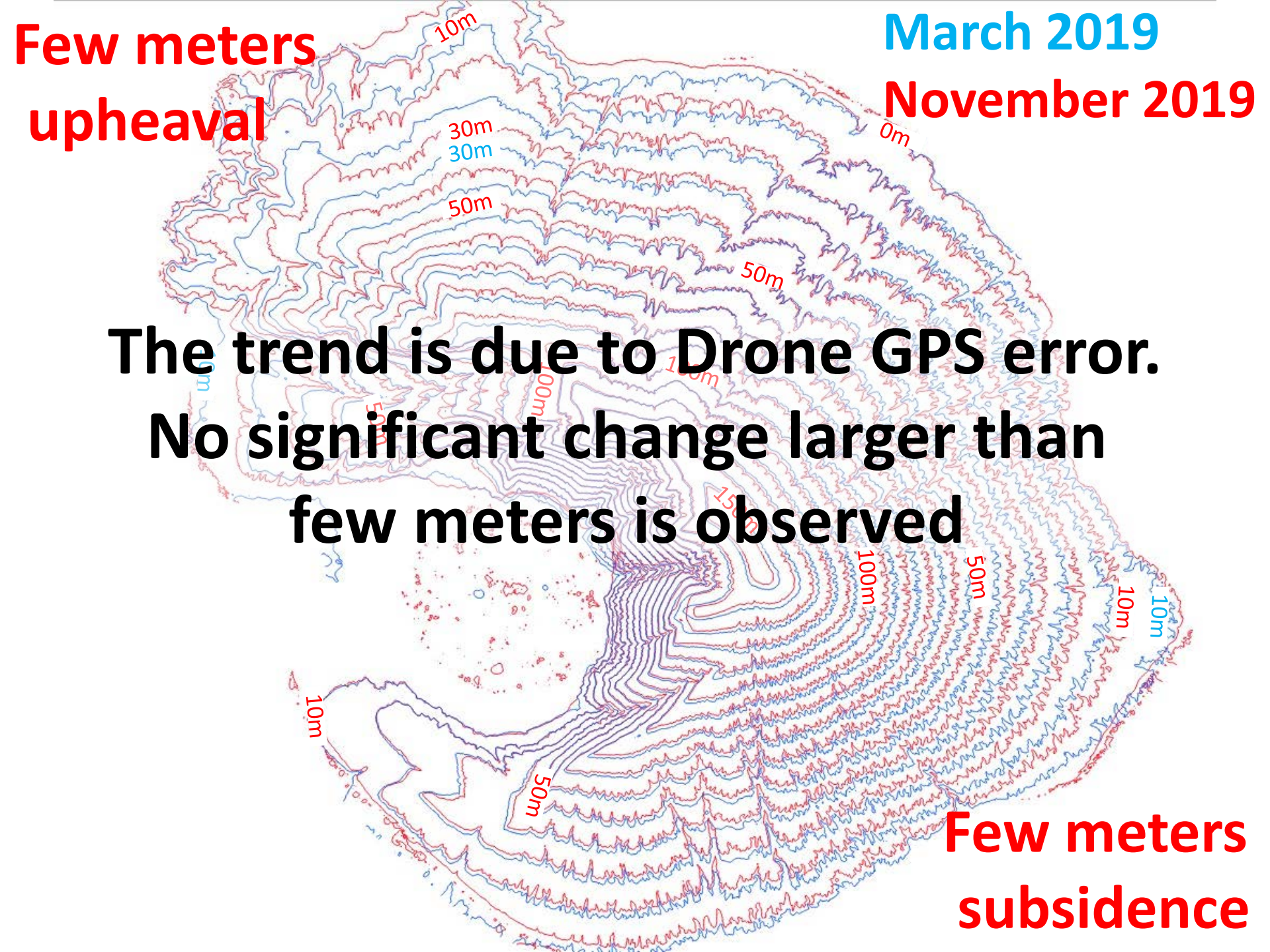




November 2019 (preliminary)






Few meters upheaval
March 2019
November 2019
10m
30m
30m
50m
50m
0m
The trend is due to Drone GPS error.
No significant change larger than few meters is observed
100m
50m
10m
10m
10m
50m
Few meters subsidence

Shoreline change is due to erosion?

March 2019

November 2019
with shoreline of March

Preliminary conclusion

1) No significant topo change from March to November 2019 in few meter accuracy except those due to erosion
2) Future regular UAV survey has to be with 10 cm accuracy on-board RTK GNSS (5MRp)

Future plan

January-February 2020: CVGHM will obtain pilot certificate and flight permission.

March 2020: Long-Range UAV survey with onboard RTK-GNSS


Terimakasih
Oh,
Don’t fly
without permission