

## PEMANTAUAN PERUBAHAN VOLUME DI ZONA INTI GUMUK PASIR PARANGTRITIS KABUPATEN BANTUL TAHUN 2011 DAN 2020 MENGGUNAKAN *DIGITAL TERRAIN MODEL*

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### INTISARI

Sebagai salah satu warisan geologi di Yogyakarta, Gumuk Pasir Parangtritis memerlukan pemantauan tidak hanya dari aspek luas area gumuk pasirnya saja, namun dapat dilakukan pemantauan morfologi gumuk pasir salah satunya dengan mengamati perubahan dalam aspek volume gumuk pasir. Penelitian yang dilakukan di Zona Inti Gumuk Pasir Parangtritis, Kecamatan Kretek, Kabupaten Bantul ini memiliki tujuan untuk mengetahui nilai volume pasir di Gumuk Pasir Parangtritis tahun 2011 dan 2020 menggunakan data *Digital Terrain Model (DTM)*.

Perhitungan volume pasir di Zona Inti dilakukan dengan memanfaatkan data DTM metode Eliminasi dan metode *Slope Based Filtering (SBF)*, dengan menggunakan metode perhitungan *Count Above Base Level* pada *software QGIS*. Perolehan data DTM metode Eliminasi dilakukan dengan menghilangkan tutupan lahan yang ada pada data DSM secara manual menggunakan *software ArcGIS Pro* dan *ArcMap 10.6*, sedangkan proses transformasi DSM metode *Slope Based Filtering* dilakukan secara otomatis menggunakan *software SAGA GIS* dengan radius 14 meter dan kemiringan lereng 30%.

Hasil pengolahan data DTM menunjukkan bahwa terdapat perbedaan volume gumuk pasir antara tahun 2011 dan 2020. Volume gumuk pasir tahun 2011 metode Eliminasi ialah 11574897.85 m<sup>3</sup> sedangkan volume dengan metode SBF ialah 11.446.410,47 m<sup>3</sup>. Volume gumuk pasir tahun 2020 metode Eliminasi ialah 15.627.395,82 m<sup>3</sup> sedangkan volume dengan metode SBF ialah 15.476.460,77 m<sup>3</sup>. Dari penelitian tersebut, dapat ditarik kesimpulan bahwa volume pasir di Zona Inti Gumuk Pasir Parangtritis tahun 2020 lebih besar dibanding tahun 2011. Hal tersebut dapat dipengaruhi oleh kualitas data DTM yang digunakan (meliputi resolusi spasial dan proses konversi DSM ke DTM). Data DTM hasil transformasi menggambarkan bahwa proses eliminasi tutupan lahan kurang maksimal sehingga terdapat objek yang belum tereliminasi dan mengakibatkan tutupan lahan dihitung sebagai volume bukit pasir.

**Kata Kunci:** Gumuk pasir, volume, *Digital Surface Model*, *Digital Terrain Model*, Eliminasi, *Slope Based Filtering*

***CHANGE MONITORING OF SAND DUNE'S VOLUME IN THE CORE  
ZONE OF PARANGTRITIS SAND DUNES OF BANTUL REGENCY IN 2011  
AND 2020 USING DIGITAL TERRAIN MODEL***

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***ABSTRACT***

*As one of the geological heritages in Yogyakarta, Parangtritis Sand Dunes require monitoring not only from the areal extent of the sand dune, but also to monitor the morphology of the sand dunes, one of which is by observing changes in the volume of the dune. The research, which was conducted in the Core Zone of the Parangtritis Sand Dunes, Kretek District, Bantul Regency, has the aim to knowing the value of the sand volume in the Parangtritis Sand Dunes in 2011 and 2020 using Digital Terrain Model (DTM) data.*

*Sand volume calculation in the Core Zone is carried out by utilizing DTM data using the Elimination method and the Slope Based Filtering (SBF) method, using the Count Above Base Level calculation method in QGIS software. The data acquisition of the DTM Elimination Method was carried out by removing the existing land cover in the DSM data manually using ArcGIS Pro and ArcMap 10.6 software, while the DSM transformation process with the Slope Based Filtering method was carried out automatically using SAGA GIS software with a radius of 14 meters and a slope of 30%.*

*The results of DTM data processing show that there are differences in sand dunes volume between 2011 and 2020. The volume of sand dunes in 2011 with Elimination method is 11.574.897,85 m<sup>3</sup> while the volume with the SBF method is 11.446.410,47 m<sup>3</sup>. The volume of the sand dunes in 2020 with the Elimination method is 15,627,395.82 m<sup>3</sup> while the volume with the SBF method is 15.476.460,77 m<sup>3</sup>. From this research, it can be concluded that the volume of sand in the Core Zone of the Parangtritis Sand Dunes in 2020 is greater than in 2011. This can be influenced by the quality of the DTM data used (including spatial resolution and the DSM to DTM conversion process). The transformed DTM data illustrates that the land cover removal process is less than optimal so that there are objects that have not been eliminated and resulted in the land cover being calculated as the volume of sand dunes.*

***Keywords:*** Sand dunes, volume, Digital Surface Model, Digital Terrain Model, Elimination, Slope Based Filtering