Imaging 50,000 Oriented Ovoid Depressions Using LiDAR Elevation Data Elucidates the Enigmatic Character of The Carolina Bays: Wind & Wave, Or Cosmic Impact Detritus?

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Abstract

80 years after aerial photography revealed thousands of aligned oval depressions on the USA’s Atlantic Coastal Plain, the geomorphology of the “Carolina bays” remains enigmatic. Geologists and astronomers alike hold that invoking a cosmic impact for their genesis is indefensible. Rather, the bays are commonly attributed to gradualistic fluvial, marine and/or aeolian processes operating during the Pleistocene era. The major axis orientations of Carolina bays are noted for varying statistically by latitude, suggesting that, should there be any merit to a cosmic hypothesis, a highly accurate triangulation network and suborbital analysis would yield a locus and allow for identification of a putative impact site. Digital elevation maps using LiDAR technology offer the precision necessary to measure their exquisitely-carved circumferential rims and orientations reliably. To support a comprehensive geospatial survey of Carolina bay landforms (Survey) we generated about a million km² of false-color hsv-shaded bare-earth topographic maps as KML-JPEG tile sets for visualization on virtual globes. Considering the evidence contained in the Survey, we maintain that interdisciplinary research into a possible cosmic origin should be encouraged. Consensus opinion does hold a cosmic impact accountable for an enigmatic Pleistocene event - the Australasian tektite strewn field - despite the failure of a 60-year search to locate the causal astroblem. Ironically, a cosmic link to the Carolina bays is considered soundly falsified by the identical lack of a causal impact structure. Our conjecture suggests both these events are coeval with a cosmic impact into the Great Lakes area during the Mid-Pleistocene Transition, at 786 ka ± 5 k. All Survey data and imagery produced for the Survey are available on the Internet to support independent research. A table of metrics for 50,000 bays examined for the Survey is available from an on-line Google Fusion Table: https://goo.gl/XTHKC⁴. Each bay is also geospatially referenceable through a map containing clickable placemarks that provide information windows displaying that bay’s measurements as well as further links which allows visualization of the associated LiDAR imagery and the bay’s planform measurement overlay within the Google Earth virtual globe: https://goo.gl/EHR4Lf.
Wind & Wave, or Cosmic Impact Detritus?

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The Carolina bay Survey

A detailed Carolina bay Survey has been undertaken since 2013 [1]. The resolution is to establish a foundation for a research framework that includes database, high-resolution LiDAR, and analysis of 1% of each other. Planform is bayCarolina. QR code for CBoD post.

The Bays above were examined in 1971 by the team of Daniels, Gamble and Wheeler [4]. Their analysis outlined the configuration of the bays, which is primarily oval, but also rectangular and rectangular in type, seen on the right in vast quantities across North Carolina.

The most common bay planform is the type, seen on the right in vast quantities across North Carolina.

The imagery can be visualized on Google Earth using a KML-JPEG tile sets for visualization on virtual globes. considering the evidence contained in the Survey data. In [16], false-color hsv-shaded bare-earth topographic maps as IDW interpolation, 0.2º search radius.

http://cintos.org/ge/Heart_DEM.kmz

The 1 km bay to its south has been heavily drained, leveled and commer-

The entire spine of Virginia's Eastern Shore peninsula is laced with enigmatic landforms are robust and resilient against

Bays CBoD

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