

Use of Unmanned Aerial Vehicles (UAVs) to Create Digital Outcrop Models: An Example from the Cretaceous Cow Creek Formation, Central Texas

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ABSTRACT

The use of unmanned aerial vehicles (UAVs) has increased in popularity among field geologists as a method of collecting quantified field data. Digital photographs were collected using a UAV and a 12 megapixel camera. The methods and workflow utilized to acquire, process and construct a high-resolution 3D point cloud (i.e., latitude, longitude, and elevation) of the outcrop exposure, including a full-color (RGB) for each point, is discussed. From the point cloud, a digital outcrop model (DOM) was developed which enables analysis of bedform geometry of well-preserved beach crest and foreshore clinothems of mixed siliciclastic and carbonate grainstones within the Cretaceous Cow Creek Formation located in Central Texas. The UAV-acquired DOM analyses are compared to field measured strike and dips of the bedforms reported by other workers at the same locality and were within tolerance, but provided continuous measurements along with detailed spatial measurements of the size and shape using the inexpensive and easily created digital outcrop model.