**DATA PAPER**

**UAV Survey Data from Clifton Camp (ST56557330), Bristol, UK**

Stephen Gray

1 Post Graduate Researcher, Department of Archaeology & Anthropology, University of Bristol, UK
stephen.gray@bristol.ac.uk

This data was collected via low-altitude UAV (Unmanned Aerial Vehicle) survey of an area of Clifton Camp (Ordnance Survey Grid Reference ST56557330), best known for its Iron Age promontory fort. The dataset comprises of metadata records, near-vertical photographs and a derived 3D polygonal mesh.

This dataset has been constructed with two kinds of reuse in mind: Firstly, the area surveyed is culturally rich and underexplored; while some of the non-natural features detected by this survey can be identified, others cannot. This data is intended to inform future investigations of the site.

Secondly, the survey methodologies employed and the structuring of the resulting dataset are intended to act as an exemplar, a standard method of creating survey data while prioritising open technologies, and of organising UAV survey datasets to ensure maximum re-usability.

**Keywords:** Archaeology; Clifton Camp; UAV; Unmanned Aerial Vehicle; photogrammetry; 3D

**Funding statement:** None.

### (1) Overview

**Context**

**Spatial coverage**

Description: Clifton Camp (ST56557330), Bristol, City of Bristol BS8 3NA, UK

- Northern boundary: +51.457520, –2.626756
- Southern boundary: +51.456569, –2.626211
- Eastern boundary: +51.456892, –2.625649
- Western boundary: +51.456869, –2.626926

**Temporal coverage**

AD250-1945

### (2) Methods

**Steps**

A custom-build hexacopter UAV was used to collect data, running Ardupilot 3.1 firmware in conjunction with Mission Planner v1.1, the flight was conducted at approximately 35m above ground level at a vertical speed of approximately 2.5m/s. The camera used was a Canon Powershot S110 running CHDK 1.2.0 and a standard intervalometer script. Ground control point (GCP) location was established using a Garmin GLO.

The 3D polygonal mesh was generated using Agisoft Photoscan 1.1.5 software.

**Sampling strategy**

GCPs were placed at intervals of approximately 10m. The intervalometer script was set to take a photograph every 5 seconds (the fastest speed mechanically possible when using the camera used).

### (3) Dataset description

**Object name**

UAV Aerial Survey - Clifton Camp (ST56557330)

**Data type**

primary data, processed data, interpretation of data

**Format names and versions**

- .tif, .obj, .mtl, .jpg, .gpz, .csv, .mp4, .txt, .zip

- ‘Readme’ inventory in .txt format
- Camera native image set in .jpeg format (compressed as .zip)
• Image set with legible GCP markers in .jpeg format (compressed as .zip)
• Image set metadata in .csv format
• Derived polygonal mesh of site in .dae and .obj formats with .jpg textures (compressed as .zip)
• Images derived from polygonal mesh in .jpg, .tif and .mp4 formats (compressed as .zip)
• Ground Control Point data in .gpx format with .tif preview (compressed as .zip) derived from Mission Planner Flight Data
• Lens calibration images in .jpg format (compressed as .zip)
• Flight data in Mission Planner 2.0 .txt format (compressed as .zip)
• Camera position information exported from Agisoft PhotoScan in PhotoScan structure file format (.xml based) and Bundler .out format (compressed as .zip)

Creation dates
01/11/2014

Dataset Creators
Stephen Gray

Language
Eng

License
CC0

Repository location
http://dx.doi.org/10.6084/m9.figshare.1372405

Publication date
09/04/2014

(4) Reuse potential
Despite its accessible location, little investigation has been done on this site. This survey helps further establish several non-natural features seen by Russell [1] in archival aerial photographs. These features include:

1. Excavations believed to relate to Brunell’s unfinished reservoir of 1845 (see area marked as ‘2’ in ‘features-of-interest.tif’)
2. A rectilinear enclosure, believed by Russell to be a mediaeval animal enclosure (see area marked as ‘1’ in ‘features-of-interest.tif’ - the much later reservoir pipeline can be seen cutting through, diagonally).
3. Several other non-natural features (for example see area marked as ‘3’ in ‘features-of-interest.tif’) are suggested both by the results of this survey and by Robert’s [2] geophysics survey of 2011.

Given that the site is a scheduled ancient monument, it is hoped that the further investigation required to identify such features will soon be undertaken. This data supports the generation of Orthorectified maps, Digital Elevation Models and 3D meshes.

A second driver for creating this dataset was the high degree of interest amongst the archaeological community in the potential application of new and affordable UAV technology. It is hoped that this dataset will act as an exemplar for the standardisation of results from similar, low-altitude aerial surveys. This dataset relates to two guides published by Jisc [3] and the Archaeology Data Service [4].

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References