

# Mapping reservoirs in the Volta basin

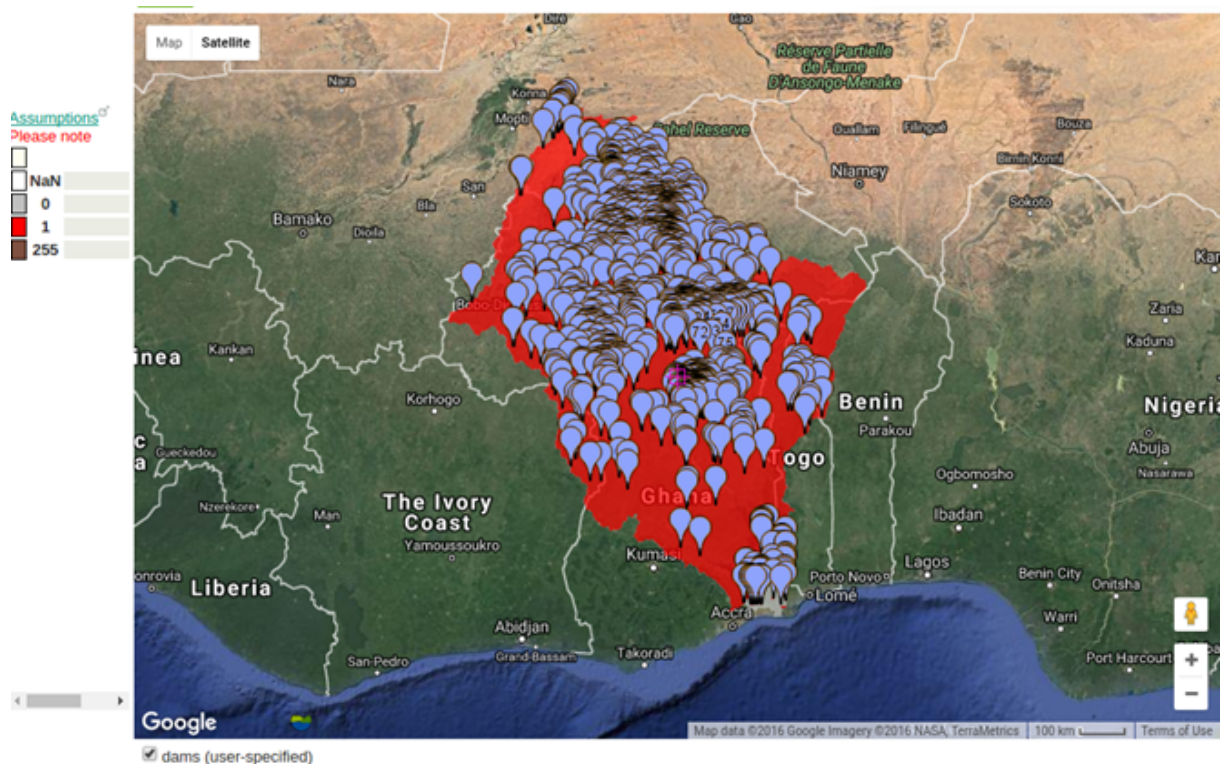
Mark Mulligan, David Smedley, Sarah Jones, Arnout van Soesbergen

## Scope and objective

**To identify and map agricultural and small reservoir systems in two study landscapes**

In most semi-arid areas of the developing world, the number, size, and location of small reservoirs is unknown. To coordinate further planning, knowledge of the existing dam inventory is imperative. Programs for reservoir rehabilitation and management depend on a knowledge of reservoir locations. This tool outlines the steps to obtain a regional reservoir inventory through remote sensing.

This has been completed for the entire Volta through work by David Smedley, Mark Mulligan, Sarah Jones and Elise Devine and a snapped dataset is available as below.



## Target audience

Water resources planners, hydrologists, and technical cooperation/ development assistance agencies. This tool is intended for use by technically schooled persons with an introductory knowledge of remote sensing. Access to remote sensing software, reasonably fast computers, and ample digital storage space are also prerequisites

## Requirements

## Description

Google Earth was used in conjunction with WaterWorld to identify reservoirs across the Volta basin by manually locating each reservoir and recording the coordinates of the centre of the retaining wall. A map of the basin was imported into Google Earth from WaterWorld to show the exact boundaries of the basin and then a grid was laid across the basin in order to divide it up into manageable chunks. After zooming into a level where individual buildings were discernible each grid was methodically scrolled over and each a pin dropped on each reservoir and its location recorded. Once the entire basin was scanned and 1181 reservoirs identified their coordinates were made available for use in WaterWorld. These were then snapped to the flow network used in WaterWorld to ensure that the reservoirs were appropriately located for hydrological analysis and modelling.

## Recommendations

Reservoir inventories are best done from imagery at the end of the rainy season, when the reservoirs are filled to their maximum extent, and cloud coverage decreases. Having a detailed database of dams allows the analysis of many ecosystem-service relevant properties such as those described [here](#).

## Limitations

- Manually identifying dams is labour intensive
- Cloud cover or shadows can affect the ability to visualise dams
- Only dams with reservoirs greater than 1 hectare in extent can be reliably identified from the high resolution imagery available in Google Earth
- Reservoir dams are much easier to identify than run of the river dams

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