**Version 7:**

**Bathymetry Points, Lake Victoria, vector point, ~2018**

Reference Information and Units:

Projection: African Lambert Conformal Conic

ESRI: 102024 (https://epsg.io/102024)

GCS: GCS_WGS_1984

File Naming Convention:

LV_Bathymetry_Points_V7.shp

Data Origin:

Admiral Bathymetric Maps:

Description: British admiral bathymetry maps of the lake. Maps were scanned and georeferenced. Once georeferenced the depth points were digitized

Points: Approximately 5,212

Year: 1900-1955

Depth Sounder:

Description: Depth readings taken from a depth sounder were read into ArcMap using X, Y coordinates

Points: Approximately 5,888

Year: 2013

German Bathymetry Map:

Description: A German bathymetry map was scanned and georeferenced. Once georeferenced the depth points were digitized.

Points: Approximately 50

Year: 1913

Acoustic Surveys from Nafirri:

Description: Instruments used are two Depth Profiling systems (a submersible Conductivity Temperature-Depth profiling system (CTD, Sea and Sun Technologies) and a YSI 650 multiparameter Sonde). Readings were read into ArcMap using X, Y coordinates.

Date: 11/2015:

Approximately 55 points

Date: 8/2016

Approximately 50 points

Limnology Survey from Nafirri:

Description: Limnology survey using acoustic equipment and GPS

Points: Approximately 10

Date: 2007/2008

Sounding data:

Description: Depth readings taken from a depth sounder were read into ArcMap using X, Y coordinates

Points: Approximately 17,200

Date: 2009

Acoustic Sounder Strata Data:

Description: Points were taken to determine the strata of the lake by using a Simrad EK60 echo sounder. These points contained Z values. The points were read into Arc using X,Y coordinates

Points: Approximately 45

Date: 2009

Lake Victoria Bathymetry Survey for EAC/LVBC:

Description: Points were taken using a single beam echo sounder 200 kHz and were provided from Ola at MMT. These points are concentrated to three bays, Mwanza Gulf (TZ), Kisumu (KY), and Port Bell (UG).

Points: 120,000

Date: 2007

Lake Victoria Regional Hydro-acoustics Working Group:

Description: The survey was conducted by the Lake Victoria Regional Hydro-acoustics Working Group under coordination of LVFO with NSF project funds. It was conducted using Tanzania's *RV. Lake Victoria Explorer*.

Points: Approximately 3,945,260

Date: 09/12/2017 – 10/5/2017

Data Development:

The final bathymetry points were created by converting all sources to the same unit(meters). Once all sources were in the same unit they were combined into the same file. When all points were in the same file a spatial query was ran to select all the bathymetry points that fell outside of the Lake Victoria shoreline polygon. Any point that was located outside of the shoreline polygon was removed from the file. The next step was to remove the redundant points. PostgresSQL was used to find all the points that were within 100 meters from another point (SQL Code 1). One of the points would be removed from the final set of points to clean up the data. The points that were obtained from the survey conducted for the EAC/LVBC were not included in the removing of points within 100 meters of one another. Any point from version 6 that was located within 100 meters of a point from the Lake Victoria Regional Hydro-acoustics Working Group dataset, was removed. All points from the acoustic survey conducted by Lake Victoria Regional Hydro-acoustics Working Group were kept regardless of their distance from each other. PostgresSQL was also used to check the depths of points in relation to points around them to determine outliers (SQL Code 2). Outliers were double checked and removed if not deemed plausible. Points that were denoted as “greater than” the recorded depth were removed if the depth was less than 60.96 meters.

SQL Code 1: Finds all points within 100 meters of another point

```
select a.objectid, b.objectid
from lv_bathymetry_points_v5 as a, lv_bathymetry_points_v5 as b
where st_distance(a.geom,b.geom) < 100
and a.objectid != b.objectid
```

SQL Code 2: Checks for points with depths that are outliers compared to neighbor points

```
select a.objectid, b.objectid, (@(a.z - b.z)) as z_diff
from lv_bathymetry_points_v5 as a, lv_bathymetry_points_v5 as b
where (@(a.z - b.z)) > 5
and st_distance(a.geom, b.geom) < 200
```