

# BioBase survey report

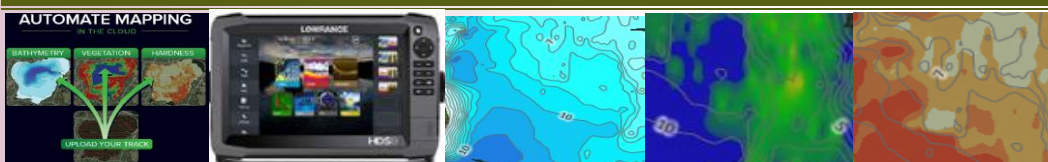
Holkham Lake, August 2019

This report provides a summary of results from a recent acoustic mapping survey. The survey was carried out for the East Anglia Area (FBG) to provide bathymetry, vegetation and bed type mapping. The information will inform an evidence-based approach to managing the fishery.



*View of Holkham Lake looking towards the north bank.*

<b>Delivery team</b>	National Fisheries Services
<b>Customer</b>	East Anglia, FBG
<b>Author</b>	Jim Lyons
<b>Date</b>	29 <sup>th</sup> August 2019



## Site and method information

- 10.4 hectares
- NGR: TG 01739 19518
- 29<sup>th</sup> August 2019
- Transducer depth = 0.3m below water surface.



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## Survey results

- Weather conditions: SW wind (10mph), dry, clear sky (0/8), air temperature = 17<sup>0</sup> C
- Average water temperature = 22.4<sup>0</sup> C
- Transect buffer distance = 20m
- Total transect length = 4.65 km
- Lake volume (estimated) = 391,515 m<sup>3</sup>
- Average recorded depth = 3.85 m (recorded depth range = 0.72m – 8.13m)
- Vegetation area cover (grid) = 37.9%
- Average vegetation biovolume (grid)\* = 7.3% (±12.5%)
- Max vegetation depth = 4.5m (0.6% of total vegetation biovolume from 4-5 m)
- Bed type composition (%) (grid) = soft (13.5); medium (84.1); hard (2.4)\*\*

\* Refers to the average percentage of the water column taken up by vegetation regardless of whether vegetation exists. In areas where no vegetation exists, a zero value is entered into the calculation.

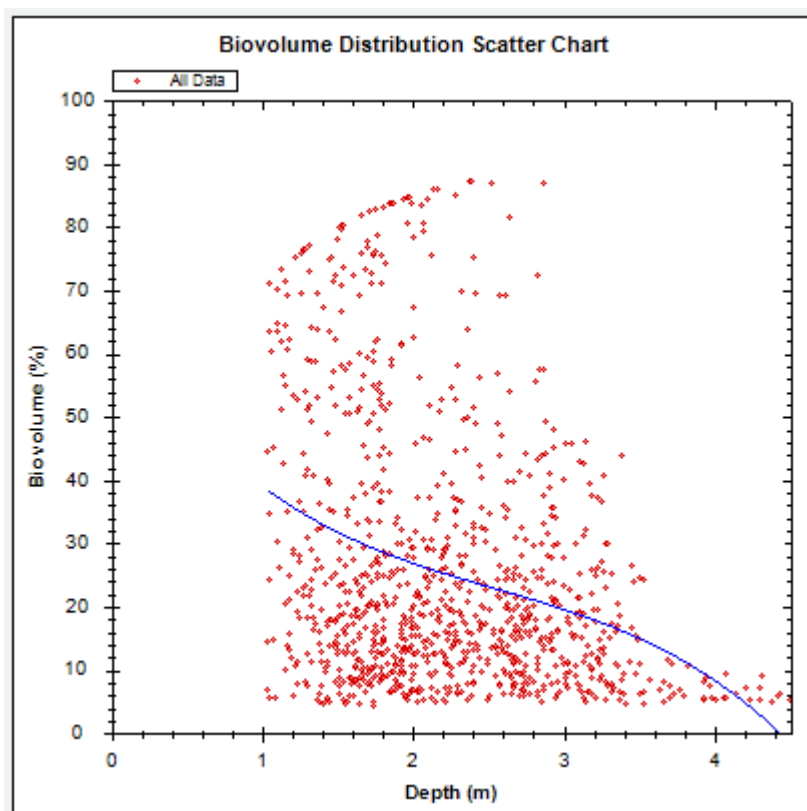
\*\* Bottom returns from area with dense plant growth compromise the sonar signal and the ability to assess hardness. Biovolume values >60% are cleansed from the data collected. Interpolated results may not expand over all covered areas or be extrapolated over areas that were cleansed.

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incident hotline  
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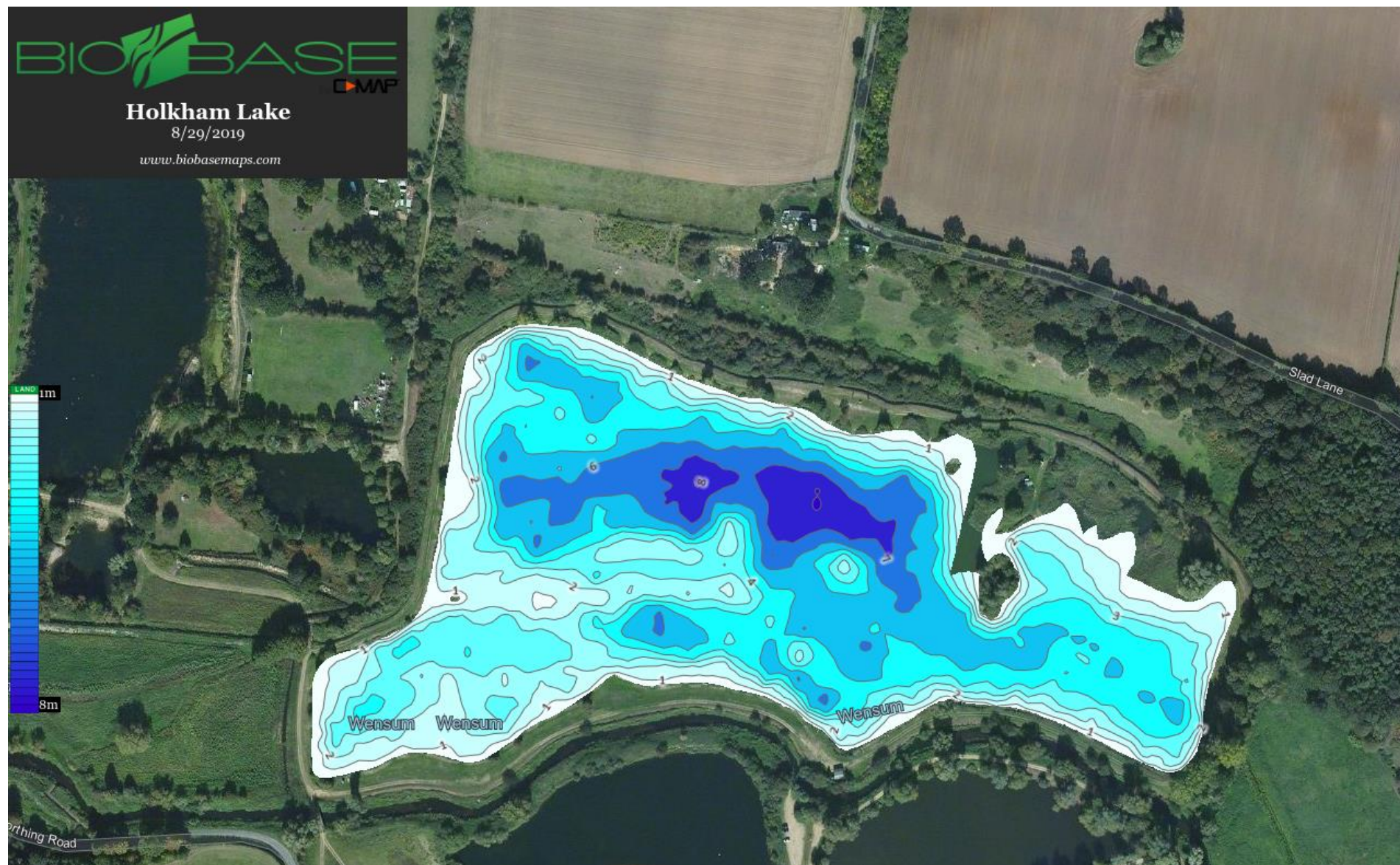
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Maximum vegetation colonisation depth (point data).





Bathymetry map (depth contour values in metres: 1m – 9m)



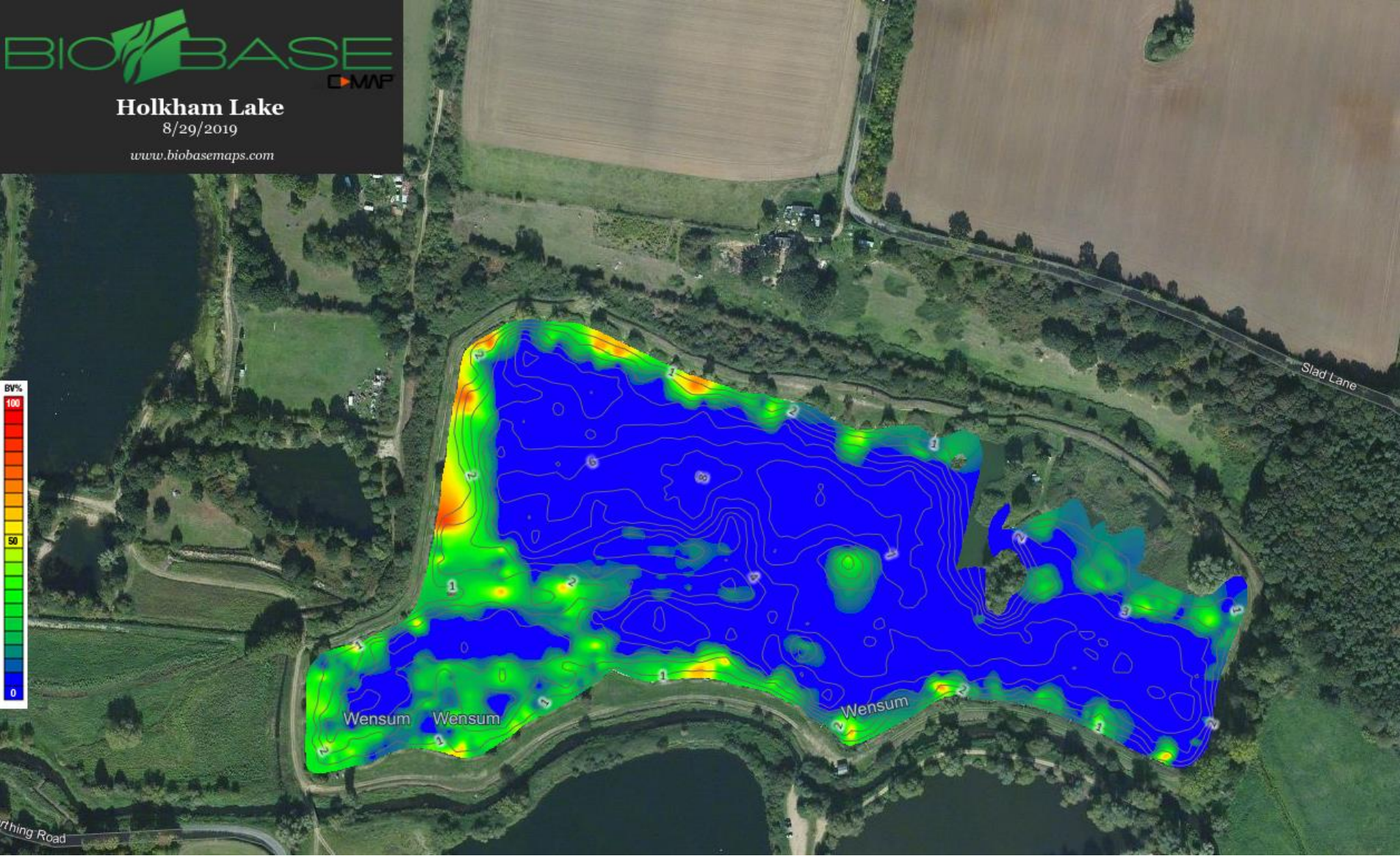
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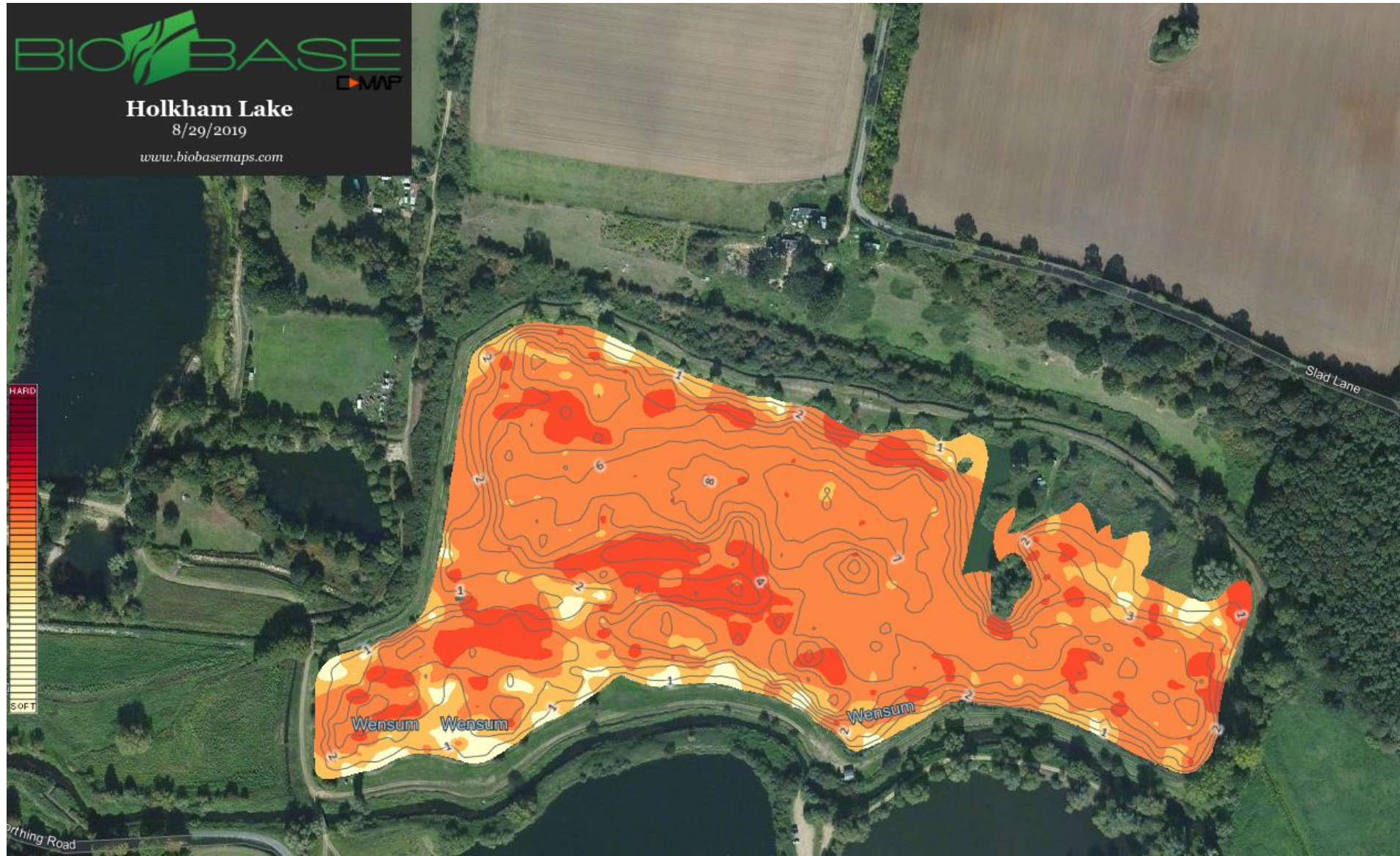


Vegetation map (percent biovolume: 0-100)<sup>1</sup>





Bed type map (relative hardness:  $0-0.5)^2$



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## Summary

Parallel transects were spaced at 20m with predominately constant speed of data collection. Intermittent stops occurred to remove excess weed from the outboard. Occasional wider spacing resulted in an analysis buffer spacing of 25m to prevent data gaps in the report maps. Coverage was as complete as possible, with some marginal areas missed due to avoid outboard or transducer damage. Although all effort was made to achieve constant data collection, individual point data created some irregular spaced data with overlaps and/or gaps resulting in an increased potential for error. Bathymetry, vegetation and bed composition analysis therefore used grid data.

Bathymetry data (grid) shows a maximum depth of 8.13 m. Bathymetry data shows depth is greatest in a central area north of the main east-west bar. A number of channels run parallel to the main east-west bar. No significant area of even depth was found although the eastern end of the lake has less pronounced depth variation.

Submerged vegetation covers 38% (grid) of the lake bed. Vegetation was recorded to a maximum depth of 4.5 m. Biovolume levels are generally low across extensive areas of the lake. Distinct elevation in vegetation presence is found across the central east-west bar of the lake. Highest biovolume values were located at the western end of this bar. Other locations with substantial vegetation cover were towards the eastern end of the main bar and in the north-east corner of the lake.

Bed composition data indicates most (93%) of the substrate to be of medium hardness. The greatest extent of soft substrate is associated with the deepest part of the lake, likely reflecting maximal deposition in this location. Much of the hardest bed was associated with sections towards the western end of the main bar and also throughout the south-west part of the lake. The remaining areas of the lake tended to have a mosaic of bed hardness types.

<sup>1</sup> Percent biovolume (otherwise known as Percent Volume Inhabited or PVI) represents the percent of the water column occupied by plant matter at each GPS location. It's a simply plant height divided by water depth multiplied by 100 for the collection of pings bound to each GPS location along a traveled path. Biovolume ranges from 0% (bare bottom) to 100% (vegetation growth to the surface).

<sup>2</sup> Bed hardness is a measure of acoustic 'reflectivity'. The hardness data generated is on a relative but continuous scale that ranges from 0-0.25 (soft), 0.25-0.4 (medium) and 0.4-0.5 (hard). Soft bottoms include loose silt or sand. Hard bottoms are compacted sand, gravel and rock.

Further information on this survey can be found at:

<https://noxreportprod.s3.amazonaws.com/568d3c28-5afc-4817-9772-e8ed98951a3a/Report.html>

If you would like to discuss the information presented in this report, please contact:

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