OPAL WATER CENTRE PROJECTS
RESULTS: 2010

CHAPMAN’S POND, YORK
OPAL York and Humber Region

Find out more about OPAL in the York & Humber Region?
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Find out more about OPAL
http://www.OPALexplorenature.org

Site Description (Ordnance Survey Grid Ref: SE 5785 4905)
Chapman’s Pond is a small pond in Dringhouses, York. The pond is a remnant of a larger lake created by clay workings, which was subsequently used as a landfill site. It is a well-visited lake by local people and is one of a few un-ticketed ponds in the region that attracts many anglers. The local residents group ‘The Friends of Chapman’s Pond’ supports the welfare of the pond and surrounding land. The OPAL Water Team has been regularly visiting the site since 2008 to collect water samples and measure properties of the pond water and will continue until 2012.

Depth Profiles
Measurements taken by probes at every 0.5m depth show how the water body changes through the year (below). Our results show that the lake is well mixed except during spring and summer when oxygen levels in the water at depth (below 1.5m) can decrease significantly. This seasonal change in deep ponds and lakes is known as ‘stratification’. 
Lake Water Temperatures: From a logger that has been submerged at a depth of 0.5 m from April 2009-2010

<table>
<thead>
<tr>
<th>Date</th>
<th>Temperature (°C)</th>
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<tbody>
<tr>
<td>02-07-2009</td>
<td>25.2</td>
</tr>
<tr>
<td>30-01-2010</td>
<td>2.2</td>
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Water Chemistry
Water samples collected quarterly in 2009/10 have been analysed in the laboratory for a range of physical, chemical and biological measurements. Data gathered during the OPAL project will show us how the water in the pond changes over the year and the overall quality of the water. Phosphorus (a nutrient in aquatic systems), suspended solids and chlorophyll (abundant in algae) show some clear seasonal variation. We are also measuring levels of metals and organic pollutants in the water. Levels of mercury (bottom graph, below) can be seen to have varied seasonally, with the two highest values recorded in Spring. Our understanding of why this and other changes are occurring will increase as the monitoring programme continues and we learn more about Chapman’s Pond.

Historical Change
Lake sediment cores provide a natural archive of changes that have taken place in the lake as well as pollution deposited onto the lake surface. A core from Chapman’s Pond was taken in 2008. By measuring the concentration of natural and man-made isotopes we can calculate that sedimentation has been fairly constant through the 20th century. A large 1980s peak in sedimentation rate is however seen (below, dashed line). What caused this? It is probably a slump of marginal mud into the centre of the pond. We will use this dating information to help us explain other changes we measure in the sediment record.

More data can be found at: [http://www.opalesplorenature.org/?q=WaterResults](http://www.opalesplorenature.org/?q=WaterResults)
Contact the OPAL Water Centre by e-mail: [opalwatercentre@geog.ucl.ac.uk](mailto:opalwatercentre@geog.ucl.ac.uk)
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