

## Introduction

The **Virtual Catchment Laboratory (VCL)** is a new tool under development that will give non-academic professionals and the general public access to state-of-the-art environmental data and models. Initially focusing on the **Loddon** catchment, the VCL's first task is to provide an interactive platform for access to the results of a NERC Impact Accelerator project that mapped Ecosystem Goods and Services. Over the internet, users can view, localise the results, adjust colour schemes and scaling, and modify weightings.

## Implementation

All tools to be deployed as well as the interface itself have been, and will continue to be, driven by the anticipated user base. Workshops with stakeholders will inform the direction of the development and provide feedback on usability and utility. For the Loddon VCL, the main users are members of the **Loddon Catchment Partnership (LCP)**, details below). The LCP needs a tool to enable non-technical specialists to access and make sense of multiple data sources across the catchment to inform catchment planning and prioritisation of restoration measures.

The web interface thus far has been developed using HTML, CSS and JavaScript, utilising plug-ins such as jQuery, Turf, ColPick, and Google Maps APIs.

This initial implementation is designed for typical PC and laptop screen sizes and is intended to work with the standard browsers. The *alpha.2* version has been tested on iPads (using Safari) by a number of LCP members in a short workshop at the beginning of September (2015) where it received favourable feedback as well as suggestions and priorities for the coming weeks.

## Future work

This tool can already deliver research data in a way that is understandable to engaged users via an interface that is intuitive. The next step is to add more data, from many different sources, and begin to incorporate some process-based models.

A second VCL is already being planned for use by a water company in order to meet their regulatory requirements while ensuring residents, farmers and businesses within the catchment can understand the reasoning behind the requests and directives placed upon them.

## Technical Details

Source shapefiles are converted to geoJSON.  
 Future development: Models will be exposed as RESTful web services conforming to the Open Geospatial Consortium Web Processing Service interface standard using the Python-based PyWPS, a framework written in Python 2.6 for the implementation of WPS 1.0.0. Data access will depend on the size, format and location of the data. The web client will send the server an HTTP GET request to execute a process with a number of parameter values and, once execution terminates, an XML or JSON response is sent back and parsed at the client side to extract the results.

## Results – The Loddon VCL, Version alpha.3, September 2015

Examples of panel contents are shown below PLUS

a) Selection of markers to add to the current map to investigate point rather than spatial data:

b) Other related and useful sites:

c) And settings for using the site:

Land Cover examples:

Changing land cover type...

... and colours.

Ecosystem service example:

Adjusting "expert" weightings...

Natural Breaks on a B/W colour scale

Weights on a B/W colour scale

Weights on a user-selected colour scale

## The Loddon Catchment Partnership

The Loddon Catchment Partnership (LCP), formed under Defra's Catchment Based Approach initiative<sup>a</sup>, has obligations for the 680km<sup>2</sup> lowland area within the Thames river basin. The LCP is a consortium of partners within the catchment ranging from the Environment Agency (EA), water companies and local authorities to parish councils, environmental charities, farmers, and land-owners. Its main aim is to meet the EU Water Framework Directive<sup>b</sup> for "good status" for all waters bodies. EA investigations show that physical modifications, pollution from urban and rural areas (nitrogen, phosphorus, metaldehyde) and waste water are key challenges to the water environment in the catchment that the LCP need to address. Furthermore, the LCP partners are concerned with the flood risk within the catchment and the protection of habitats and wildlife as a whole.

<sup>a</sup> catchmentbasedapproach.org <sup>b</sup> ec.europa.eu/environment/water/water-framework

Some of the LCP partners