Assessing the ecosystem services of the UK gravel pit lakes

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Summary
There are more than 500 working sand and gravel quarries in the UK, and numerous extinct workings which have been flooded to form gravel pit lakes. To date, the primary repurposing of gravel pit lakes has been for amenity and conservation. However, ex-mining sites, which are usually located on river floodplains, may be potentially important in providing capacity for floodwater retention. Gravel pit lakes also collect sediments and thus may have potential for sequestration of carbon and removal of toxic contaminants which could influence downstream sites. The importance of gravel pit basins in provision of these ecosystem services on a national scale is currently not well understood.

Aim
This project aims to quantify the role of gravel pit lake complexes in flood mitigation, carbon sequestration and pollutant removal across a range of UK sites to inform guidelines for ex-gravel pit management.

Scope
Flood mitigation potential will be evaluated by use of continuous hydrological monitoring instruments at flagship East Midlands site Attenborough Nature Reserve to determine impacts of gravel pits on hydrograph timing and magnitude. The sedimentation and collection of carbon and pollutants will be achieved by field investigation of a number of UK sites where sediment traps will be installed and sediments analysed for elemental composition to establish collection rates of carbon and toxins. The work will include collection of primary field data using a boat, analysis of secondary monitoring datasets from hydrological monitoring and a previous long-term monitoring study at Attenborough Nature Reserve. The project will be supported by Cemex (UK) who will facilitate access to sites and monitoring datasets.

References

Applications
Please apply by using the application form sending completed forms to pg-funding@nottingham.ac.uk.
Applicants are required to complete the Equal Opportunities Form. Referee forms and guidance notes for referees are also available.

Applications will remain open until the scholarships are filled.

Applicants for the EWR doctoral programme should have at least a 2:1 degree in a Physical Sciences, Life Sciences or Engineering discipline.