# OC06 - How much organic carbon is buried in Britain's ponds?

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Ponds have been spotlighted as potentially powerful carbon sinks. This hypothesis is based on their high productivity, the burial of biomass in their often anoxic sediments and suggestions that their total global area may have been substantially underestimated. Whilst larger water bodies such as lakes, or terrestrial habitats such as deciduous woodland, feature in many estimates of carbon storage, ponds are a missing piece of national and global carbon budgets. This presentation outlines a first estimate for the total organic carbon (OC) stored in ponds in Britain. Carbon stocks were quantified in sediment cores taken from fifty-five ponds, chosen to include a diverse range of pond types. Forty of the ponds were from north east England comprising ten each from lowland arable fields, permanent pasture, dune slacks or wetlands. In addition, five ponds were sampled from each of three biogeographically diverse habitats elsewhere England: a lowland peat mire in Yorkshire, glacial relic pingo ponds from Norfolk and lowland heath on the Lizard peninsular in Devon. Cores varied between 20-30 cm depth and the carbon was measured at every 1cm distance down each core. The percentage of OC in sediments was strikingly different between pond types, e.g. lower in arable fields, higher in the pingo ponds. However when the carbon was expressed as g OC $cm^3$, to allow for the bulk density of sediment, the differences were markedly less, although individual ponds within each type were varied resulting in considerable overlap between OC measures for the different pond types. As a result there were few significant differences in the quantity of sediment OC between the pond types which allowed the data from all fifty-five ponds to be combined to give an overall estimate of OC in a standard volume of sediment 1 metre square by 20 cm deep, a conservative limit to the depth our coring. Estimates of the total area of pond habitat in Britain were taken from the Countryside Survey 2007, a national survey used to record the extent of habitats types throughout the country. Multiplying up the estimate of OC in the standard $1m^2$ of pond sediment based on our survey data by the Countryside Survey data for the total area of ponds gives a first approximation of OC in pond sediments for the whole of Britain. Furthermore, although the carbon values are for the UK they may be applicable to similar temperate regions of Europe and North America.