



# South West Climate Change Impacts Partnership (SWCCIP)

## House of Lords Select Committee on Science and Technology inquiry to examine water management

1. The South West Climate Change Impacts Programme (SWCCIP) is the regional partnership helping to investigate, advise and inform on the impacts of climate change in the South West across a range of sectors.

### **The impacts of climate change on water management**

2. The SWCCIP has a utilities sector group that is exploring how climate change will impact areas such as water management, in the South West. The South West's geography, popularity as a tourist destination and with more than two thirds of the land area supporting agricultural production, these factors present challenges for water management in a changing climate.
3. Climate change is potentially the most serious problem affecting water resources in the longer term and the one with the most uncertainty attached to it. The SWCCIP's scoping study "Warming to the idea"<sup>1</sup> outlines in detail the impacts of climate change on water resources, in terms of challenges and opportunities. The key issues for water management in the South West, as a direct result of climate change, can be divided into seasonal climate impacts and the subsequent challenges and opportunities arising from those impacts.
4. The UK Climate Impacts Programme climate scenarios suggest that the South West will experience drier summers with higher summer temperatures. This presents a number of challenges, including increased evaporative losses from surface water stores, an increased risk of water demand rises leading to reservoir draw down and an increased risk of algal blooms and eutrophication in reservoirs containing reduced water levels and low inflows.
5. These factors could lead to a likely reduction in deployable output. Using the results of the UKCIP 2002 scenarios<sup>2</sup> a recent UKWIR report<sup>3</sup> indicated that by the 2020s the reduction in the late summer mean river flow could be as much as 42%, assuming a medium emissions scenario. Computer models of the region's water resources system show that these changes in river flow translate into a significant loss of deployable output.

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<sup>1</sup> *Warming to the idea*, January 2003 [www.oursouthwest.com/climate/scopingstudy.htm](http://www.oursouthwest.com/climate/scopingstudy.htm)

<sup>2</sup> *Climate Change Scenarios for the United Kingdom*, Tyndall Centre and Hadley Centre, April 2002

<sup>3</sup> *Effect of Climate Change on River Flows and Groundwater recharge: UKCIP02 Scenarios*, UKWIR Report Ref N<sup>o</sup> 03/CL/04/2

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6. The reduction in river flows will lead to poorer water quality, as there will be less water available for dilution and therefore increased stress on the aquatic environment. This in turn is likely to lead to tighter environmental authorisations (abstraction licences and discharge consents) and therefore further reductions in deployable output.
  7. Many water companies are experiencing increasing problems with the eutrophication of reservoirs. This is expected to get worse over the next 5 to 10 years and is largely the result of agricultural run-off flowing into reservoirs. Eutrophication causes the production of excess water treatment works sludge and can, in extreme cases, result in reservoir water being virtually untreatable by normal means and too polluting to be released into a river. This leads to increased operating costs and a reduction in deployable output. The higher temperatures that are projected from climate change will exacerbate these eutrophication problems, as some algae will be able to over-winter. One way of reducing eutrophication is to install destratification scheme at vulnerable reservoirs that pump air into the water and produces a mixing effect. However they require the use of energy, the cost of which can be expected to increase as fossil fuel dependency reduces.
  8. The changing climate is also expected to bring an increase in winter rainfall. This impact could result in increased run-off, which can lead to over-stressing and backing up of the sewer network. There are also problems associated with the transfer of sewage sludges to agricultural land though difficulty in spreading and land access and an increased potential for nitrate flushing into water stores and courses. Increased winter rainfall could also lead to further soil erosion and sedimentation. Yet rising winter rainfall could also bring potential opportunities for water management in the South West, with greater potential for increasing water releases for hydropower and greater potential for one-season recharge of larger reservoirs and aquifers. Incidents of flooding are also expected to rise with climate change, which could result in the potential over-loading of sewage treatment plants, over-stressing and backing up of the sewer network. Water distribution may also be adversely affected by localised flood events.
  9. Rising sea levels may reduce the deployable output of both surface water and groundwater sources. Major river intakes are often placed as close to the tidal limit as possible in order to benefit from the maximum catchment area. If sea levels rise, it is possible that some of these intakes will be in brackish water. There is potential for saline incursions into water abstraction plants near river mouth (e.g. Exeter) as well as the potential for saline incursions into groundwater abstraction boreholes (e.g. Dawlish), both of which will affect the deployable output.
  10. Whilst the impacts of climate change on the South West may present an opportunity for a longer growing season, this could lead to more intensive land use and greater incidence of winter ploughing, with associated sediment erosion into reservoirs and storm sewers.
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11. The climate has already changed over recent decades and will continue to do so at an increasing rate, yet the nature, timing and extent of necessary adaptation to our changing climate is not yet well understood. There is a need to develop and disseminate sector-specific information and advice for businesses and organisations that emphasise the 'must dos' and mechanisms are needed to ensure that lessons learned are promulgated widely. The SWCCIP aims to help investigate and deliver the necessary solutions to enable the South West region to adapt to climate change.

Sarah Hendel-Blackford,  
South West Climate Change Impacts Partnership Coordinator  
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