

Future water uses, abstraction and alleviation Fiona Bowles

Water and sewerage companies



13 water and sewerage companies and 10 water only companies.

Supply 1.3 million customers with around 360 million litres water.

Treat nearly 500 million litres of sewage from 2.6 million customers every day.



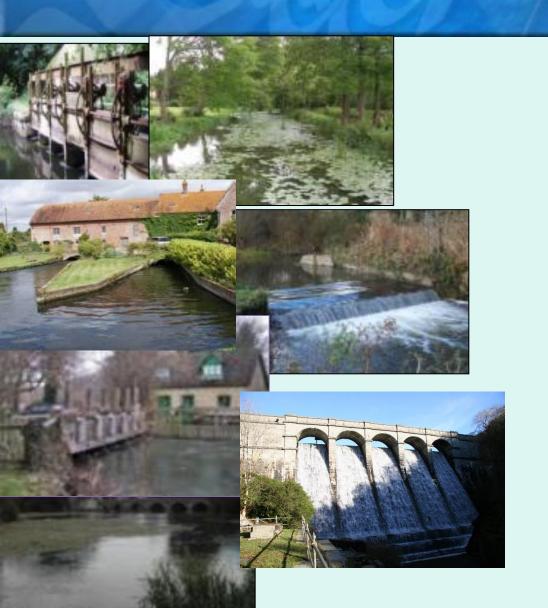
Water efficiency - starting position





The Challenge for British Rivers;





National Population:

2011- 63 million 2035- 73 million

One of the highest densities in Europe – little space for rivers

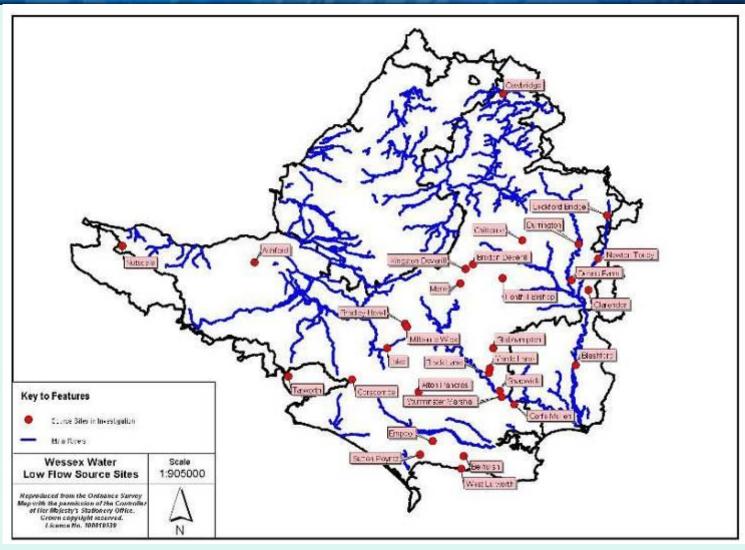
Each person uses 150I/d of water has an average water footprint of 4645I/d (40% of which is from the UK)

And they all produce phosphate....

Environmental Investigations

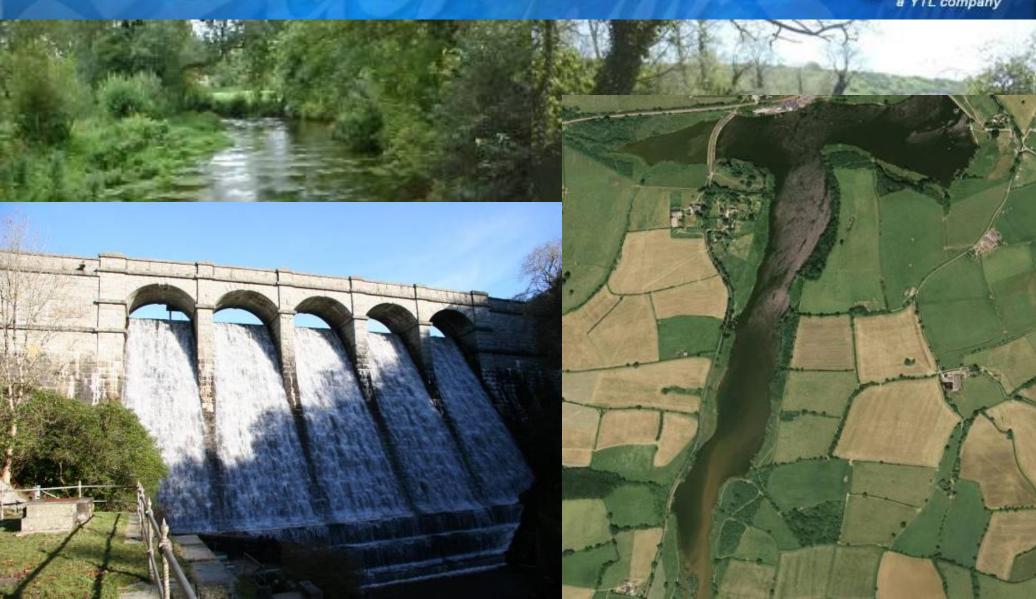






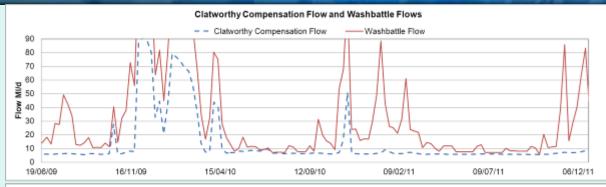
The effects of abstraction on rivers

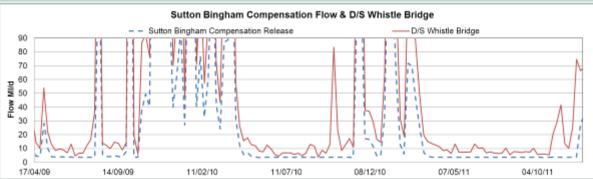


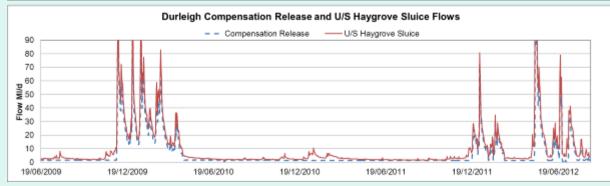


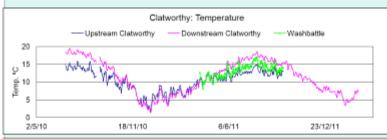
Flow & temperature for 3 Somerset reservoirs

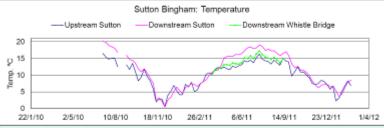


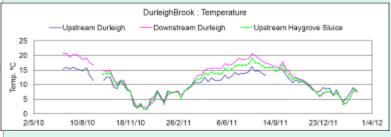






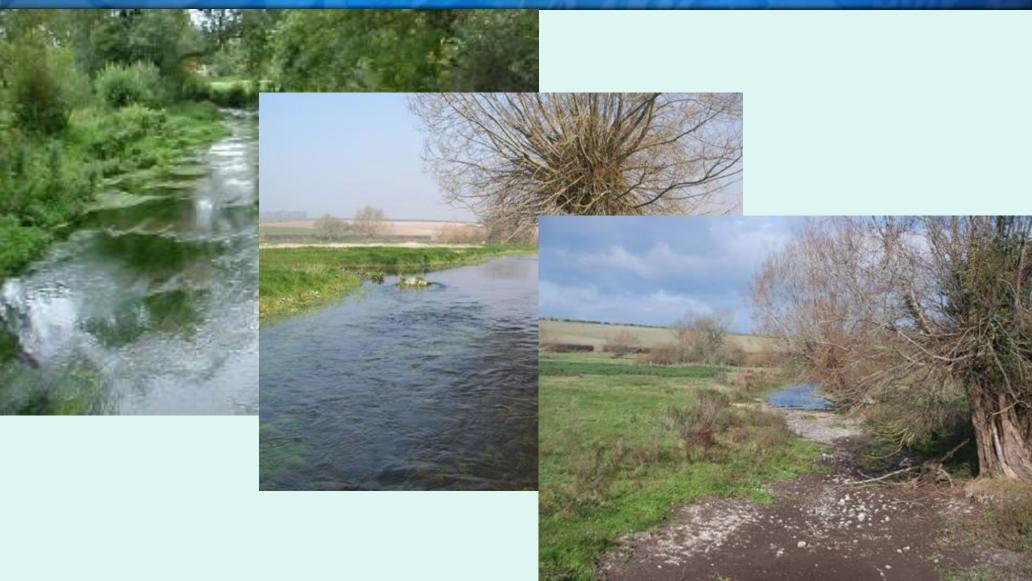






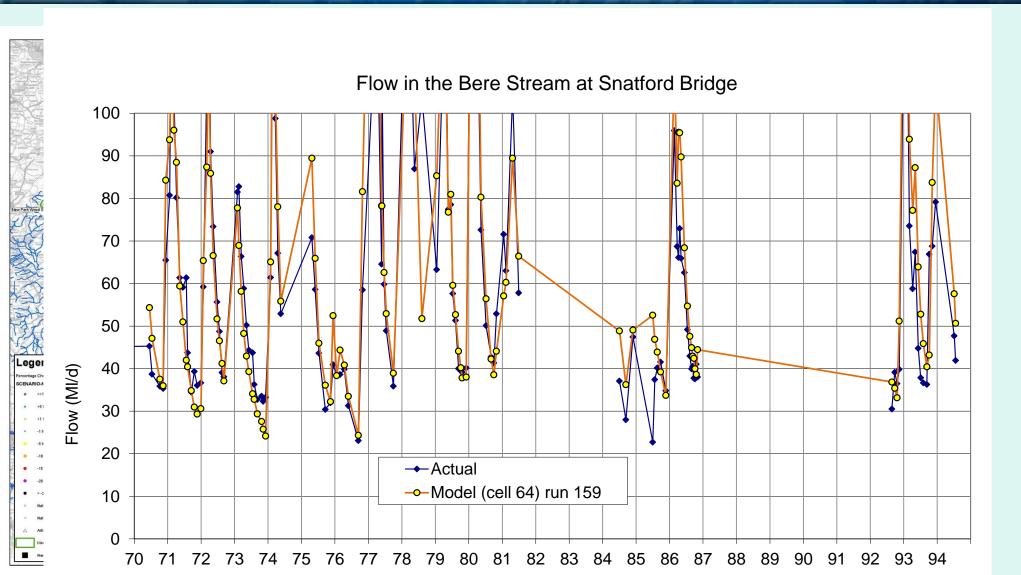
Abstraction in Chalk streams





Chalk – groundwater modelling of flows





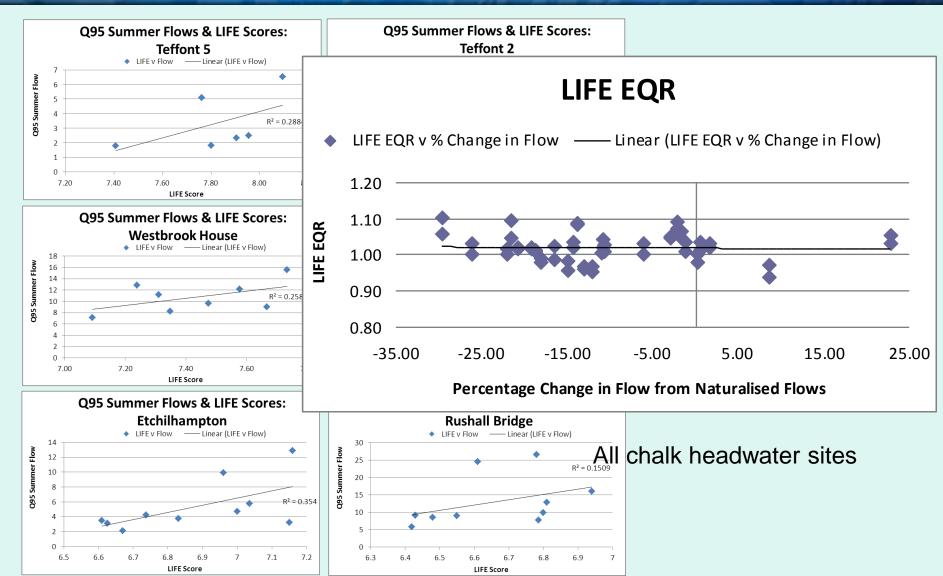
Estimating the impact on flow





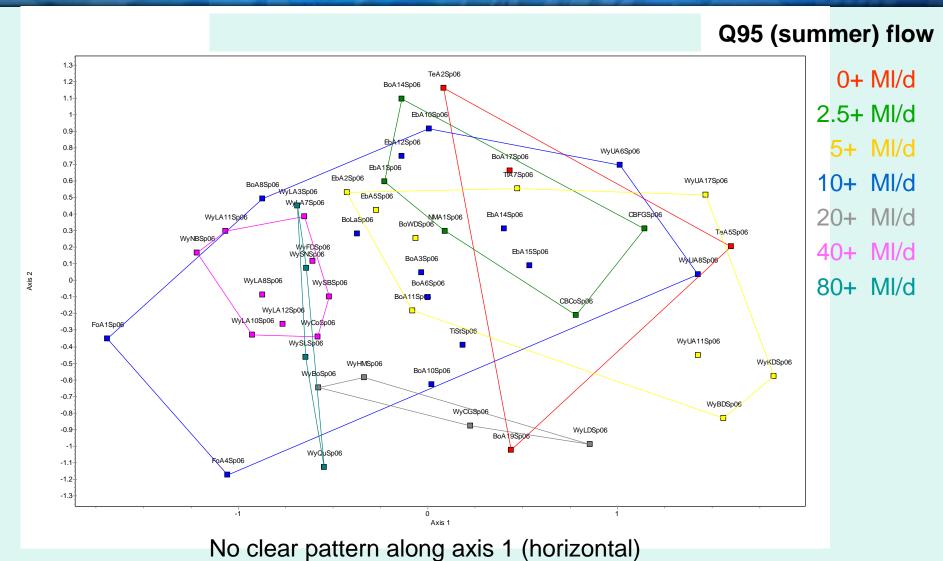
Effect of flow & abstraction on LIFE score





Effect of flow on the macroinvertebrate community (Avon sites)





Effect of temperature on the macroinvertebrate community





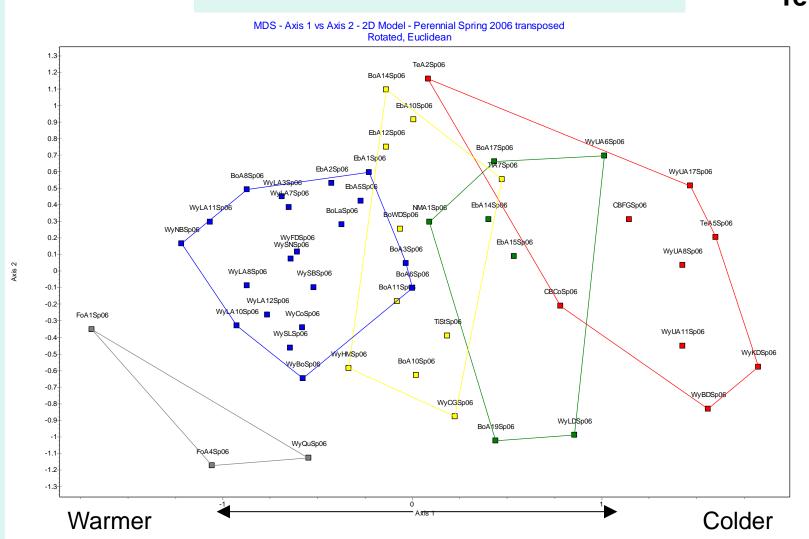
11°C +

12°C +

13°C +

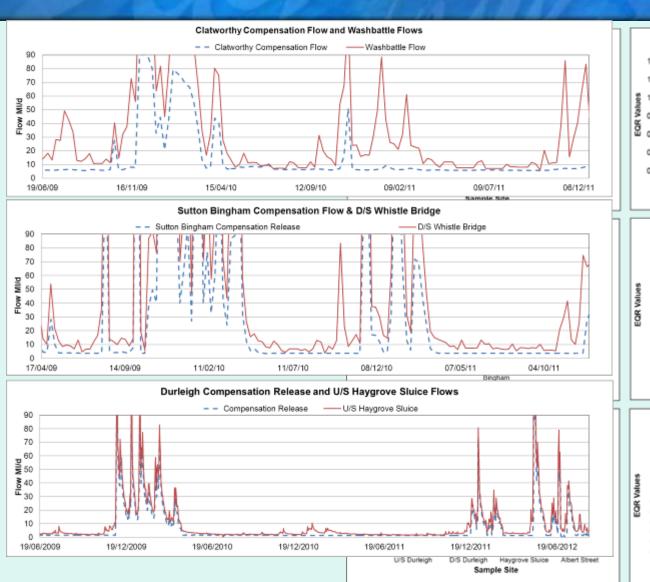
14°C +

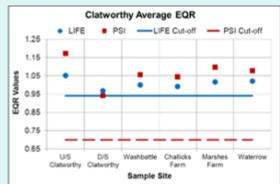
15°C +

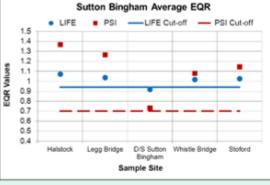


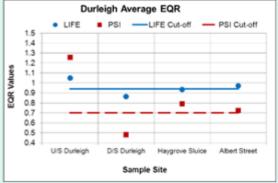
Flow and LIFE scores for reservoirs





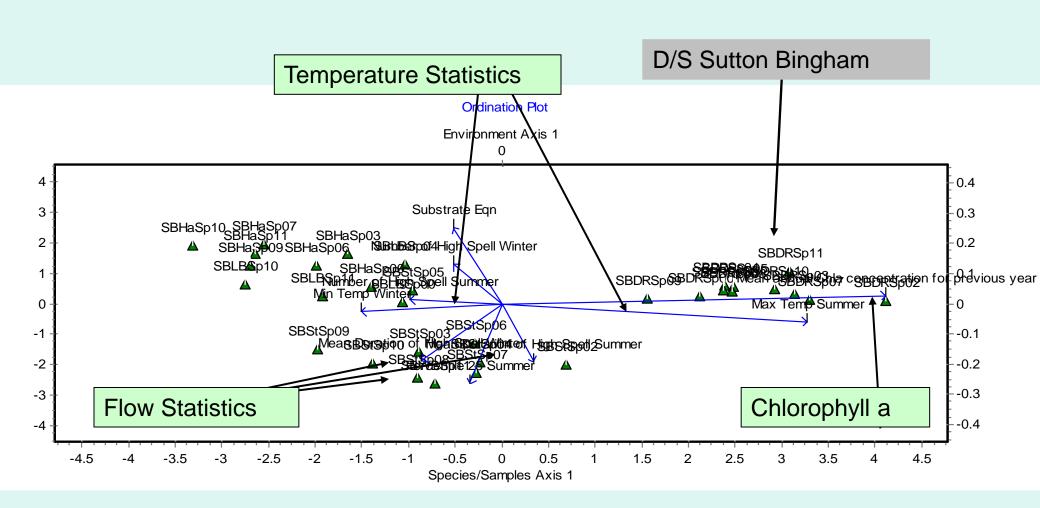






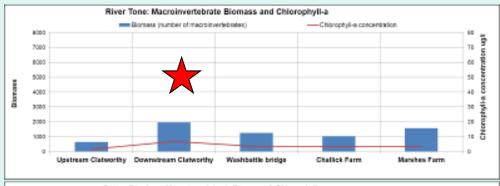
Multivariate Output: Sutton Bingham Reservoir

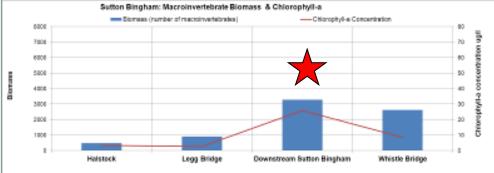


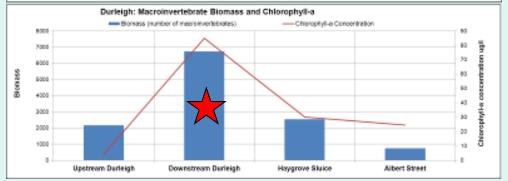


Impoundment effects on abundance









mesotrophic

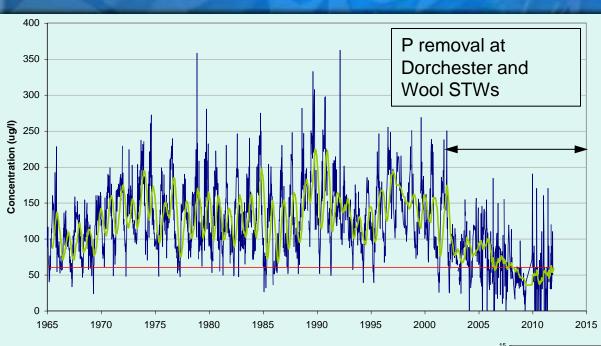


Sites immediately downstream of impoundment

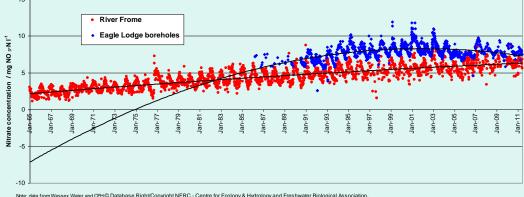
hypertrophic

Nutrient trends on the River Frome





Comparing the nitrate concentration in the River Frome (at East Stoke) and Eagle Lodge groundwater

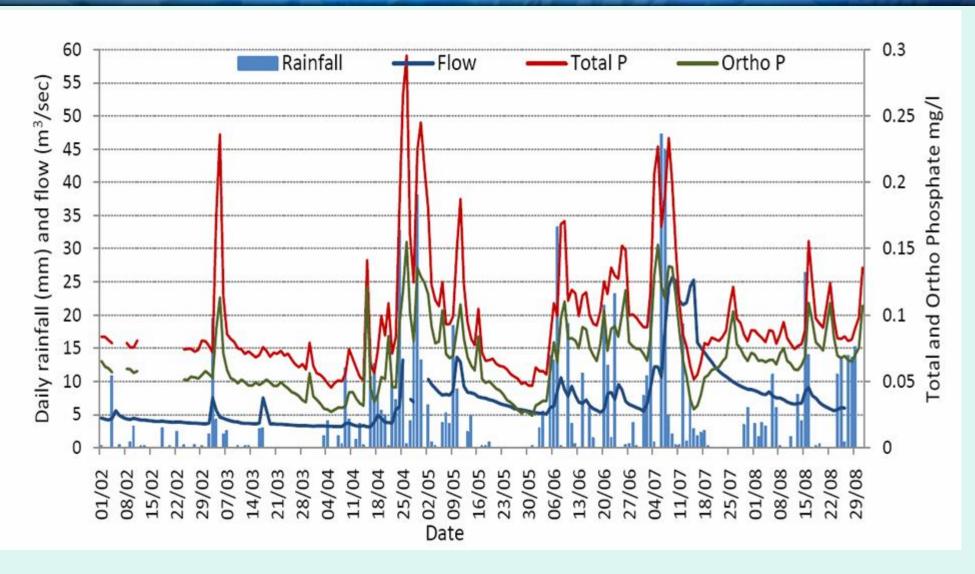


Note: data from Wessex Water and CEH© Database Right/Copyright NERC - Centre for Ecology & Hydrology and Freshwater Biological Association. All rights reserved.

Source: FBA, CEH, Wessex Water

Online continuous monitoring station





River ecology impacts



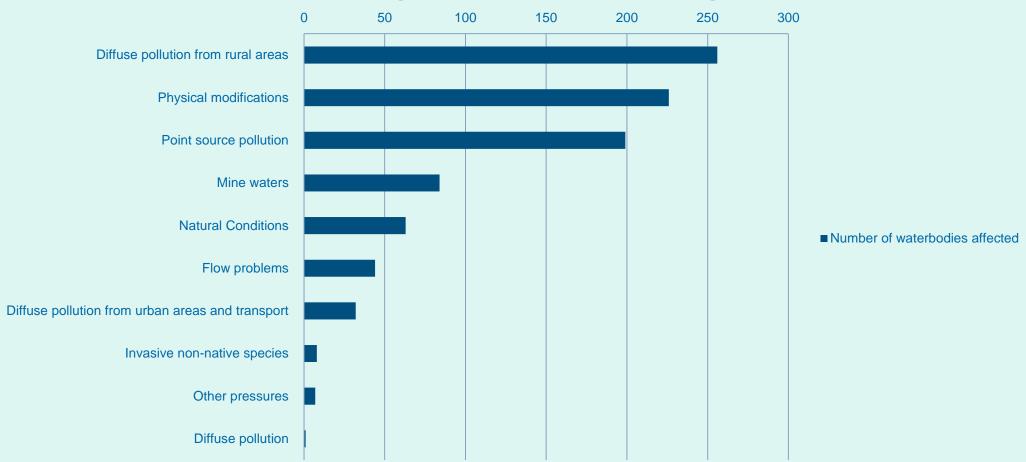


- Flow- size of river, depth & width
- Gradient
- Temperature
- Nutrient
- Suspended solids
- Impoundment
- Chlorophyll a

Problems affecting water in the SW (2012)



A chart showing pressures that are causing failures



Provided by the Environment Agency

Abstraction-Water resource management plans





- Supply demand balance
- Consultation
- Environmental and Social costs
- Carbon costs
- •Strategic Environmental Assessment
- Climate impacts



What does society want?



Draft Charter for Chalk Streams

Introduction

Over 85% of the chalk streams on this planet are in England yet the condition of these iconic waters are a national disgrace; they suffer from pollution and over-abstraction and have experienced a significant loss of their natural habitat. Both industrial and housing developments are approved in

Angling Trust, Feb 2013

Some stakeholder views...



COMPLAINT TO THE COMMISSION OF THE EUROPEAN COMMUNITIES
CONCERNING THE FAILURE OF THE UNITED KINGDOM (UK) TO COMPLY
WITH THE HABITATS DIRECTIVE (92/43/EEC) IN RESPECT OF THE RIVER
AVON ('THE HAMPSHIRE AVON') DESIGNATED AS A SPECIAL AREA OF
CONSERVATION

But the majority...



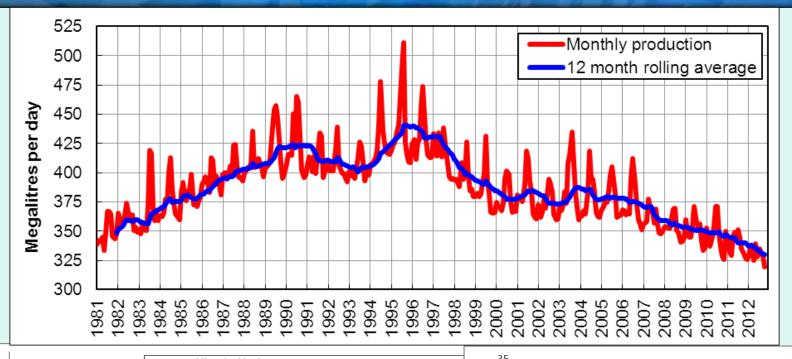


WTP survey 2012

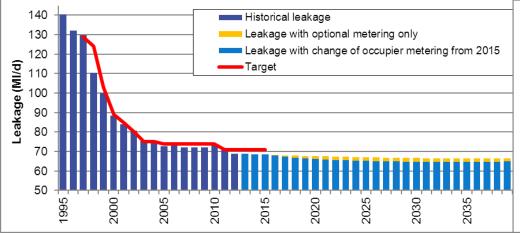
- 86- environment
- 146 water conservation
- 74 avoid interruptions
- 12 worried about hosepipe bans
- 292 wanted the lowest bill

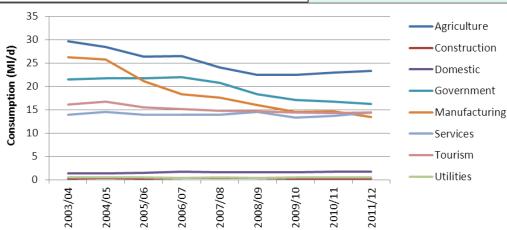
Trends in demand for water- Wessex Region





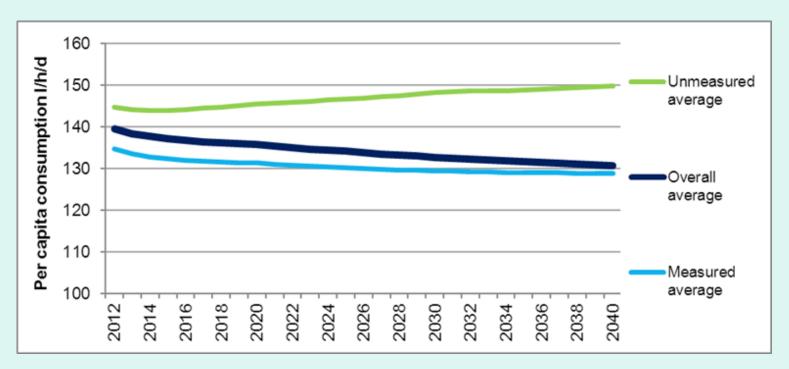
1981-2012





Per capita consumption - future





- Wessex region forecast a decline130 l/h/d by 2040
- Demand per person must come down if population is to grow

From 'silo' 'to 'catchment management'



Dorset Wild Rivers

Rehabilitating the River Frome

Strategy for managing Nitrogen levels in the Poole harbour catchment to 2035

Catchment sensitive farming

FWAG South West Natural England

Wessex Water

Catchment Initiative

Piddle

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Frome

Wild Purbeck

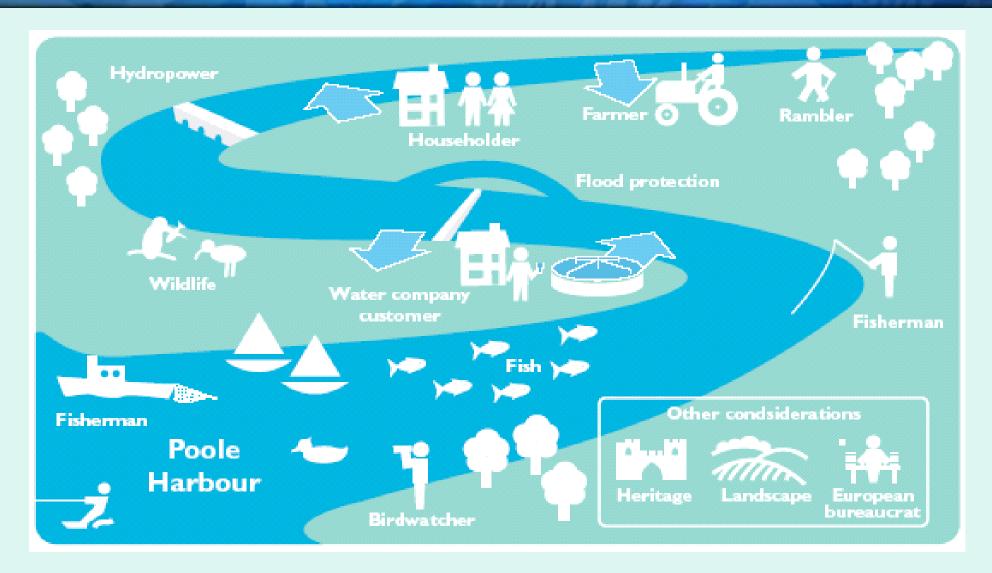
River Frome Salmon Project

Frome water level plan

Frome and Piddle catchment initiative December 2012

The move to the catchment approach



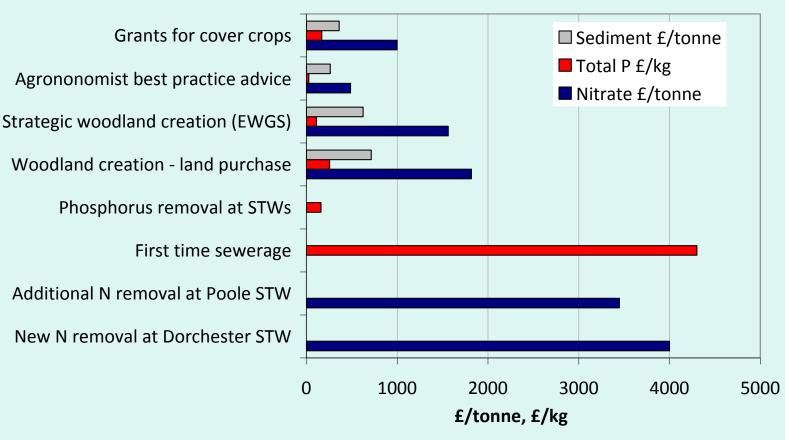


Making benefit based decisions





Indicative value



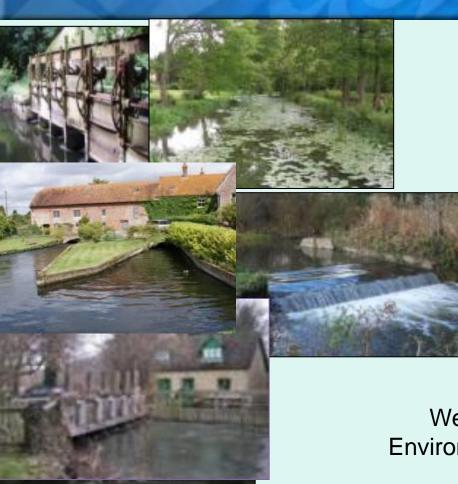
Delivering improvements 2015



- Reduction in abstraction-minor
- River restoration for flow
- Catchment management
 - For nitrate (drinking water treatment)
 - For phosphate to protect drinking water sources
 - To reduce impact of reservoirs downstream
 - To offset sewage treatment inputs
- Test AIM incentives to use sensitive sources least

The future of British Rivers will depend on





- Good science
- Adaptive management
- Partnership
- Society that cares

Thanks to:

Wessex Water, APEM, CASCADE
Environment Agency and Natural England
& partners on the
Wessex Chalk Stream Project
Frome & Piddle Catchment Initiative