

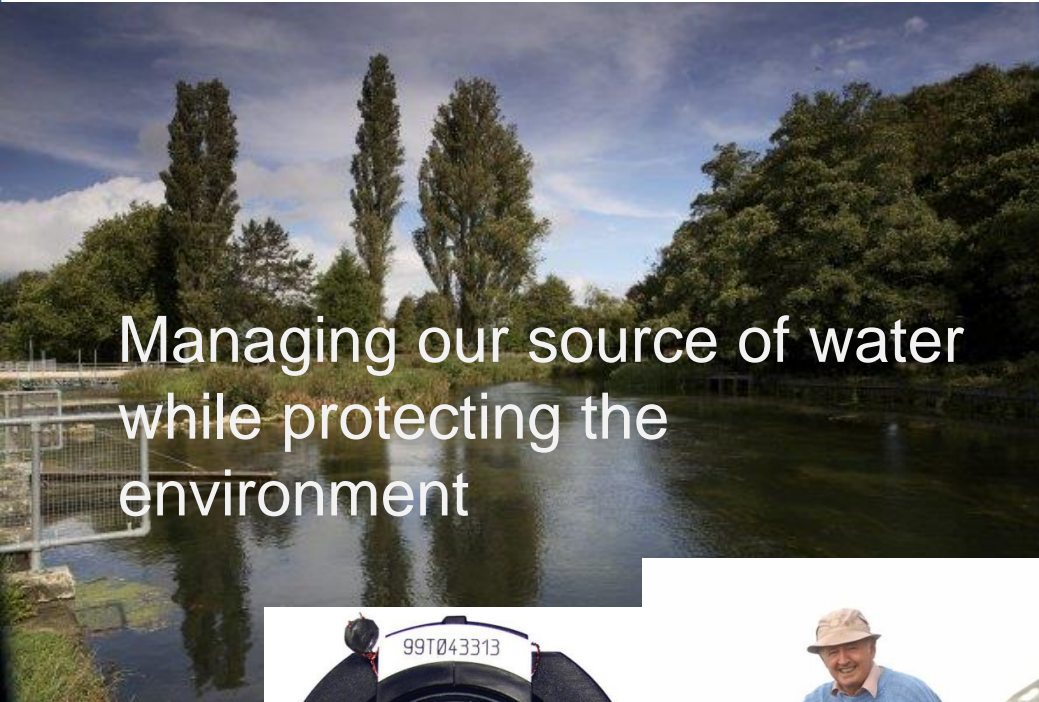
UK Drought: Experiences and Planning Framework

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Outline

- ➔ EA role in water resource management
- ➔ History of droughts in UK
- ➔ Current drought risk and challenges
- ➔ Drought planning and response
 - ➔ Legislative framework
 - ➔ Mechanisms and interventions
 - ➔ Governance arrangements
- ➔ Long term resilience
- ➔ Conclusions

Managing water resources – our role



Managing our source of water while protecting the environment



Managing public water supplies

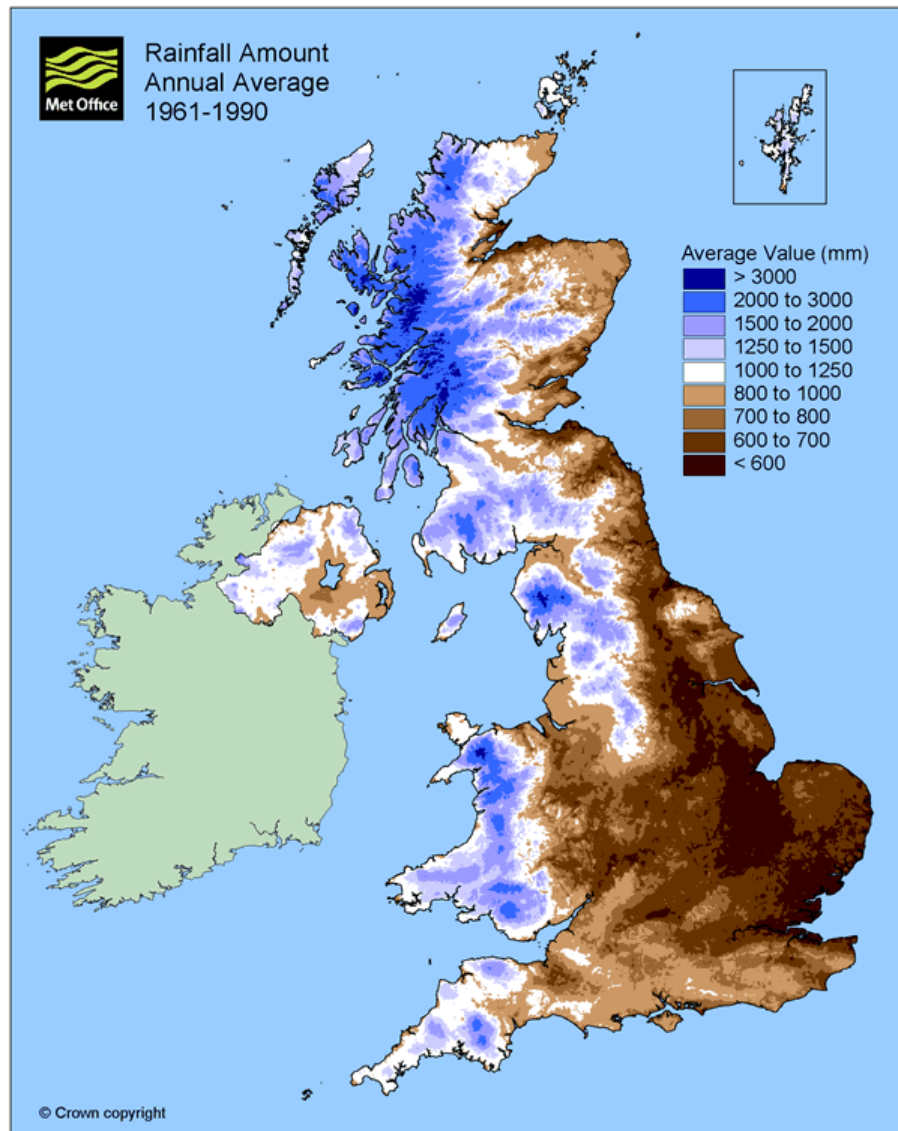


Encouraging a wise use of water

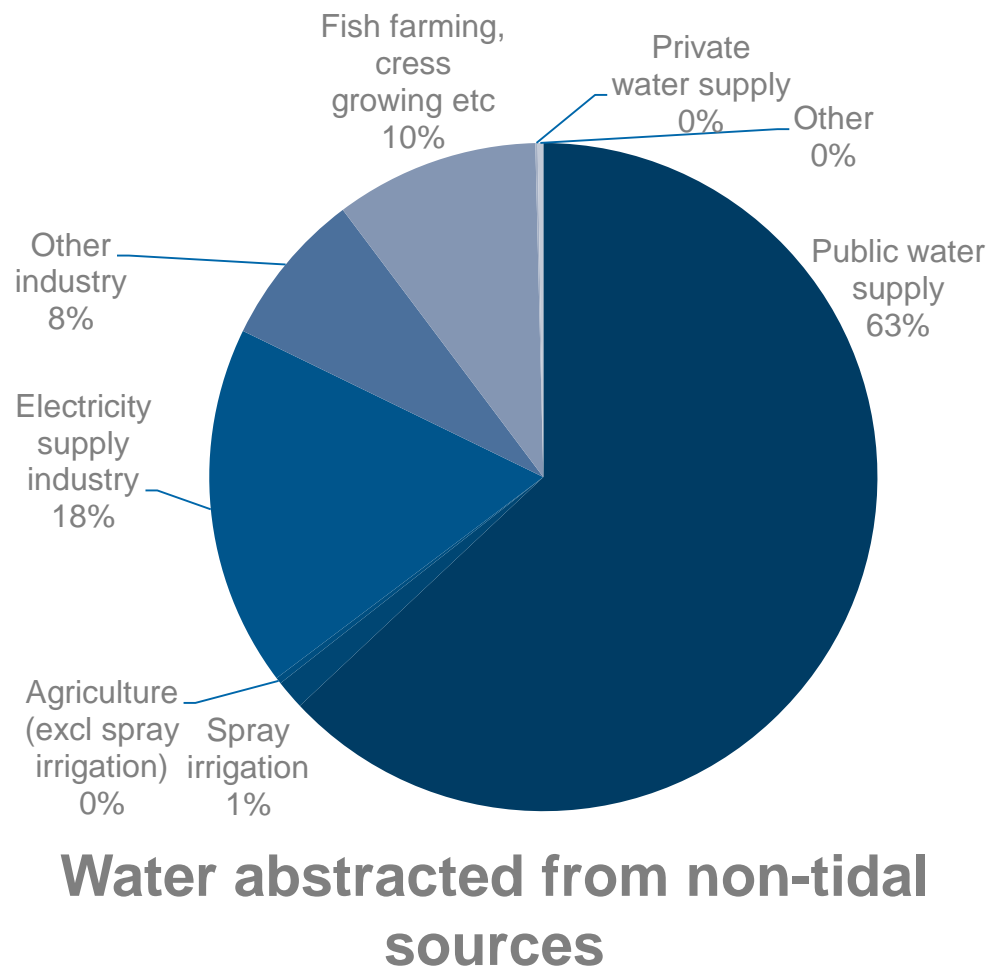
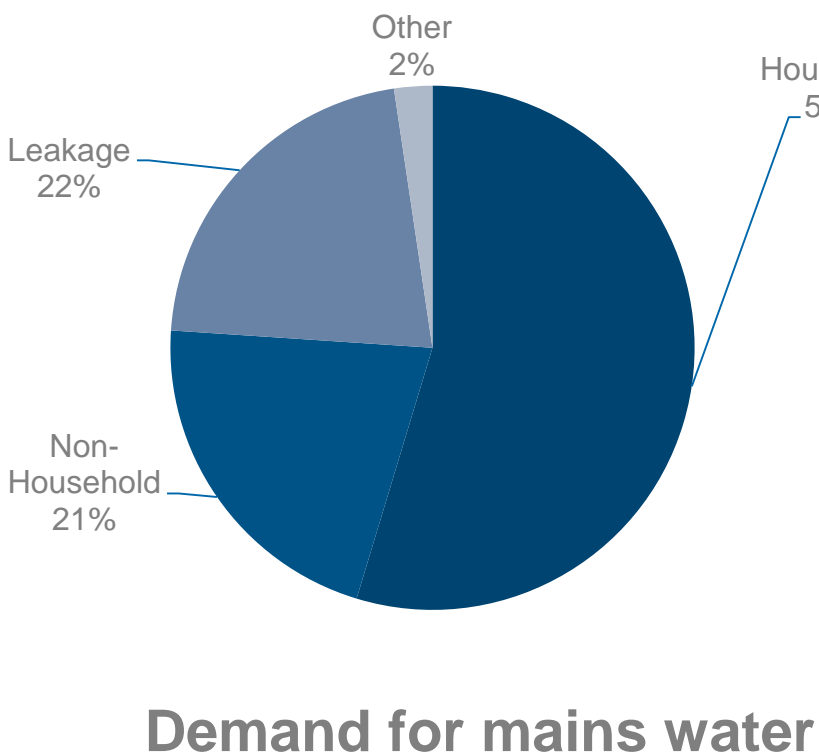


Managing droughts

Average UK rainfall

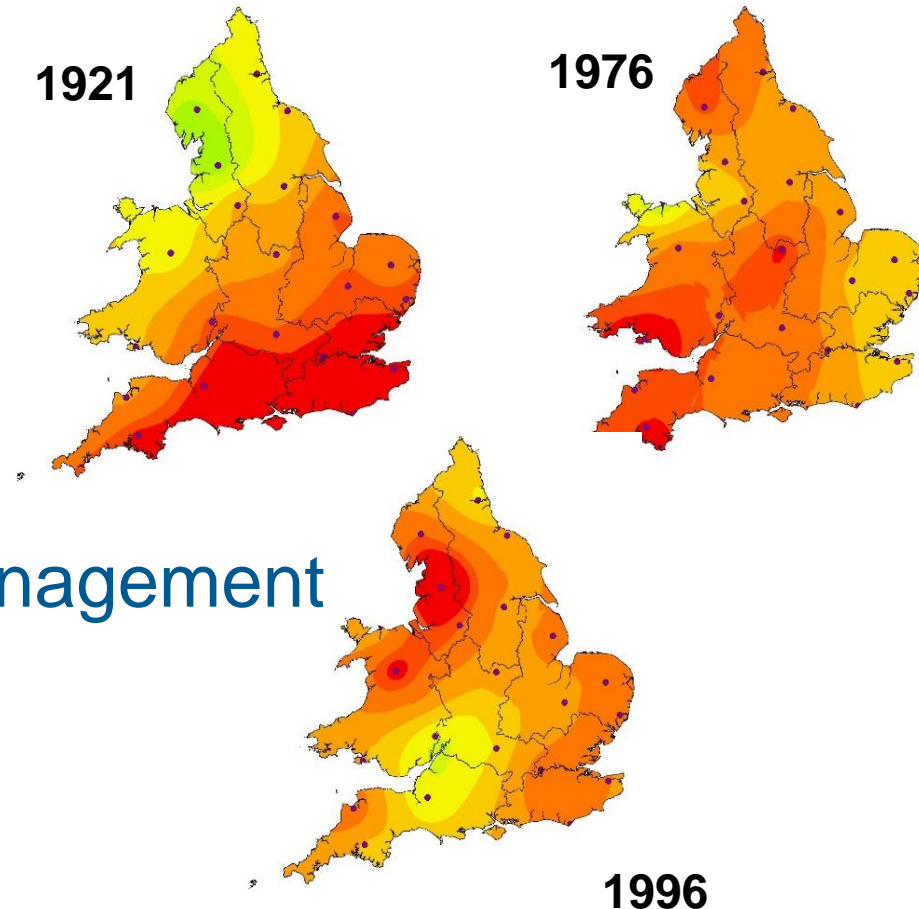


Where does the water go?



Droughts: UK historic

- ➔ Spatial variation
- ➔ Temporal variation
- ➔ Impacts vary by sector
- ➔ Improvements in risk management
 - ➔ impacts not as severe



Source: Water UK Long term planning framework. Aridity Index calculated for 1921, 1976 and 1996 events

1976 Drought - standpipes



1995 – North East



2010 – 2012



River Teme- April 2012



Ladybower Reservoir- September 2011



Howden Reservoir - July 2011



Tittesworth Reservoir 2011

What is the current challenge?

- Much of England is at 1% risk of **severe water supply** restrictions in any year

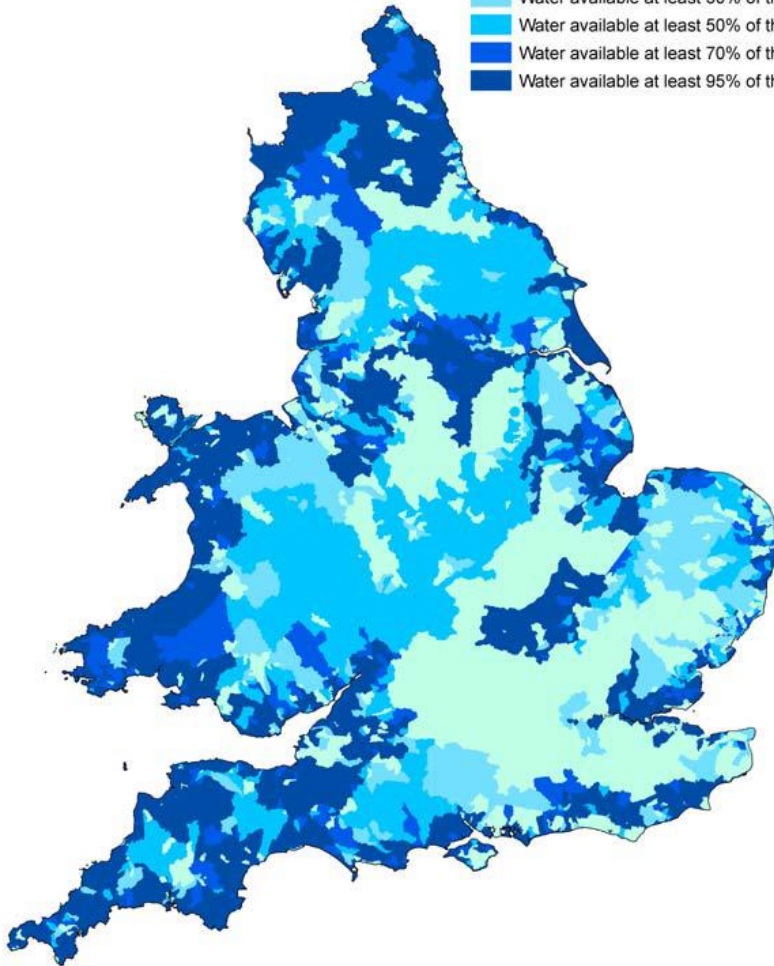


- Risk is likely to **grow** with future pressures.....
- Socio- economic costs of an extreme drought could be **billions**

Current water availability and pressures

Water resource availability

- Water available less than 30% of the time
- Water available at least 30% of the time
- Water available at least 50% of the time
- Water available at least 70% of the time
- Water available at least 95% of the time

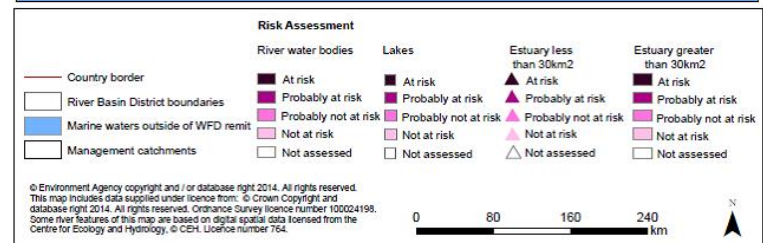
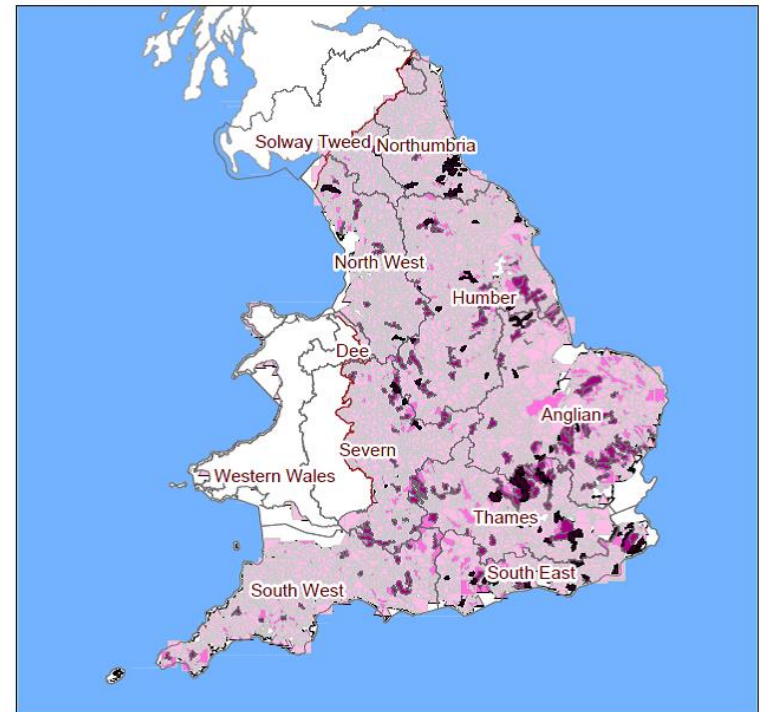


Water resource availability

Risk of failing to meet status and no deterioration objectives by 2027 due to pressure from Abstraction and Flow in Rivers, Lakes and Estuaries

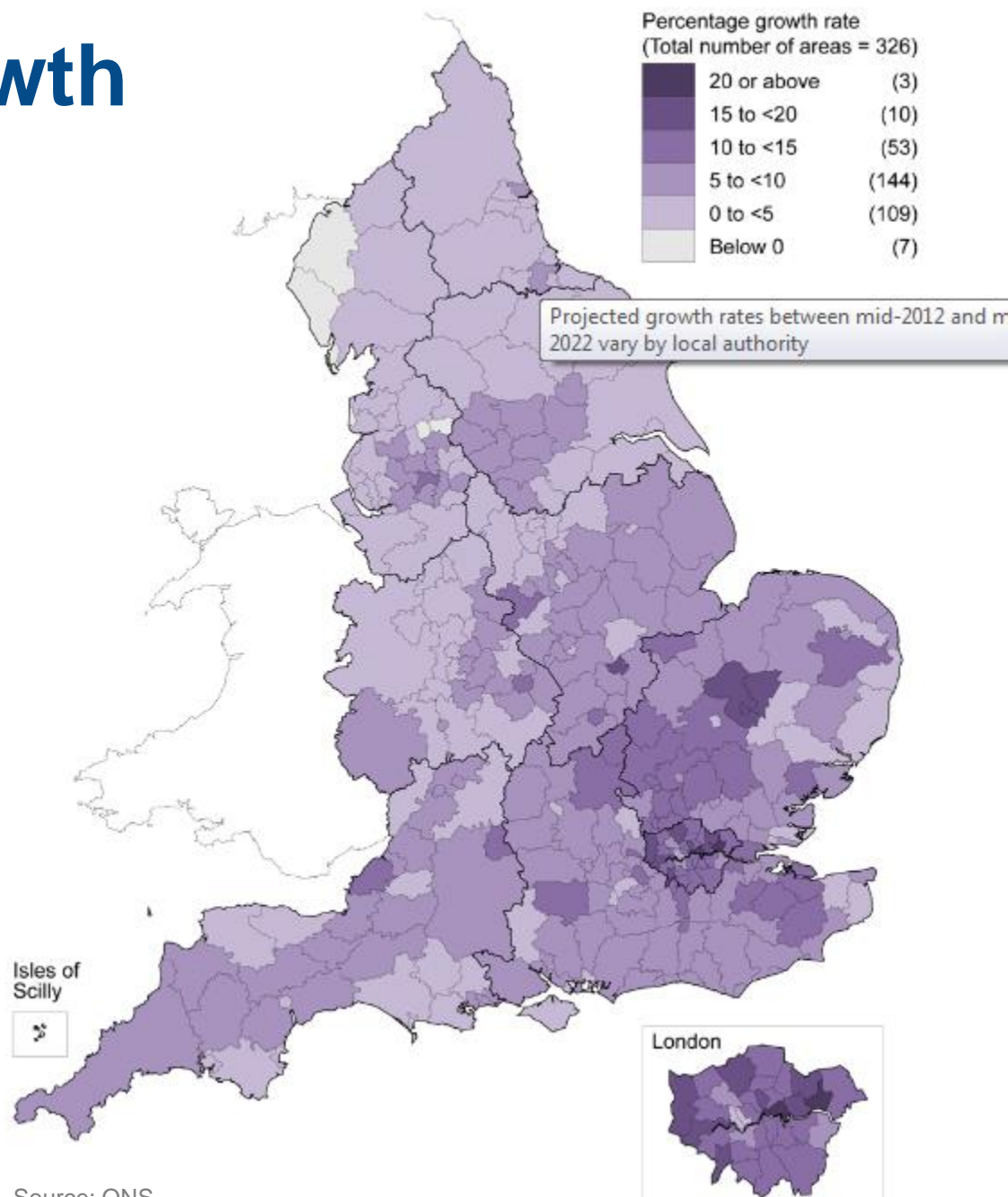


England

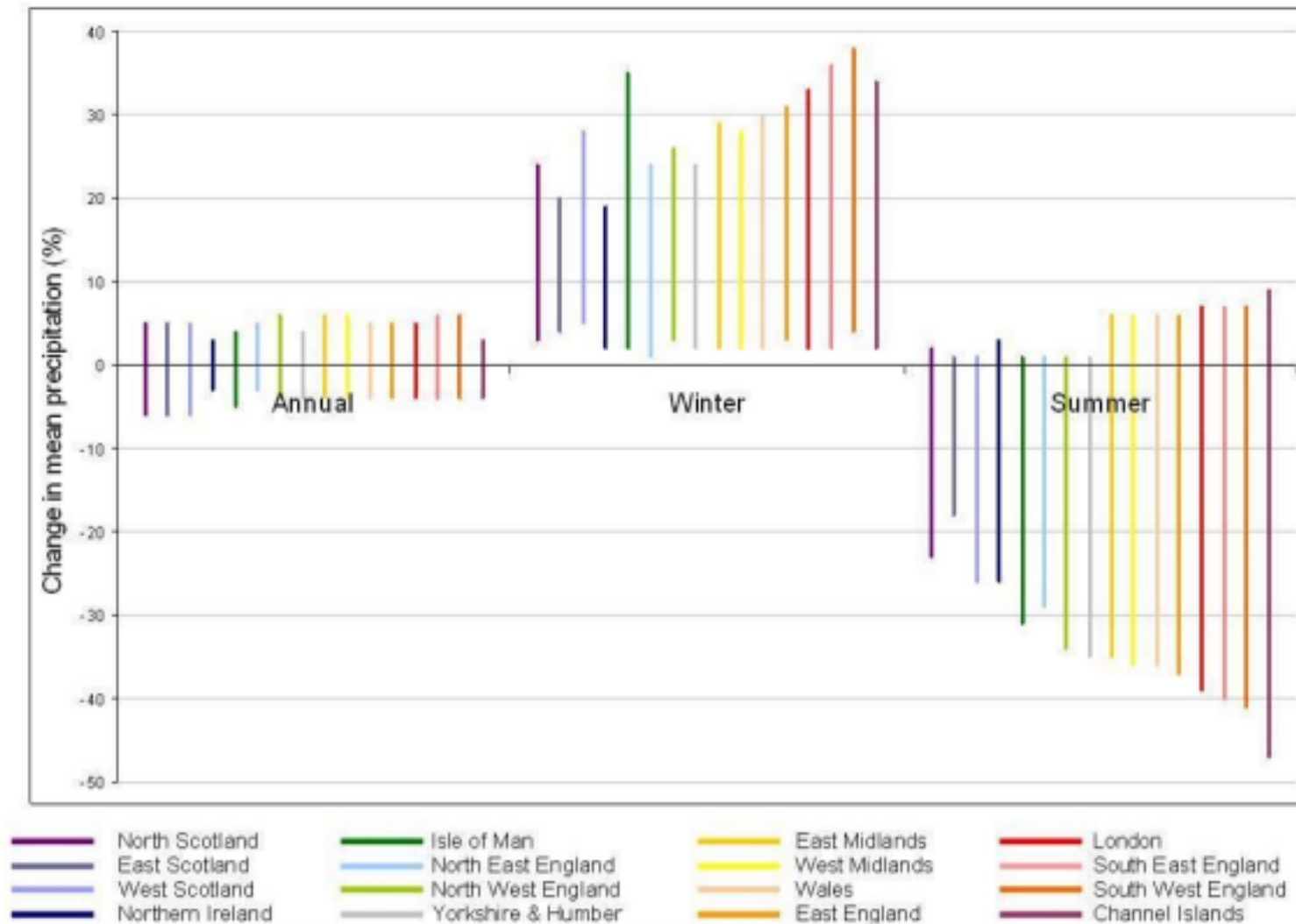


Population growth

Projected population growth rate by local authority, England, mid-2012 to mid-2022

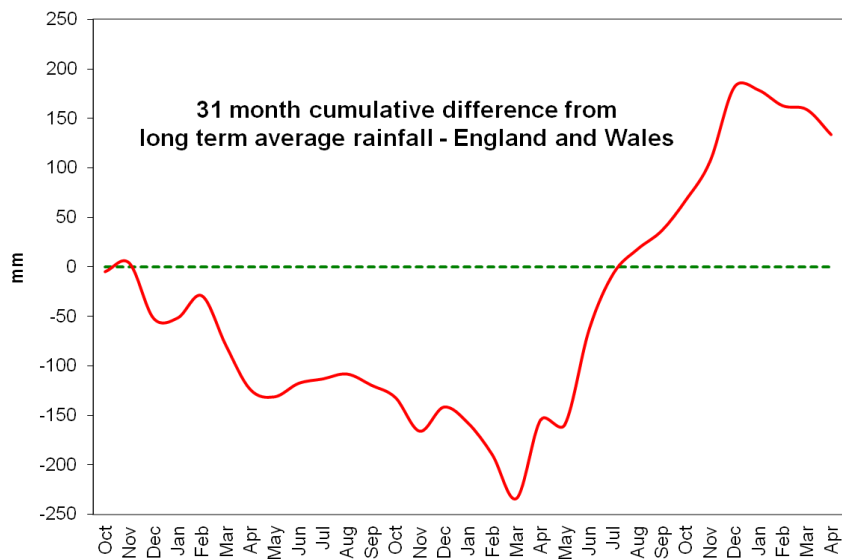


Climate change



(Source: Met Office from CCRA1 2012).

From drought to flood



Public Perceptions: A challenge



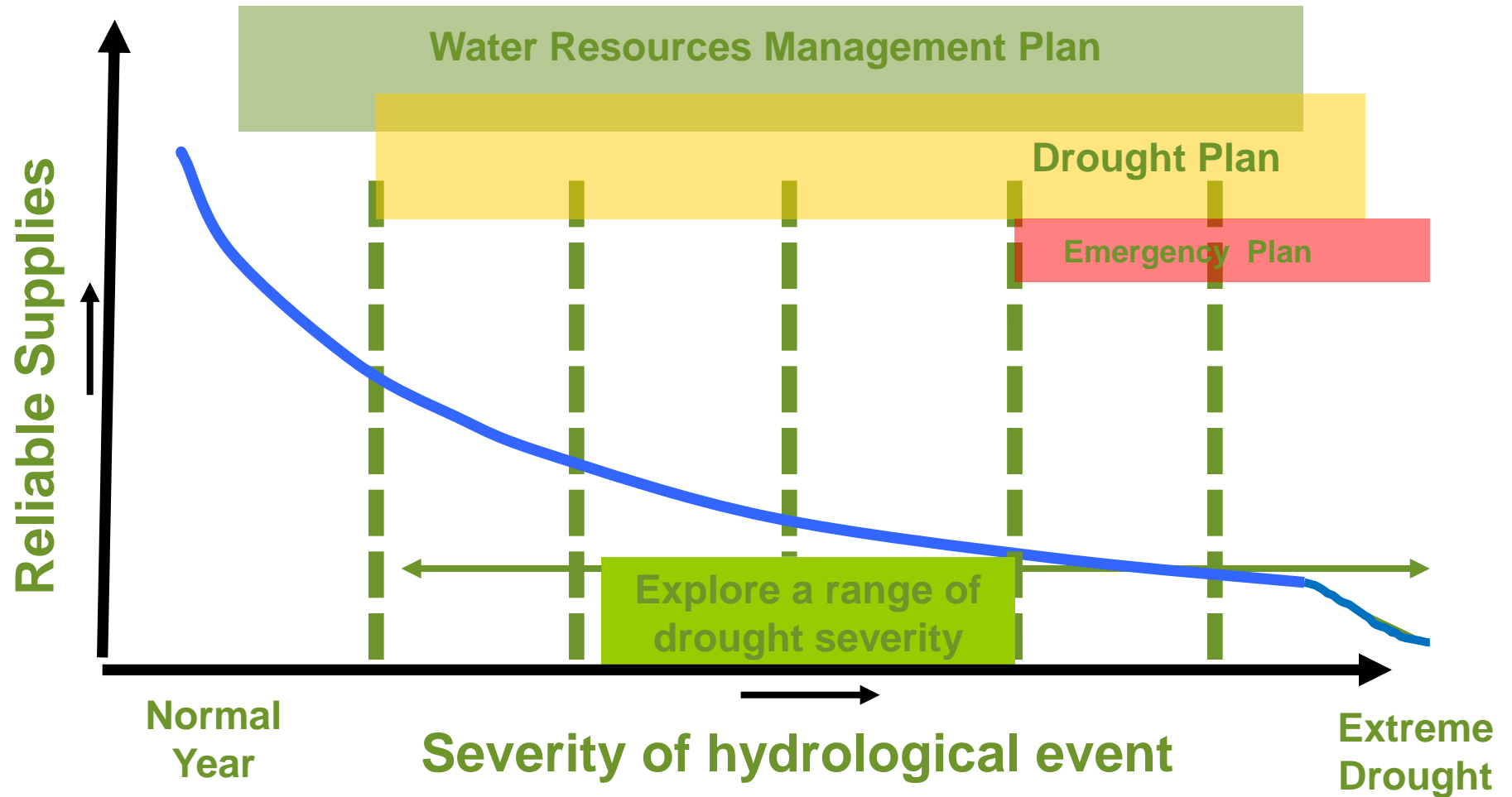
Legislative framework

- ➔ Water Industry Act, 1991, Section 76
- ➔ Water Resources Act 1991 (amended by Environment Act 1995 and Water Act 2003) – Sections 73 - 81
- ➔ Flood and Water Management Act 2010
- ➔ Drought Direction 2011 affecting the 'non-essential uses

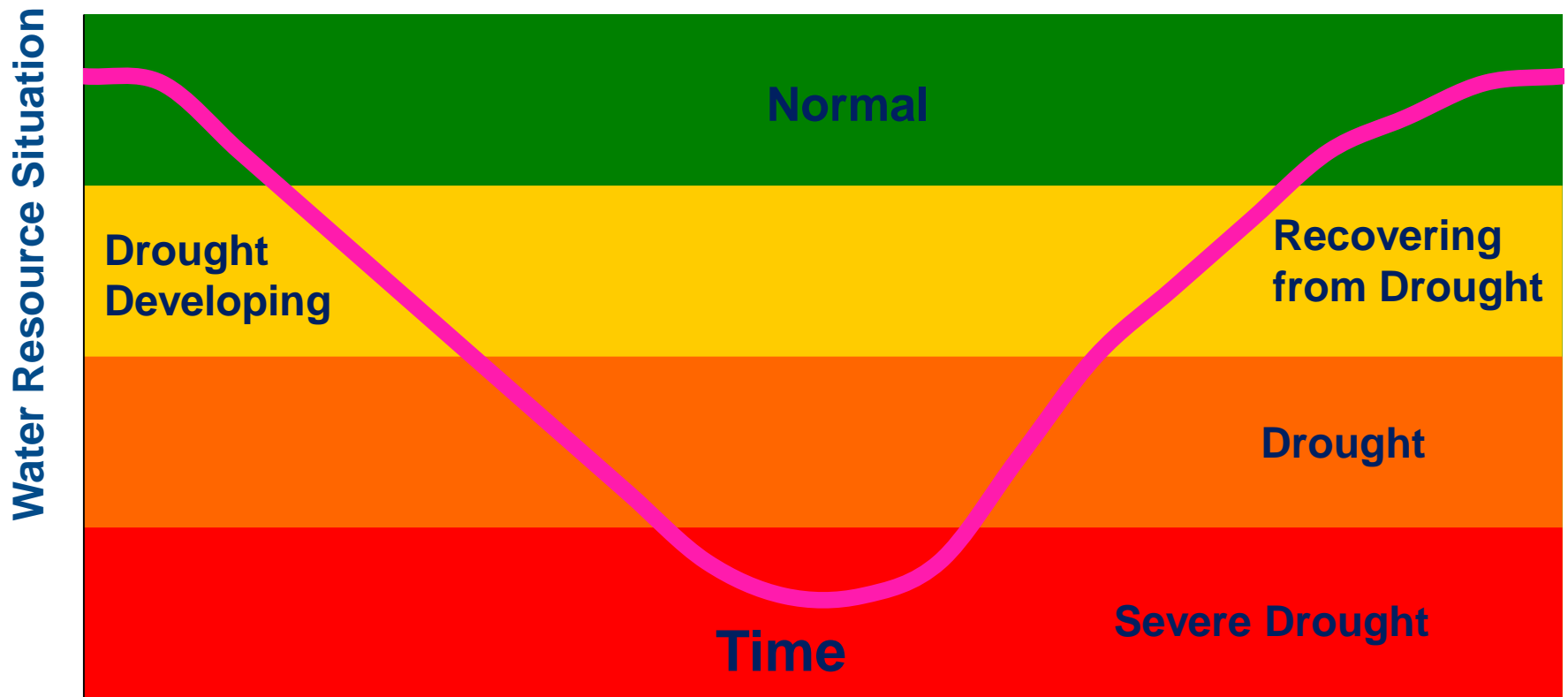
Water Act 2014

- ➔ New resilience duty for Ofwat as economic regulator to ensure companies invest
- ➔ Power for Secretary of State to direct water companies on security of supplies
- ➔ Measure to make it easier for water sharing across sectors
- ➔ Co-ordinating statutory cycles for long term water resources and drought planning

Water Company Planning



EA Drought Response



Bringing together science and public perceptions to describe droughts

Drought interventions

Environment Agency (by area)

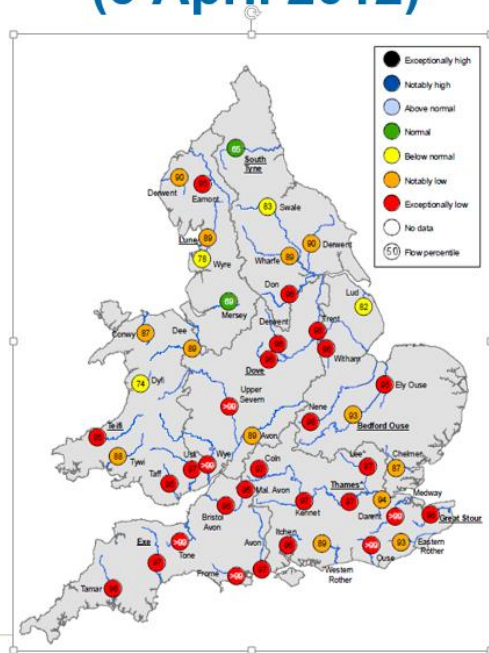
- ➔ River support schemes
- ➔ Environmental incidents response
- ➔ Abstraction cessation conditions
- ➔ Voluntary abstraction restrictions
- ➔ Section 57 restrictions (on spray irrigation)
- ➔ Environmental drought orders

Water companies (by water supply zone)

- ➔ Customer campaigns
- ➔ Temporary use (hosepipe) bans
- ➔ Water supply drought permits
- ➔ Water supply drought orders
- ➔ Drought orders to restrict business uses/other abstractors
- ➔ Tankering/water transfers
- ➔ Emergency drought orders

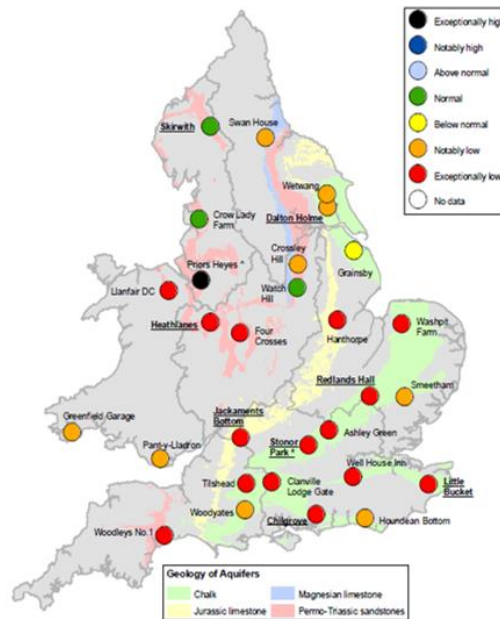
EA drought monitoring programme

River flows (3 April 2012)



IRC
12C Daily mean river flows for 3 April 2012 expressed as a percentile and classed relative to an analysis of historic daily mean flows for the same time of year

Groundwater (3 April 2012)



Groundwater levels for indicator sites for the week ending 3 April 2012, classed relative to an analysis of historic values for the same time of year. Geological map reproduced with kind permission from UK Groundwater Forum, BGS © NERC. Crown copyright. All rights reserved. Environment Agency, 100026380, 2012

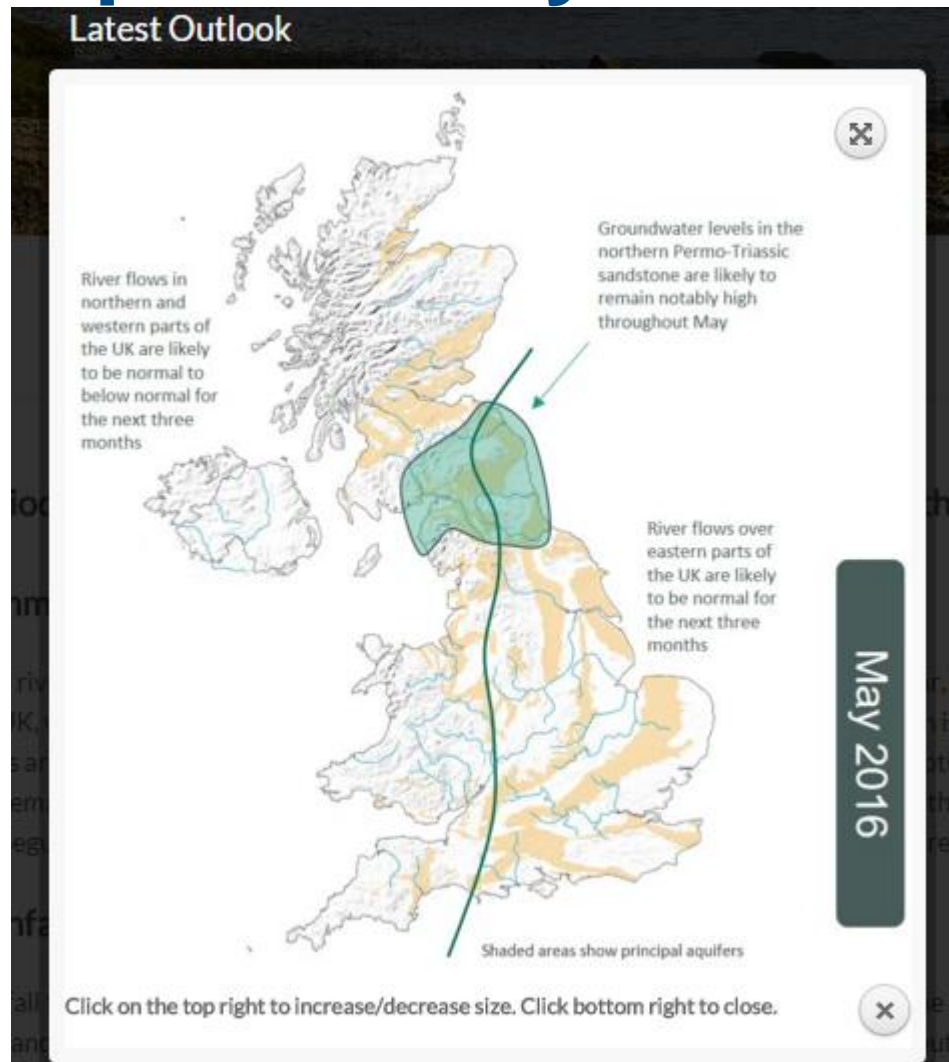


National drought surveillance network (Feb 2011)

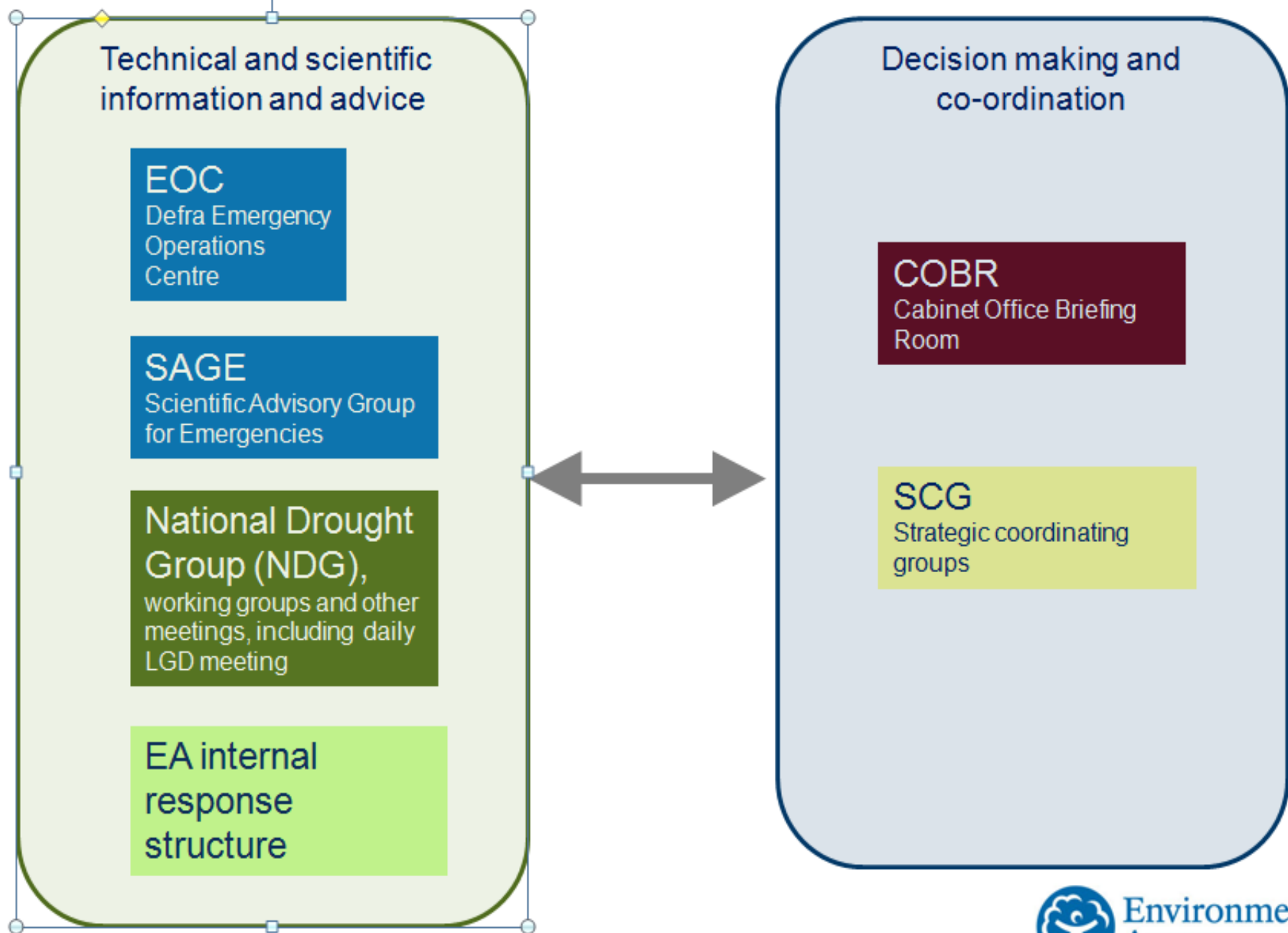


Hydrological Outlook UK

<http://www.hydoutuk.net/>



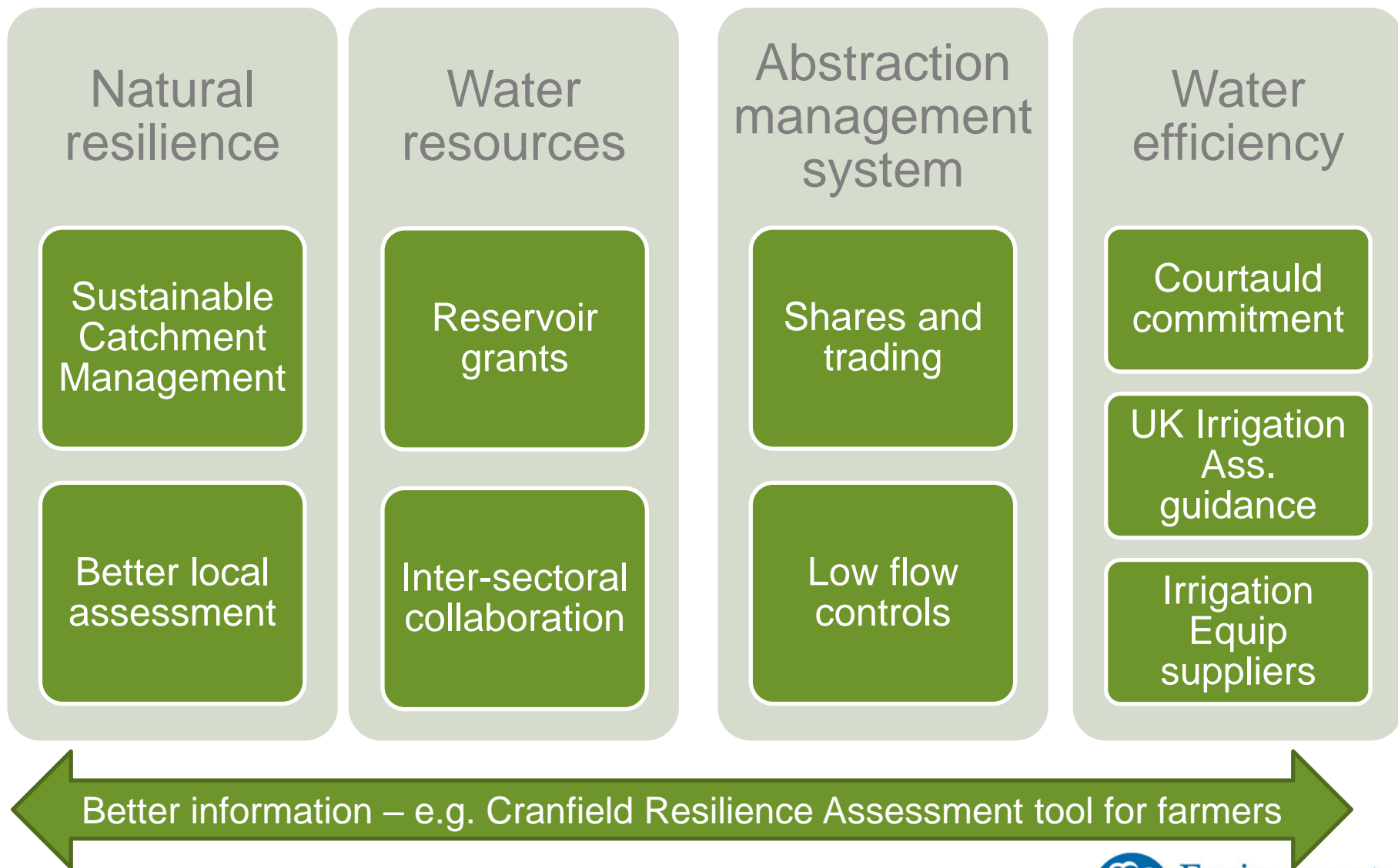
Organisation during a severe drought



Is it future proof?

- ➔ Do we fully understand the risk?
- ➔ Drivers for cross sector investment in Water Act measures?
- ➔ Public willingness to pay for resilience?
- ➔ Communicating uncertainty, low probability high impact risks

Key elements underpinning resilience



In conclusion

- ➔ The current UK drought framework provides planning systems which are working well so far, but.....
- ➔ Longer term uncertainty about climate change and what pattern of future droughts we may experience is high on the agenda for many
- ➔ Extent of cross sector engagement is high and planning framework and future policy should support this
- ➔ A whole system approach at catchment scale may be the answer.