

UKCP18 and the water industry

RMetS / Grantham Institute conference 20 February 2019

LOVE EVERY DROP. PUT WATER AT THE HEART V OF A WHOLE NEW WAY OF LIVING.

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Climate vulnerabilities





- Dry region <600mm rainfall; classified as 'water stressed'
- Low lying and extensive coastline
- Sensitive habitats e.g. The Broads
- Clay and peat soils
- Population growth +20% by 2045
- Extensive infrastructure: 38,200 km of water mains, 77,000 km of sewers, 6,000 pumping stations
- Water demand can increase by >30% on a hot day

Water Resources Management Plan



- Water companies have a statutory obligation to prepare and maintain a Water Resources Management Plan (WRMP).
- In their WRMPs, companies must set out how they will ensure they have sufficient water resources to meet the current and future demands of their customers, over a minimum 25 year period.
- WRMPs are published on a five-yearly basis and must follow government planning guidelines.



Use of UKCP09

- Extensive use of the Spatially Coherent Projections
- Some use of Probabilistic Projects and H++ for comparisons
- Use elsewhere focussed on high intensity rainfall and sea level changes





Additional analysis

- New analysis of drought risk using variety of historical data and stochastic approaches
- Further extension of Serinaldi and Kilsby (2012) monthly rainfall generator to include East Atlantic Index
- Review of meteorological drivers in historical droughts
- Extreme value analysis using Bayesian methods



University of East Anglia		
Observed droughts in the greater Anglian region since 1920		
David Lister, Tim Osborn, Phil Jones and Geoff Darch		
2018		
University of East Anglia		
An assessment of extreme drought rainfall sequences in stochastic weather- generator output for the greater Anglian region		
David Lister, Tim Osborn, Phil Jones and Geoff Darch		
2018		
Climatic Research Unit School of Environmental Sciences University of East Anglia		
THE ANGLIAN CENTRE FOR WATER STUDIES		
ANGLIAN WATER AND UEA WORKING IN PARTNERSHIP		
(CRU RP23)		



Forecast year (year ending)

7

Adaptation in WRMP19



- Major investment (c. £300M) in climate change adaptation between 2020 and 2025
- Mixture of demand and supply side measures



Alternative approaches

Much greater focus on understanding system sensitivity and vulnerability

Adoption of techniques that evaluate robustness of solutions to a wide range of future scenarios e.g. Robust Decision Making (Harou et al)

Work with Water Resources East has used 200, 91-year weather sequences and 33 climate change scenarios



Low Resilience



Potential use of UKCP18



UKCP18 output	How use	Advantages (+) and challenges (-)
Global model projections (and derived projections)	Hydrological modelling; demand modelling	+ Spatially coherent + Weather types - Fewer scenarios
Regional model projections	Hydrological modelling	+ Spatially coherent - Much fewer scenarios
Probabilistic projections	Sensitivity testing	+ Test uncertainties - Harder to use in modelling
Convective permitting projections	Storm impact modelling	+ Gap filled - Limited runs
Observations	Modelling	+ Weather types
Marine projections	Flood risk assessment	+ Updated global + Return levels + Post 2100

Emerging challenges

What does climate change mean for recharge? Modelling and reality...

What does climate change mean for water quality? Groundwater and surface water

How do severe and extreme drought change in future? New PhDs exploring

Adaptive planning: can climate change be a signal or must adaptation be fully proactive?





RESPONSIBLE BUSINESS OF THE YEAR 2017

BUSINESS IN THE COMMUNITY



THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2015