



Adaptation measures for water supplies in extreme weather events

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Issues covered in the Chapter

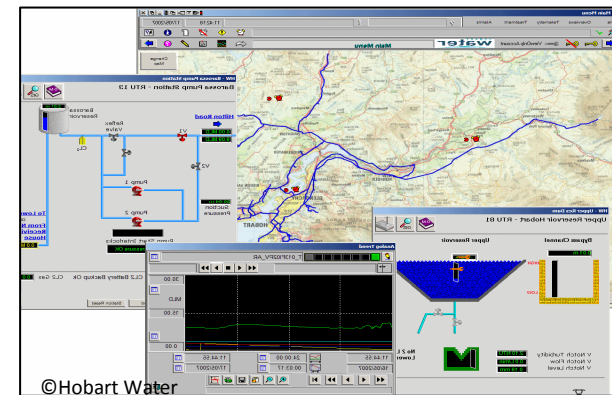
- Adaptation measures for drought events
- Adaptation measures for flooding events
- Emergency distribution of water / alternative supplies
- Recovery of drinking water supply systems



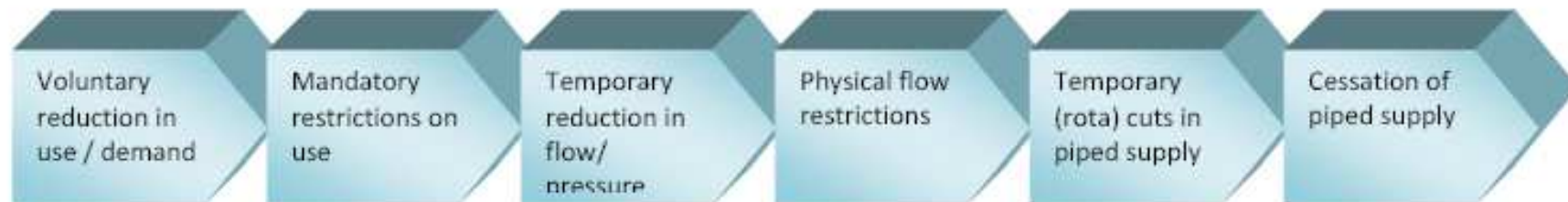
Adaptation measures - drought

Water resources

- Long term planning
- Interconnection of strategic water resources
- Resource optimisation (remote control)
- Assess quality impacts



Demand management



Adaptation measures - flooding

Planning – location / protection of assets



Adaptation measures - flooding

Interim adaptation measures



Semi-permanent flood barrier

Rapid deployment
1km in <5 days

“Low-tech” installation



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Adaptation measures at treatment works

Coping with greater variability in water flow & quality

- Water quality monitoring & controls
- Flow controls (weirs, pipes, pumps etc)
- Adequacy of treatment processes
- Appropriateness of disinfection arrangements
- Dosing equipment
- Delivery of treatment chemicals
- Storage of treatment chemicals
- Drainage systems
- Power supplies (contingency arrangements)
- Training of staff / operators



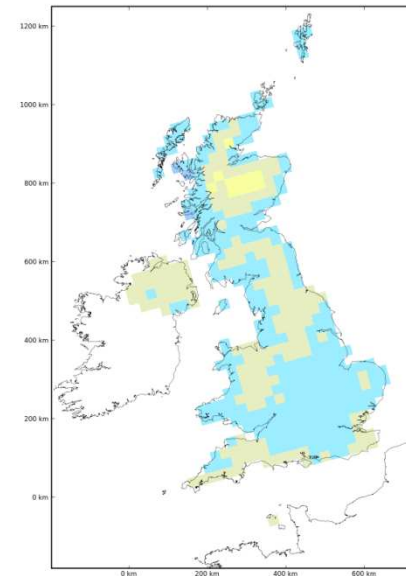
Adaptation measures in the UK water industry

UK Climate change predictions

- An increase in the intensity, severity and frequency of extreme weather events
- Reduced availability & quality of water in rivers, reservoirs and aquifers
 - Increased quality challenges
 - increased treatment & energy costs
- Increase in demand at times of reduced availability
- Vulnerability of assets
 - Flooding due to inadequate drainage & sewerage systems
 - Assets in coastal / floodplain areas
 - dams and reservoirs, (increased siltation and slippage)
 - burst pipes (increased ground movement)

Impact on UK water industry

- Nationally £500m of investment proposed to improve resilience through:
 - protection of assets
 - adaptation of assets and operational activities
 - provision of additional capability



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Recovery after extreme events

Key principles in recovering a water supply system

Catchment:

- review risk assessment – new/ revised hazards

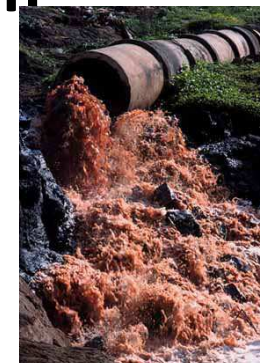
Treatment works:

- Assess damage & risks, repair, restore treatment, verify controls are working

Storage & distribution assets:

- Assess damage & risks, repair,
- verify controls are working
- phased re-introduction of supplies

Phased sampling / verification of controls



Recovery after extreme events

Phased recovery of WTW assets – quality focussed



- Use skilled, experienced personnel
- Ensure source protection
- Reinstate critical controls:
 - physical treatment
 - disinfection
 - chemical treatment stages
- Reinstate non-critical treatment in stages
- Assess / rehabilitate / test equipment / disinfect / sample / verify controls



Case studies in chapter

- Azerbaijan
 - transboundary water resource transfers
 - impact of climate change on water resources
- Hungary
 - water supply problems following power cuts
- UK
 - flooding of a large water treatment works



Further work

- Review / editing
- Gaps / other issues.....?

