EUREAU
European Union
of Water
Operators

Drought: Water Services Implication

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Scope of Presentation

- This is Eureau's position on short-term responses to a drought crisis

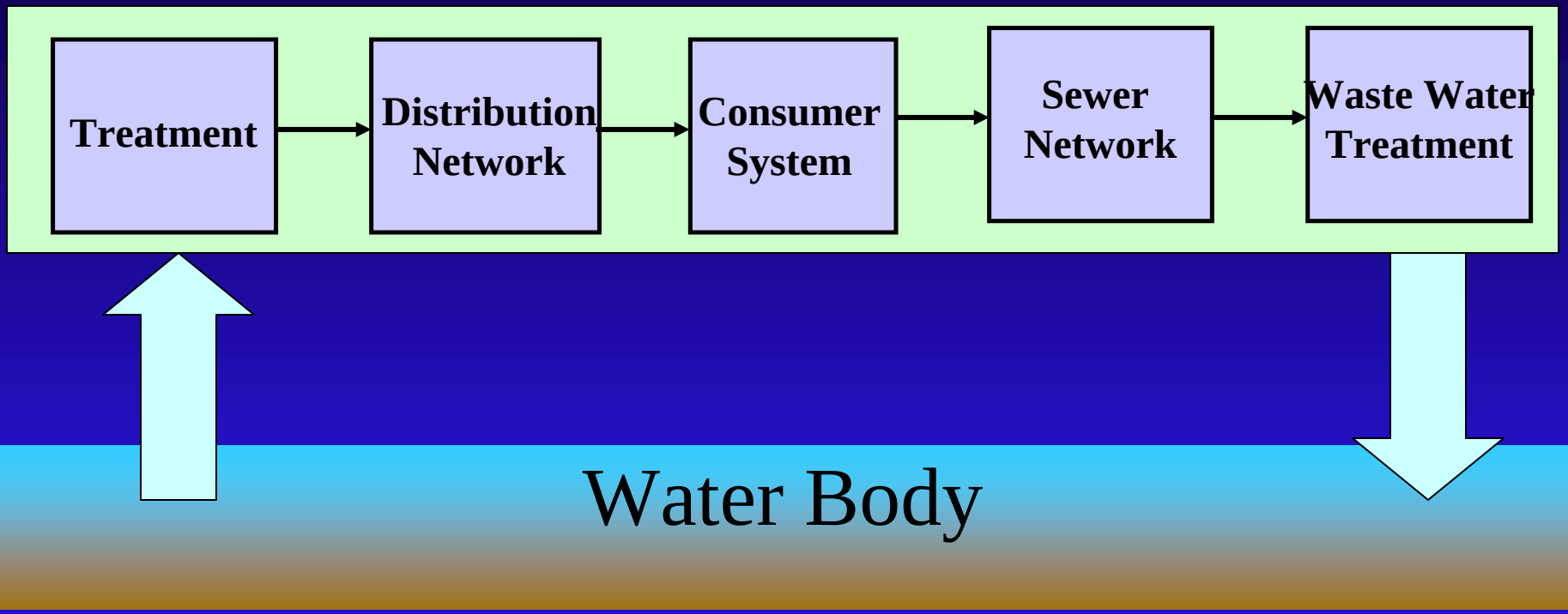
In the longer-term:

- Drought planning is part of overall water resource planning
- Factors such as abstraction licensing, Integrated River Basin Management, flooding, recharge and spatial planning should be considered

Background

- 2002 Flooding
- 2003 Droughts
- 2004 Low water levels in aquifers
- Climate change : Extreme event more likely in coming decades
- New EC consideration for potential actions

EUREAU 's Interest In Drought Issues



EUREAU 's Interest In Drought Issues

- Higher water demand for garden watering, personal use, swiming pools, fire-fighting etc.
- Lower availability of resources
- Higher competition for resources
- Reduction in raw water quality and warmer waters
- Higher vulnerability of networks due to soil compaction
- Environmental impact of abstraction

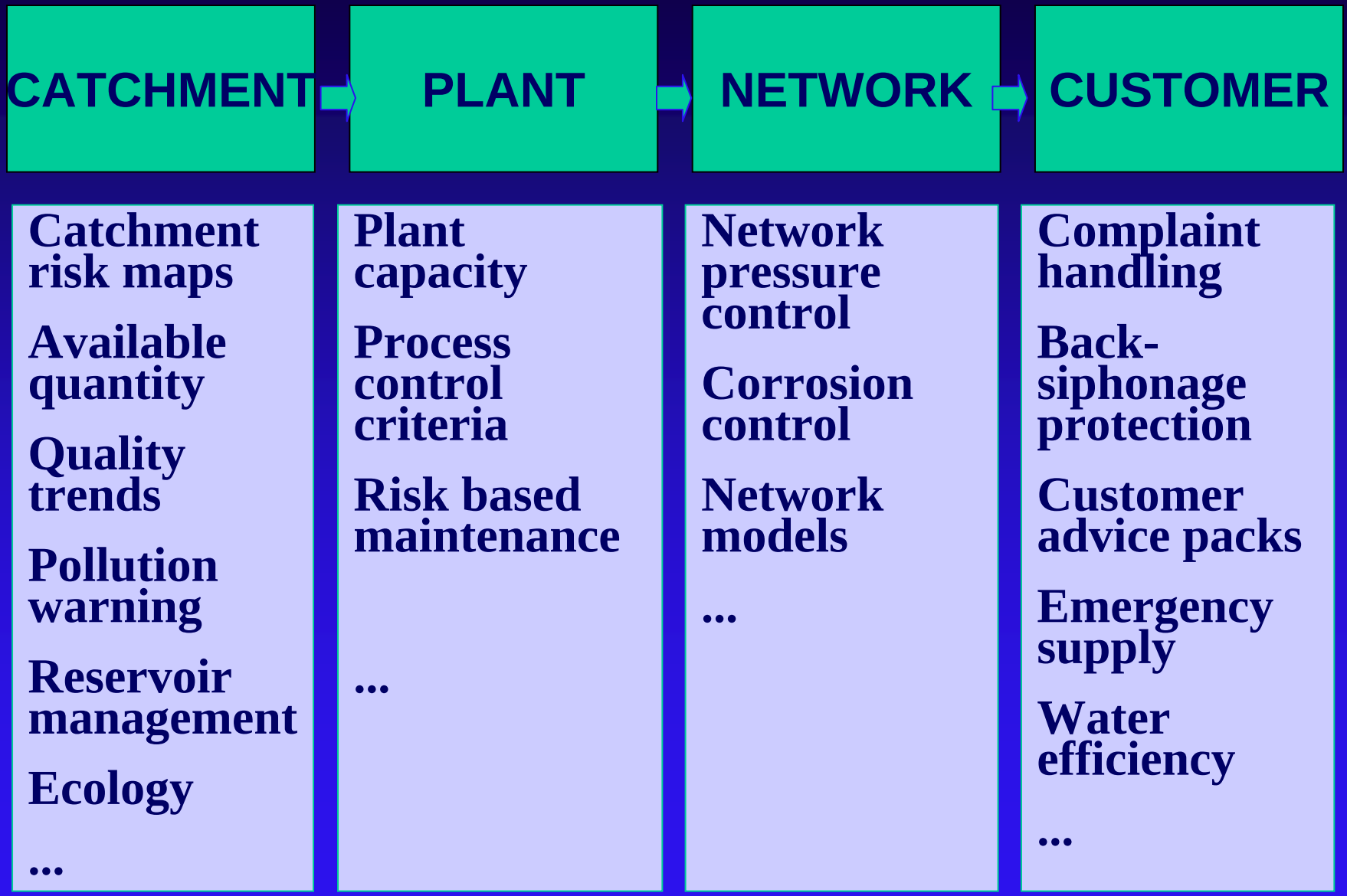
EUREAU 's Interest In Drought Issues

- Higher ecological impact of treated wastewater: low oxygen, high NH4, Fish toxicity
- Loss of water from leaking sewers
- Constraints on repairs & maintenance (both DW and WWTP): Stopped/ delayed
- Civil and legal responsabilities relating to service failure ?

Water Supply Side: Goals

1. Permanence of service:
   - Public Health (toilet flushing, cleaning etc.)
   - fire-safety alone warrants the permanence
   - maintaining essential services
2. Microbiological quality:
   - absolute safety, System wide appraisal of risks and effective controls
3. Chemical Quality– including Algal toxins, Endocrine disrupters
4. Customer acceptability – appearance/taste

Water Supply: Risk Management



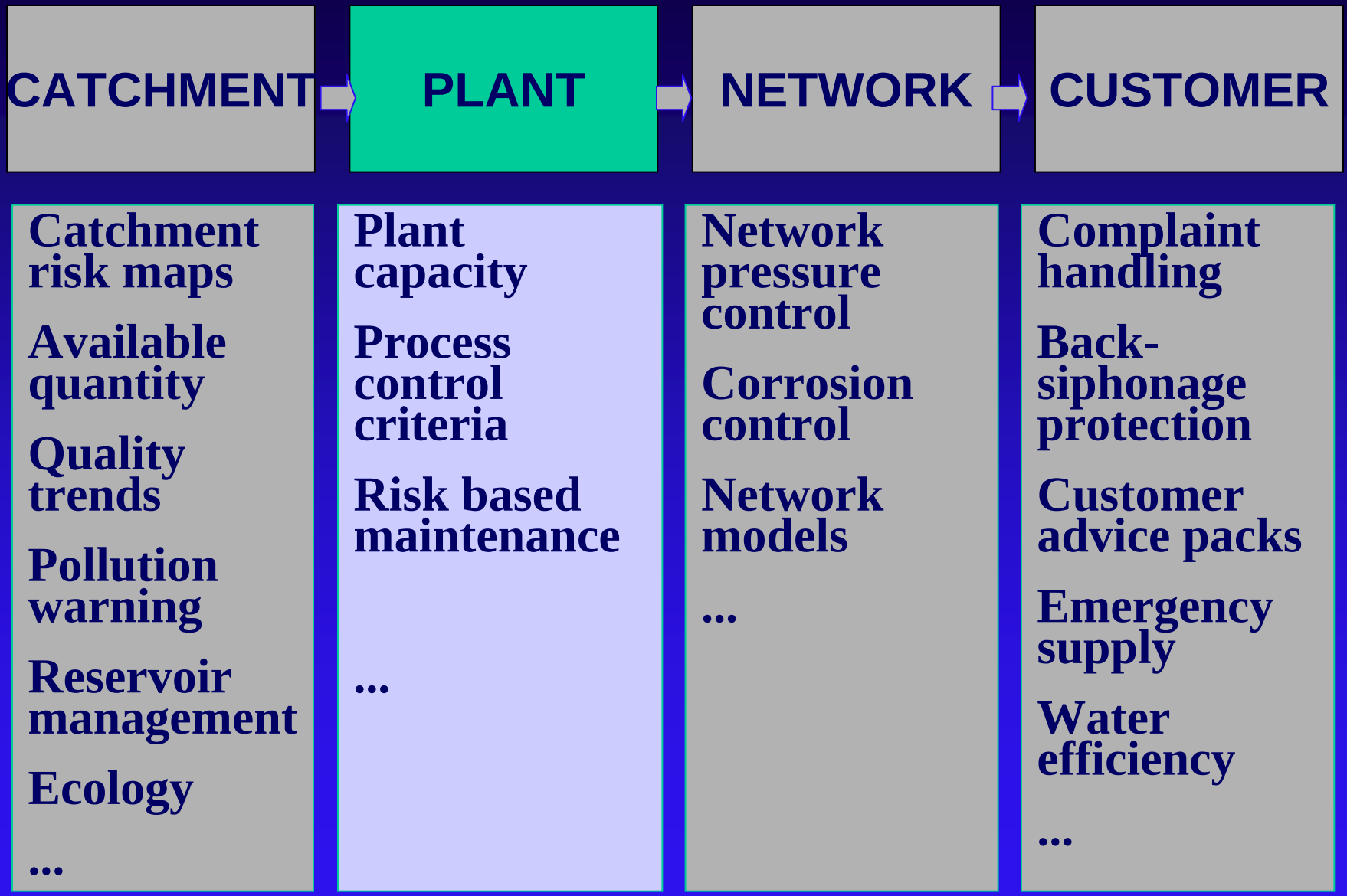
Water Supply and drought

CATCHMENT	PLANT	NETWORK	CUSTOMER
Catchment risk maps	Plant capacity	Network pressure control	Complaint handling
Available quantity	Process control criteria	Corrosion control	Back-siphonage protection
Quality trends	Risk based maintenance	Network models	Customer advice packs
Pollution warning	...	...	Emergency supply
Reservoir management			Water efficiency
Ecology			...
...			

Water Supply and drought: Catchment and environment

- Catchment water quantity and quality reduces during drought
- Drought may require additional abstraction this may affect Natura sites
- Water utilities have to consider Habitats, Birds and Environmental Liability Directives.
- This means early planning

Water Supply and drought



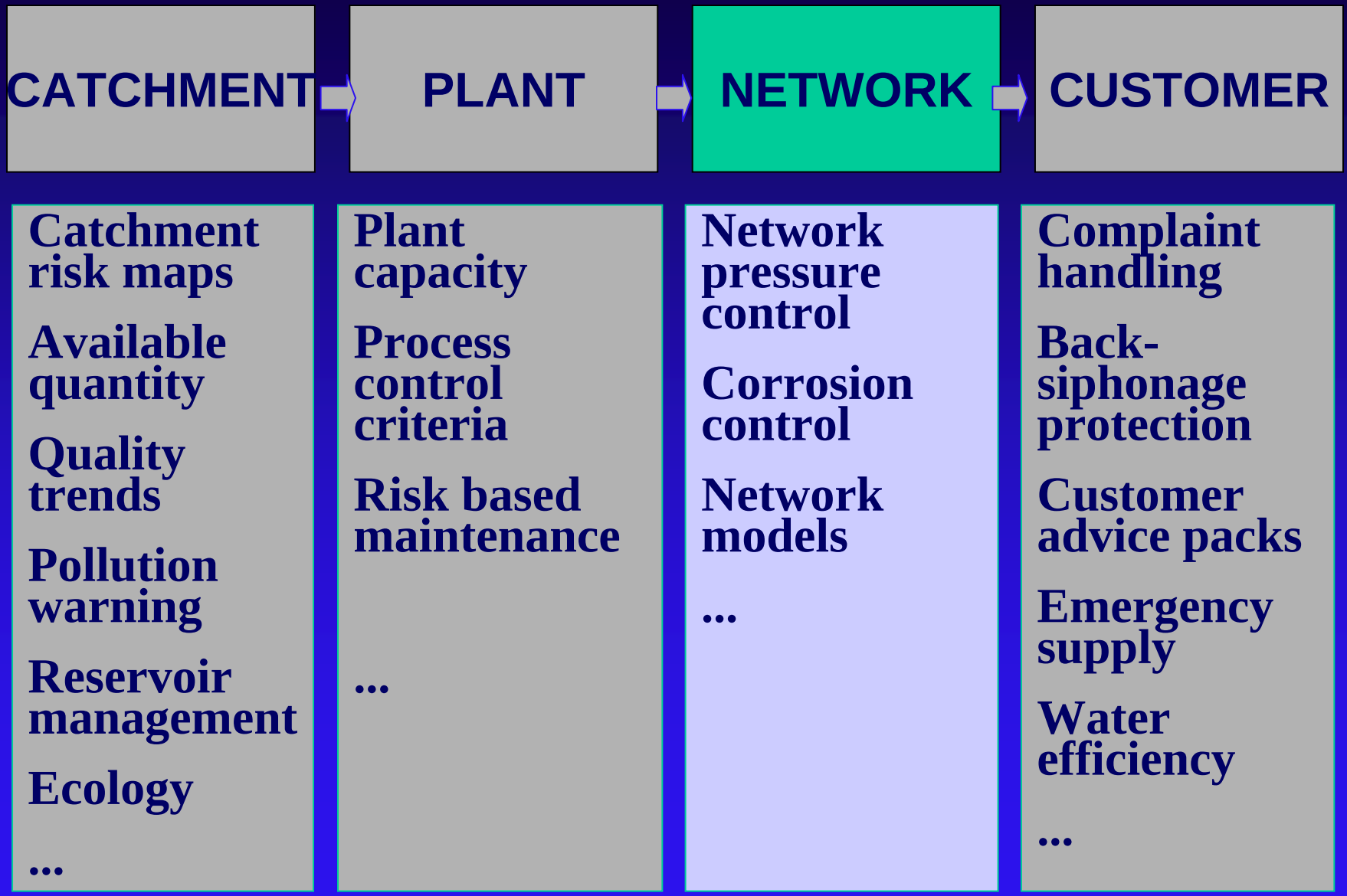
Water Supply and drought: Plant stop

- WTP Stop
  - Is current practice when scheduled for a couple of hours
  - Involves appropriate procedure for restart
  - Restart may require several hours to be complete and safe

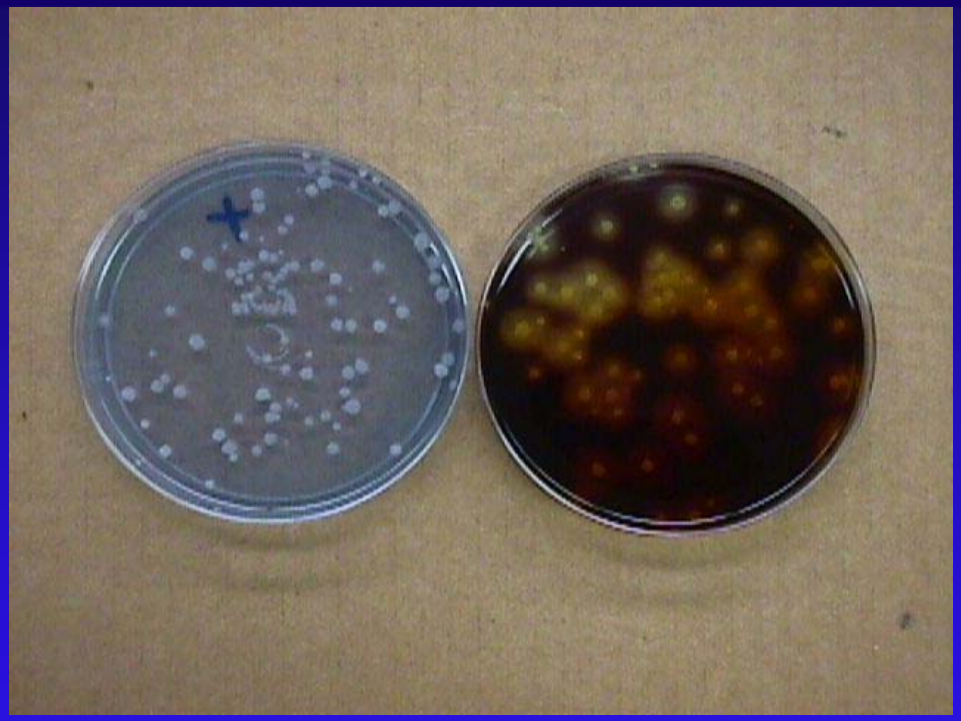
Water Supply and drought: Plant stop

- WTP Stop for drought may last several days
- Several days may be required to restart:
  - Low pump speed to reach hydraulic gradient
  - Sedimentation basin to stabilise
  - Filter flushing: Sand F and GAC Filters
- Consequent loss of flexibility and resilience
- Very low output may not be technically achievable
- In many cities there is no spare treatment capacity and alternative supplies

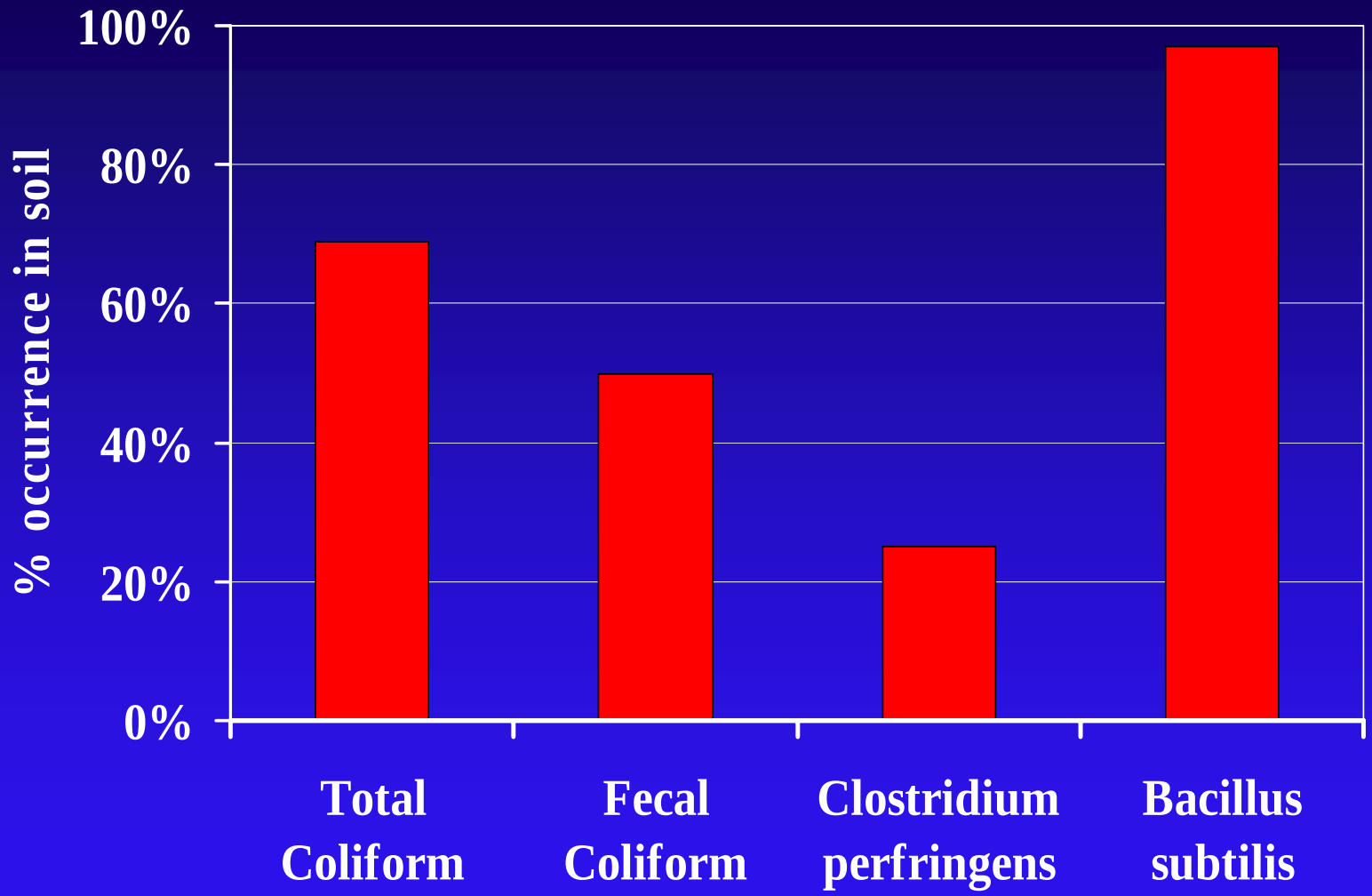
Water Supply and drought



Water Supply and drought: Network



Water Supply and drought: Network



Adapted from Kirmeyer et al. 2000

Water Supply and drought: Network

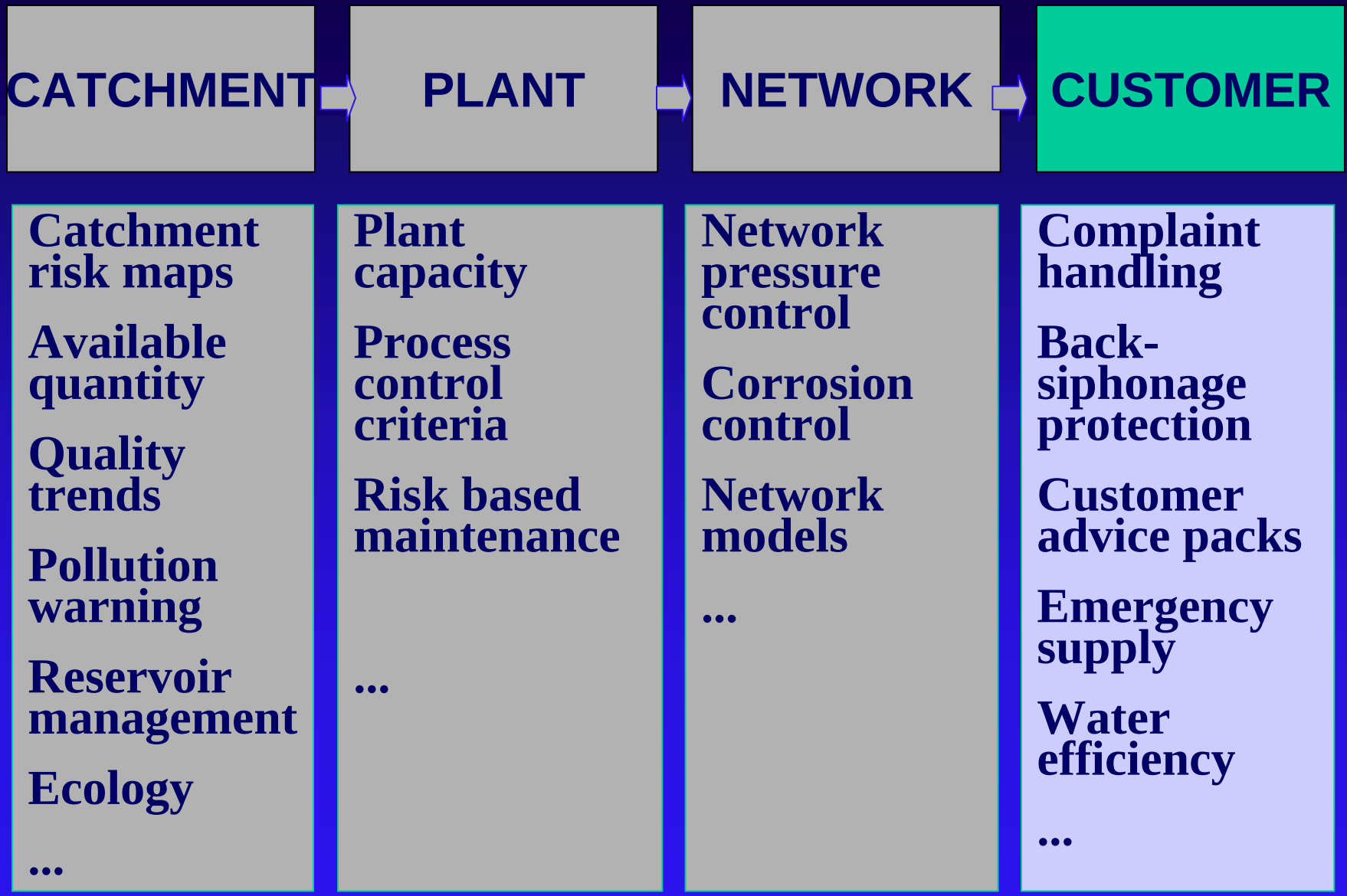
- If network pressure < environment
  - pipeline leaks provide a potential portal for entry of pathogens
  - heavy procedures in place to handle subsequent situations
  - Potability of water may be compromised
- Water supply must be ≥ demand

- Network dewatering will lead to further leakage due to joints deterioration

Wastewater side and drought

- Higher wastewater residence time in sewers: H2S formation: odour, corrosion etc.
- Potential impact on rivers + bathing, shellfish waters
- Higher treatment level may be required: COD, PO4, …
- Supplementary quality control
- Full-capacity required: No maintenance
- 60% to 80% of supply returns to the environment as wastewater - a major resource

Water Supply and drought



Water Supply and drought: Customers

- Customer liaison must be part of drought planning
- Early information is essential to limit demand
- Combined messages from water utilities, Governments and environmentalists is needed
- Impact of essential use restrictions is questionable
- Safety must not be compromised
- Emergency supplies should be in place

Long term solutions

- Options:
  - Conservation and efficiency
  - Water reuse and recycling
  - Desalination technology
  - Increased storage (dams)
  - Water transfer
  - Mobile treatment unit for WWTP effluent reuse
  - Network optimisation

Long term solutions

- Water recycling/ conservation/ efficiency : operational in industry
- Potential for development in water supply/wastewater management e.g.:
  - aquifer recharge possibilities
  - temporary tariff increase during drought
  - water reuse
  - full metering with remote sensing

Conclusions

- Public water supply must have priority
  - Public health, Fire safety, Essential services
- Failure to meet demand may contaminate the network
- Involve water utilities in the drought planning process and crisis management
- Water utilities should plan for drought
- Alternative supply must be available
  - Mobile treatment plant, bottles, tankers
- Funding must allow for drought planning

Thank you