

SESSION III: Pop-Up Talks

- 1) **Simon Collander-Brown**, DSTL
 - 2) **Anant Prakash**, BP
 - 3) **Simon Cook**, Southern Water Services
 - 4) **Rosalind West**, DEFRA
- Specialist: **Jan Kwakkel**



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Problem Statement

- How do we plan for the Future Requirements for Defence?
- Complexity of problem
 - Uncertain context
 - Knowledge of system is incomplete
 - Some systems are inherently uncertain
 - Systems change in response to our decisions
 - Systems change in response to other peoples decisions
 - Others may be trying to play the system to gain advantage
 - Others may be trying change the system to gain advantage

Approach

- Currently use “scenario” planning
 - Build small numbers of plausible futures
 - Complex analysis to identify which factors drive outcomes
 - Any shortfalls in capability
 - Process designed to tie in key decision makers

Results and Feedback

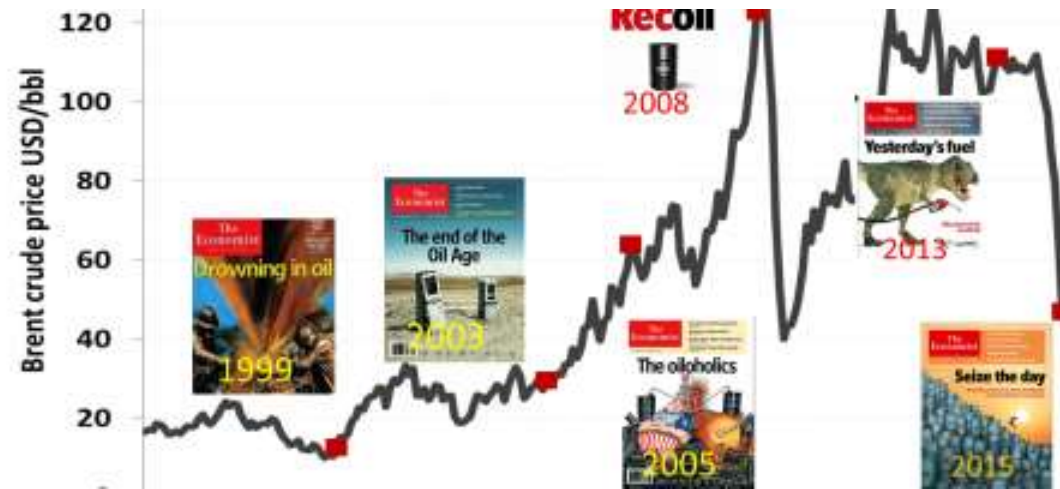
- Current method gives useful results
 - Slow
 - Expensive
 - Doesn't deal with uncertainty well
- Other methods being examined
 - Generally for simpler systems
 - Shorter time frames
 - No or constrained opposition
- Want to test hybrid methods in near future

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Problem Statement



- What problem did/does your organisation face?
 - Planning price, or oil price assumption
- How was/is this problem complicated by elements of uncertainty?
 - Uncertainty of oil price
 - Risk of sub economic investments and projects
 - Plenty of scenarios, forecasts, predictions and forward strips available – but huge range.
 - Strategic complications – Commitment to dividend. Changing Geopolitics. Sector deflation.
 - Time horizon for typical oil and gas investments to turn cash flow +ve is 8-10 years

Approach

- How did/does your organisation make decisions in light of the uncertainty it faces?
 - Bottom up analysis
 - Price and profit calculations for various assets
 - Deterministic calculations and sensitivities
 - Development of scenarios, portfolio analysis

Results and Feedback

- What decision did your organisation make, and how was this informed by the preceding uncertainty analysis?
 - Allocation of capital: Projects, workforce, capex, opex
- What challenges or limits did your organisation experience in implementing the decision-making process?
 - Uncertainty on realisations
- How were the results of the decision-making process communicated to the ultimate decision makers/insiders/shareholders/public etc.?
 - Complex analysis. Simple charts.
- How could your decision-making process improve?
 - Faster analysis and turnaround, less complexity. Probabilistic considerations.
- How can the research community support improvements in your decision-making process?

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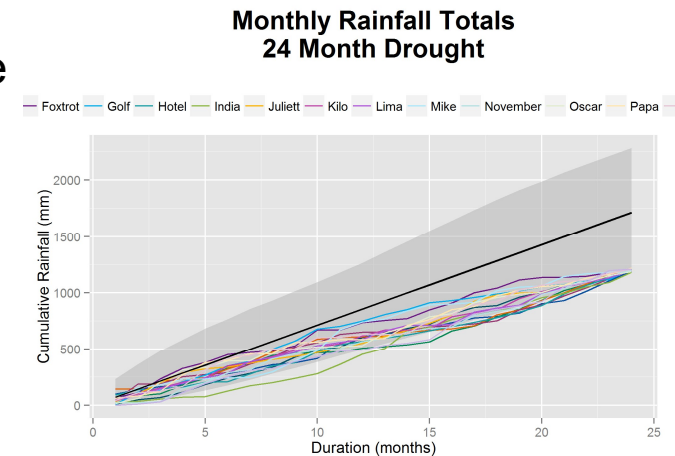
Risk and Uncertainty for Water Resource Planning

Simon Cook

Problem Statement

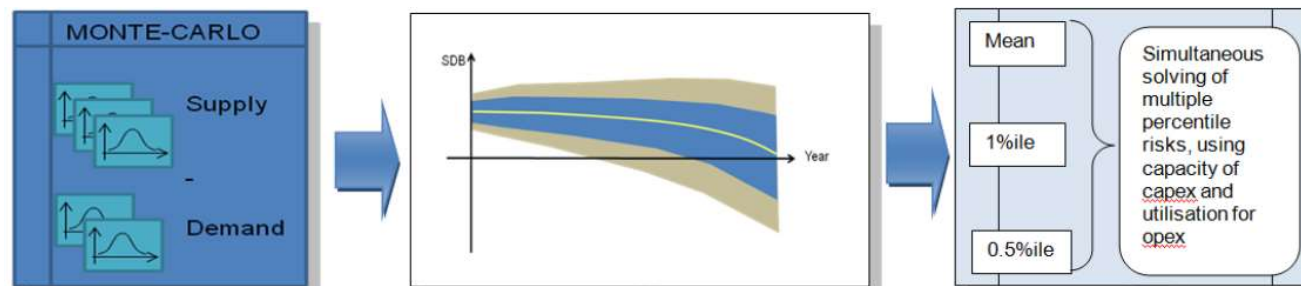


- Southern Water have a statutory obligation to produce a Water Resource Management Plan for a minimum of the next 25 years
 - Weather Variability and Drought
 - Climate Change
 - Impacts of New Technology
 - Source Behavior and Lack of good historic observations
 - Water Quality
 - Forecasts of Demand (Population Growth, Development, behavior)
 - Environmental Impacts
 - Limits of Resource Models (Data, Computing Power)
 - What Options are Available
 - Where and how should we invest for the future



Approach

- Adopted a stochastic Approach to Weather Variability (Rainfall)
- Multiple Climate Change Scenarios (Perturbations)
- Multiple Growth Scenarios for Demand
- Integrated Monte Carlo Approach for Supply/Demand Balance
 - Target Headroom
 - Accounts for all major sources of uncertainty
- Investment model reflects multiple states of the world
 - Dry, Normal, Intermediate
- Investigated a Real Options approach for no regret investment
- Statutory Consultation Period + Informal engagement with regulators and stakeholders



Results and Feedback



- Weather Generator wasn't perfect (PET and Bias correction)
- Technically Difficult / Harder to communicate
- High degree of challenge from regulators
 - New and advanced techniques (lack of acceptance/confidence)
 - Southern Water were going it alone
- Approach has informed guidance for next set of Water Resource Management Plans for all companies
 - Better Accounting for uncertainty and risk
- Future Plans
 - Further develop and extend the approach
 - Improve estimates of Resilience (Reliability and Failure models)
 - Extend real options,
 - Better capture customer and environmental preferences
 - Better Environmental Forecasting
 - Sustainability and Resilience

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Department
for Environment
Food & Rural Affairs

Identifying priority risks in the 2nd Climate Change Risk Assessment (2017)

Dr Rosalind West
Defra Climate Change Adaptation Team

With thanks to Kathryn Humphrey & the
Adaptation Sub-Committee of the Committee on Climate Change



Problem Statement

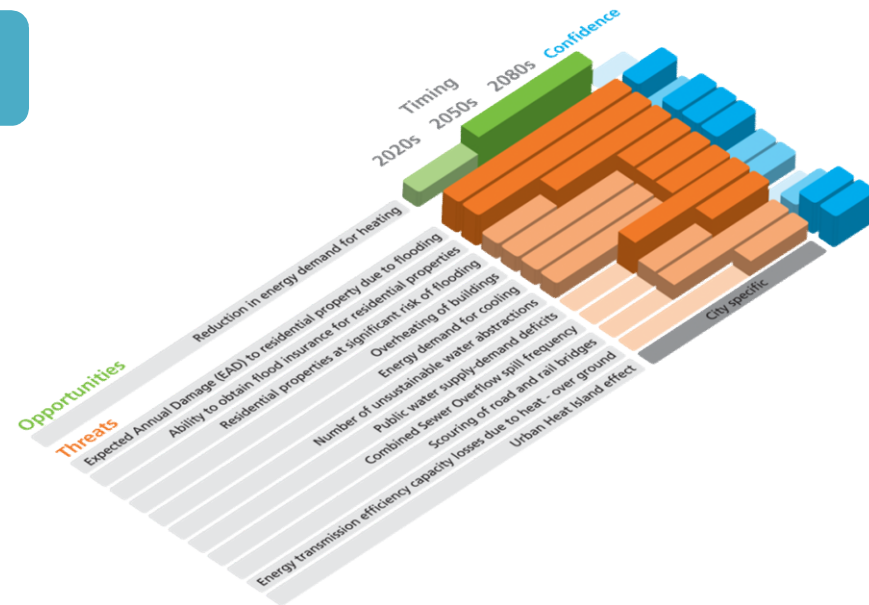
- ***The Problem:*** How to identify the **most urgent risks** from climate change for government to consider in the next five years.
- ***Uncertainties*** at every stage:
 1. Assessing the **current and future level of risk**
 2. Estimating the **effect of planned and autonomous adaptation on residual risk**
 3. Assessing **benefits of action in next 5 years**
- ***Outcomes*** affect national adaptation plans of the UK government and devolved administrations



UK Climate Change Risk Assessment

CCRA 1 (2012)

- **100+ risks and opportunities** from climate change in the UK.
- Large programme of **external evidence and research work**
- 11 sectors



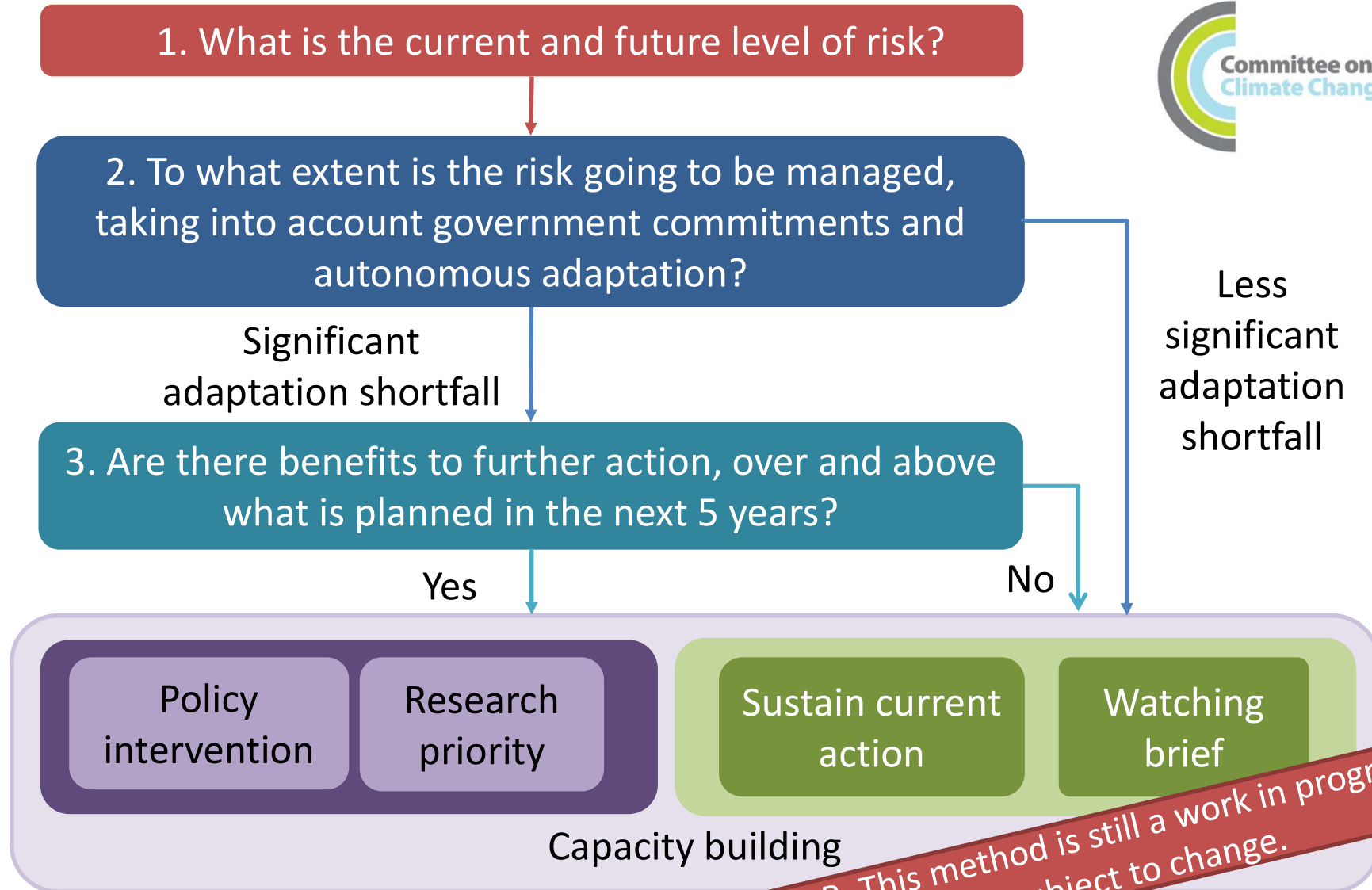
CCRA 2 (2017)

- Identify policy areas:
 - **with barriers to adaptation** and/or
 - where adaptation is **most urgent** during 2017 – 2022

Key issues for CCRA 2:

- How climate interacts with **socio-economic factors** in affecting risk
- How the **effects of adaptation actions** are/could alter risk levels
- How **climate change overseas** could affect the UK

ASC's approach to urgency scoring



N.B. This method is still a work in progress and subject to change.



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SESSION III: Q & A

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