

# The CREW project: Urban Diffuse Pollution Control

Julian Dawson, Andrew Cuthbert,  
Rebecca Wade

Funded by The Scottish Government



# Centre of Expertise for Waters

- CREW is a partnership between the James Hutton Institute and all Scottish Higher Education Institutes which ensures that water research and expertise is available and accessible to the Scottish Government, to support the development and implementation of water policy in Scotland



[www.crew.ac.uk](http://www.crew.ac.uk)



# The Vision

*“To create a centre of expertise to deliver objective, independent integrated and authoritative evidence to support the Scottish Government in relation to its activities on water”*



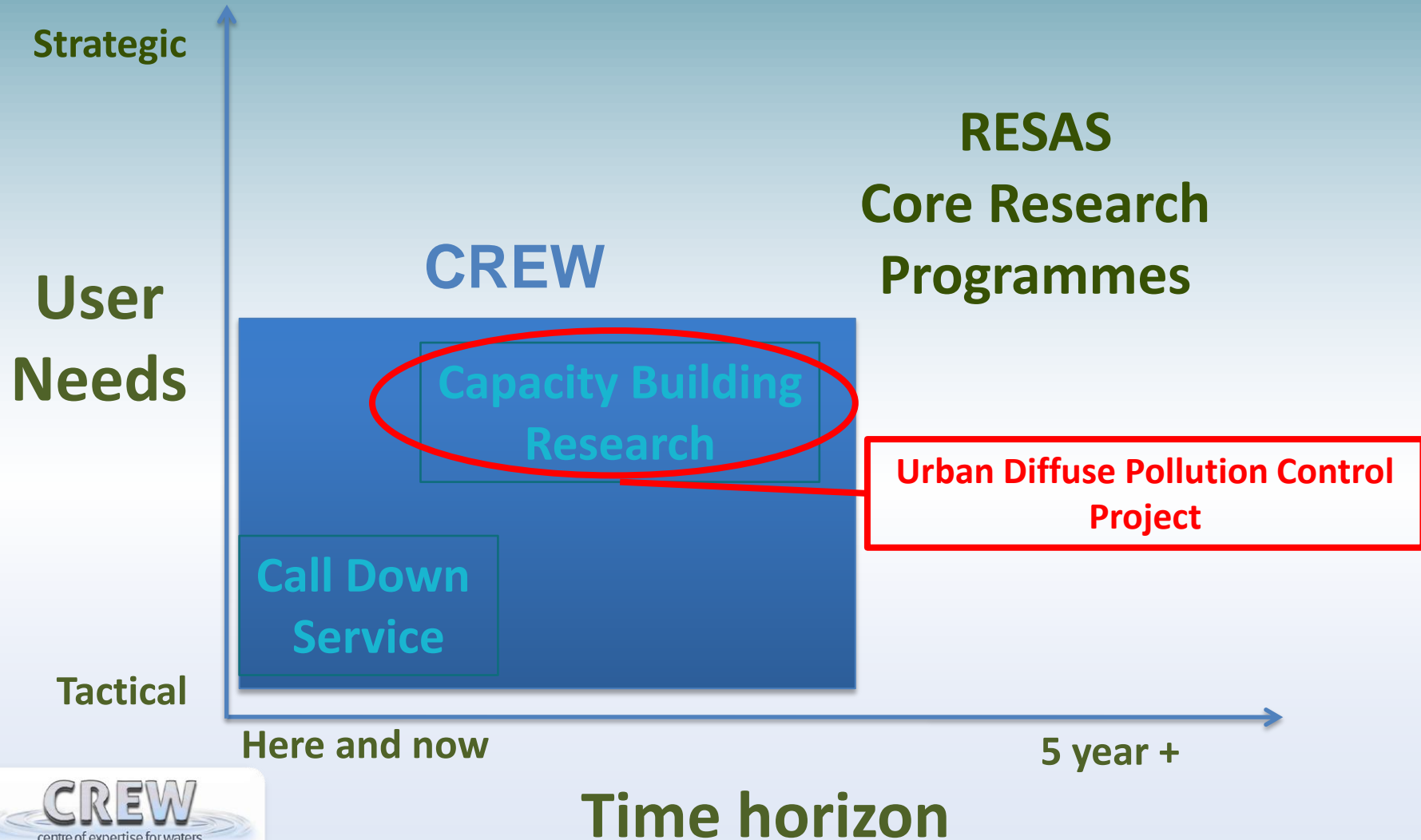
# Remit

- Headwaters to coast, rural to urban
- Delivering timely and accurate advice to the Scottish Government
- Developing knowledge exchange between science, policy and practice
- Understanding and translating needs
- Simplifying complexity

# Underpinning Philosophy

- Policy as the starting point
- Shortening supply and demand chains
- Collaborative and inter-disciplinary research across the supply base
  - Working with Scotland's Universities
  - Broadening networks of expertise
  - Holistic/integrated evidence
- Enhancing science impact by better use of existing evidence

# RESAS Water Research



# Urban Diffuse Pollution Control

- Methodologies to identify sources, pathways and mitigation measures with multiple benefits
- Inform Scottish policy development on:
  - The Water Framework Directive
  - River basin management planning under the Water Environment and Water Services (Scotland) Act (2003)
  - Surface water management under the Flood Risk Management (Scotland) Act (2009)



# Background

- Managing water within urban spaces is an essential infrastructure requirement
- Historically undertaken in isolation from other urban functions and spatial requirements
- More sustainable approaches to urban water management are being applied which can have multiple functions and benefits
- **Can SUDS mitigate urban diffuse pollution?**



# Research requirements

- Develop relevant integrated tools to understand sources, pathways & mitigation of diffuse pollutants
- A) Assess which methods best identify sources and pathways for a given urban environment and/or readily available information
- B) Evaluate mitigation strategies that meet diffuse pollution prevention and provide multiple benefits in terms of cost, energy, water & cultural sustainability

# Stage 1 (3 months)

- Critically review available methods for identification of sources and pathways of diffuse pollutants in urban environments
  - Air pollution (air quality assessments/inventories)
  - Polluted land (current & historic land use maps, Defra/DoE industry profiles of potential contaminants)
    - Industrial - multi point & multi inorganic/organic pollutants
    - Parks/gardens/golf courses - nutrients/pesticides
    - Airports - salt, metals, anti-freeze and POPs
    - Construction sites
  - Roofs, roads & railways (traffic density, road-side air quality)
  - Sewage cross-contamination (water quality, leaks/repairs/flooding records)
  - Geological, geochemical and hydrological data

# Stage 2 (3 months)

- Critically review mitigation measures, from source to end of pipe, for diffuse pollution prevention allied with an assessment of their multiple benefits
  - Behavioural changes
    - Voluntary measures
    - Community or industrial level
  - SUDS
    - Many different designs/scales available
    - Effective pollutant mitigation?
    - Water quality benefits allied with multiple benefits?



# Stage 3 (6 months)

- A case study (Scottish urban area) incorporating scenario testing of sustainable mitigation measures and their multiple benefits
  - Site identification
  - Consultation with stakeholders
  - Assessment methodology



# Update: Stage 1

## Sources

- Transport
- Industrial sources
- Fertilizers/sediments
- Green house gas emission (GHG)
- Leakage along pipes
- Golf Courses
- Airports –AntiFreeze
- Personnel care products
- TBT – antifouling agents on boats, ships
- Construction sites – cement
- Railway Trams
- Litter
- Sewage



## Multiple Benefits

- Amenity – Access, Aesthetics
- Noise reduction
- Water /Flood Control
- Water Quality benefit
- Environmental quality – Biodiversity, Habitat
- Q or L
- Carbon storage
- Air quality
- Economic Investment
- Maintenance benefits
- Intervention



# Update: Stage 3

- Scenario-testing, Light Burn, Glasgow



# Conclusions

- Improving the link between science and policy
- Integrated approaches to urban water management providing drivers for improvements
- Improved appreciation of the range of benefits that come from sustainable water management options

# The Project Team

- Scottish Government Policy Contact
  - Derek Wilson
  - James Hutton Institute
    - Julian Dawson, Andrew Cuthbert
  - University of Abertay
- Rebecca Wade, Chris Jeffries, Roshni Jose, Neil Berwick, Rohit Singh
  - Middlesex University
    - Lian Lundy
    - BGS
- Fiona Fordyce, Brighid O'Dochartaigh, Solveigh Lass-Evans
  - SUDS/Green Infrastructure Advisor
    - Neil McLean (Creative Drainage)
    - University of Dundee
      - Chris Spray