

# Outcomes from the SAGES Forum on Integrated Water Cycle Management Workshop 11/12 May 2017 - Abertay University

## Introduction and Background

The aims of the Workshop were to:

1. To identify key research needs and areas of synergy related to global challenges in water cycle management.
2. To establish two or three working groups– to develop responses to future calls for Global Challenge research projects or other suitable calls.

The Forum Steering group had previously identified the following grand challenges and major issues that can provide a focus for the discussions:

1. *Capitalisation on data sets for integrated decision making in a changing socio/political world*
2. *Assessing the balance between centralisation and de-centralisation of policy and technology. The different approaches required for ground and surface water management and rural and urban water/wastewater systems.*

The Forum Steering group had also identified major issues that might form areas of study within the themes:

- A. *Emerging pollutants*
- B. *Ground water and surface water interface.*
- C. *Water cycle management*

## Workshop Participants and Programme.

The workshop was attended by 23 delegates from 11 institutions, including guest speakers from SEPA, BGS and CREW ([Attendance list document A](#)). The guest speakers provided a useful overview of the research landscape.

## Guest Speakers

On day 1, Peter Singleton of SEPA provided an overview of regulatory issues and trends. ([SEPA presentation document B](#)). These are not just about environmental improvement in isolation but also about ensuring social and economic success, supporting innovation, helping communities see the environment as providing opportunities, engaging boardrooms and delivering through partnerships. He presented an engagement spectrum diagram, and a desire for movement along the spectrum to encourage improvement through engagement. Peter also highlighted that new challenges are more complex and interrelated and that we are using three planets of resources and need to reduce resource use. Other research needs include; targeting effort to manage risks in bathing waters, how to make case for sustainable win-win solutions and how can we improve our source apportionment of pollutants in catchments. Peter is keen to explore how SEPA can work with Universities. He is very keen on collaborative work and welcomes ideas for joint projects SEPA can help us put together bids but may not be able to take RCUK money.

Alan MacDonald of BGS introduced examples of international water challenges in his presentation on Groundwater and Global Challenges ([Groundwater Presentation document C](#)). He noted Sustainable Development Goal No 6 but mentioned that water underlies many others. He is optimistic about groundwater sources but noted that internationally, more money

goes to health care but water spend may be cost effective in improving health. We need to use appropriate technologies. He presented a map of groundwater availability in Africa but we need to assess how groundwater availability will respond to climate variability and increasing abstraction. Alan presented a simple resilience framework. He also presented an Indian example on the Ganges/Indus/Brahmaputra of massive abstraction that needs to be managed in sustainable manner. He concluded on groundwater quality issues and highlighted potential problems with arsenic and salinity.

On day 2, Jannette MacDonald of JHI and CREW summarised CREW activities and provided an update on the Scottish Government Hydro Nation initiative ([CREW/Hydro nation Presentation document D](#)). She highlighted that CREW research is demand driven in response to emerging water policy issues. Current and likely future areas of focus include; private water supply cost, community economics, dissolved organic carbon, harmful algal blooms, risk areas for private water supplies from land contamination, prevention-led approaches, flooding a coastal erosion, river basin management plans particularly the risk to bathing water and shellfish, diffuse pollution septic tanks etc. Common cross cutting themes include the identification of risk, DOC, and how to assess policy success and hence identify likely future success. International dimensions included testing policy application e.g. Tanzanian water law and policy are world class but application is an issue and Sustainable Intensification of Agriculture. Janette also identified partners for interaction research work such as Water Witness international (Edinburgh Based), the Alliance for Water Stewardship and the Nature Conservancy Water Fund. Much of the international work will be managed in future through the Scottish Government Hydro Nation International initiative. Links with Forum should be developed through Rachel Haliwell, the Barry Greg and Jon Rathjen.

### **Group Activities.**

Group activities were undertaken on both days. On day 1, three working groups were established to explore each of the major issues above i.e. (i) emerging pollutants, (ii) ground water and surface water interface (iii) water cycle management. The groups reported back to a plenary session where a number of common research needs emerged. These were:

- Behaviour change, stakeholder awareness, equity
- Influence of extreme events
- Bioaccumulation
- Technological innovation, monitoring and analysis
- Environmental flows and functions; Ground water, surface water, coastal/delta.
- Risk management, resilience and change
- Information and decision making systems.

On day 2 the working groups reconvened to begin to develop the key research needs into research questions and to consider the potential for developing these ideas for discussion and further development at a second Integrated Water Cycle Management Forum meeting in late 2017 or early 2018.

The groups provided suggestions on:

Emerging Pollutants ([GpA Emerging Pollutants Presentation document E](#)).

Water Cycle Management ([GpC Water Cycle Management Presentation document F](#)) & ([Theme C questions and initial activities document G](#)).

Surface Water/Ground Water Interfaces ([GpB SW GW interfaces document H](#))

## **Outcome of the Workshop**

The three working groups agreed to work in parallel to further develop the ideas above.

- The emerging Pollutants group will be coordinated by David Oliver and Joseph Akunna
- The Water Cycle Management group will be coordinated by Daniel Gilmour and Irena Connon

Following the meeting, it was noted that the Surface Water/Ground Water interfaces group had been a small group from a limited number of institutions. The group produced some excellent output that should be taken forward. This could be done either, as a working group if a co-ordinator could be identified, or ideas could be picked up by the other two groups. This will be discussed and resolved at the SAGES Scientific Meeting in November.

Each group will develop outline work plans, including potential funding opportunities and will present these at a second Forum workshop in late 2017 or early 2018. Progress reports will be presented at a meeting the SAGES annual conference where decisions on the timing venue and programme for the second workshop can be taken.

David Blackwood will seek SAGES approval to progress to the second stage of the Forums activities, including checking the availability of funds to support working group meetings.