

**ANNUAL REPORT 2012-13**  
**Centre of Expertise for Waters**



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## 1. EXECUTIVE SUMMARY

Scotland's Centre of Expertise for Waters, CREW, delivers objective and robust research and expert opinion to support the development and implementation of water policy in Scotland. During 2012-13 CREW has supported policy teams working on Hydro Nation, flood risk management, catchment management and the Water Framework Directive, drinking water and waste water services, as well as wider policy.

Under the Hydro Nation Policy the need for a Centre of Expertise for Waters is set out. In that sense CREW is *part of* policy. CREW has also supported the Hydro Nation Forum with Iain Gordon (James Hutton Institute chief executive) being a member; developed the Hydro Nation Scholarship Programme and provided briefing for the Water Resources Bill.

Highlights of CREW's support on flood risk management includes providing an expert to sit on advisory committees (such as the Scottish Advisory and Implementation Forum on Flooding, and the Scottish Government Flooding Policy Stakeholders Group); responding to call-down requests such as carrying out a survey of Local Authority needs related to natural flood management; supporting SEPA's development of an appraisal methodology for assessing flood risk management measures (via expert review); and carrying out a project on flood insurance to inform policy discussions and Scottish Government interaction with the Scottish Parliament petitions committee on this issue.

CREW has provided research to support catchment management. This includes producing the Scottish Rivers Handbook; providing research on climate change and significant water management issues, as well as non-native plant species to inform river basin management planning; and feeding into catchment management policy such as DEFRA's Professional Water Quality Advisory Group.

CREW has supported Scottish Water in its role to provide drinking water and waste water services. This includes scientific analysis on aerial spraying for the protection of watercourses, and guidance on sewer flooding of agricultural land.

As well as offering specific support to Scottish policy teams, CREW has wider impact. It promotes Scotland's water related expertise overseas by seeking collaborations in Malawi, China and Europe (EU Green Week). Larger funding proposals have been submitted because of networks developed from CREW projects, such as the DEEP BLUE EU Collaborative Project. CREW looks forward to offering continually improving services to support water policy in the coming years.

## 2. EXTERNAL CONTEXT

CREW focuses on the challenges of current and future water-related policies particularly as they relate to gaps in knowledge, data and management practices. Projects carried out this year and still underway address issues faced by CREWs three main “customers” – Scottish Government, Scottish Water and SEPA. CREW has provided significant support for policy teams in Scottish Government and SEPA in implementation of the Flood Risk Management Act (2009), the Water Framework Directive and development of the Scottish Pilot Catchment Initiative and the next round of river basin management plans.

The Hydro Nation Strategy developed significantly this year with the publication of the Hydro nation prospectus and proposal for legislation (2012), and the passage of the Water Resources Bill (now Act, 2013) through the Scottish Parliament. CREW supported the Bill team through the Scottish Parliament legislative stages, and has supported the Hydro Nation Strategy more generally, for example by developing and recruiting students for the Hydro Nation Scholars Programme, and contributing to discussions on the Water and Waste Water Innovation Park.

CREW’s relationship with Scottish Water has further developed this year. Support has been provided for policy issues around waste water treatment and uses, aerial spraying of pesticides that affect water courses and raw water quality. The Drinking Water Quality Regulator has become a new CREW “customer”.

The CAMERAS (Co-ordinated agenda for marine environment and rural affairs science) partnership is in flux, with a new evidence strategy being developed. CREW is involved in workshops to develop the strategy. We are keen to engage with the resulting strategy to link more closely with CAMERAS partners in identifying evidence and research needs and meeting priorities as effectively as possible.

Internationally, CREW (as part of the James Hutton Institute) attended Green Week (Every drop counts: the Water Challenge) in Brussels in May 2012. A poster on the role and remit of CREW was presented, and international contacts and networks made. The Director of CREW has developed water related collaborations in China.

### 3. INTERNAL CONTEXT

CREW is a developing initiative. The facilitation team actively monitor activities, outputs, and feedback from policy contacts. Several actions and projects have informed this monitoring:

- The project “Evaluating CREW” aims to explore and improve science-policy-practice interfaces, and to foster effective links between research and the policy development and implementation cycle within CREW.
- Call down feedback forms are sent to the call down “customer” along with the outputs of an enquiry. This asks for feedback on both the output and the process.
- A review exercise, carried out at the CREW steering group in August, provided the team with feedback from steering group members.
- Regular catch-up meetings with RESAS.

In response to this feedback and more informal feedback a number of changes have been made within CREW:

- Wendy Kenyon has been appointed manager of CREW.
- Emily Hastings now coordinates the call-down service
- Sue Morris now coordinates the capacity building projects
- New [steering group](#) members have been appointed. These include Prof John Rowan (who will act to increase links with the HEI community), Prof Bob Harris, Prof Louise Heathwaite and Sue Petch (Drinking Water Quality Regulator).
- A revised process has been established to develop, scientifically check and procure HEI partners for capacity building projects
- The CREW standard operating procedures have been reviewed by the Scottish Government and agreed by all parties

The main risks to CREW relate to staffing capacity. CREW's success is entirely dependent on the expert staff working within it. Appropriate staff, with sufficient time, are needed to facilitate CREW and work on projects. We have found that whilst experts are keen to work with CREW, their capacity to do so, given other longer term commitments, can be limited. This remains a challenge and is managed by monitoring staff workload, being supportive of CREW experts, and additional recruitment where appropriate.

## 4. OUTPUTS AND OUTCOMES

### Supporting Policy and Practice:

#### Stakeholder Engagement

- Continued development of the CREW Website.** The [CREW website](#) acts as a shop window for CREW and is under continual development to record outputs and services. In 2012 the website was re-vamped. Key (new) features for this year have been (i) the publication of a call down page which provides information on all (non-confidential) call down requests and outputs; (ii) a publications page; (iii) a Hydro Nation page setting out information on the Hydro Nation policy including the Water Resources Bill (now Act) and Hydro Nation scholars programme, iv) access for policy gatekeepers to a password protected part of the site, so they can check on call down progress.
- Source control workshop led by University of Abertay for CREW.** During 2011 the SUDS Working Party (a group of stakeholders from SG, SEPA, Scottish Water etc. who meet regularly to discuss key issues relating to Sustainable Urban Drainage Systems) identified the further implementation of Source Control as a key issue. The group requested help in progressing this work via a workshop. [A source control workshop](#) was designed and carried out with the SUDs working party on 27th February 2013. *Policy contact: Drew Hill (SG).*
- CREW Blue Health project presented at Greenspace Scotland conference.** The outputs from the [CREW Blue Health project](#) have been presented at numerous stakeholder conferences. These include: a presentation by Jenny Roe (Heriot Watt University) at the [Environment and Human Health and Wellbeing](#) Conference in Edinburgh on the 11<sup>th</sup> March 2013; A presentation on Blue Health at the 'SMaSH' (Scottish Managed Sustainable Health Network) meeting on 19 March 2013 with stakeholders present from NHS, Central Scotland Green Network, Clyde valley green network. *Policy contact: Anne Conrad (SEPA)*
- CREW stand and poster at EU Green Week focussing on water.** EU Green Week is the biggest annual conference in European environment policy. It took place in May 2012 in Brussels with the theme: [Every Drop Counts - The Water Challenge](#). CREW had a stand at the conference, attended sessions and [presented a poster](#). The event attracted over 3,000 participants from government, business and industry, non-governmental organisations, academia and the media. The CREW poster was also displayed at the [EU Water Blueprint Conference](#) in Cyprus in November 2012. This conference enabled consultation and debate between

stakeholders, Member States and the European Commission on the implementation of the Blueprint to Safeguard Europe's Water Resources.

5. **Presentations and poster at Knowledge Exchange Scotland: Policy Impact and Practice conference.** This [conference](#) held in October 2012 is designed specifically for Scotland's research community to address KE related questions. [CREW made a significant contribution](#) with a stand, two presentations and a poster. Iain Gordon presented on *Knowledge Exchange on Environmental Issues*; Sue Morris made a presentation on *Connecting Scotland's water research with policy*, and Emily Hastings and Sue Morris presented a poster on *Evaluating science policy and practice interfaces*.
6. **CREW workshop at the Hydro Nation Forum and Conference.** CREW's Director, Bob Ferrier, was asked to design and run a workshop entitled "Exchanging and exploiting Scotland's expertise" at the high profile Hydro Nation conference run by Scottish Council for Development and Industry in December 2012. This conference was a key event in progressing the hydro nation policy and hosted the first meeting of the Hydro Nation forum (see below).
7. **CATCH II project findings presented at conferences by Prof Spray.** The findings from the [CREW CATCH II project](#) (Fully integrated catchment management planning Catchment Advice Template and Exchange II) have been included in several conference presentations by Professor Chris Spray of University of Dundee. These include his keynote speech at the [RAFTS/ASFB Annual Conference March 2013](#); and presentation at [UN Year of Water Co-operation event at the Scottish Parliament](#).
8. **CREW stands at conferences.** In order to increase the profile of CREW in the academic and policy community, the facilitation team has organised stands at key conferences. These include the [SNIFFER Flood Risk Management Conference](#), and the [MASTS annual science meeting](#) (and the Knowledge Exchange Scotland conference and EU Green Week mentioned above).

#### Policy relevant outputs

1. **CREW manager sits on the SAIFF NFM task and finish group.** The [Scottish Advisory and Implementation Forum on Flooding](#) (SAIFF) is a partnership between the Scottish Government, Scottish public bodies and stakeholders. It supports implementation of the Flood Risk Management (Scotland) Act. SAIFF comprises a series of working groups (called Task

and Finish Groups), each with a specific remit. Wendy Kenyon (CREW manager) sits on the Natural Flood Management Task and Finish Group. As such she contributes to developing specific guidance and undertaking further analysis of technical issues related to Natural Flood Management. *Policy contact: Heather Forbes (SEPA).*

2. **CREW manager sits on the Scottish Government Flooding Policy Stakeholders Group.** FPSG's aim is "to maintain the provision of expert advice to the Scottish Government and other relevant organisations and ensure that a broad community of interests is aware of the current and future plans for its implementation." Wendy Kenyon sits on this group and provides research updates. Updates include work from CREW, Theme 2 and other relevant flood related research. *Policy contact: Judith Tracey (Scottish Government)*

3. **CATCH II outputs support Scottish Pilot Catchment Initiative, and policy South of the Border.** The CATCH II outputs and workshop held in March 2012 informed the development of the Scottish Pilot Catchment initiative. *Policy Contact: Joyce Carr (Scottish Government).*

Professor Chris Spray (from the CATCH II team) has been invited to join the DEFRA Professional Water Quality Advisory Group, which advises on Catchment Management development for England and Wales. *Policy Contact: Richard Cole (DEFRA).*

Prof Spray has also been invited to a number of meetings run by the Environment Agency on catchment management to talk about work in Scotland. *Policy Contact: Damian Crilly (DEFRA).* These interactions south of the Border increase Scotland's profile and reputation for excellent catchment management.

4. **Report on the Impact of riparian invasive non-native plant species on freshwater habitats and species.** This [report](#) was requested to inform policy development under the UK Technical Advisory Group (under the Water Framework Directive), Alien Species Group. It is a review of the impact of riparian invasive non-native plant species, particularly their impact on freshwater habitats and species. Feedback on the report was good. The report will help inform policy decisions by the UKTAG Alien Species Group on how riparian alien species are taken account of in Water Framework Directive classification and risk assessment. *Policy Contact: Jo Long (SEPA)*

5. **Aerial Spraying Guidance for the Protection of Watercourses:** Scottish Water requested information on the existing operational protocol for the spraying of Asulam by helicopter. This requires a minimum 50 metre no-



spray buffer zone from all surface water bodies, wells, boreholes and springs. [The report](#) sets out the science behind the protocol and its current relevance. The report is being used by Scottish Water to review the protocol and assess whether it should be changed. *Policy Contact: Mark Haffey (Scottish Water).*

6. **Coastal erosion brief to inform the Minister.** This brief summarises the current Scottish situation with regard to coastal erosion. It provides information on the scale and location of coastal erosion, populations affected by coastal erosion and the potential implications of climate change. The brief was passed to the Minister to inform him on these issues. *Policy Contact: Neil Ritchie (Scottish Government).*
  
7. **Natural Flood Management and Local Authorities in Scotland survey and report.** Local Authorities (LAs) have responsibility for implementing local flood risk management plans, including implementation of natural flood management features where appropriate. To encourage use of NFM measures, the Scottish Government asked CREW to survey LAs to find out what they need to enable them to work with land managers/owners to implement NFM measures. [This report](#) details the survey and responses. The output was positively received and the policy contact stated “it will help identify what guidance Scottish Government and SEPA need to provide to enable LAs to implement NFM measures confidently”. *Policy Contact: Debi Garft (Scottish Government).*
  
8. **Guidance to Scottish Water on sewer flooding to agricultural land.** Scottish Water receives a range of questions from land managers and property owners in relation to sewer flooding of domestic and industrial / agricultural property. They requested guidance on how to respond to questions related specifically to sewer flooding on agricultural land. A report was produced to inform Scottish Waters responses to such questions. The report will help Scottish Water in responding to questions from the public. *Policy Contact: Sara MacCallum (Scottish Water).*
  
9. **CREW Scottish Rivers Handbook.** The CREW capacity building project [River functioning and resilience](#), raises awareness of concepts in fluvial geomorphology and its importance in determining the habitat that river ecosystems rely on and its role in natural flood management. The work also aims to promote best practice for managing and restoring the geomorphology of rivers. The project was completed by a team from the James Hutton Institute and the University of Stirling. A Scottish Rivers Handbook has been written, which provides an overview of the geomorphic character of Scotland's rivers. This handbook includes a

foreword by Prof Louise Heathwaite, Chief Scientist. *Policy Contact: Roger Owen (SEPA).*

10. **Scottish Detailed River Network methodology.** CREW was requested to assist in producing a new Detailed River Network as required by the Flooding Risk Management (Scotland) Act 2009. Scottish Water culverted watercourse datasets and culverted watercourse datasets from Scottish Local Authorities was cross-referenced to identify where differences exist. A team of CREW experts scoped out the work required to develop a full new Detailed River Network and proposed a methodology. This will be implemented in a CREW capacity building project. Policy feedback on this initial scoping project and the associated workshop has been excellent. *Policy Contact: Heather McCabe (Scottish Government).*
  
11. **Review on the effects of switching monochloramine for chlorine in disinfection.** The water industry (Scottish Water) is required to deal with complex chemistry and at the same time meet ever more stringent quality standards. Sometimes, as a result of chasing one particular standard, changes to the water chemistry have affected the quality of the water in unforeseen ways. To inform thinking in just such a case CREW was asked by Scottish Water to provide information on the current understanding of disinfectant choice on lead and copper corrosion, case studies, and guidance on the effects of sampling protocols on lead and copper measurements. A [report](#) was produced. *Policy contact: Simon Parsons (Scottish Water).*
  
12. **CREW Director sits on European Union Joint Programme Initiative.** Prof Bob Ferrier sits on the Science and Technology Board of the EU Joint Programme Initiative (JPI) on Water Challenges for a Changing World. The Council of the European Union launched the Joint Programming Initiative to increase research collaboration by Member States. It seeks to mobilise skills, knowledge and resources, with a view to strengthening Europe's leadership and competitiveness on water research and innovation. The JPI "Water challenges for a changing world" deals with research in the field of water and hydrological sciences.

## 5. IMPACT ON POLICY

1. **Scotland's Centre of Expertise for Waters - part of the Hydro Nation Policy.** The [Hydro Nation Prospectus and Proposals for Legislation](#) sets out the Scottish Government's ambition for Scotland to become the first Hydro Nation. It states that a Hydro Nation will "Share Knowledge on

Water Issues. Developing a Water Centre of Expertise and Research...” CREW is this Water Centre of Expertise, and works with the Hydro Nation policy team to progress the Hydro Nation agenda. *Policy Contact: Jon Rathjen (Scottish Government).*

2. **Prof Iain Gordon is a member of the Hydro Nation Forum.** The [Hydro Nation Prospectus and Proposals for Legislation](#) states that a Hydro Nation will establish a Hydro Nation Forum which will be the focus for international debate, knowledge exchange and policy development on water issues. Prof Iain Gordon (Chief Executive of the James Hutton Institute) accepted an invitation to sit on the Hydro Nation Forum. The first meeting was held in Edinburgh in December 2013, which Prof Gordon participated in. *Policy Contact: Jon Rathjen (Scottish Government).*
3. **Value of Scotland's water resources briefing.** A [CREW briefing](#) prepared for the Bill team in advance of the Stage 3 debate of the Water Resources (Scotland) Bill, led to a (successful) Government amendment (number 6 in the [Marshalled List](#)). The Act now includes the words “...means the value of the resource on any basis (including their monetary or non-monetary worth)” in section 1. In the stage 3 debate the Deputy First Minister stated “Scotland's centre of expertise for waters—CREW—led by the James Hutton Institute, is busy producing research that will support the hydro nation agenda, including a recently published report on the latest evidence and thinking about developing the value of water resources.” [Scottish Parliament official report \(17087\)](#). The policy contact reported that the briefing provides “Early scope for setting out the basis on which we will report to Parliament on the progress against the hydro nation duty.” The briefing was also welcomed in a [Scottish Parliamentary motion](#) (S4M – 05895) lodged by Maureen Watt, MSP, on 11 March 2013, supported (at time of writing) by 31 MSPs. It states “Parliament welcomes the publication of *The Value of Scotland's Water Resources* by the James Hutton Institute Centre of Expertise for Waters, ... considers this valuable learning resource contains information on the importance of Scotland's water ... looks forward to its [James Hutton Institute and CREWs] continuing contribution to political and academic debate.” *Policy Contact: Jon Rathjen (Scottish Government).*
4. **Flood Insurance Provision research informs policy and parliamentary discussions.** Issues of insurance provision are reserved to the UK Government. However, the Scottish Government is involved in discussion with the UK Government regarding the cessation of the Statement of Principles on flood insurance in June 2013. The Scottish Government Flooding Policy team requested research on the current affordability of flood insurance in flood risk areas in Scotland and the likely impact of the cessation of the Statement of Principles on different socio-economic groups living in flood risk areas. The policy contact thought the [CREW report](#) good. It “informs policy development on flood insurance and

negotiations with Defra in order to deliver the best outcomes for Scottish flood insurance policy holders”. Subsequently, the report has informed both the Scottish Government and the Scottish Parliament petitions committee in their consideration of petition [PE01441](#) – Flood insurance problems. The work has had impact on (and is cited in) the [SPICe briefing](#), Scottish Government [correspondence](#), the [official report](#) (790). On 7<sup>th</sup> May 2013 a Scottish Parliament Public Petitions Committee debate on flood insurance will take place. The CREW research will inform government thinking and speeches for this debate. *Policy Contact: Fiona Quinn (Scottish Government)*.

5. **Peer review of report to develop an appraisal methodology assessing the most sustainable flood risk management measures.** SEPA is developing an appraisal methodology to set out an approach to assessing the most sustainable flood risk management measures as required under the Flood Risk Management (Scotland) Act 2009. Halcrow carried out a report on this appraisal methodology, and SEPA requested a review of this study by CREW experts. The peer review was considered vital as the methodology will be used as the basis of millions of pounds of public spending decisions. Feedback was that the reviews were “very good” and that “a lot of time and effort was obviously taken to provide useful feedback which has helped SEPA progress the methodology”. This review is distinct from a similar review focussing on coastal erosion mentioned above. *Policy Contact: Kat Ball (SEPA)* **THIS OUTPUT IS CONFIDENTIAL.**
6. **CREW report informs SEPA’s Article 5/SWMI report.** Part of the Water Framework Directive Article 5 reporting requirements is horizon scanning to identify potential risks to water quality from diffuse pollution driven by future land use and climate change. CREW research requested by SEPA carries out this horizon scanning, and will feed onto the SEPA report on significant water management issues. Feedback from policy contacts has been excellent - “The report looks great, and we are most grateful for all that effort...The outputs will ensure that land use change and climate change pressures will be taken into account in the forthcoming Significant Water Management Issues Report”. *Policy Contact: Jannette MacDonald (SEPA)*.
7. **National Natural Flood Management (NFM) workshop led by Hutton staff for CREW.** SEPA and Scottish Government requested a [NFM workshop](#). 33 academics, policy makers and practitioners attended from Scotland, England and Ireland. Feedback from policy teams was excellent. The impact of the workshop has been to initiate dialogue between SEPA and the Environment Agency (EA) to work complementarily. The EA subsequently halted plans to fund more NFM pilots in England, as the workshop illustrated the breadth of work being carried out in Scotland that the EA could draw on. The workshop

enhanced Scotland's reputation for NFM through-out England and Ireland. *Policy contacts: Debi Garff (Scottish Government) and Heather Forbes (SEPA).*

8. **Hydro Nation Scholarship programme development and recruitment.** The [Hydro Nation Prospectus and Proposals for Legislation](#) sets out the Scottish Government's ambition for Scotland to become the first Hydro Nation. The programme of action to be taken under the Hydro nation banner includes "Saltire Water Fellowships and Scholarships". The [Hydro Nation Scholarship programme](#) is the first step. CREW has developed the programme and recruited the first cohort of Hydro Nation Scholars. The policy contact is delighted with the development of the programme and very happy with the quality of the first cohort of students. *Policy Contact: Jon Rathjen (Scottish Government).*
  
9. **Coastal Flooding in Scotland guidance document impact in Scottish Parliament.** This [CREW guidance](#) provides up-to-date knowledge and information relating to coastal flooding in Scotland. It synthesises existing science and research on issues relevant to climate change, sea level rise, coastal flooding, coastal erosion and flood defences together with strategies of coastal adaptation. The guidance document has had impact in the Scottish Parliament and with a local authority. The [SPICe petition briefing](#) written in advance of consideration of petition [PE01459](#) heavily relies on (and cites) this CREW work. The guidance document was also requested by the [Stonehaven Flood Action Group](#) for use in relation to discussions with the local authority about their most recent flood event. *Policy Contact: Neil Ritchie [originally Stan Irvine] (Scottish Government).*

### Benefits to other stakeholders

1. **CREW Register of Expertise.** The [CREW Register of Expertise](#) is a searchable listing of individuals active in water research in Scotland. The success of CREW lies in its ability to draw on Scotland's extensive pool of research talent working on water related issues, and using this talent to respond to policy needs. Whilst CREW uses this register to find experts to carry out research, it is a public register and is used by consultants, the Scottish Government, academics, students in search of water experts in Scotland. It currently includes contact details of 134 water expert.
  
2. **Mentorship of the Natural Talent Apprentice on the Allan Water Project.** The Allan Water was identified as a catchment with a potential for natural flood management (NFM) measures to ease flooding to communities within the catchment. CREW was approached to help in taking forward the [Allan Water Natural Flood Management Project](#) through the Natural Talent Apprenticeship scheme (run by The Conservation Volunteers). The

[CREW contribution](#) to this project enables mentoring of the apprentice by the Centre for River Ecosystem Science (CRESS) at the University of Stirling, and experts at the James Hutton Institute. The apprentice is Laurence Belleni. This project is increasing capacity in Scotland on NFM. *Policy contacts: Debi Garft (Scottish Government) and Heather Forbes (SEPA).*

3. **Waterworks schools photography competition.** A [schools photography competition](#) was run throughout the year. The aim was to get pupils thinking about water in Scotland and how vital it is to every aspect of our lives, to reflect our relationship with water, how we use it, and to take photographs that demonstrate the importance of water in Scotland. The competition was open to any primary school in Scotland. All of the entries and the monthly winners can be seen on the James Hutton Institute's [Facebook page](#). The competition increased the profile of water issues in Scottish schools.

## 6. COLLABORATION AND MULTIDISCIPLINARY WORKING

### Collaborations

1. **CREW Water Futures Day 2012.** CREW organised a Water Future's Day on 7th November 2012, in Edinburgh. The workshop was held to explore upcoming water policy challenges and consider how research can offer support. The day was a collaboration between CREW facilitation team, policy contacts in Scottish Government, SEPA, Scottish Water, the Drinking Water Quality Regulator, and the Scottish Higher Education community. This will influence CREW work in future. The report is [available](#).
2. **Guidance on buffer strip width.** Buffer strips are a key measure for improving water quality in the Scotland Rural Development Programme. However, no Scottish guidance currently exists on how wide buffers should be. SEPA requested simple guidance that relates width to slope, soil type, river typology and other risk factors. This project is a collaboration between the James Hutton Institute, CEH and CXC (who fund Davy McCracken, SRUC's contribution). *Policy Contact: Jannette MacDonald (SEPA).*
3. **CREW involvement in EPSRC Flooding Network:** The LWEC (Living With Environmental Change) and the EPSRC (Engineering and Physical Sciences Research Council) are funding three new research projects related to flood risk management. To help co-ordinate across these projects and link the new research to that previously undertaken, the EPSRC asked Prof Gareth Pender (Heriot-Watt) to submit a grant proposal

to fund a co-ordinating network. CREW have committed to supporting the network by contributing to steering and management. A final decision on the proposal has not yet been made, though it was positively received.

4. **Scottish Water, SEPA and the James Hutton Institute collaboration on Hydro Nation.** In response to the Scottish Government's ambition to become the first Hydro Nation Scottish Water, SEPA and the James Hutton Institute have been in discussion to develop a shared vision and joint approach to this policy. Whilst the collaboration involves the James Hutton Institute, CREW is involved in facilitating it. This initiative is supported by the Scottish Government (discussed by Nicola Sturgeon in her stage 3 debate on the Water Resources (Scotland) Bill ([Official Report, 17087](#))).
5. **CREW involved in discussions with UK Water Research and Innovation Partnership.** The [UK Water Research and Innovation Partnership](#) (UKWRIP) is composed of private, public and third sector bodies. It aims to address urgent and important water challenges and provide the evidence to support effective decision-making, joined-up policies, and a coordinated coherent approach to the development and dissemination of new knowledge, technologies and skills. These objectives chime with CREW's objectives. CREW has been in discussion (with the Scottish Government) to feed into the framework and action flowing from it. The interaction is ongoing.
6. **DEEP BLUE - EU Collaborative Project.** Networks developed from the CREW project [Emerging Contaminants of Concern in Waters](#) have led to CREW experts from the James Hutton Institute being involved in the EU Collaborative Project: *Developing the Environmental impact base to mitigate Emerging Pollutants; Building Learning and Understanding to Enable Change*. This proposal is currently under review within the EU. CREW is cited by both the James Hutton Institute team and the Middlesex team as a mechanism to facilitate connection to the policy community.
7. **CREW collaborates with the NERC Water Security Knowledge Exchange Programme.** CREW has on-going collaboration with the [NERC Water Security Knowledge Exchange Programme](#) (WSKEP), chiefly via Alan Jenkins who is a member of the CREW steering group and Director of the WSKEP. Director of CREW, Bob Ferrier sits on the Advisory Board of the WSKEP. The WSKEP is a long-term initiative funded by the [Natural Environment Research Council](#). The aim is to accelerate the uptake of research and help inform the direction of future science to ensure sustainable use of our water in the future. A joint [James Hutton Institute-](#)

[CREW-WSKEP workshop](#) was held in May 2012 in Edinburgh focussing on Integrating ecosystems and social systems to enhance water resource management.

8. **CREW Collaboration in China.** Director of CREW, Prof Bob Ferrier has set up a [new collaboration](#) with the Natural Environment Research Council's Centre for Ecology and Hydrology, the Chinese Academy of Sciences and China Agricultural University. This new Centre-Centre research collaboration will tackle some of the global challenges of food, water and energy security.

## 7. **PROGRESS REPORTS ON ACTIVITIES**

### Summary of progress

[The CREW facilitation team](#) has met its objectives during the year. Activities have included managing the call down service, developing the website, improving the register of experts; administering and supporting capacity building projects in collaboration with MASTS partners; producing papers for meetings; producing awareness raising and publicity materials for CREW (e.g. publicity flyers, PowerPoint presentations, posters for conferences); organising steering group meetings; presenting CREW at conferences and attendance at CREW and other water-related events; liaising with relevant organisations and networks.

- All aspects of this project are on track, all deliverables have been met.

[CREW Website](#): The CREW website acts as a shop window for CREW and is under continual development to record outputs and services. In 2012 it was re-vamped. Key (new) features for this year have been the publication of a call down page; a publications page; a Hydro Nation page setting out information on the Hydro Nation policy including the Water Resources Bill (now Act) and Hydro Nation scholars programme, amongst other things.

- All aspects of this project are on track, all deliverables have been met.

[Evaluating CREW](#): The Evaluating Science Policy Practice Interfaces project involves defining a baseline for CREW engagement with key end users (policy makers and practitioners) and then to evaluate and periodically report on those interactions. End-user feedback is used to identify what has worked and why or why not, and to adapt the next cycle of engagement to address any imbalances. In particular, the project considers whether the outputs and outcomes have been achieved; and whether CREWs structures are effective. Six outputs are available from this project.

- All aspects of this project are on track, all deliverables have been met.



**Call down service:** The CREW call down service provides the Scottish Government, SEPA and Scottish Water with access to reliable and impartial information from leading experts. In 2012-13: Revised procedures have been agreed for authorising spend and commissioning projects; non confidential requests are now put on the [website](#); feedback forms are sent to all policy contacts at the end of a project. Between April 2012 and March 2013, 35 call down requests were received. CREW assesses the appropriate route for requests to be delivered. Of these, 30 have been or are being delivered by CREW. The call down service continues to show high demand and as discussed above, outputs are demonstrably valuable to policy contacts.

- All aspects of this project are on track, all deliverables have been met.

**Capacity building projects:** All capacity building projects proceeded on the basis of clear aims, objectives and planned activities as identified in the action plans CREW required for these projects. The status of all projects is set out below:

### **Natural Flood Management (NFM) Knowledge System**

The project, carried out between April 2011 and August 2012, contributes to the baseline knowledge related to natural flood management (NFM). It provides evidence for and supports implementation of the Flood Risk Management (Scotland) Act 2009. The project was completed by a team from JHI and Heriot Watt University. Seven outputs are available.

- The project is complete, all deliverables have been met.

### **River Functioning and Resilience – Scottish Rivers Handbook**

The project, undertaken between April 2011 and December 2012, raises awareness of concepts in fluvial geomorphology and its importance in determining the habitat that river ecosystems rely on and its role in natural flood management (NFM). The work also aimed to promote best practice for managing and restoring the geomorphology of rivers. The project was completed by a team from the James Hutton Institute and the University of Stirling. A Scottish Rivers Handbook has been written as a result of the work. This handbook provides an overview of the geomorphic character of Scotland's rivers. The handbook is being printed now.

- The project is complete, all deliverables have been met.

### **Coastal Flooding**

The project carried out between April 2011 and August 2012 contributes to our understanding of coastal flooding in Scotland. A practitioners' guidance document was produced. The purpose is to provide the most up-to-date knowledge and information relating to coastal flooding in Scotland ensuring that the information is based on the best available scientific evidence. In particular, it synthesizes existing science and research on issues relevant to climate change, sea level rise, coastal flooding, coastal erosion and flood defences together with strategies of coastal adaptation. The work was

carried out by a team from the James Hutton Institute and the University of Dundee. One output is available.

- The project is complete, all deliverables have been met.

### [Fully Integrated Catchment Management Planning Catchment Advice Template and Exchange II \(CATCH-II\)](#)

This project established a common understanding of the activities and objectives of integrated catchment management (ICM) projects in Scotland. It used the knowledge and experience of established ICM projects to identify opportunities and challenges to delivering Scotland's policy commitments to water management at the catchment-level. Key messages have been disseminated to ICM policy makers, agencies and practitioners in Scotland, in the UK, and to international audiences via the HELP basin network. Three outputs are available.

- The project is complete, all deliverables have been met.

### [Water, Health and Well-being \(Blue Health\)](#)

This project, carried out between April 2011 and December 2012, contributes to our understanding of this area of research by raising stakeholder awareness of the state of knowledge of the role of water in relation to well-being (e.g. a cause of stress, or a factor influencing psychological restoration). It collates the latest evidence of the role of water in relation to well-being. The project engaged with stakeholders to identify links in relation to water and well-being. The work was carried out by a team from the James Hutton Institute and Heriot Watt University. Five outputs are available.

- The project is complete, all deliverables have been met.

### [Hydro-literacy; Knowledge Exchange for Public Engagement](#)

Key elements in 2012-13 were:

- A schools [photography competition](#) which ran throughout the year. The competition was open to any primary school in Scotland. Entrants were asked to submit photograph relating to an aspect of contemporary water use – its impact on our daily lives, threats to water resources, ways in which we rely on water.
- Hydro Nation Scholarship programme development and recruitment. CREW was asked to develop the programme and recruited the first cohort of [Hydro Nation Scholars](#).

- The project is complete, all deliverables have been met.

### [Communicating flood risk through language and maps](#)

This project is being carried out by a team from the James Hutton Institute and Heriot Watt University. The aim is to conduct an international review of good practice regarding the communication of risk awareness raising messages about natural hazards. It explores different ways of representing

flood risk to Scottish citizens. Possible strategies, informed by good practice from other domains, have been tested with a stakeholder participation exercises to evaluate to what extent SEPA might benefit from changes to its communication approach.

- This project is almost complete.

### **Urban diffuse pollution control**

This work will inform Scottish policy development on the Water Framework Directive and river basin management planning required under the Water Environment and Water Services (Scotland) Act (2003), and surface water management under the Flood Risk Management (Scotland) Act (2009). The work is being carried out by a partnership between the JHI and University of Abertay Dundee.

- This project was on track, but the (much loved and missed) lead expert died in a recent tragic accident. We are considering how to take this project forward.

### **Emerging Contaminants of Concern in Waters**

The project will provide a comprehensive review of the sources, impacts, risks and monitoring of water related 'known-unknowns'. This will include potential emerging contaminants of concern within Scottish watercourses; data availability; impact assessment on ground and surface water. Water Framework Directive compliance (and coastal environments - Bathing Water Directive) and current and future risks are being assessed. Current and future monitoring and assessment methodologies for emerging contaminants of concern within Scottish watercourses are being explored.

- This project was on track, but due to experts being involved in a recent fatal accident, we are considering how to take this project forward.