

## Report on the Autumn 2015 meeting of Scottish Freshwater Group

*The 95<sup>th</sup> meeting of the Scottish Freshwater Group took place on 29<sup>th</sup> October 2015 at the University of Stirling. The day's proceedings were chaired by Matthew O'Hare (CEH, Edinburgh), comprising an eclectic mix of morning talks and a focus on river restoration during the afternoon session. There was also a special announcement about our Spring 2016 meeting...please read on to find out more!*

The morning session kicked off with PhD student Crystal Smiley (University of Glasgow), who is researching the source of freshwater contributions to the North Atlantic using an isotopic tracer study to clarify the signal between ice and snow profiles. Using preliminary findings from the Loch Etive catchment in Glencoe, Crystal informed us that not all snow is the same due to the influence of physical properties, hydrochemistry, water density, ice crystal structure and atmospheric conditions during deposition. Crystal identified three isotopic sources along a gradient with composite 'mixed' signatures between depleted ice and enriched snow signatures. She also reported a consistent trend of increasing enrichment signal, indicating additional "freshening" of snow-derived inputs, from source to sea. Next up, Nick Hanley (University of St Andrews) took the floor to discuss placing monetary values or estimates of willingness to pay (WTP) for water quality improvements in terms of its connectivity with direct and indirect well-being benefits. Various case studies were cited to describe two key approaches, including their strengths and limitations, in establishing a true valuation 1) Contingent Evaluation 'V' e.g. WTP for a reduction in cyanobacterial blooms in Loch Leven, Fife (Hunter et al., 2012); and 2) Choice Experiment 'CE' e.g. WTP trade-off between different attributes and levels in the Boyne river catchment, Ireland (Stithou et al. 2012). Then Kenneth Porter (University of Stirling) went on to talk us through the [SCIMAP](#) work. This has been developed to visualise Faecal Indicator Organism (FIO) hotspots and in-situ tracers to target FIO movement through the landscape, for informing mitigation efforts on UK priority catchments (e.g. R. Yealm, R. Wyre): Figure 1. Bringing the wide-ranging presentations of the morning session to a close, Diane Lawrence (University of Edinburgh) highlighted the complex adaptive interactions of ecological communities to environmental change, using a tree-hole bacteria field experiment and fjord algae mesocosm study for investigating their response to elevated temperature and CO<sub>2</sub> conditions, respectively.

We then broke for lunch and enjoyed engaging with a range of poster presentations.

Zarah Pattison (University of Stirling) opened the afternoon session, which focussed on river restoration, with a presentation on her PhD research. Zarah outlined the environmental factors influencing the spread of three invasive riparian species, namely Himalayan Balsam, Japanese Knotweed and Giant Hogweed, and their impact on native biodiversity, indicating lowland rivers were most impacted where invasive species tend to dominate, detected most at the local scale than large scale catchment-scale surveys. Then Hannah Clilverd (University College London) provided an overview of the removal of river embankments and successfully modelled effects on river-floodplain hydrodynamics on the River Glaven in Norfolk. Following on, Eric Gilles (CBec Ltd. and University of Glasgow) went on to discuss the application of sophisticated 2D modelling technology to accurately predict eco-hydraulic outcomes and minimise flood risks of river restoration design, using the Allt Lorgy in the Spey catchment as a case study. Finally, Hamish Moir (Cbec Ltd.) touched on the pilot catchments (e.g. R. Leven, Fife) which were prioritized by SEPA for river restoration projects to improve physical condition and deliver on WFD objectives. Hamish emphasized that a no-one-size-

fits-all solution to river restoration, dividing these into 'design', 'assisted recovery' and 'do nothing' approaches, depending on their potential capacity to self-recover from the constraints of physical pressures. These risk-based decisions were made by comparing the degree of impact with geomorphic process dynamism or intensity index, and illustrated using the Eddlestone Water (= design), Allt Lorgy (= assisted) and White Esk (= do nothing): examples which reflected the aforementioned intervention continuum from intricate involvement to giving a helping hand and letting the river do the recovery work, respectively.

Afterwards, we visited the local pub to continue our friendly discussions.

The next SFG meeting will comprise a 2 day event, including a local BioBlitz, taking place on 21<sup>st</sup> and 22<sup>nd</sup> April 2016 at the Scottish Centre for Ecology and the Natural Environment (SCENE), Rowardennan. SFG meetings will return to Stirling University in Autumn 2016.

If you would like to receive further details please email Laurence Carvalho ([laca@ceh.ac.uk](mailto:laca@ceh.ac.uk)) or visit the SFG homepage (<http://www.ceh.ac.uk/scottish-freshwater-group>). It is now also possible to receive SFG notifications via Facebook (Scottish Freshwater Group) or follow us on Twitter @Scottish\_FwGrp.

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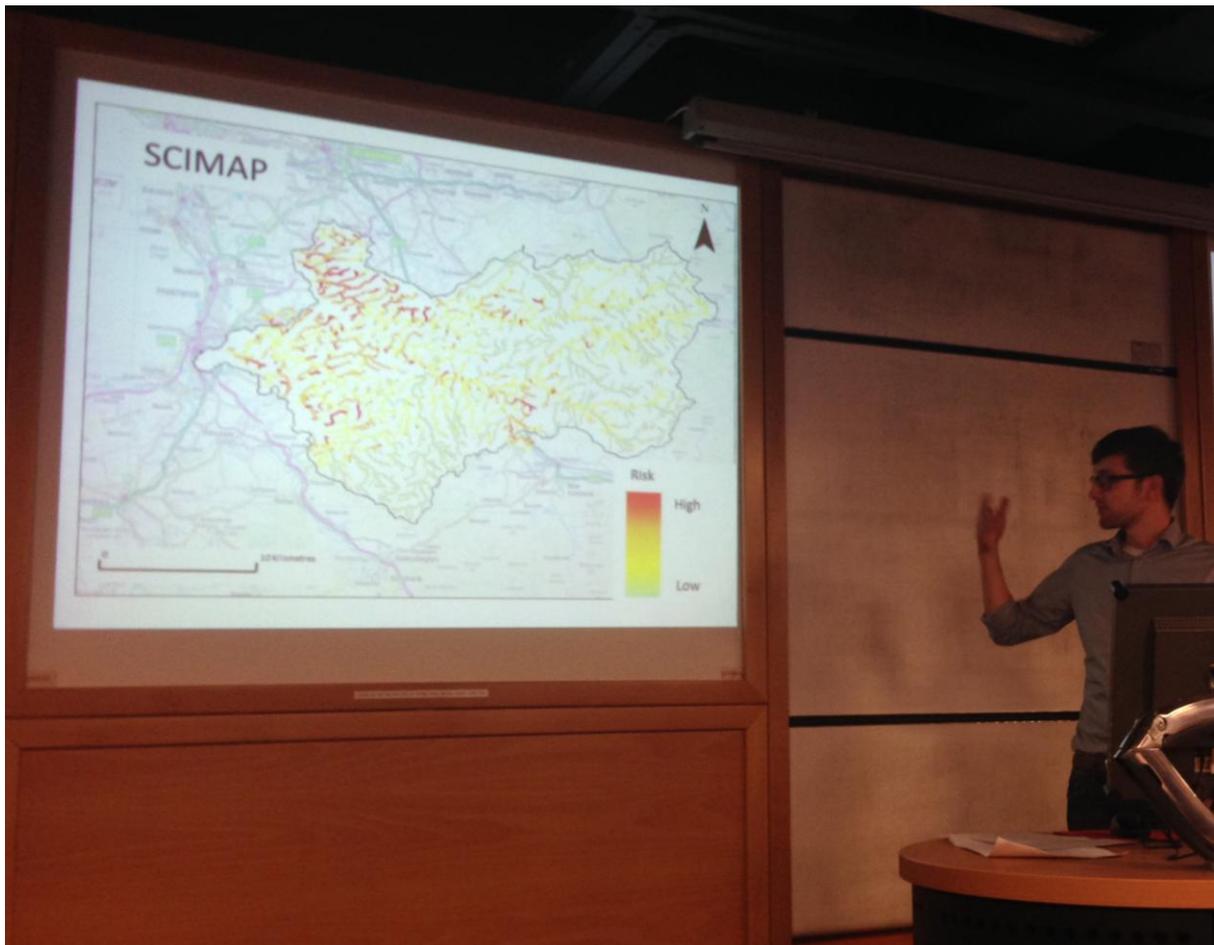


Figure 1. Kenneth Porter introduces SCIMAP for FIO catchment tracking [photo credit – Pauline Lang]



Figure 2. Hannah Clilverd summarizes efforts to restore the River Glaven, Norfolk [photo credit – Pauline Lang]