

e-Bulletin #13

In this issue I provide you with some of the highlights from two recent events I have attended on uncertainty. The first a workshop on how to work with uncertainty in modelling, and the second a conference on 'Decision-making in the Twilight of Uncertainty' held last week. Both provided interesting thoughts on the role of uncertainty in science and how we communicate it to a wider audience.

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- News from recent workshops and conferences on the topic of uncertainty
- *Fifth modelling workshop*: Tuesday 14th January

Fifth modelling workshop

The fifth modelling workshop in Hebden Bridge will take place on Tuesday 14th January at Hebden Bridge Town Hall. In this workshop we will:

- **General testing of interventions**

It is important that we understand what happens to the catchment objectives when we activate each intervention in turn. Do the changes make sense?

- **Sensitivity analysis**

Looking at each intervention, we use the software to see which variables it is most sensitive to changes in. We ask whether this makes sense based on our own understanding.

An invitation will be out shortly. I look forward to seeing many of you there.

Uncertainty Workshop, 11.11.2013

About two weeks ago, I presented to a team of academics at a workshop in London on the theme of uncertainty. A focus of this was to talk about how we communicate uncertainty. This is a big issue in environmental management at the moment, and one which many projects stumble upon when they don't get it right. By structuring our knowledge in a model that is based on probabilities, we are defining each relationship in the model based on how confident we are in our understanding. Some outputs from the model will be in the form of "based on our understanding we think that if we do x, y and z as interventions, we have a X% chance of reducing flood risk". Using the language of probability communicates our uncertainty clearly.

Decision-making in the Twilight of Uncertainty, 19.11.2013

One of the take-home messages for me was the many different types of uncertainty we will be faced with. Including scientific uncertainty (whether we have built the model correctly in the first place, and whether the model can cope with change), option uncertainty (do we really know the effects of different interventions – and are some simply unforeseeable) and ethical uncertainty (different individuals value the same things differently – and these values changes over time). We need to recognise those we can reduce and those we cannot.

The guidance for decision-makers was also particularly interesting, and included: a) being flexible – having an option C when you cannot decide between options A and B; b) being robust – choosing options that limit the chance of surprises; and c) selecting a level of confidence – needing to find that optimal point where you are confident *enough* to make a decision to the face of the uncertainties.

It was nice to see that a lot of the recommendations made at this conference on how to deal with uncertainty, are things we are already doing in Hebden Bridge. A lot of these centred on seeking transparency in the models we produce, and communicating our outcomes with humility (so that wider stakeholders understand the assumptions we have made). Rather than hiding the uncertainty that exists, we need to clearly show the confidence that we have in our findings.

Between now and Christmas I will be busy working on translating all of your hard work in the workshops thus far into a working model in Netica. This is a piece of software specifically designed for building and working with Bayesian networks. The next bulletin (which I will aim to send out before Christmas) will detail this 'behind the scenes' work, so you are kept up to speed with the latest project developments.