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Workshop Report

Innovative Monitoring Strategies and Decision Support Workshop
River Great Ouse Catchment UK
10th & 11th November 2016

Day 1: The Club, Alconbury Enterprise Campus, Alconbury Weald, Huntingdon, UK.
Day 2 at local Environment Agency offices, Brampton, Huntingdon, UK

1. Purpose

This INTCATCH workshop was delivered in partnership with the Interreg: WaterCog project and the Life IP: Natural Course project to explore the relationships and synergies between the projects.

1.1 Workshop Objectives:

The workshop was split into two parts, where day 1 involved the widest possible set of stakeholders, and day 2 was solely for the INTCATCH partners.

> **Day 1:** To work with catchment stakeholders to generate a broad set of current and future requirements or desirables, for monitoring and managing the catchment which frame decision support needs.
>
> **Day 2:** To reflect the stakeholder requirements into the plans for the INTCATCH project, the decision support system and identify any gaps in planned actions.

2. The Approach

The workshop was designed by Downstreams CIC (the INTCATCH Exploitation Partner) to be interactive for attendees and to explore the challenges where the INTCATCH project may be able to improve the monitoring and management of catchments. The workshop used open question plenary discussions, targeted group working on problems and solutions, and some simple 'gamification' of the INTCATCH project products.

The primary purpose of the activities was to inform the decision support needs of the catchments, but the presentation about 'Decision Support Systems in the context of INTCATCH' was deliberately left to the end of the day so as not to bias stakeholders views. Figure 1 below illustrates the structure of the workshop.

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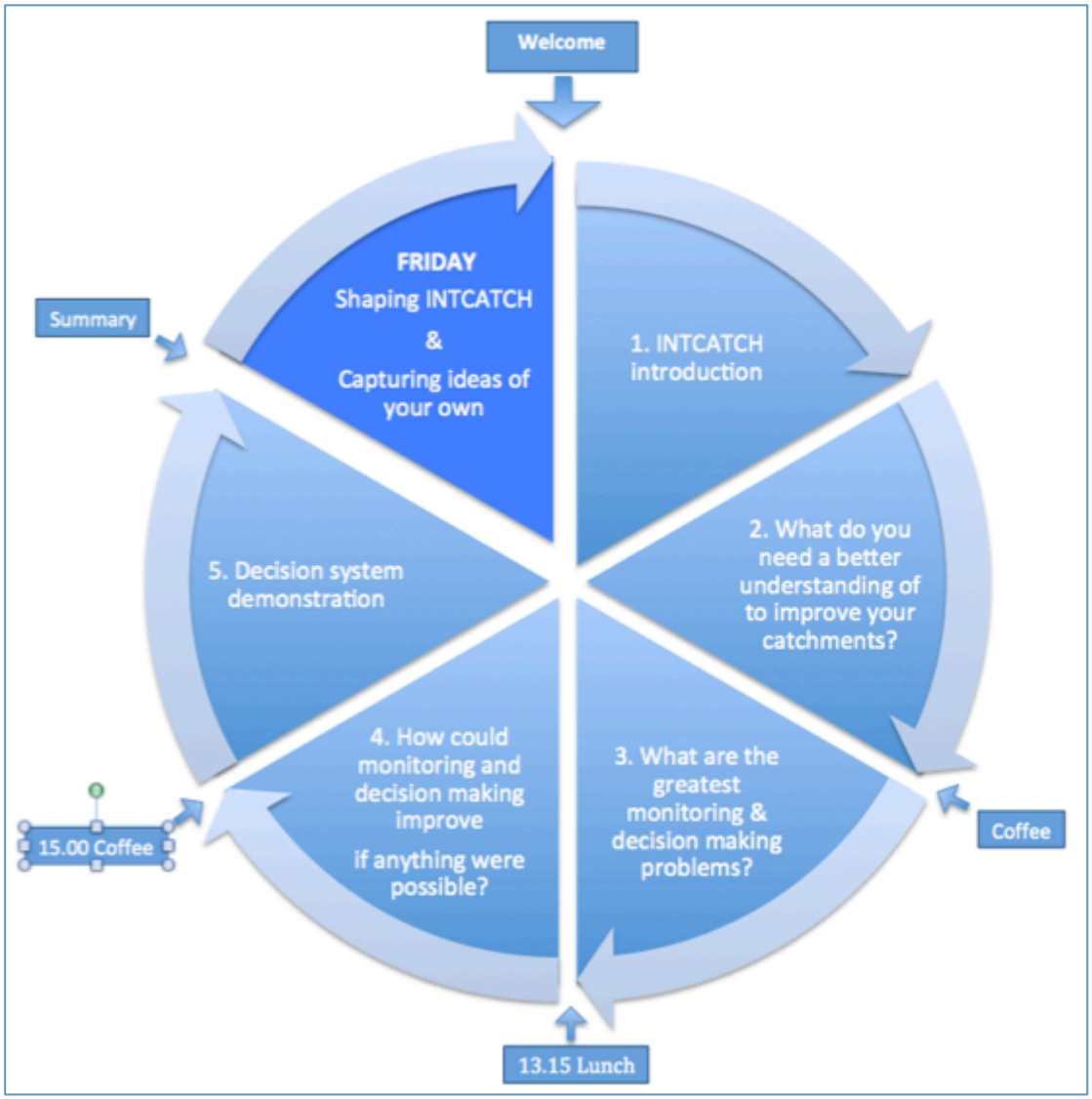
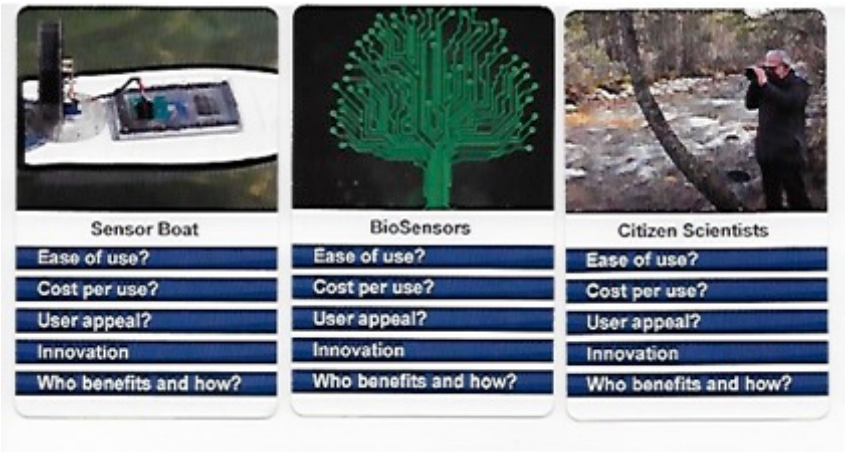
Figure 1: The Workshop Structure



The gamification was achieved by creating a set of 'Top Trump' cards for the INTCATCH project. This deck of cards included each of the INTCATCH tools and approaches being tested and a series of extra cards for 'players' to adapt. Figure 2 below shows a sample of the INTCATCH cards used.

Figure 2: Three of the INTCATCH Cards



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3. Workshop Outputs

The workshop has generated a number of tangible and intangible outputs. The tangible outputs are:

a) A list of the issues which need to be better understood to improve catchments, which included some prioritisation – see section 3.1
b) A deeper insight into the monitoring and decision making problems related to the top 6 issues – see section 3.2
c) A series of sketched out ideas or scenarios as to how the INTCATCH tools (and others) could be used to improve catchments – see section 3.3

The intangible outputs of a stakeholder workshop such as this are harder to quantify but often more important. This workshop involved 31 attendees, drawn from academia, business, NGOs, and regulators. Twenty were local stakeholders who care about the River Great Ouse catchment, specifically the catchment partners involved with the Cam and Ely Ouse (CamEO) part of the catchment. The other attendees were specialists on water quality monitoring, citizen science, and managers of environmental monitoring and pollution/land use risk management programmes across the UK.The attendees were invited to engage with each other and share experiences and perspectives in the plenary and group working activities.

The opportunity this workshop created for open sharing of views, challenges and ideas was extremely valuable and new relationships were established that will bring future benefits to all 3 EU funded programmes represented at the workshop. Informal feedback included quotes about the quality and breadth of attendees and the interesting workshop sessions helping attendees to explore outside of their usual way of thinking.

3.1 Issues that need better understanding

The workshop attendees created the following list of issues that needed better understanding to improve catchment monitoring and management. The issues highlighted in bold blue were the ones that were given the highest priority.

Real-time water quality and understanding episodic events	**What are impacts of groundwater and surface water interactions?**
Vulnerability, understanding and managing risk and how can modelling play a stronger role?	**Who are the stakeholders in the catchment, what do they care about and where is there conflict?**
Where does the P in the catchment come from? (improving SAGIS?)	**How do geomorphology improvements affect water quality?**
Delivering a high level outcome versus avoiding minor breaches of standards, which is most important?	Do water company customers understand, appreciate and influence activities to improve catchments?
How can rivers link with Smart Cities?	Diffuse pollution, sources and impacts
How do we develop an affordable baseline knowledge of a catchment?	What is the role of human eyes and ears in monitoring a catchment?
What quality of information is needed to lead to better decision making	How can we design the best monitoring exercises?
What are the benefits of interventions on absolute water quality?	Where do the Pesticides in the environment come from?
What sensors are available	Sources of pressures on rivers
What is the desired state of the river? And Is WFD delivering what people want?	Sustainability: society, economy and environment, what is the impact of growth on water quality?
What are the effects of weather on water quality?	Understanding complex catchments as a whole system

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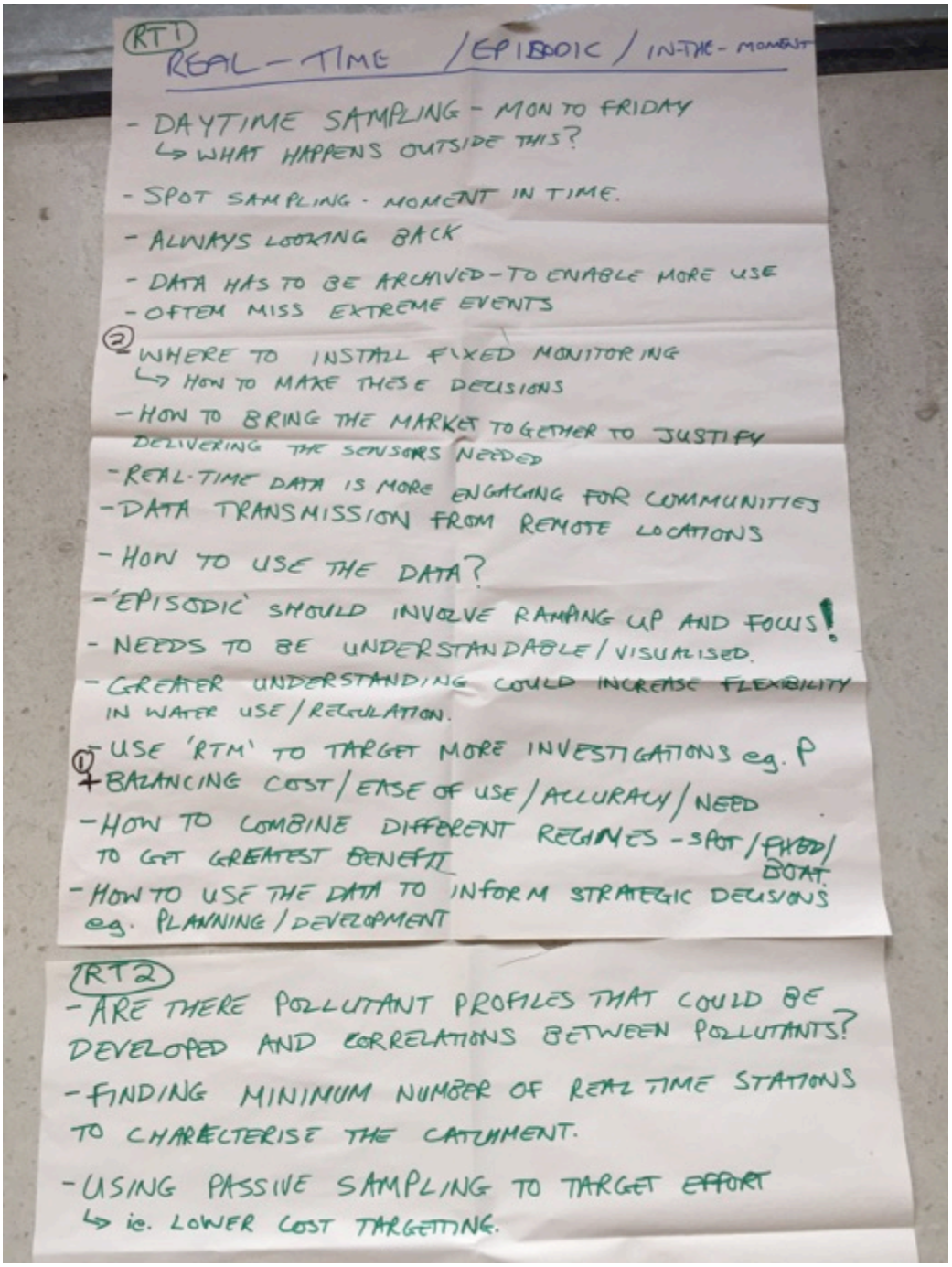
3.2 Monitoring and decision making problems related to the top 6 issues

The top 6 issues in the table in section 3.1 (Bold and Blue) were prioritized by the majority of the stakeholders present. These issues were then discussed in more detail by groups to explore the specific challenges around those issues. The flip charts have been photographed and included to avoid misinterpretation of the information.

3.2.1 Real-time water quality and understanding episodic events



A second group also considered the challenges around real time monitoring.

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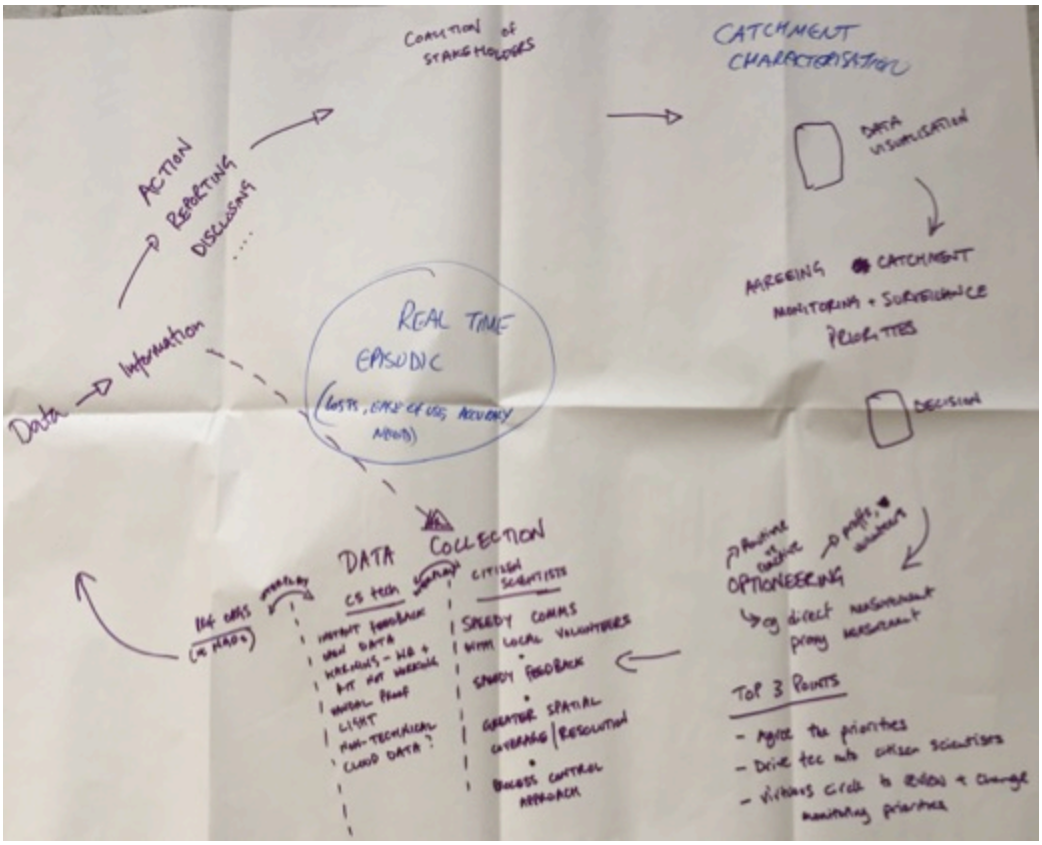
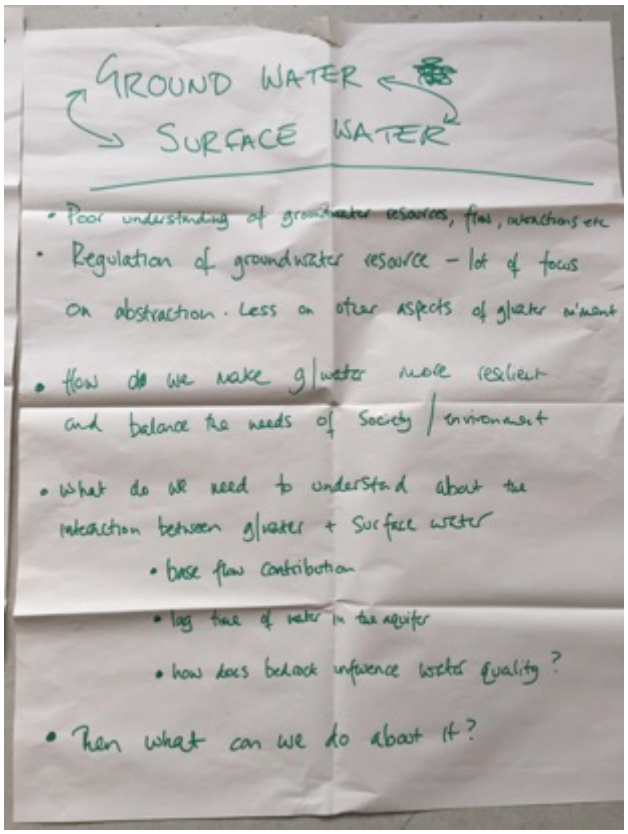
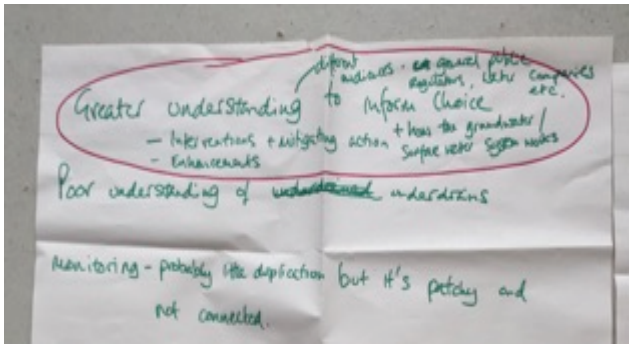


3.2.2 What are the impacts of groundwater and surface water interactions?





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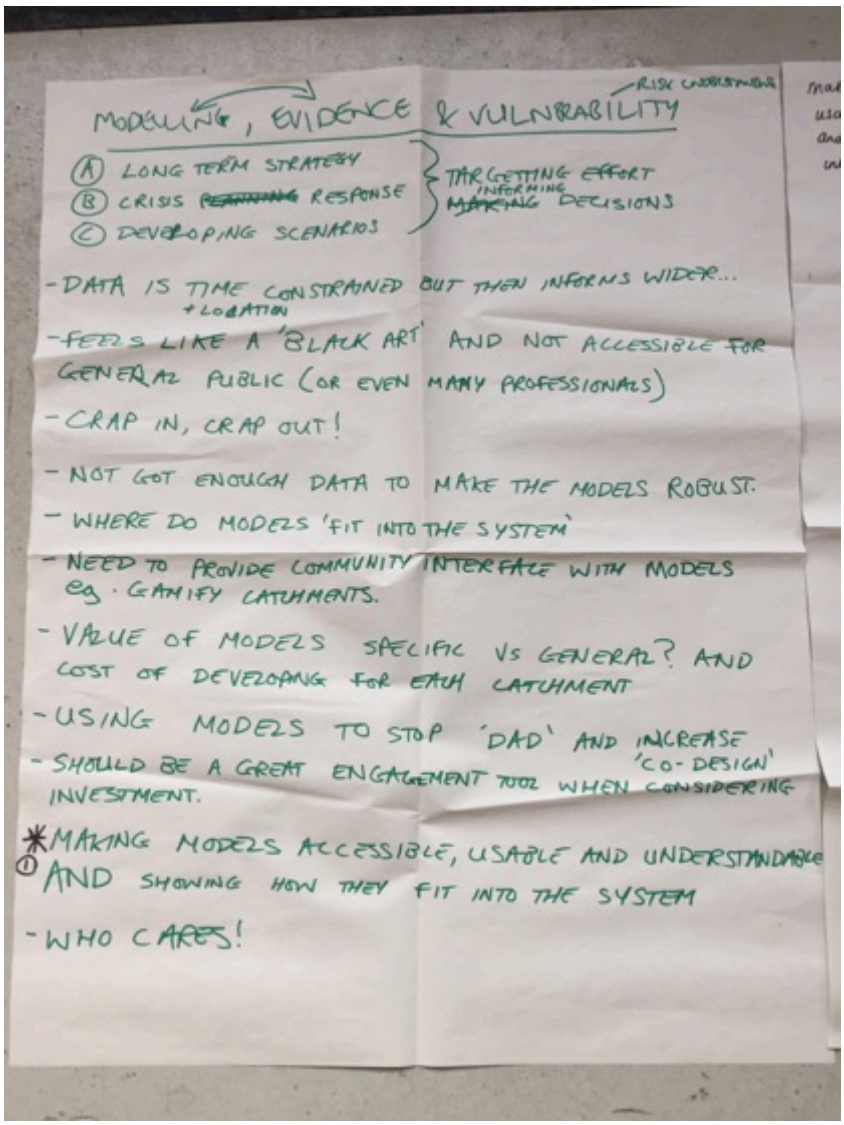
3.2.3 Vulnerability, understanding and managing risk and how can modeling play a stronger role?



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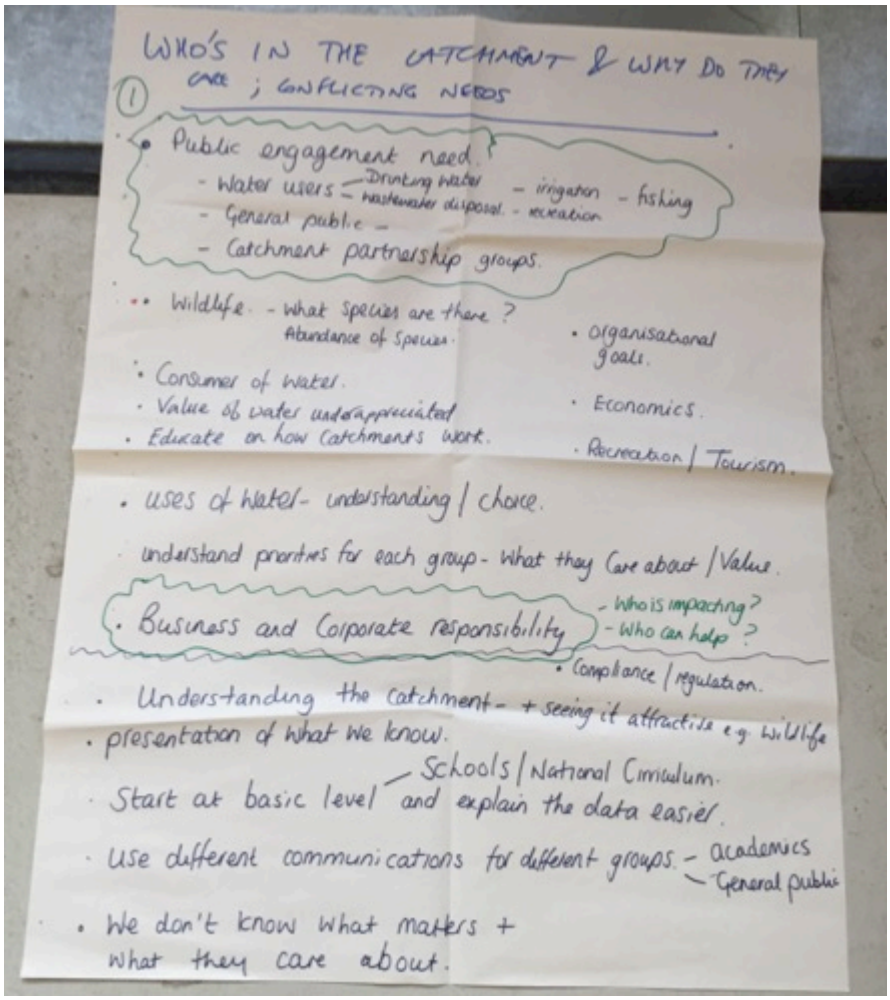
3.2.4 Who are the stakeholders in the catchment, what do they care about and where is there conflict?



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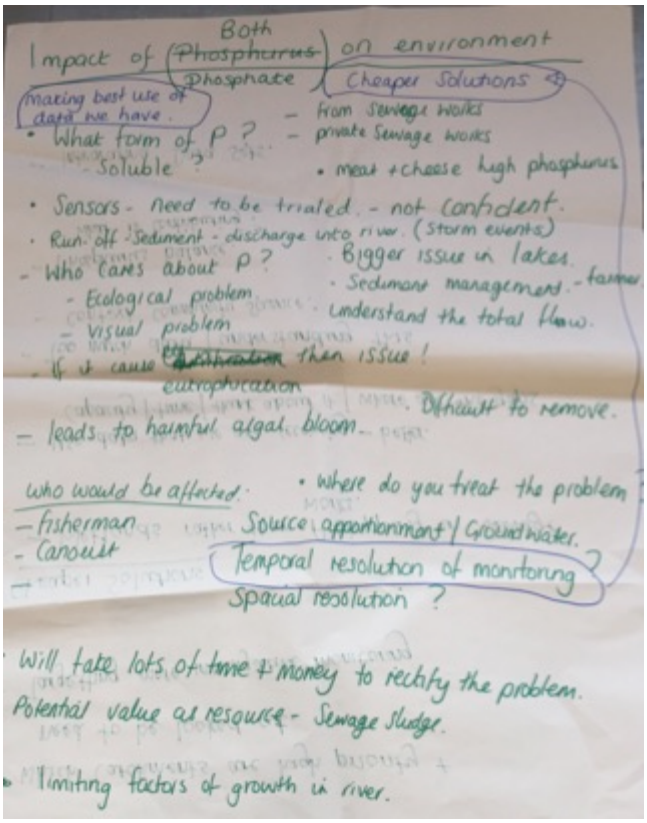
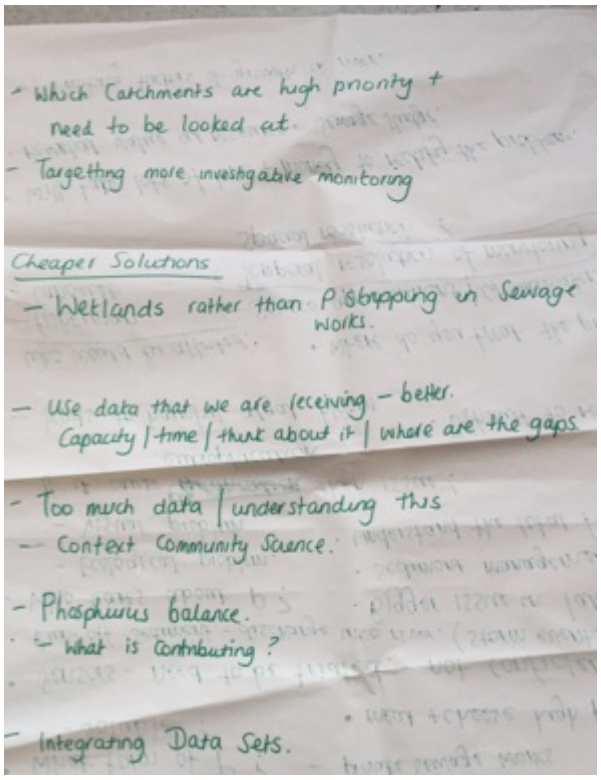
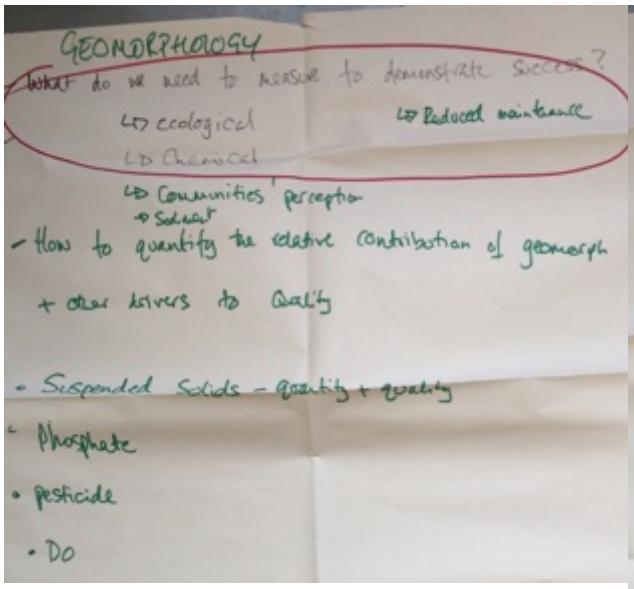
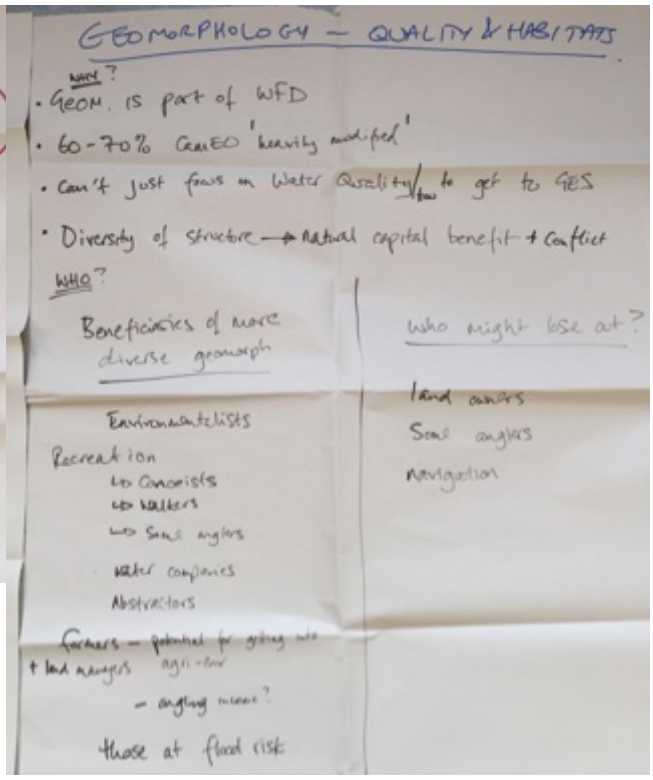
3.2.5 Where does the P in the catchment come from?





3.2.6 How (do?) geomorphology improvements affect water quality?





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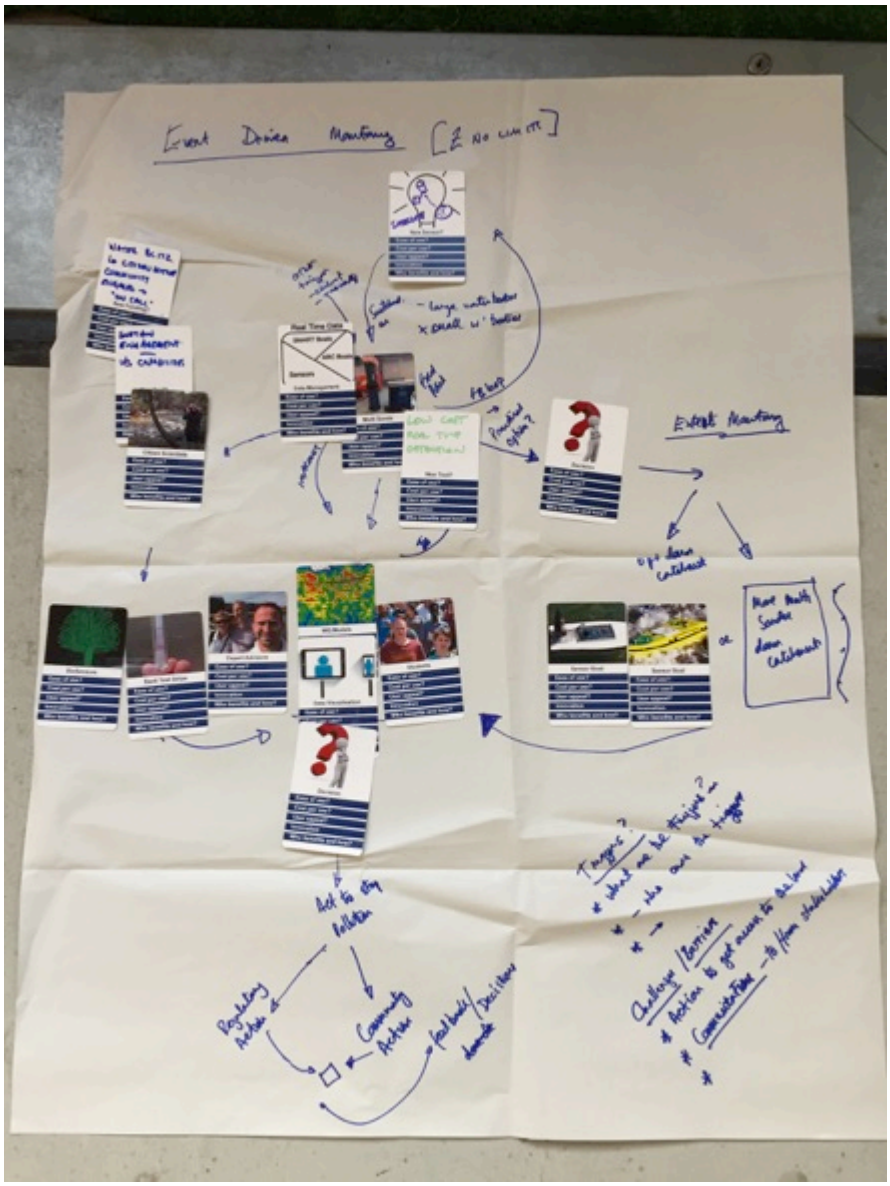
3.3 Stakeholder ideas to use the INTCATCH tools

Four of the issues that had been considering in greater detail were then used to explore how the INTCATCH tools could be used monitoring and managing catchments and to inform decision support systems. The INTCATCH 'Top Trumps' cards were used for this interactive session and as the images below show, each group used them in different ways.

3.3.1 Real-time water quality and understanding episodic events

This became 'Event Driven Monitoring' in this descriptive process map.



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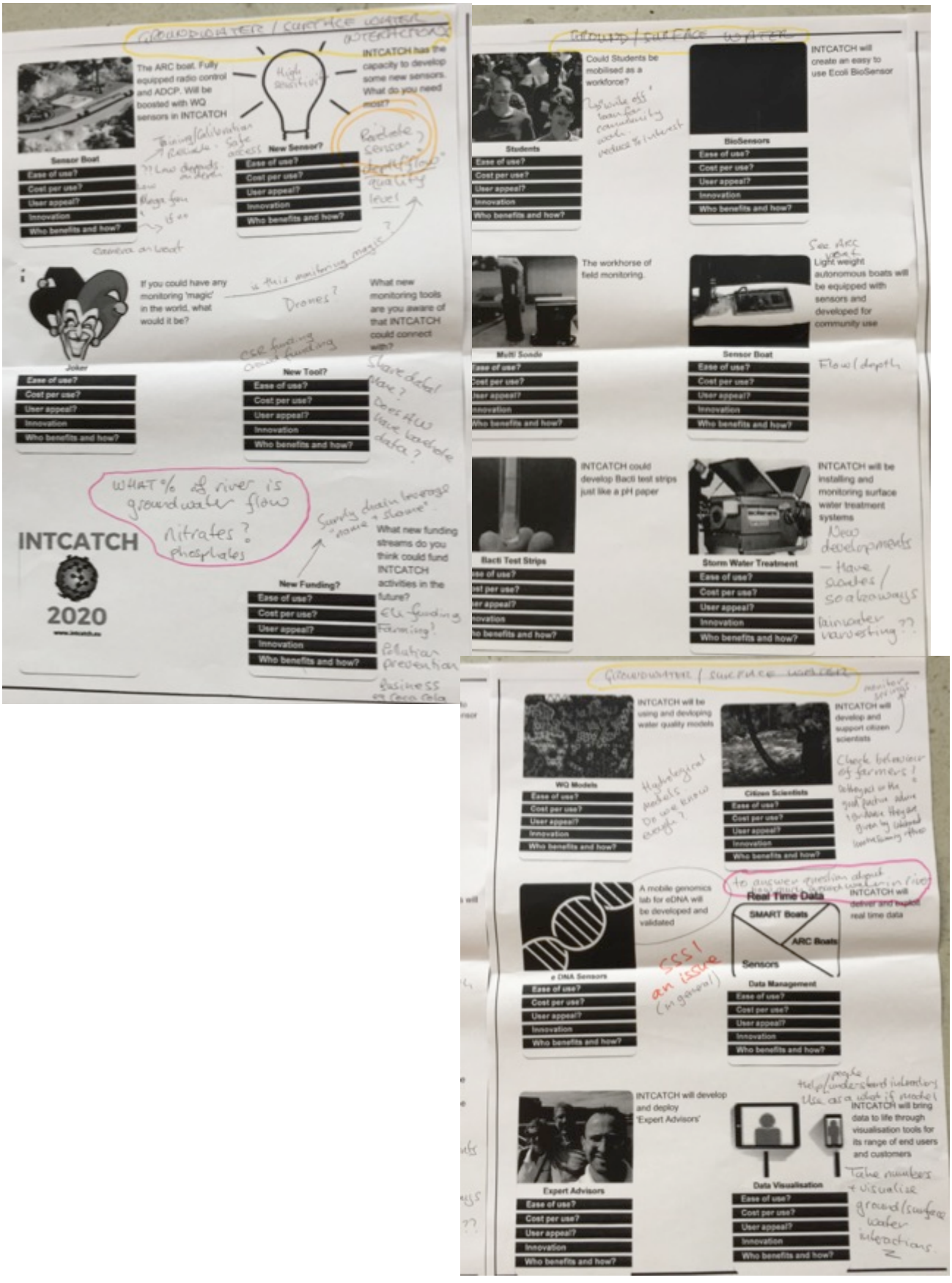
3.3.2 What are the impacts of groundwater and surface water interactions?



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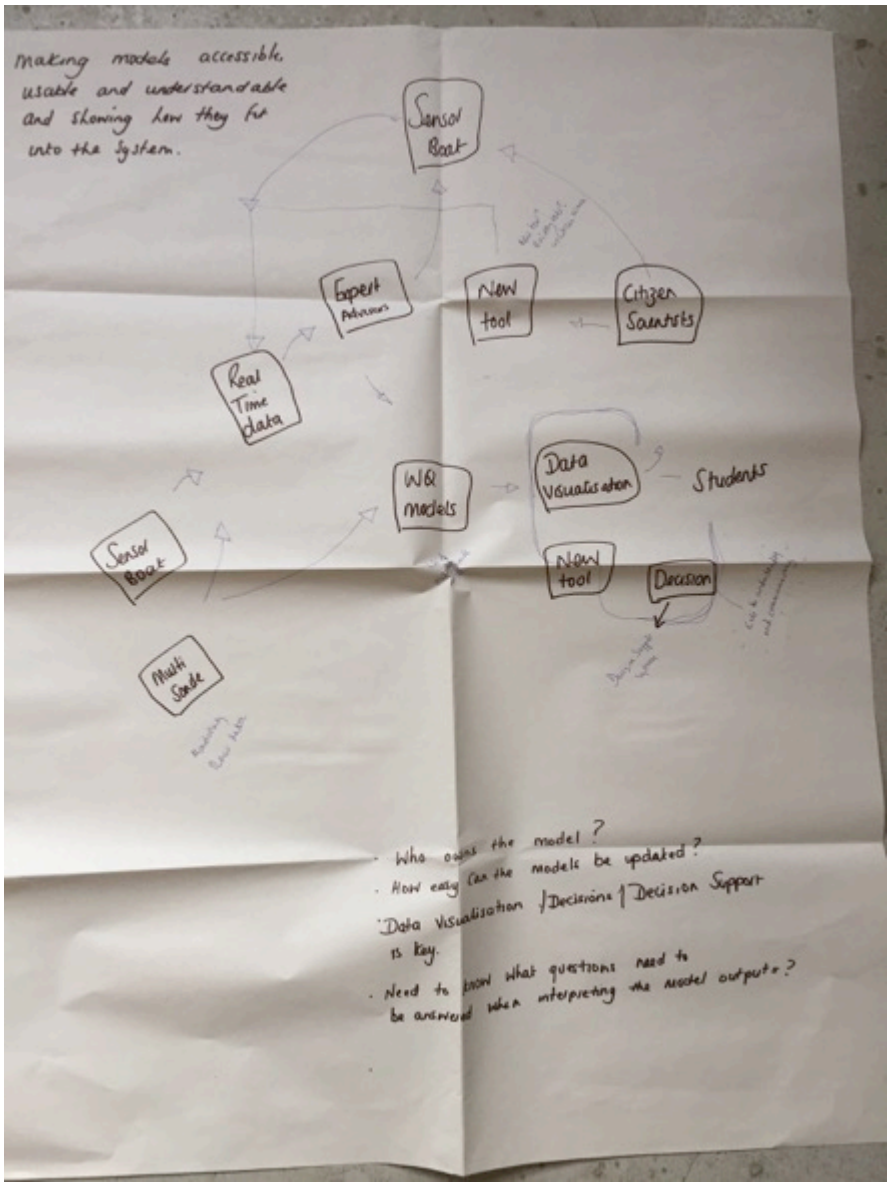
3.3.3 Vulnerability, understanding and managing risk and how can modeling play a stronger role



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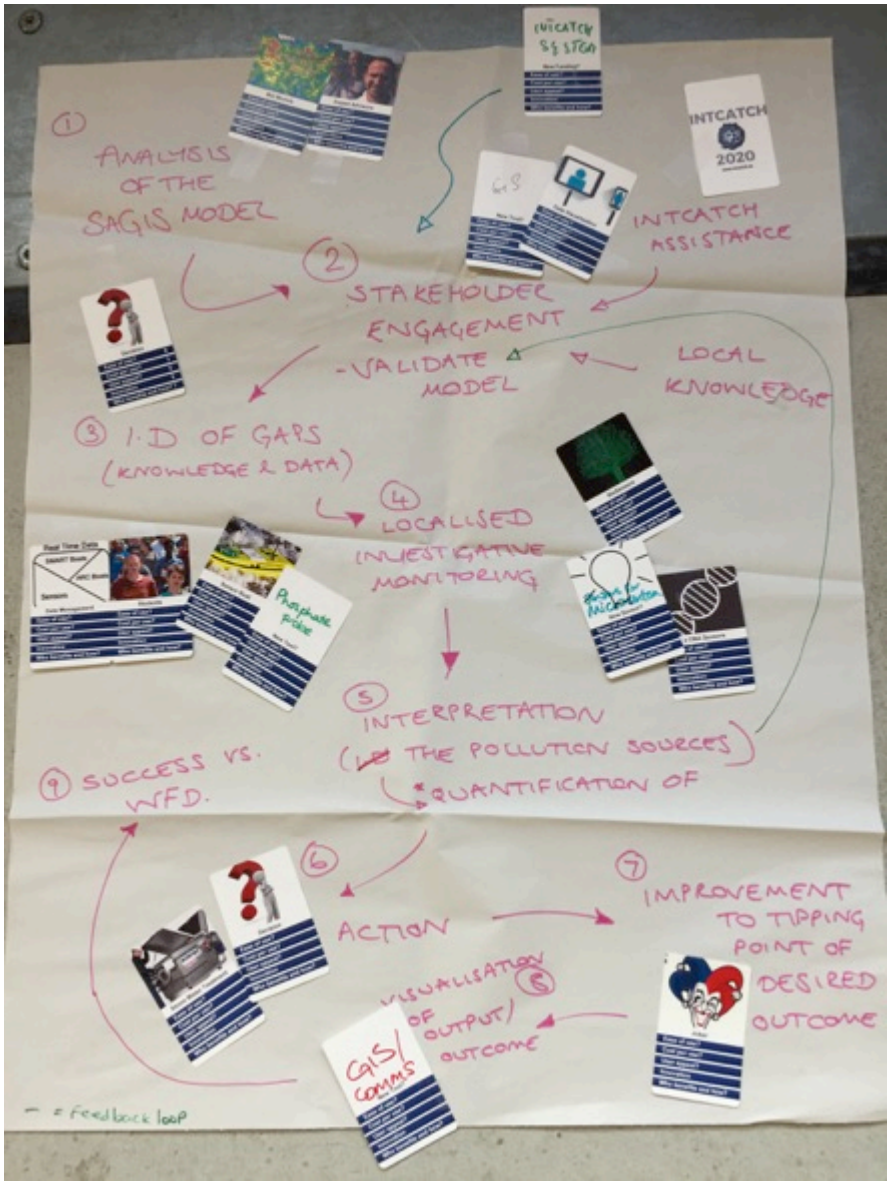
3.3.4 Where does the P in the catchment come from?



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4. Day 2: Reflecting Stakeholder Requirements into the INTCATCH Plans

As noted in the workshop objectives, Day 2 involved the INTCATCH partners only. The second was an opportunity to review the insight gained from the stakeholders and to consider how that could be used to shape INTCATCH activities and in particular the Decision Support System. The flipcharts and detailed images above proved very useful for this and will continue to be used to improve the project as it is being delivered.

There were two particular summary insights drawn from the stakeholder engagement:

1) That there are 3 key types of decisions that those involved with a river or lake catchment would need to make;
    - How can we engage with or use the river or lake?
    - How can we target monitoring to manage or improve the river or lake?
    - How can we reduce impacts on the river or lake?
2) That there is also a wide range in the complexity of decisions, and the information needed to support those decisions, which potentially varies by types of stakeholders.

So, when discussing the Decision Support System, it is clear that one size will not fit all potential users. It is therefore important that the INTCATCH partners give due consideration to the range of potential end-users and consider how there needs will be met.

It was also clear that the concept of 'who' can do environmental monitoring was also of interest to the participants. Whilst this concept was new to some of the participants, the value of volunteers, and in the guise of 'citizen scientists' was discussed as both a challenge and an opportunity. The programme team are focusing on activities that look at the potential for citizen science to take up the new tools and deliver high quality data, at a spatial and temporal resolution that cant be currently delivered through the statutory monitoring programmes. The next stages will be to work with Thames 21 partners to take the key elements of this workshop to engage Catchment Partners in London, and therefore gain further insights into how strategies can be developed using new tools and techniques, with as wide a set of stakeholders as practicable.

The INTCATCH partners also reviewed a range of data and information sets for sub-catchments in the River Great Ouse. Based on a broad discussion it was decided to focus the INTCATCH demonstration activities for the River Great Ouse catchment in The Wissey Catchment. The key drivers for this decision are:

- Rural catchment nature (comparing to the four London rivers with their urban/semi urban catchment nature
- Characterized challenges on:
    - Phosphate from rural diffuse sources including communities and arable and livestock agriculture
    - Outputs from P Sagis modeling
    - Wider pesticide interests including impacts on quality of potable supply
    - Groundwater fed watercourses, with both groundwater and surface water run-off challenges
    - Generally high quality water with specific contaminant challenges
- Catchment partnership in place, including important stakeholder interest from landowners, business, water company and civil society (community, Rivers Trust)
- Other relevant pollution and water resource management projects that would benefit from, and contribute to the value of IntCatch

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5. Actions and Next Steps

This workshop report is being shared with all participants and made available to the wider INTCATCH partners who weren't able to attend the workshop. This will allow partners to review the outputs of the workshop and gain their own insight. In addition the following actions will be taken:

1) The INTCATCH partners will encourage and seek opportunities for further stakeholder interaction in the River Great Ouse, and particularly the Wissey Catchment.
2) The activities to be delivered through IntCatch will be developed with and shared through the CamEO catchment group.
3) All attending Stakeholders will be added to the INTCATCH stakeholder list and provided with update information and opportunities to engage with the project.
4) The INTCATCH project will seek to be a focus for addressing the problems identified through this workshop (where feasible).
5) INTCATCH partners will agree the information needs to input to the Decision Support System for the Wissey catchment.

Workshop Report completed by:
Downstreams CIC Ltd, and Environmental Sustainability Associates Ltd
22 November 2016
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Further IntCatch information

This report and presentations arising from the workshop, and more details on the programme can be downloaded from:

www.intcatch.eu

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Annex 1 Attendees

Geoff Brighty	INTCATCH project team
Lesley Parsons	
Anthony Parsons	
Paula Nickson	
Simon Redding	
Mark Scrimshaw	
Tamsin Russell	
Weibke Warner	
Maurtizio Di Donato	
Alessandro Titonnell	
Nathalie Gilbert	
John Bryden	
Peyo Stanchev	
Teresa Brown	Environment Agency
Mark Corcoran	
Brenda Mace	
Sam Hurst	
Helen Blower	
June Jones	
Rikk Smith	

Dave Johnson	Rivers Trusts
Simon Browning	
Barry Bendall	
Jonah Tosney	
Chris Gerrard	Anglian Water
Stuart Knott	
Martin Bowes	
Joff Edevane	
Nigel Simpson	Natural England
Ian Thornhill	Fresh Water Watch
Peter Landshoff	Cam Catchment Partnership

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