

# Monitoring WQ:

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*the umbrella body of the rivers trust movement*

**where there's water, there's life**

# There was once an astronomer, and engineer and a mathematician on a train.....



Some thoughts.....a Case Study with Q to answer.....a discussion.....

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**where there's water, there's life**

**Catchment  
Based Approach**  
Partnerships for Action



# Monitoring uncertainty; 'Real' data vs. 'Modelled' data? s

They are both good but which one is best?

1. Sources of uncertainty:
  - Measurement (instruments and protocols)
  - What you are measuring (understanding/relevance)
  - Analysis/interpretation
2. Weight of evidence (constrains..)
3. Give the example of NVZs & HS2

*Put in target drawing from Michelle  
Relevance vs quality*



Discussion: We will come back to this in the final discussion of this session...

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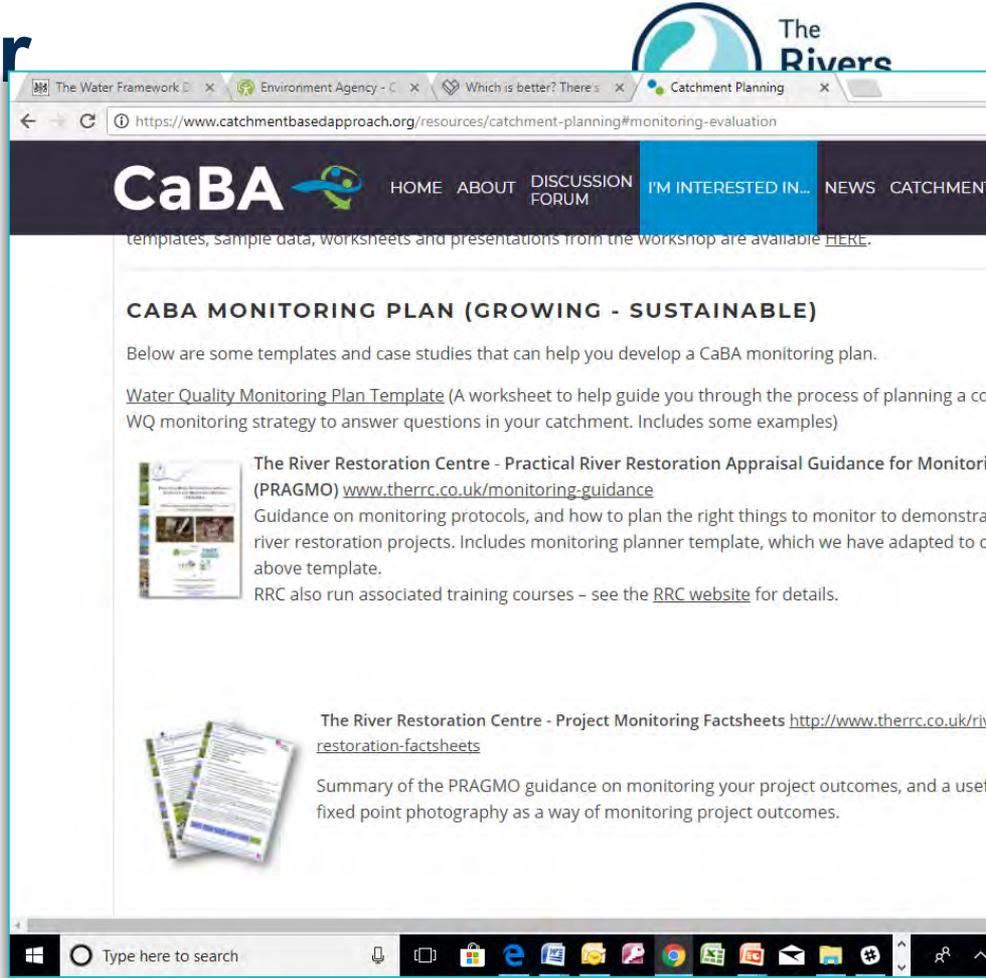
# The monitoring planner

## The planner just helps us to ask the right questions

- 1) Why is the monitoring being carried out?
- 2) What information will be collected?
- 3) How will this be done, by who and at what cost?
- 4) Who will the acquired data be used by & how will they analyse it?

Identified in workshops last year as the most difficult bit of catchment planning

<https://www.catchmentbasedapproach.org/images/Documents/WaterQuality/monitoring>



**Discussion: Is anyone using the planner any feedback for us.....? (think SMR)**

# A spot sampling case study.....

Upstream STW

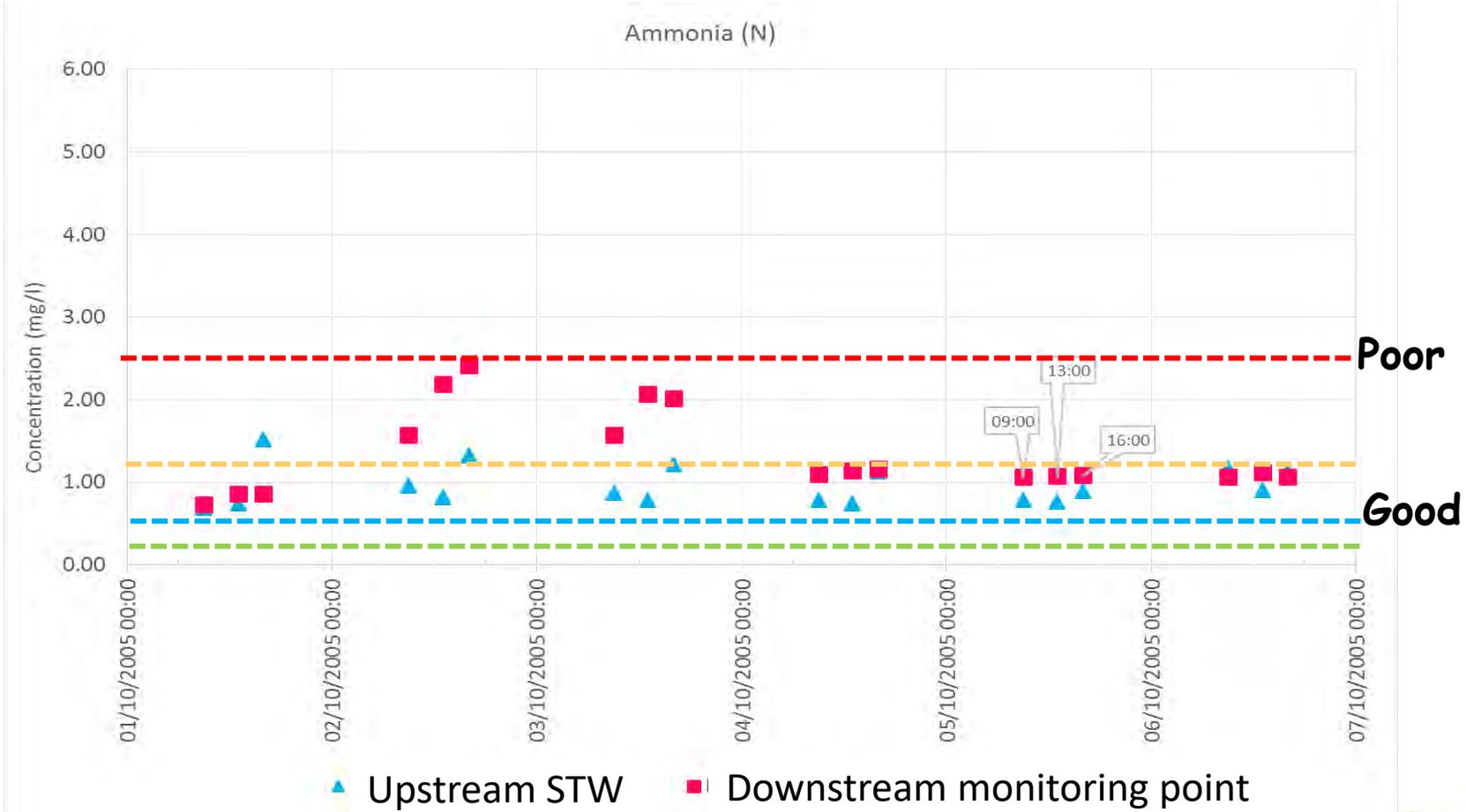
Downstream monitoring point

11 km

The issue under investigation: High ammonia at 'Downstream monitoring point' monitoring point.....

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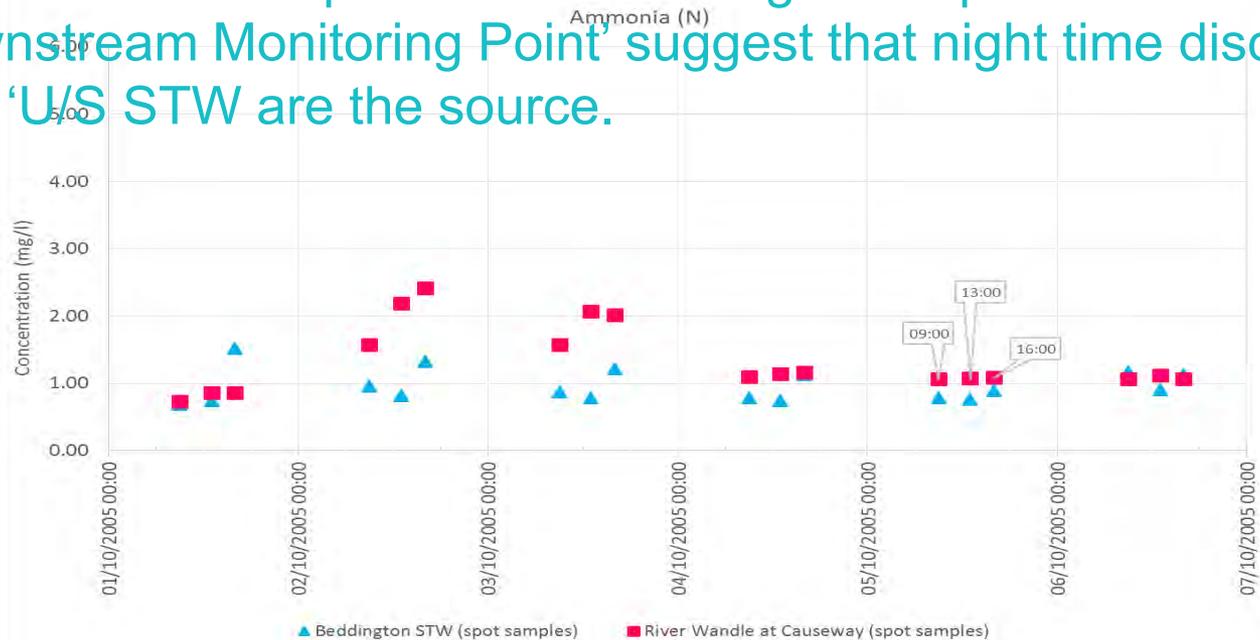
# An example from spot sampling.....



# Q: If you only had the spot sampling below, what could you say about the cause of the elevated ammonia concentrations at 'Downstream Monitoring Point'? (chose one statement)

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- 1) There is no evidence that the source of the ammonia problem is 'Upstream STW'.
- 2) The elevated concentrations of ammonia may be associated with pollution 'events' upstream. The monitoring below 'Upstream STW' is not detailed enough to highlight whether the works is the source of these pollution events.
- 3) The elevated concentrations of ammonia are associated with pollution 'events' upstream. The timing of the peaks in ammonia at 'Downstream Monitoring Point' suggest that night time discharges from 'U/S STW are the source.

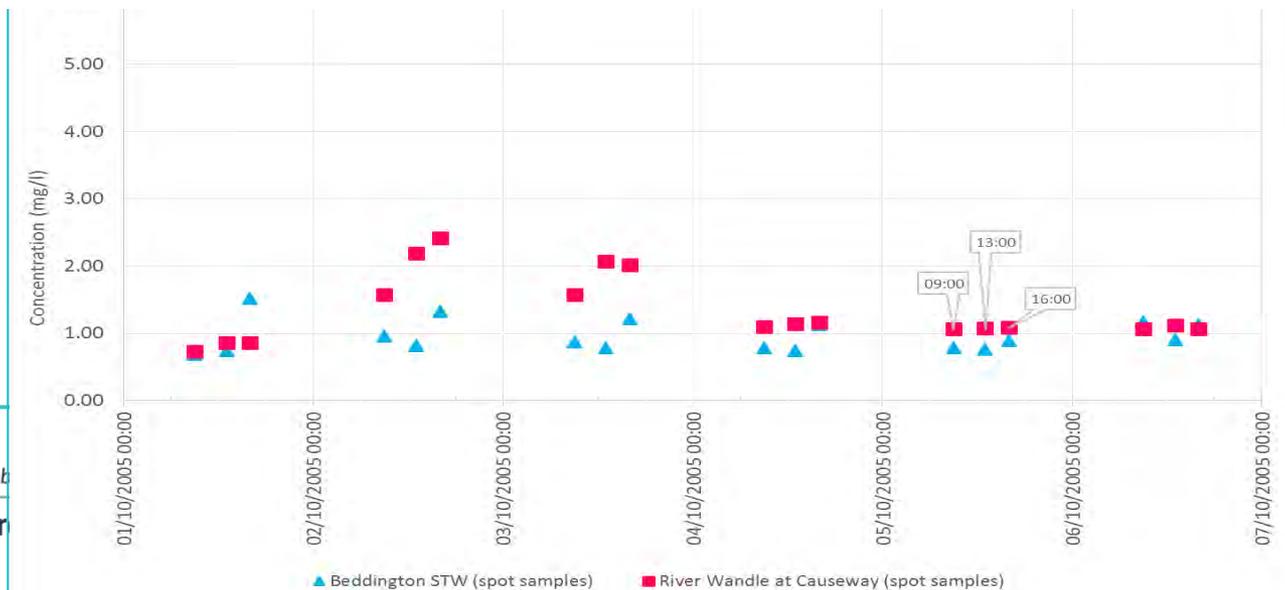


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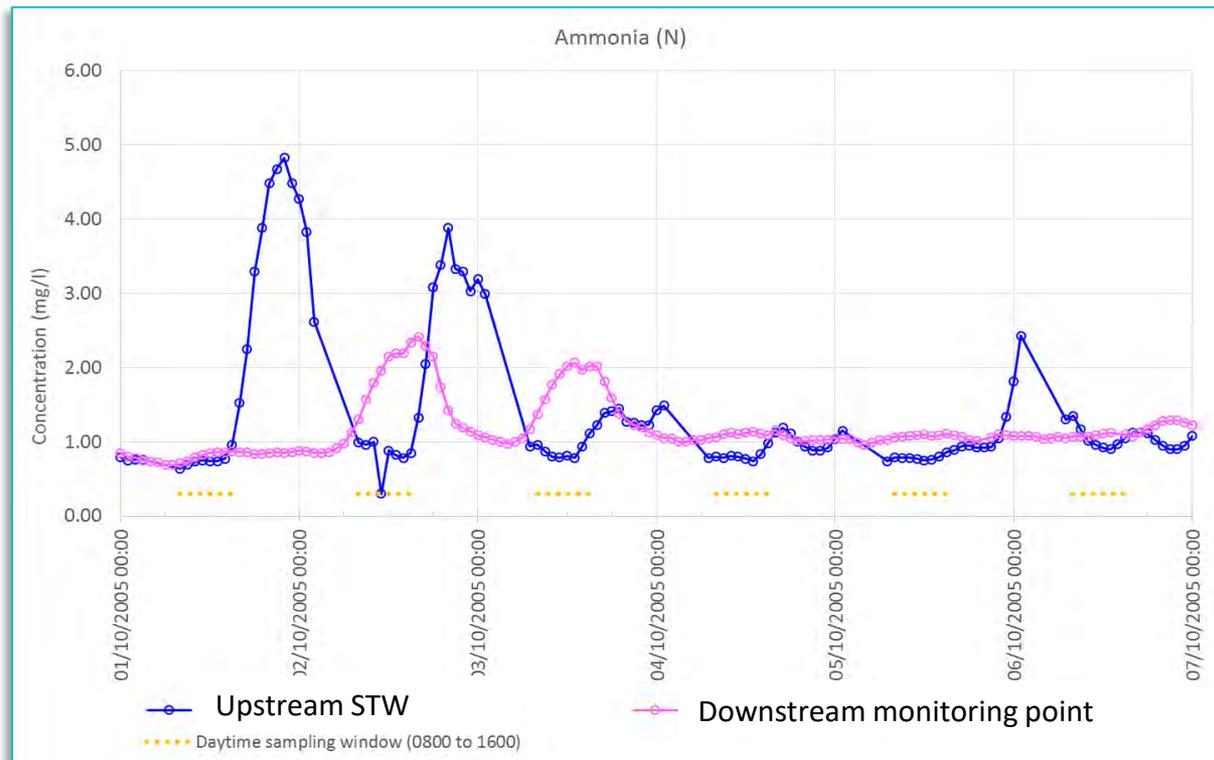
**Q: How could we rapidly reduce the uncertainty as to the source of the pollution events? Rank the list below.**

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- 1) EA or other ecological monitoring (fish, inverts, diatoms)
- 2) Dry weather walkover survey to identify potential point sources.
- 3) Plot WQ against flow and or rainfall
- 4) Riverfly monitoring above and below U/SSTW discharge.
- 5) Work out the time of travel from U/SSTW discharge to D/S monitoring.



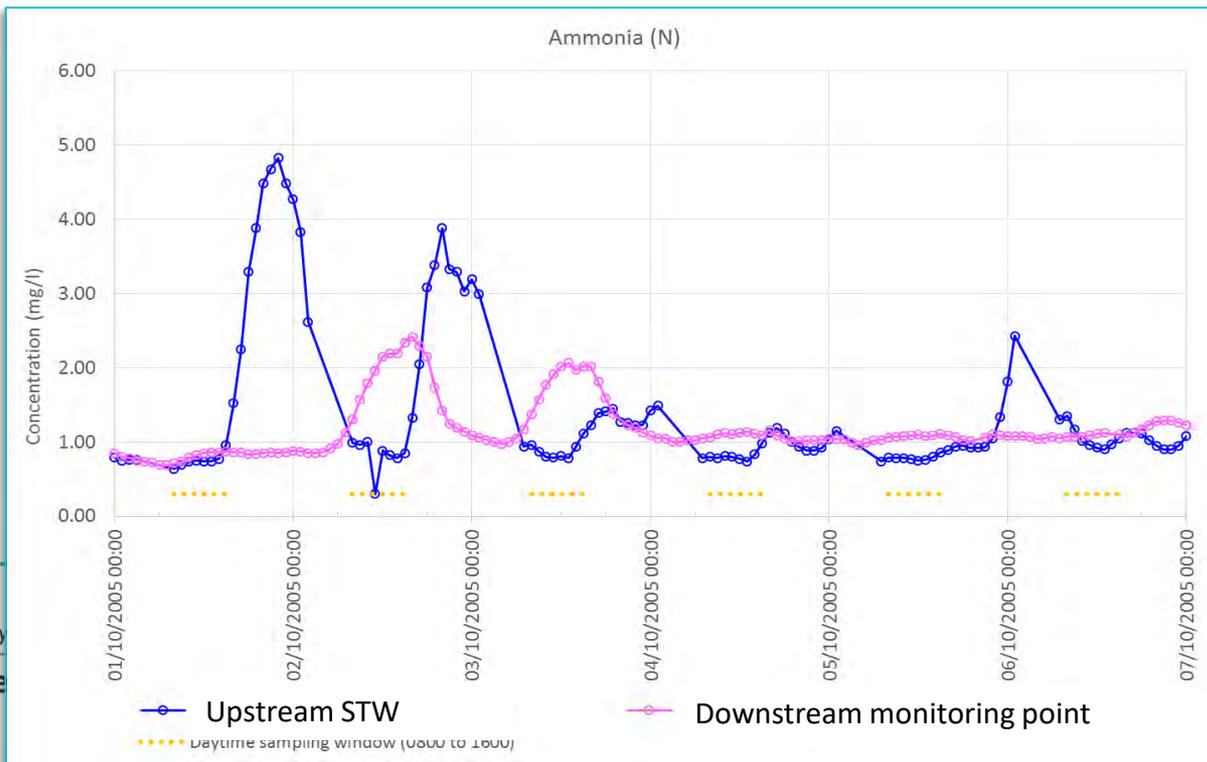
# A continuous monitoring signal....



# Q: Is it possible that U/S STW is NOT the source of the high ammonia?

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1. The monitoring below the STW is representative of the outfall not the mixed river water quality. (Uncertainty)
2. The calibration of the kit below the STW is out. (Uncertainty)
3. It only happened on a couple of days, one off issue?
4. Another? Unknown unknowns.....



the umbrella body  
where there

# Summary of the example

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1. **If we were commissioning this data and had planned this monitoring to answer the ammonia question we might not have used spot sampling. (Why, what, how and who?...).**
  - **Why:** To find out if the STW is the cause of the eco problems
  - **What:** Diurnal fluctuations in ammonia
  - **How:** Continuous sampling (every hour)
  - **Who:** Matt Lowenthal and his group

However,

2. **Spot sampling can get us a long way if we use a weight of evidence approach. (.....the baby and the bathwater.....)**

# Summary of the example

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t

1. If we were commissioning this data and had planned this monitoring to answer the ammonia question we might not have used spot sampling. (Why, what, how and who?...).
  - **Why:** To find out if the STW is the cause of the eco problems
  - **What:** Ecology above and below STW discharge
  - **How:** RiverFly +
  - **Who:** A very clever aquatic ecologist

However,

2. Spot sampling can get us a long way if we use a weight of evidence approach. (.....the baby and the bathwater.....)

# Summary of the example

rs  
t

1. **If we were commissioning this data and had planned this monitoring to answer the ammonia question we might not have used spot sampling. (Why, what, how and who?...).**
  - **Why:** To find out if the STW is the cause of the eco problems
  - **What:** Is there any other source of pollution?
  - **How:** Dry weather walkover
  - **Who:** A volunteer who is trained to look for CSO/Septic tanks/Slurry etc

However,

2. **Spot sampling can get us a long way if we use a weight of evidence approach. (.....the baby and the bathwater.....)**

**Q: Is our aim to produce a 'pool' of environmental data for each catchment from a variety of sources (EA, Water Co & third party) which we all have access to?**

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1. Seems like a good aim? (It's what is already happening?)
2. OpenData vs. licensing
3. Think about experience from the evidence sharing platforms
4. So now we think the way forward is:
  1. Share understanding. Synthesis of raw data rather than the data itself. Reports, storymaps etc
  2. Share location and contact for raw evidence (on GIS). So we know what data exists and who to talk to...
  3. Get folk together with an 'independent broker' (workshop + draft business cases => shovel ready projects for the appropriate funding stream)

# Q: What are the main barriers to generating a pool of data that the CaBA partnership can access and use?

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1. Acceptance of third party data by the EA (not any more?)
2. Licensing of non OpenData (use the EA standard license)
3. Quality of third party data. (think quality vs. relevance)
4. Use of third sector data for regulation and enforcement
5. Training (this is part of a water quality course that we ran...)
6. Other

Put in diagram of accuracy vs relevance

**Discuss: Are these still the main barriers ?**

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## Q: Would you be happy to commission data collection within your catchment to solve your priorities?

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1. A CaBA monitoring plan that includes the EAs investigative program and more is where we think we want to get to.....are you already there?
2. What about water companies data? Could you see your partnership influencing their monitoring (Customer panels?)
3. Are partnerships starting to commission data from anywhere else? E.g. Universities, volunteers etc

## Q: Could data collection be used to build capacity in the partnerships?

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1. Would it build capacity if CaBA partners were commissioned to do relevant data collection e.g. Walkover surveys.
2. What, if anything, is stopping this from happening?

# Q: Does the diagram below help us have a common picture of where we are heading? (Over lunch) (prototypes?)

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