**MATH3001 Report**

Structure:

1. Introduction
2. Flood mitigation – examples, introduce FEV as a model and expand greatly on model and uses, square lakes
3. Aire
4. Calder
5. Don
6. Irwell
7. Comparison of all rivers in one section all together

To do:

* Edit report with all comments and suggestions.
* Talk about FEV more mathematically – it is an integral over discharge, formulas are approximations as we cant exactly work out integral.
* In section 2, talk about FEV as a model and expand – different estimates, how we can use it, how we can verify it. Then apply it to the different rivers in following sections (as opposed to introducing FEV using case study). Criticise model where appropriate.
* Talk more extensively about why we did first exercise – to verify we could reproduce Tom and Onno’s graphs, therefore making verifying and making their results more reliable as well as enabling us to create our own model which we can automate and apply to rivers chosen by us. Learnng and verification process.
* Add new section talking about how chosen monitoring stations represent entire river
* Are there any other estimates like FEV that can be used in flood mitigation? What are they, how were they created. Compare and contrast.
* Discuss effectiveness of different flood measures along with cost effectiveness of them. How good are certain flood defences.
* Explain where GaugeMap gets its data from so not as ambiguous.
* Look at 1866 flood in Leeds.
* Expand all captions for figures.
* Add update on Leeds Flood Alleviation Plan – where are they up to, is it going as planned, any changes to original proposed plan etc.
* Define cost-effectiveness juxtaposing it against cost-benefit before discussing this. Discuss.
* Compare rivers and explain goal of comparison – combine into one section.
* Explanation of all flood defences, especially Manchester flood basins – how do they work etc. Provide sketches/pictures. Refer all to FEV and what fraction is mitigated with each plan.
* Add new section on return periods. Include stats.
* Research whole new river.
* Start to investigate rainfall scenario analyses, spatial rainfall distribution.
* Include map of river with monitoring station highlighted.

Overall report:

* Edit narrative – mixture of active and passive voice is needed. Not too many pronouns as starts to sound unprofessional.
* Decide on individual title.
* Sort title page.
* Do graphs in python

In appendix:

* Code
* Diary style entry on how I started with R but switched to python and why.

Section on FEV as a model:

* Introduce FEV.
* Verification of it as a model regarding Aire, Calder, Don.
* Application of model to our own rivers – Irwell.

CAPTIONS:

Explain so the graph can stand alone. Include punctuation.