Authors' responses to interactive comment RC1 from Erin Coughlan de Perez

This paper is a fascinating glimpse into the day-to-day operations of flood forecasters. It is very helpful to have this described in the published literature, to understand how information is communicated and how forecasters interpret model results before issuing alerts.

We thank the reviewer, Erin Coughlan de Perez, for her positive comments with regards to this paper's added value in published literature, as well as her valuable feedback which will help improve the paper for final publication.

1) While the concept of the paper is excellent, my major suggestion is to re-work the framing. As a reader, it is difficult to follow the logic of the paper. Often, it seems to be an interesting mix of quotes from interviews, lacking some analysis to identify relevant points and present them in a structured manner.

As per your comments and comments from other reviewers, the paper's framing will be reworked to provide a more logical storyline. More specifically, the following changes will be made:

- The Introduction and Context sections will be merged into a single section which highlights the EA's current policy and objectives with regards to undertaking/implementing probabilistic forecasts in practice. This will provide a framework for the objectives of this paper (see our response to comment 2) below).
- Section 4.2 will be merged with section 4.1 to provide contextual information about the duty officers' roles (see our response to comment 6) below).
- Section 4.3, one of the highlight sections of this paper, will be rewritten following the same format as the rest of the paper (text and supporting quotes) to constitute a more substantial section.
- The Discussion will be rewritten to link more clearly the interview results and recommendations (see our response to comment 3) below).

2) The introduction provides interesting context to the flood forecasting situation in the UK, but the details often seem disconnected. It is not quite clear how the authors are leading up to a solid research question. At the end of the introduction, it becomes clear that the EA is going to transition to probabilistic forecasts, and that the researchers will interview the forecasters about this transition. However, it is not really clear what the purpose is for the interviews. My suggestion is to re-write the introduction with a clarified mandate, leading up to the question that will be then answered in the paper.

- The current Introduction and Context sections will be merged to provide clearer context for this paper and a clarified mandate.
- The context and mandate will be clarified by first exposing the EA's current objectives to transition to probabilistic flood forecasts (from recent policy documents).
- The pitfalls to meet these objectives will be clearly identified in this new merged Introduction-Context section.
- We will conclude the Introduction-Context section by stating how this work aims to tackle some of the pitfalls identified, through these interviews and paper. This will form our clearly reformulated and contextualised research question.

- This will form a clearer storyline leading up to a solid research question and interview results, analysis and recommendations.
- This section will also contain literature review information about the need for probabilistic flood forecasts in practice and the challenges of decision-making facing uncertainty. This is to expand the context of this work to the wider geoscience communication theme.

3) Similarly, the section 4 is very interesting; it is neat to have a window into the ways of working of these flood forecasters. However, the quotes and text do not form a coherent story for the reader. The section 4 does not seem well linked to the recommendations in section 5 – it is not clear to the reader how the interviews resulted in the recommendations. They read more like a policy brief than a research output; perhaps this would be better suited as a commentary than a research article?

Using quotes to support textual insights is a very common format for interview-based publications and constitutes a valid research article format. We will explain this paper format beforehand in the Methods section, supported by similar paper formats in the field. We do however appreciate that some readers may be unfamiliar with this format and will clarify links between the text and quotes where needed in the paper.

In order to link more clearly the interview results and recommendations, we will:

- Link Table 1 topics with 1 or 2 recommendations.
- Rewrite the Discussion section to combine Sections 5.1 and 5.2, where each paragraph will present: interview finding(s) – literature finding(s) – 1 or 2 recommendations.

4) In particular, section 5 seems to bring in the idea of decision-makers, but all of the interviews were with forecasters and those responsible for issuing warnings. There was no analysis in section 4 of who the decision-makers are, what decisions would be made based on the warning, or how that affected the information that was released.

The duty officers interviewed are decision-makers at the heart of the forecasting chain. They collaboratively decide whether to issue flood warnings operationally and pass relevant information on to other decision-makers further down the chain (both internal and external to the EA; e.g. the public, flood incident duty officers and emergency responders). When discussing Fig. 1, we will clarify the duty officers' roles as decision-makers within the EA. We will also highlight and briefly describe other decision-makers in the chain, internal and external to the EA, who act on the information provided by the duty officers.

5) The recommendations in section 5 seem to be generally good practice recommendations for whenever a forecasting system might have some sort of change, but not necessarily linked to the research results. In addition, most of the recommendations do not seem to have any relation with the characteristics of this particular change in forecast systems; the fact that the new system is probabilistic rather than deterministic.

See response to comment 3) above. Together with the EA co-authors of this paper, we will make these recommendations more specific and clearer.

6) Here are some examples of additional places where the text could be changed to present a clear research statement to the reader: Section 3.3 question 2 – as a reader first encountering this

statement, I am not sure what you mean by this. Section 3.3 question 3 – when you say "potential impacts", what does this mean? As a reader, I can't anticipate what exactly you are looking for.

Question 2 will be merged with Question 1, both in the question wording and Results section. Indeed, the variety of information used by the duty officers highlighted in Section 4.2 (corresponding to Question 2) is an integral part of the duty officers' roles.

By "potential impacts" we mean the challenges and opportunities that this transition might lead to for MFDOs and FWDOs. The wording of Question 3 will be clarified.

7) The text would benefit from a few additional examples, if possible.

A few additional relevant examples will be added to the text, with supporting quotes, to guide readers more clearly through the results storyline.

8) Some additional points for clarification: Page 6 line 213: How is running the NFFS different from the information given by the FFC? How will those NFFS localized model runs update or change the flood forecast of the FFC? It would be helpful to have a worked example, of what was produced by the FFC, what was communicated to the forecasters, what additional data they gathered, and what warnings they then communicated to people and what decisions were made based on that information.

The NFFS contains locally tailored hydrological and hydraulic models, which provide local flood forecast information, complementing the national and county scale information provided by the FFC, as mentioned on Page 6 lines 202-204. This will be clarified in the paragraph on Page 6 lines 212-219.

The decision-making storyline/worked example you mention seems a very good approach to narrating how duty officers make decisions. We will rewrite parts of the current text in Section 4.1 to reflect this new narrative, supported (if possible) by EA graphics.

9) Page 6 line 234: What do you mean that they wait for the forecast to be "confident"? Is this not a deterministic forecast?

As stated in the glossary of technical terms (Appendix A), confident here refers to "A forecaster's expert judgement of how certain they are that the forecast is right". The forecast is composed of two scenarios, which might sometimes show very diverging outcomes. This may lead to the duty officer being less "confident" about the signal shown by the forecast and the decision to make. Furthermore, combining different sources of information (highlighted in Section 4.1.1, but also in Section 4.2; e.g. national/county scale forecasts, mode performance information, river level correlations), the FWDO will add some expert judgment to gauge whether they can "trust" what the two forecast scenarios show. This will be clarified both in the text and in the glossary. This should make more sense once Sections 4.1 and 4.2 are merged (see response to comment 6) above).

10) The title is eye-catching, but the question that is being asked by the interviewee (water over bank vs. Armageddon) is about the magnitude of the event rather than about probabilities, while the paper is about transitioning to probabilistic forecasts.

We think that the title captures the paper's content very adequately. Indeed, the question raised by one of the interviewees and used in the title: "Are we talking just a bit of water out of bank? Or is it

Armageddon?" reflects the binary perspective of duty officers on this decision-making problem. This is a challenge at the heart of this paper and at the heart of the probabilistic forecast-lead decision-making process. The title will be explained in the paper abstract and introduction.