PWSCG consultation recommendations – Use of risk and uncertainty information in forecasts

1. Background and context

The overall objective of the consultation as agreed by the PWSCG:

To establish how best to communicate probabilistic weather forecasts and warnings to the UK public to enable them to make better informed decisions.

The consultation is split into 2 main phases:
- Initial stakeholder interviews and desk research (as input to the paper for Oct 2012 PWSCG meeting)
- Development of any further primary public research (to be completed or scoped by end Dec 2012 with related recommendations presented to the Jan PWSCG meeting)

2. Findings from primary research

This section summarises customer feedback from the following sources:
- Annual Public Perception Survey (GfK Nov 2012)
- The joint research with the BBC around the presentation of uncertainty (Ipsos Mori Sept 2012)
- Regular feedback from the public who contact the weather desk (ongoing)

2.1 Segmentation of the current UK public based on their use of weather information

This segmentation work has enabled the EA to develop a new and more targeted communication strategy.

- It is clear that there are synergies between the EA user and weather user segments with the EA’s reach audiences mapping to the MO’s “disengaged” audiences and the EA’s support audiences mapping to the MO’s “engaged” audiences.
2.2 Current communication of probabilistic weather forecasts
BBC TV is the main channel used by the public for accessing weather information. This audience currently feel well served by its weather coverage (Ipsos Mori, Sept 2012) and do not feel that they have any unmet needs in this respect. The most common concern with current weather coverage is that it is sometimes perceived as inaccurate.

The Ipsos Mori findings suggest an initial negative response to all the concept versions of how to communicate uncertainty that were tested with the audiences, with comments relating to “vagueness”, “basic” and “non committal”. However, once the groups had been “educated” using the “stick in the river” analogy (see Annex) all participants became more positive to most of the concepts. Results showed an appetite for information about why forecasts may be “wrong” and a consensus that the forecasters would then be judged less harshly when they did get it wrong. Most appreciated an initial “story” around the bigger picture and how this affected the uncertainty around the weather.

It is important to note that there is little appetite for degrees of confidence. Attributing a confidence level to a forecast can undermine trust and be potentially confusing, especially alongside probability information.

Results from this research found that there are two key barriers to the introduction of probabilistic information:
- Insufficient current understanding of the challenges involved in forecasting, and
- Varying degrees of confidence with numerical expressions of probability (e.g. percentages).

As noted previously, a primary weather-related concern for the majority of the public (and one that impacts on most decisions) is whether it will rain or not. As such it would seem that probabilistic information related to this as a first step would be most useful.

With an appropriate introduction, audiences would regard the “supplier” (in this case the BBC) more highly for their honesty, and the introduction of probabilities would have a positive impact on the brand and reputation. The converse is also true:

“…don’t tell us whether there is a less than 5% chance of rain or 20% or whatever just to cover yourselves. Instead tell us just whether there is more or less than 50% chance of rain because that means something.” (Weather desk feedback July 2012 re probabilities)

2.3 Examples of situations when communication of uncertainty could provide more useful forecasts and so potentially improve accuracy perceptions:

Some base their decisions on a deterministic forecast which can have financial implications:

“Had a days work in Beverley today which is over 100 miles from where I live. Your weather forecast said rain setting in for the day and heavy at times and as the job was outside, I cancelled the job. Needless to say it didn’t rain”. (Weather desk feedback May 2012 re BBC web accuracy)

Others are just annoyed when the forecast is “wrong”:

“Your forecast of today’s weather in Exeter, which you made yesterday, predicted a dry day. You were, however, completely wrong as it has rained quite a bit today in Topsham.” (Weather desk May 2012 re: general accuracy)

2.4 Consistency
The public are more likely to believe that an organisation’s forecast is accurate (and trust in that organisation’s capability) if the story is consistent across the different channels used by
that organisation (Ipsos 2012) and between organisations. There are currently many examples of where this is not the case at present: There are inconsistencies:

- within the MO website:
  “…when you write your text forecast summaries – could you look at your detailed breakdowns so that they add up rather than contradict.” (Weather desk feedback June 2012 re general accuracy)
  “…..I have noticed increasing discrepancies between different options on my chosen location, namely between the 5-day and the map forecast…. Which one am I to believe? Should the information not be in sync?”(Weather desk feedback June 2012 re accuracy of Met Office website)

- between Met Office website and android app:
  “I have noticed there appears to be a difference in data from 2 Met office products. That is the website and the android application. I presume the data should be from the same source and just wanted to ask which data is correct?” (Weather desk feedback June 2012 re general accuracy)

- Text vs Symbols:
  “Why does the weather forecast for Bristol on Saturday say "Some sunshine is possible" when there's a glowing bright sun logo all day from 10 until 7? It's nonsense.” (Weather desk feedback June 2012 re accuracy for BBC web)

- Met Office vs TV/radio broadcasters:
  “….. As I said, so many times you get it wrong but the TV and radio get it more right - no idea how - I thought they get their info from your office…” (Weather desk Sept 2012 re accuracy MO web)

3. Recommendations:

Quick Wins:

1. Review reasons for current inconsistencies in %, symbol and text information within and between Met Office platforms. Amend where appropriate.
2. Develop educational material for the explanation of current probabilistic indicators (i.e. PoP and the temperature range graph) on the Met Office website and link to the pages where it is currently used. Consider the use of hover over technology. Consider how/if to apply to apps.
3. Revise the current language used around probabilistic elements to ensure it is not too technical (e.g. Chief Forecaster Assessment for warning information) or subjective. Look at the onward “journey” of this message and how it is translated (if at all) into public language before broadcasting/printing. Identify where the message could change and ensure clear guidance on the type of changes that are appropriate and those that are not (and why). Consider building up a case study of events to demonstrate the different weather scenarios and the “good/bad/ugly” of appropriate related language and message content.

Medium term activity:

4. Establish a consistent and aligned matrix of related symbols, text/language and percentages. Investigate whether this can be set as an “industry standard”
   - Work with as many other organisations and specialists in this field as possible (including UK partners/competitors)
   - Jointly develop a system based on a small number of % bands
   - Round probabilities to the nearest 10%
   - Provide a key with qualitative labels to help interpret the % bands (e.g. 80-100% extremely likely/ very high chance, 60-80% likely / high chance, 40-60% possible / some chance, 20-40% unlikely / little chance, 0-20% extremely unlikely / very little chance)
Assign relevant symbols/icons to each band.

5. Apply the output of the matrix to all MO channels. Work with partners to help them apply the same principles to ensure a consistent message for the public.

6. Consider which type of events are the most appropriate for the introduction of probabilistic information through broadcast media. This is likely to relate to the more extreme and uncertain weather, including warnings, and should include reference to previous equivalent scenarios for comparison.

7. Work with key “reach” partners (primarily the BBC and ITV) to develop a “drip feed” approach to the introduction of probabilistic forecasts across the different channels, ensuring that the type of content is tailored by channel:
   - Employ a mix of media to prepare audiences for coming changes
   - Express probability in broadcasts in simple, everyday language at first
   - Introduce percentages more widely online, reviewing later for inclusion on other media
   - Keep any additional visuals clear and minimal, such as the track executions used to explain the different paths a storm could take across the country. Graphic representations such as tracks are useful for conveying probabilities at a national level to provide an overview while avoiding information overload.
   - Tell the ‘weather story’ to explain how uncertainty has come about
   - Present a consistent approach across platforms and align with other broadcasters

8. Review the use of probabilities within warnings:
   - Conduct a qualitative research project to better understand the public’s requirements from a warning service
   - Consider what action the public are expected to take as a result of which type of warning
   - Establish whether the warnings are having the desired effect, and if not why not
   - Consider moving away from impacts or consequences towards a range of values that would create impact. The potential for winds greater than 100 mph may be ‘high’, resulting in greater risk of widespread damage. Consider overlaying the individual threshold options being worked on within the MO
   - Review the colours and related wording within the impact matrix to ensure it is fit for purpose for the public.

9. Work with key partners to align the colours used for warnings across government organisations.

10. There is an opportunity for the Met Office to take an active part in the Sciencewise-ERC project (via EA and Defra). This is entitled Risk and Likelihood: The Challenge of Instigating Action. This will help to better understand the issues across agencies and those related to communication of information around warnings.

Longer term activity

11. Review the probabilistic capabilities developed for the Olympics work in the light of the public segmentation work. Establish which segments this should be aimed at and use the learning to date to develop how this should be communicated. Develop relevant versions of the output to test with the target market. Make use of Market Research Online Communities (MROCs) to iteratively develop the concepts before uploading to “Invent” for further trial and feedback.
   - MROCs invite only online communities. They make use of a wide variety of different tools and techniques to engage relevant respondents, via the media they are used to, in dialogue about a topic of mutual interest. The objective is to build a level of trust with respondents that will encourage an open and interactive dialogue to enable a better understanding of true customer usage and attitudes in general and at the point of use.