



## Validating Communication: An empirical test of strategies for communicating uncertainty in seasonal climate prediction

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In order for seasonal climate predictions to be appropriately used in decision making it is essential that end-users are aware of both the probabilistic nature of these predictions, and how well the models used to produce them actually perform (as captured by measures of skill). This means that climate service providers face the challenge of identifying effective strategies for communicating these complex uncertainties to stakeholders varying in expertise and information preferences.

In two online Decision Labs participants from climate-sensitive sectors (n=264 and n=58 respectively) were shown different formats for presenting seasonal forecasts. Of six formats developed, four were shown to statistical experts (Bubble Map, Violin Plot, Bar Graph, Quantitative Table), while three were shown to statistical novices (Confidence Index, Bar Graph, Qualitative Table). For each format, two seasonal forecasts were shown: higher-skill (for Ethiopia) and lower-skill (for Iberian Peninsula). Participants' objective understanding of the forecasts was measured, along with preference, perceived familiarity, and subjective interpretation.

We found evidence that: a) even where skill is correctly recognised as being "worse than climatology" subjective judgements of tercile likelihood are influenced by forecast likelihood; b) for statistical novices adding qualitative categories to information about skill aids understanding; c) when presenting information about "likelihood of tercile" tabular representations tend to be better understood than visualisations, although they are less useful when users require information about the ensemble distribution; and d) preference for particular formats is related to perceived familiarity, but not objective understanding.

Based upon these findings we recommend that providers 1) do not present seasonal forecasts by default if skill is below climatology; 2) provide frameworks to help users interpret what skill means; and 3) work with users to identify areas where preferred formats may be misinterpreted. Above all however, this work highlights the importance of testing communication strategies with intended user groups.