

# The weather risk attribution forecast for October 2011

Dáithí Stone<sup>1,2</sup>, Mark Tadross<sup>1</sup>, Chris Lennard<sup>1</sup>

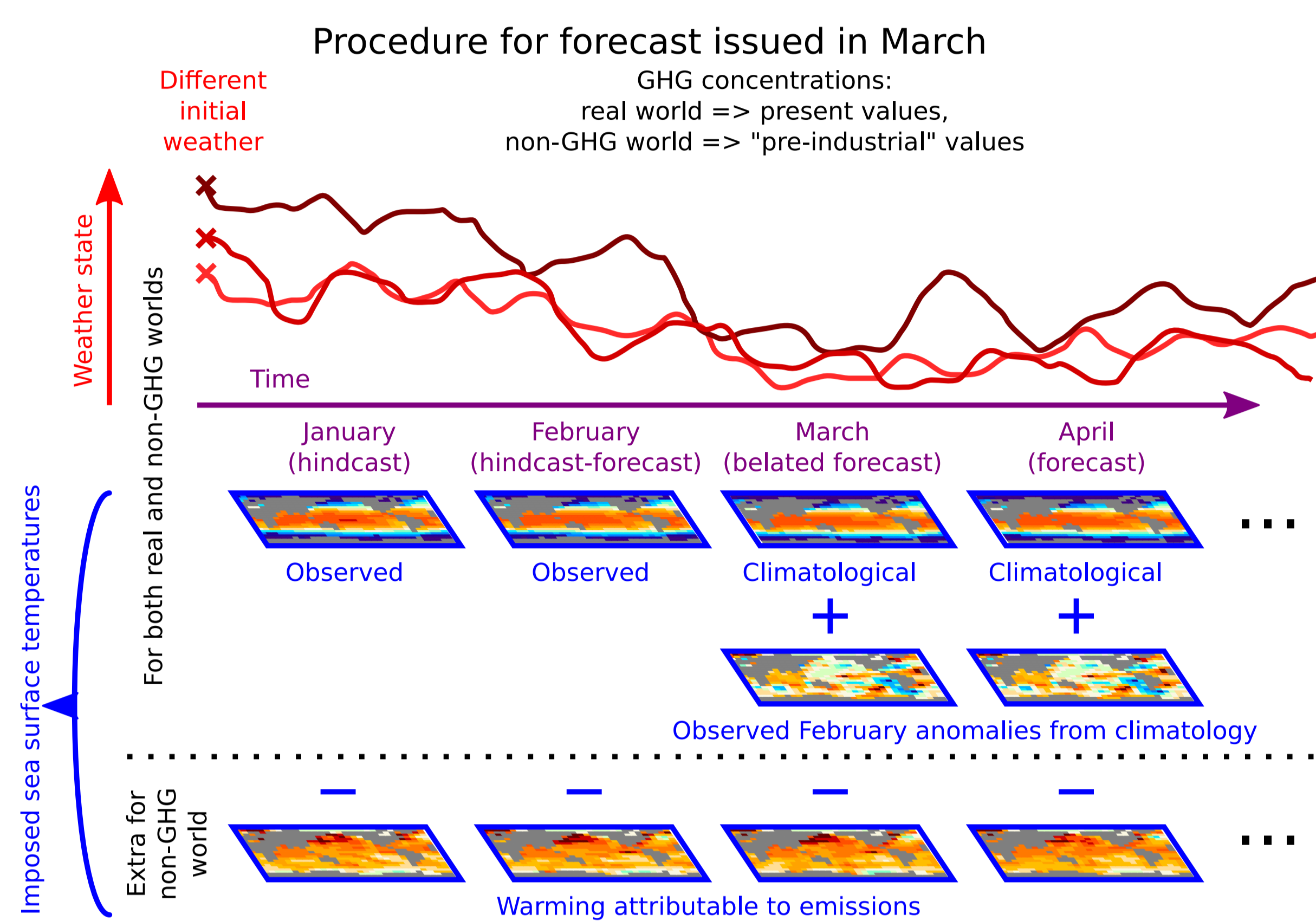
1. CSAG, University of Cape Town, South Africa  
2. Lawrence Berkeley National Laboratory, U.S.A.

<http://www.csag.uct.ac.za/attribution-forecast>

## 1 Abstract

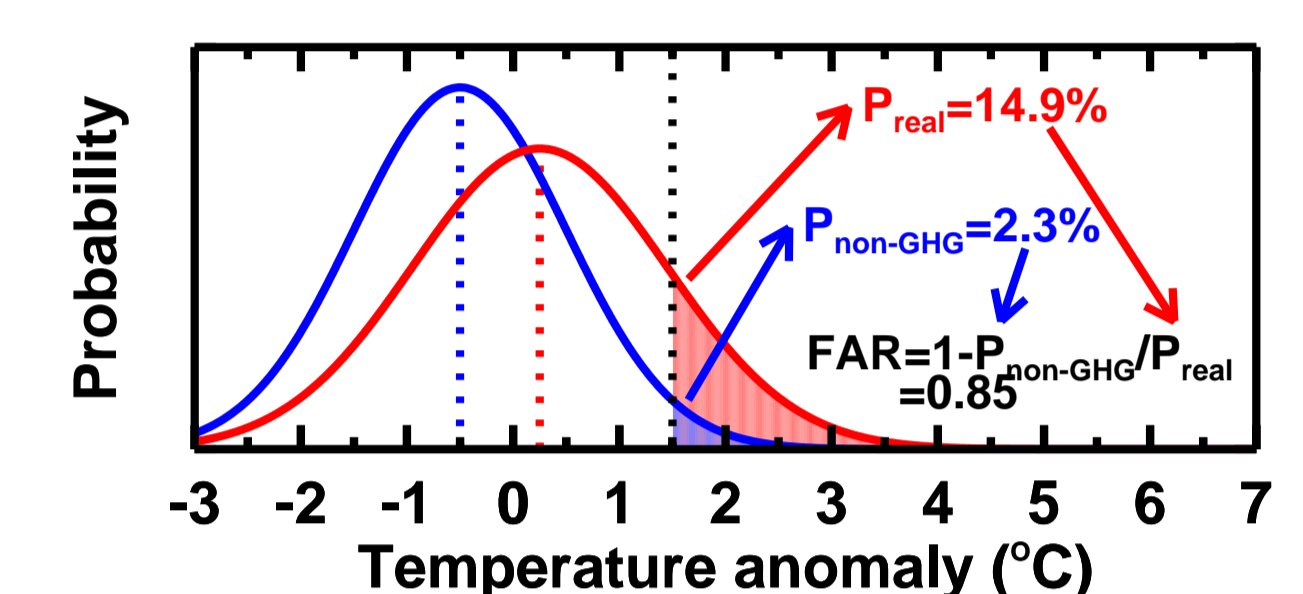
This poster presents the October 2011 “attribution forecast” from the world’s first objective real-time system for examining how anthropogenic emissions have contributed to weather risk in our current climate. By comparing real seasonal forecasts against parallel counterfactual seasonal forecasts of the climate that might have been had human activities never emitted greenhouse gases, this “attribution forecast” responds proactively to the question: “Has this event been made more or less frequent by our emissions?”

## 2 Method



This service uses UCT’s standard monthly seasonal forecast and a parallel forecast under a “non-greenhouse-gas” scenario. Only the one-month lead forecasts are shown in this poster.

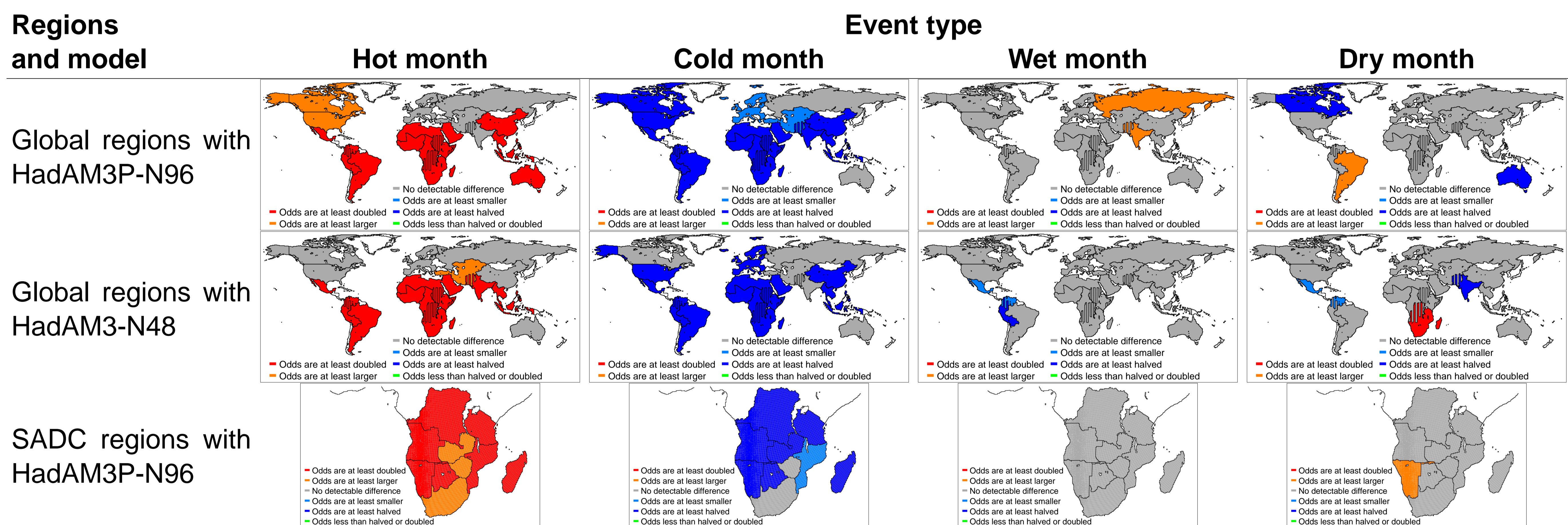
The probabilities of predefined unusual events are estimated from both forecasts and compared.



Attribution forecasts are made for unusually (historically 1-in-10 year) hot, cold, wet, and dry months over 17 regions around the world using HadAM3P-N96 and HadAM3-N48, and over 10 nations in southern Africa using HadAM3P-N96. Attribution statements are made regardless of whether an event is forecast (or has occurred in the case of “attribution hindcasts”).

## 3 The attribution forecast for October, issued in September

Statements concern what can be said with confidence concerning exceedance of various attribution thresholds, rather than estimates of what is most likely.



The lack of confident statements for unusually hot events in northern mid-latitude regions during their winter months has been a consistent feature since the first attribution forecast in January 2009, as is the lack of consistent signals in both models for precipitation events.

## 4 Service issues

- Will we always end up being retroactive anyway?
- How accurate does a real-time system need to be?
- How can individual statements be contextualised in the overall product (selection bias)?
- Should we be looking at attribution to total anthropogenic forcing (instead/as well)?
- How spatially/temporally representative are these attribution statements?
- What do we do when our “expert” hunch disagrees with our “objective” statement?

## 5 Technical issues

- Are these statements robust against inclusion of unrelated atmospheric models?
- Are these statements robust against uncertainty in attributable SST warming (including lack of SIC adjustment)?
- Are any of these statements highly conditional on the anomalous SST state?
- Are there connections between seasonal forecast performance and attribution forecast performance?