Obtaining More Useful Forecasts Earlier

Leonard A Smith

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Abstract

Academics have always played a wide variety of roles in the Global Weather Enterprise; the training of the "next generation" in all three sectors of the Enterprise, as well as for entities using forecasts, will remain a core task. In the future the variety of these roles will increase, indeed I expect completely new opportunities and needs will arise, and it is unclear how the current sectors will move to fill, or fail to fill, these opportunities.

Over the past twenty years, the information of value in operational forecasts has grown tremendously; arguably we have no comprehensive estimate of the value that today's forecasts yield society, much less the value they could yield. The total economic impact of extreme weather is not nearly as relevant to the enterprise or society as the fraction of that impact which could be mitigated by a reliable two week probability forecast, but it is much easier to estimate. Two of the biggest obstacles to growth, in my opinion, are limited resources and the failure to move forward faster. The two are related, of course.

Academics engaged with the two other components of the global weather enterprise (and with practitioners) may have a better understanding of those sectors than they do of ours. Our students and colleagues are deeply embedded within those sectors and provide continuous feedback, both to brag and to complain. Changes in academia, in particular stronger incentives for deliverables (a greater number of papers) and for "impact" (some non-academic doing something suggested in one of our papers) incentivise us to stay in model-land, while appearing not to on a quick reading. At the same time, the incentive to engage with practitioners pushes us to move towards the real-world. CATS' work on Pakistan's heatwave earlier this year, led by Dr Erica Thompson, was a combination of meteorology, an understanding of the events on the ground, and communication with in-country NGOs, the Pakistan Meteorological Department, and the START FUND to clarify everything from an agreed definition of "heatwave" to the usefulness (or lack thereof) of state-of-the-art forecasts of heatwaves in Pakistan. This work, along with other projects in disaster risk reduction (DRR), the energy sector and the insurance sector, make it clear to us that the biggest challenge of the next ten years will be in communicating and realising the value operational probabilistic forecasts (already) offer.

Where does this task fall within the enterprise? Which sector within the GWE will be incentivized to quantify the growing economic and societal value of the insight that the GWE allows? Can the GWE restructure itself to thrive in this new environment? It may be our success in forecasting that leads to our greatest challenge. Probabilistic weather forecasting is being recognised as holding greater value across a wider range of practitioners; realising this value requires transdisciplinary expertise beyond meteorology and hydrology. In addition, feedback **from** practitioners on the shortcomings of today's forecast system can lead to new insights for improving the forecast system: but who will translate the growing plethora of insightful feedback from practitioners into a form that can guide model development? This evolution will transform the structure of the enterprise as we know it. How do we embrace and guide this evolution to obtain more useful forecasts as soon as possible?

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