

The expert view: how to think about disaster risk

Interviewers: [Gareth Byatt](#) – Principal Consultant, [Risk Insight Consulting](#)
Interviewee: [Jeff Da Costa](#), Disaster Risk & Early Warning Systems
Researcher

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Jeff,

Thank you for making the time to talk with us about your research work on disaster risk and early warning systems. I am looking forward to hearing your views about action to take to reduce risk and what can and should be done to ensure disasters are avoided.

Can we begin this interview with an overview of your background and your current activities and areas of focus?

Jeff: Hello Gareth, thank you for reaching out to me, I am glad to be able to share my contribution. My research focuses on disaster risk governance and early warning systems. I study how risk signals move from forecasts into decisions and action (and back again). A central part of my research examines systemic risk within warning systems. Forecasts travel through a chain of institutions, procedures and decision rules before they reach operational actors. At each step, signals are interpreted, filtered and translated into action. My work reconstructs these processes during real events, such as the July 2021 floods in Luxembourg, to understand how warning systems function in practice. I also study preparedness and decision-making at multiple governance levels. Overall, my focus is on how institutional design shapes whether early warning systems enable anticipatory action.

Gareth: Is there one aspect of disaster risk and / or early warning systems that you would most like to see worked on and changed, in 2026 and in the coming years? Is investment in these systems sufficient?

Jeff: Honestly, one of the main challenges is still defining what we mean by an early warning system. There is no universal agreement. Different communities describe the system in different ways depending on their focus, for example weather forecasting, hydrometeorological warning systems, multi hazard warning systems or whole of government approaches. This diversity is not unusual, but the distinctions matter because they shape how we determine what constitutes an effective early warning system. Measuring that effectiveness is difficult but possible, and doing so requires research that goes beyond forecasting and atmospheric science. We need stronger interdisciplinary work that brings together physical scientists, social scientists and economists to examine how warnings translate into decisions and outcomes, including the economic value of these systems. That requires research funding and institutional support to move from recognising the need for this work to actually doing it.

The Disasters Avoided initiative highlights examples of proactive action around the world to avoid disasters.

Gareth: Thanks for these thoughts, Jeff. In [your article for The Conversation published in February 2026](#), you talk about how, after disasters occur, public debate often treats them as unexpected or unprecedented, and that this reaction is associated with how societies process shock and how authorities often explain what has happened as unavoidable, rather than because of choices that have been made.

Are there certain actions that authorities can and should take to change this mindset and narrative?

Jeff: I think authorities could change the narrative by communicating disasters in a more honest and structured way. Many disasters are avoided every year because warning systems, preparedness measures and decisions work well. Those moments are important opportunities to show what effective risk management looks like. When things do go wrong, however, public communication often focuses on generic messages about nature, heroism or resilience. These elements matter and deserve recognition, but they do not replace the need to examine what actually happened within the warning and decision system. People expect accountability and transparency when disasters occur. Trust grows when authorities explain how risk signals were interpreted, what decisions were taken and what can be improved. Another shift concerns how disasters are discussed in relation to climate change. The influence of climate change on hazards is well studied, and attribution science continues to advance, but in the context of warning systems the central question is whether institutions recognise risk signals and act on them. Returning to climate change explanations after an event can distract from examining how warning and governance systems functioned. The more useful conversation focuses on preparedness, decision processes and institutional learning.

Gareth: You also describe in the same article that a real challenge lies in how institutions are organised to interpret, trust and act on probabilities. How can we improve this? I wonder about the role of governance here, and how good data can be used for a better understanding of risk tolerance (you mention the use of risk thresholds in your piece for the Conversation)? As you write about in the article, uncertainty cannot be eliminated – the challenge is to decide how much uncertainty is acceptable when lives and livelihoods are at stake.

Jeff: Improving this requires attention to governance and to the people these systems are designed for. Forecasts already express risk probabilistically, but institutions need clear decision rules that translate those probabilities into action, including agreed thresholds that reflect how much risk societies are willing to tolerate. At the same time, effective warning systems depend on understanding the people who receive and act on warnings. Decision makers design these systems for real communities with different capacities, experiences and relationships to risk. What works in one context may not work in another. A warning system designed for communities that regularly evacuate ahead of hurricanes will not function the same way in places where people have limited transport options or little experience responding to official warnings. Designing effective systems therefore requires understanding whether people can anticipate and act on short notice, whether they need more time, and which actors must be involved in different scenarios.

This requires sustained interdisciplinary work that connects forecasting, governance and social understanding of risk.

Gareth: Should authorities have a mindset of reviewing scenarios against “very early indicators” of potential problems rather than waiting for the threshold trigger to be reached?

Jeff: Yes, because early indicators extend the time available to understand what might unfold and to prepare responses. Forecast systems often detect elevated risk several days before formal warning thresholds are reached, and reviewing those signals allows authorities to consider scenarios and coordinate early. This does not mean triggering full emergency responses too soon, but creating space for anticipation. In an age of rapidly expanding data and AI driven forecasting, institutions also need clear ways to interpret early signals, otherwise the volume of information can quickly become overwhelming.

Gareth: Linked to what we have just been discussing, do we talk enough about the basic elements of hazard and vulnerability and what action is right to take to address vulnerabilities?

Jeff: In practice the hazard often receives more attention. Early warning systems detect hazards, while vulnerability determines how severe the impacts are. Reducing risk requires addressing both together and ensuring that warning information is linked to actions that reduce vulnerability.

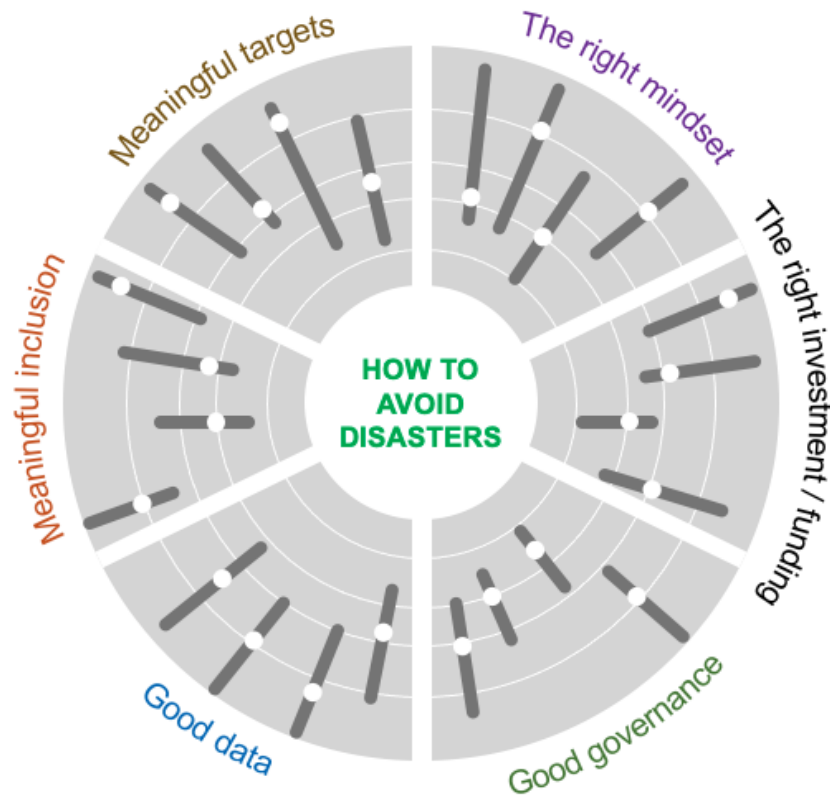
Gareth: Can systems thinking help us fully think through what is required and to look carefully at options and the consequences of taking different action (including thinking about counterfactuals).

Jeff: Systems thinking helps reveal how these elements connect and influence outcomes. It also allows us to examine alternative pathways and consider how different decisions shape risk and response. This is an area I am particularly interested in exploring further in my research.

Gareth: The discussion points above, on mindset, investment, governance, data and how to engage with people and have good targets link to the six factors of our Disasters Avoided model. I’d be interested in your view on this model, which we have developed following research we have been undertaking since September 2022, and how it relates to early warning systems.

Jeff: I like the idea behind the model. Framing disasters through the lens of disasters avoided is a powerful mental shift because it encourages us to look at prevention rather than only analysing failures after events occur.

I also think it provides a useful way to reflect on how factors such as governance, data, investment and inclusion interact. One aspect I would approach carefully is the language of “right” or “wrong”, particularly around governance. Different political systems may perform very differently across these dimensions. Some systems that many would not consider “good governance” in a normative sense can still be highly effective in certain aspects of disaster management.



[The Disasters Avoided model](#): © G Byatt, I Kelman & A Prados

Gareth: Thanks for your thoughts on our model, Jeff. On the aspects of having the right mindset and meaningful inclusion, what role do you think the media can play in helping to improve societal inclusion in the discussion on how to avoid disasters, including how to make early warning systems as effective as possible? We have discussed the role of the media with various people that are associated with this area including Andy Revkin, Roger Pielke Jr., Lisa Robinson and Anita Makri.

Jeff: *The media plays a major role in shaping public understanding of disasters and risk. At the same time, the media landscape has become more fragmented, with audiences increasingly spread across different outlets and platforms. Journalists have an important job, but they also work under strong constraints, including tight timelines and constant information flows. In that context, editorial standards, ethics and integrity become even more important. Reporting on disasters and risk requires careful balance between communicating urgency, explaining complexity and maintaining public trust, which is becoming increasingly challenging in a fast moving and polarised information environment.*

Gareth: Do enough good news stories and disasters avoided make the news, and if not, should there be more effort in publicising good examples for people to learn from – do you have any particular examples you could share?

Jeff: Positive examples are important, but they do not always fit easily into how news is produced or what audiences expect. News tends to focus on dramatic events and immediate impacts, whereas disasters avoided often appear as the absence of something happening. There is still value in highlighting these cases, particularly in comparative studies that examine how preparedness measures, governance or early warnings helped reduce losses. I think education may play an even larger role than the media in shaping how societies think about risk. Understanding disaster risk as part of everyday life and decision making is something that develops over time, and it does not always come naturally.

Gareth: Part of my own focus is on urban development. Do you have any thoughts or advice about early warning solutions that relate to and concern urban areas in particular?

Jeff: Cities compress time as much as they compress space. Hazards can quickly cascade through dense infrastructure and large populations, so the timing of decisions becomes critical. I find it useful to think in terms of events rather than static conditions, an idea Carlo Rovelli discusses in his work on time. Disasters unfold as sequences of events, and early warning systems operate within those evolving processes. In urban environments this means recognising how quickly decision windows open and close, and ensuring institutions are able to act within that time.

Gareth: Do you have any recommended reading or sources of information for people to review about disaster risk and early warning solutions?

Jeff: One book I am currently reading, although it is not about disasters directly, is *The Order of Time* by Carlo Rovelli. It offers a fascinating perspective on how we think about events and processes. Rovelli challenges the intuitive idea that time moves uniformly from past to future and instead describes a world made of interacting events that unfold locally and relationally. This perspective is surprisingly relevant for disaster risk and early warning. Hazards, warnings and responses rarely follow neat linear phases such as preparedness, response and recovery. They evolve through sequences of events where timing, interpretation and interactions between systems shape outcomes. Thinking about risk in terms of evolving events rather than fixed stages can be a very useful way of approaching complex warning systems and cascading impacts.

Gareth: Thank you very much for your time, Jeff. We look forward to continuing to follow your work.