



# CLIMATE VARIABILITY: UNDERSTANDING YOUR CHANGES IN RISK FOR 2021

2021



The longer term impacts of climate change on the frequency and severity of natural disasters such as hurricanes, wildfires and flooding have been considered by insurers for many years. It's only recently, though, that credible shorter term forecasts and models have become available for pricing and managing insurance exposures.

reask has developed a global approach to assessing climate variability, combining physics, climate data and machine learning to complement the baseline view of risk developed by carriers, and the market as a whole. We brought together a panel with reask and five industry leaders to explore what is emerging from the latest scientific research, what is available to insurers today, how this is being used by companies and how the regulatory outlook is likely to evolve.

**Matthew Grant**  
InsTech London Partner

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## Part One: Understanding the issues

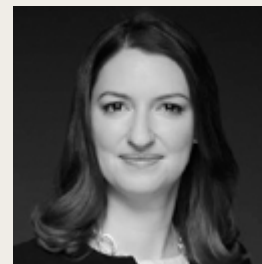
### Speakers



**Nick Hassam**  
reask  
Co-Founder and Chief  
Commercial Officer



**Marcus Rivaldi**  
Twelve Capital  
UK CEO, Head of ILS,  
Credit and Equity Analytics



**Dr. Jessica Turner**  
Guy Carpenter  
Managing Director,  
Catastrophe Advisory

**Climate change has impacts for insurers over different time horizons. Nick, what information are your clients looking for to help make decisions in the short term?**

**NH:** Organisations are increasingly keen to understand how tropical cyclone risk is changing over different time periods. Climate variability spans across a broad range of temporal periods. At reask, we have access to information that allows us to understand how the climate is varying even within an individual season. With this information insurers can do a variety of things: look at embargoes, backup insurance covers, and other forms of hedging. It really comes down to what an organisation is trying to do. The key for us at reask is to move beyond a static approach, and allow the short term climate trends to inform us on our view of risk.

**Nick, why have you brought together this group to talk about climate variability?**

**NH:** This group consists of experts that reask has a great deal of respect for. Our goal in bringing them together is to expand the conversation on what is important for insurers to understand. We want to get a feel for how different organisations can utilise the types of products that we're developing. reask is driven by what the market is keen to see in terms of understanding catastrophe risk. This is different depending on the segment of the market.

**Jessica, your role is to advise Guy Carpenter's clients on capital protection and reinsurance buying. What information do your clients need to make decisions regarding climate change in the short term?**

**JT:** On a year on year basis, it's important to understand that natural variability is swamping any kind of climate change signal. The large swings in losses may be because of natural variability - not climate change. However, attribution studies have shown how much more likely an extreme event occurred because of climate change. A study showed that Storm Desmond in the UK was 60% more likely compared to preindustrial greenhouse gas loading. There's a balance between natural variability and the impact that climate

change is having. However, I am seeing a tendency for the media to claim every big event is because of climate change. This might not be the case.

**Jessica, is climate change starting to be taken into account in the longer term in annual views?**

**JT:** I think it is starting to be taken into account. I get asked all the time how to incorporate climate change into business decisions, but it's tricky. One thing an insurer can do is calculate the future change in their average annual loss (AAL), and adjust their prices each year to account for it. They could also try to slowly rebalance their portfolio to get away from some of the risk. I think doing the calculation in the medium term does have benefits for decision making in the 12 month period.

**Jessica, where are companies today in terms of being able to use information from organisations like reask to help with short term guidance?**

**JT:** The information could be really useful from an operational perspective. It would be helpful to know at the beginning of the season how many claim adjusters I might want to hire. Also, whether I should renegotiate contracts for rebuilding that I know will have to be done. From a reinsurance perspective it's always been a bit more of a challenge. The renewal periods are slightly mismatched to when there is the most skill in terms of seasonal forecasting. This is a challenge that could be overcome though.

**What's the distinction between the creation of hurricanes and forecasting landfalling hurricanes?**

**JT:** It's much easier to forecast hurricanes that are being created in the Atlantic basin. This is because it depends on things like ocean heat, which is relatively easy to predict. But to predict landfall, steering flow needs to be predicted. This is much harder to forecast on a seasonal basis.

**Richard, how do you see the distinction between the macro effects of climate change and the seasonal variability?**

**RD:** In terms of climate change, I consider it as a steady background drift. I find the potential link between climate change and seasonal variability fascinating - for example, how climate change could make El Niño and La Niña more vigorous. This could then feedback into the seasonal noise. One concern is that models may not account for present day risk. New science suggests that only the present should be looked at to inform risk for current and future seasons. Historic trends may not be relevant, yet they are often used in models. But if the baseline is set correctly for today, models should be able to cope with the next 10 years in terms of climate impacts. However, this could vary due to peril.

**Richard, how much more confidence do you think there is in seasonal forecasting now compared to 20 years ago?**

**RD:** The resolution of the models that are currently being built are up to four times better than they were 20 years ago. Weather forecasts now are being made six months ahead, alongside statistical forecasts. 20 years ago it was just statistical forecasts. The European Centre for Medium-Range Weather Forecasts (ECMWF) runs 51 forecasts at the start of the year, and is a good example of what can now be done in terms of forecasting. The quality of forecasts has improved, and the number of forecasting agencies has also

increased.

**Nick, how do you aggregate all the variations in the forecasts and provide information to clients in a way that allows them to make decisions?**

**NH:** We operate across long term, probabilistic views of risk and we do a lot of event response analysis. We also have a seasonal and climate trend product that looks at the expected frequency and severity of events. In terms of how these products are used, we work with organisations to incorporate or augment their existing framework. We therefore enable our clients to incorporate our information into their existing workflow. Our goal is to augment and supplement our client's existing views of risk. This can give them an improved understanding of how the current climate variability is impacting the way in which they transfer risk.

**Nick, how does modelling capture the exponential speed of climate change?**

**NH:** It's important that we consider what has happened to date. Our clients need to understand how much experience of climate change has been incorporated into our models as they currently stand, and if this is enough. The only way this is possible is through the real capturing of climate variability. We want to help our clients understand exactly what the potential variability of the climate is at this point in time. As an example, Lloyd's have stated that they want all managing agents to ensure that their catastrophe modelling processes incorporate all impacts of climate change to the current day.

## Part Two: Practical applications

### Speakers



**Richard Dixon**  
Inigo Insurance  
Head of Catastrophe  
Research



**Dr. Kirsten  
Mitchell-Wallace**  
Lloyd's  
Head of Portfolio  
Risk Management



**Matthew Jones**  
Nasdaq  
Head of Catastrophe  
Risk Products

**Matt, how actionable is seasonable forecasting information and how could it best be used by an insurer?**

**MJ:** The information that reask is producing is really useful to an insurer or reinsurer. I wouldn't recommend using this sort of information to alter the price of a primary insurance policy. Changing the policy price year on year based on seasonal forecasts will make the insurer unpopular with the policyholder. But this sort of information can help in a number of situations. It could help an underwriter decide whether or not to buy facultative reinsurance. Another example is how for a subscription market, the information could influence whether an insurer wants to increase or decrease its share of a risk.

A slightly different example is reinsurance buying for insurance companies. They likely have some facility to put tactical reinsurance in place. With tactical insurance, there is flexibility in when and how it is bought, and what sort of reinsurance programme to buy. This means that seasonable forecasting information can help with making that decision. However, it does depend on how good the skill is, when the skill comes and how it intersects with renewal dates.

**Matt, Nasdaq is making many new models available around the world. What do you think about the need for the abilities that reask brings to the market?**

**MJ:** We have a platform that can host Oasis based models, and already have 12 different vendors. I like reask's approach as it is very global. They don't section off one region at a time, but rather try to understand the global nature of cyclone risk. This brings in a new dimension. Being able to see if there's a relationship between regions can be used to calculate how much risk an insurance or reinsurance company takes compared to what's in the risk policy. Nasdaq already has a global probabilistic flood model on its platform, but it would be great to compliment that with reask's global tropical cyclone model.

**Marcus, you have a different perspective as an investor in catastrophe bonds. What are the challenges you face when making decisions?**

**MR:** We're always trying to improve our understanding of risk for making investment decisions. A few years ago, there were weaknesses in the traditional hurricane forecasting approach on a seasonal basis. The focus was mainly on hurricane count, but that is not necessarily a good predictor of loss. In a season there can be a large number of storm counts, but not much insurance loss. Now with reask, we are looking at landfall probability and genesis location of hurricanes. We believe these two things are more useful when thinking about risk from a portfolio construction perspective.

**Marcus, how are the ILS (Insurance Linked Securities) markets reacting to climate change in the long term?**

**MR:** The heightened level of activity over the last 20 years and the volatility around that is likely to be the new normal over the next 40 years. As a result, the reinsurance industry will need capital market involvement to help take on this peak peril risk. This bodes well for the future of the ILS asset class. It also ties in well with the ESG (Environmental, Social, Governance) agenda. ESG investors want to support climate transitions that are necessary for the global economy. Insurance plays a key role in doing that, and is a big part of the offer to investors.

**Kirsten, what is your team at Lloyd's doing?**

**KMW:** The purpose of my team is to ensure that the way risks on the market are managed is sustainable, so we can continue to share risks. Our mission is to understand and control catastrophe risk at a syndicate level and for the market as a whole. To do that, we have our famous realistic disaster scenario framework. We also collect probabilistic risk representations from all of the syndicates and stitch them together to get an overall Lloyd's view. As well as doing that, we look into how the modelling is done and the exposure management functions within the organisation.

**Kirsten, is seasonal forecasting something that you're looking at?**

**KMW:** Reinsurance purchase is more of a long term thing related to the minimum regulatory capital requirements. I think in the short term, it's more about underwriting decisions or making specific decisions in marginal cases. Seasonal forecasting information could be useful in this case, but it's not an overall determinant. We're not looking at seasonal forecasting.

**Kirsten, many organisations think of Lloyd's as an example of the best practice in this area. Where can people go to learn more about what you're doing?**

**KMW:** It isn't public information at the moment. This year we're going to be doing a thematic review. This is where we speak to lots of different managing agents and find out what they're doing on a specific topic. From that we produce recommendations on best practice and publish that for the market. This year, we're asking 10 syndicates what their methodology is for making sure that their current risk is up to date.



## Audience Questions

**Matt, do you think the insurance industry has a role to play in helping corporates manage what the TCFD (Task Force on Climate-related Financial Disclosures) calls 'transition' risks?**

**MJ:** The TCFD put out an instrumental report in 2017. We're now starting to see the outcome of that through the recommendations that are coming out on a country by country basis. In terms of transition risks, I think the insurance industry has a part to play. It's important to recognise there's an interdependency between transition risk and fiscal risk. If there's a large transition risk, the fiscal risk is reduced and vice versa. Due to this sense of dependency, the insurance industry should be able to help with both.

**To what extent does climate change represent an opportunity for positive change in the industry?**

**MR:** There is a lot of pressure now from regulatory sources for us to talk to our investors about the risks to our funds from climate change, and also the role that our funds have in supporting positive change. The insurance industry is happy to talk about what they're doing at a corporate level, but not what they're doing on the liability side. There's unfortunately a lot still to be done. But the insurance industry has the potential to play a huge role in driving positive change.

**RD:** We tend to be fed by the media or politicians that everything is getting worse. Some areas might see an increase in risk, some might see a decrease. CORDEX (Coordinated Regional Climate Downscaling Experiment) has looked at the changes in wind in Europe for each of the warming pathways. They found very little change in wind risk. But even then, change in terms of hazard is not the only thing that affects risk. Changes in exposure and vulnerability are important. It is not just the hazard that can drive change in the future.

**MJ:** Most studies I've seen focus on the change in hazard. But it's important to think about how mitigation and vulnerability will change over time as well, although this is hard to do.

**Kirsten, do you take into account hazard exposure?**

**KMW:** We're so early in the journey of looking at the impact of climate change. There is a tendency to focus on the hazard. Doing a test with current day exposure vulnerability and changing the hazard isn't a good representation of the future climate. It's a good way of starting the discussion and bringing attention to a very important problem. However, I worry that some of these outputs might have too much importance placed on them. They are very uncertain. Uncertainty needs to be communicated better. And with cat modelling, layering climate change on top adds a whole new level of uncertainty.

**Jessica, how do you make business decisions with the uncertainty surrounding catastrophe models and climate change?**

**JT:** There are so many different sources of uncertainty. There's a lot of talk about representative concentration pathways (RCPs), but no one knows what future greenhouse gas emissions are actually going to be. It depends on economic development, techno-

logical breakthroughs and policies. Even if you choose a RCP and timeframe to look at, the climate models don't agree with each other. I encourage people not to only look at the multimodal mean - multiple models need to be looked at to get a spread of the uncertainty.

### **Nick, how is all this going to play into parametric insurance for reask?**

**NH:** From reask's perspective, parametric is something that allows us to use our models to the maximum, because we have such a focus on hazard and trigger. In the coming weeks and months we'll have announcements of clients, specifically on the parametric side. These include long established companies as well as startups in the MGA space.

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