BIZCOMMUNITY

# Black Swan events and their spatial consequences

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Using location data to anticipate and prepare for 'what's next' in a dynamic and often unpredictable world.

In a world where the unexpected has often reshaped history, 'Black Swan' events are a stark reminder of our collective vulnerability to the unforeseeable. These events, defined by their rarity, severe impact, and the widespread post-event perception that they were predictable, present a unique challenge in risk management and forecasting. Historical examples, ranging from the Spanish flu to the Covid-19 pandemic, the 2008 global financial crisis, and ongoing geopolitical shifts, demonstrate the profound and often unanticipated effects such events can have on global systems.

Brian Civin, chief sales and marketing officer at AfriGIS, emphasises the importance of acknowledging the unforeseen in our predictive models. “In a dynamic world where the only constant is change, traditional models often fall short in anticipating these outliers,” says Civin.

Civin highlights the crucial role of geospatial analytics in this context. By mapping and analysing spatial data, we can gain a deeper understanding of the dynamics at play in these unpredictable scenarios. “Geospatial analytics isn't just about mapping data; it's about interpreting complex patterns and trends that could indicate looming challenges,” he explains. This approach is especially relevant in urban planning and environmental management, where spatial data can reveal trends and vulnerabilities that might otherwise go unnoticed.

The unpredictability of events like the assassination of Archduke Franz Ferdinand in 1914, which precipitated World War I, further underscores the importance of this approach. Such events, though unpredictable, have cascading impacts that reshape history. “We need to look beyond the obvious and anticipate the ripple effects of these events,” Civin notes.

The ongoing climate crisis exemplifies the need for proactive risk management in the face of environmental uncertainties. “Climate change is accelerating at an alarming rate, bringing with it a host of challenges that our traditional planning methods are ill-equipped to handle,” Civin warns. He points to the increasing frequency and intensity of extreme weather events, from severe thunderstorms and heatwaves to flooding and coastal erosion, as indicators of our changing

environment. In South Africa, for instance, the occurrence of snowfall, once a rare phenomenon, has become more regular, signalling a significant shift in weather patterns.

Effective risk management in this context involves considering the potential impacts of such events on various aspects of society, including demographics, politics, and regional stability. “Asking ‘What if?’ is not just a theoretical exercise; it’s a practical approach to ensuring preparedness for the unexpected,” Civin asserts.

AfriGIS’s collaboration with the South African Weather Service and other stakeholders highlights the importance of standardised and accessible data use. Civin stresses the integration of weather data into daily decision-making processes. “Weather influences everything from our daily attire to infrastructure planning. It’s time we recognise its critical role in our strategic planning,” he says.

Marna Roos, senior client consultant at AfriGIS, echoes this sentiment, emphasising the global access to data as a significant advantage. “We have much to learn from countries with advanced disaster management systems,” she says. “Our focus should be on actively utilising data to create resilient and adaptable solutions.” She points to the necessity of factoring in specific weather risks like hail and lightning and adjusting logistics and service delivery in response to environmental changes. “Collaboration is key,” Roos adds, “as it allows us to tap into a wealth of resources and expertise beyond our individual capacities.”

Singapore’s approach to urban planning, where spatial data is used to understand and mitigate the Urban Heat Island effect, serves as a prime example. The city-state analyses data on temperature, greenery, and built-up areas to identify hotspots and implement strategies to reduce heat absorption, such as increasing green spaces and green roofs.

Roos notes the challenge lies not in the availability of data but in its effective application. “The true task is to ask the right questions tailored to our unique needs and use the data to anticipate and prepare for the unpredictable,” she says.

Civin and Roos advocate for a vigilant and technologically equipped approach to adapt to and respond to anomalies and evolving challenges. By doing so, risks can be mitigated, environments adapted, and community and business sustainability ensured in the face of uncertainty. This approach encompasses predicting extreme weather events, managing flood risks, aiding in agricultural planning, optimising renewable energy sources, and mitigating urban heat islands – all critical in safeguarding against the adverse impacts of climate change."

**Five ways weather and location data can safeguard against the adverse impacts of climate change**

1. **Predicting Extreme Weather Events:** Advanced weather forecasting, using location data, predicts extreme weather like hurricanes, enabling early warnings and timely evacuations to protect lives and property.

2. **Flood risk management:** Location data identifies flood-prone areas, aiding in infrastructure planning such as flood barriers and drainage systems to reduce flood impact.

3. **Agricultural planning:** Weather and location data guide farmers in crop selection, irrigation, and preparation for extreme weather, ensuring food security.

4. **Renewable energy optimisation:** Location data identifies sites for renewable energy sources, while weather data predicts energy output, essential for energy grid management.

5. **Urban planning and heat mitigation:** In urban areas, this data helps combat heat islands by identifying hotspots and guiding the development of green spaces and cooling infrastructures.


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