ASIA INSURANCE REVIEW
Member: Beacon International Group, Ltd.
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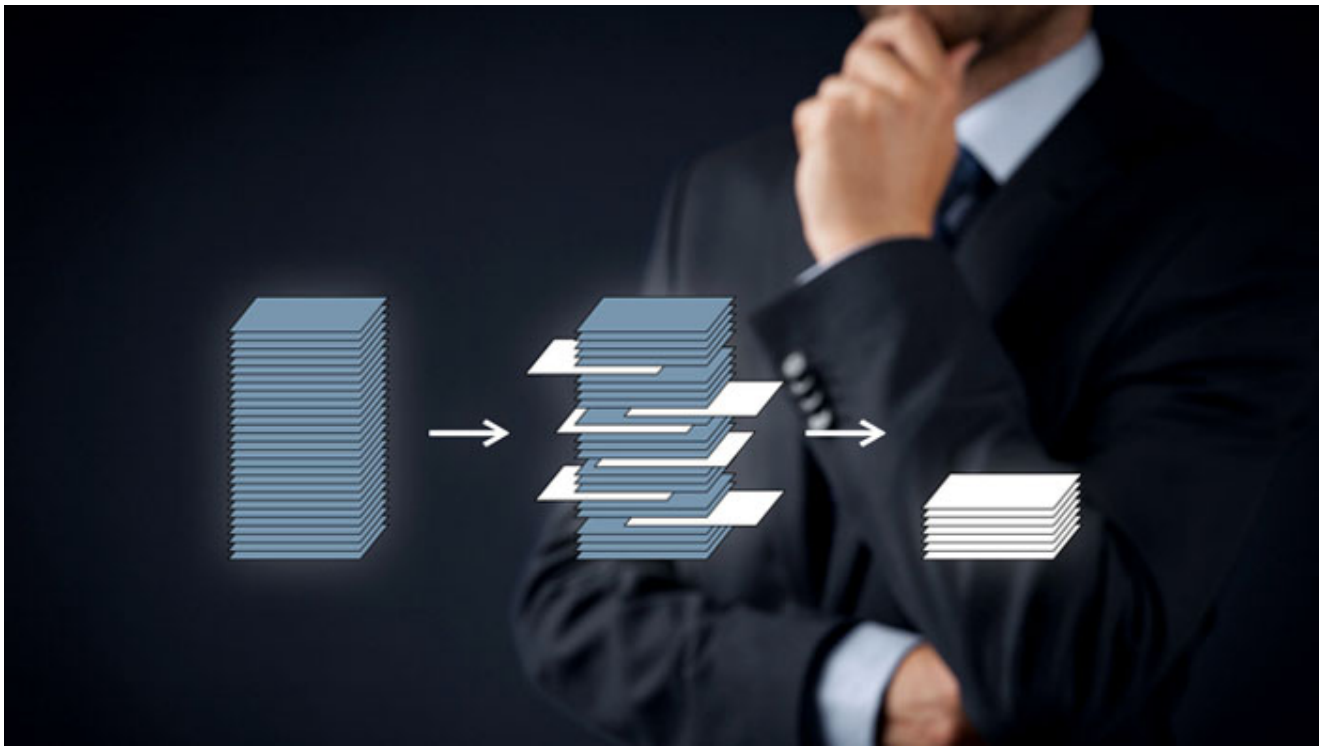
Leveraging environmental data

Source: Asia Insurance Review | Dec 2018



Big data enables insurers to quantify risk, design and price insurance products and validate and settle claims. **CelsiusPro** director business development and technology **Sebastian Glink** offers some insights.

Big data, machine learning, AI and the internet of things are buzz phrases that are becoming increasingly relevant in the insurance industry. However the industry is only slowly warming up to these trends. In the areas of climate, agricultural and natural catastrophe risk particularly, big data and analytics can help insurers when it comes to product design, operational efficiency and underwriting results.

Environmental monitoring systems (EMS) play an important role in converting big data into relevant information for insurers. The global availability of (satellite) data with growing historical time series can bring plenty of opportunities for those insurers who are ready to use them systematically to move to the next level.

Translating data into relevant information

A large number of environmental datasets can be accessed at very little cost. However, this data needs to be processed and put into context to be useful to insurers. This is the added value of EMS solutions. EMS source data from various data providers in a variety of formats, homogenise the data and data formats and aggregate the data to the desired temporal or spatial levels.

This allows underwriters, analysts and claims managers to understand baseline weather for regions and seasons, to conduct trend analysis, to analyse footprints and impacts of historical and actual extreme weather or Nat CAT events that are relevant for underwriting and the settlement of insurance contracts.

Boosting availability and effectiveness of parametric products

Parametric products depend on measurements of third-party data such as remote sensing data from satellites. The increase of environmental parameters, the spatial density and the higher number of available measurements allow for the efficient development of effective insurance contracts and a reduction in basis risk.

Some years ago, weather index insurance policies could only be written on weather stations of national met offices with a long history data. Needless to say, there were hardly any weather stations near the location of the insured risk in those days.

Nowadays, thanks to gridded satellite data, we can select the reference grid that is precisely at the insured location. Furthermore, data can easily be aggregated to administrative regions for meso and macro covers, which pay out when adverse weather conditions, such as drought or heat waves, hit entire regions.

Increase client satisfaction and operational efficiency

While the calculation of the settlement amounts with respect to parametric covers happens automatically alongside the systematic sourcing of the underlying data, there are also significant advantages to the loss adjustment of traditional indemnity-based insurance policies. Combining additional data layers such as land use, street map or satellite view increase the significance of such information.

In the case of loss adjustment of indemnity-based insurance policies, a qualified person must inspect the claim of the insured. With the environmental data at hand, claims managers can validate certain claims by checking the relevant weather or Nat CAT data. Should the claim come from a client whose property is clearly in a region affected by an extreme event, and should the claimed amount be small, the claim can automatically be processed after intersecting the affected area with the event footprint.

Clearly not all claims can be handled without physical inspection, but a large number of smaller claims can be assessed in this manner. A swift payout increases client satisfaction and operational efficiency while decreasing loss adjustment cost.

Crop models that are based on climate and vegetation data track the crops during the growing season and provide insurers with loss estimates throughout the year. They further provide regional yield estimates per crop, which can be used to support the loss adjuster's decision in the regions and numbers of inspections needed to validate claims.

Experience in environmental data for the insurance industry

CelsiusPro addresses this need with a solution that has been developed in house. CelsiusPro's EMS uses climate, vegetation, yield and Nat CAT data that is publicly available from various sources worldwide, and imports about 120m new data points daily.

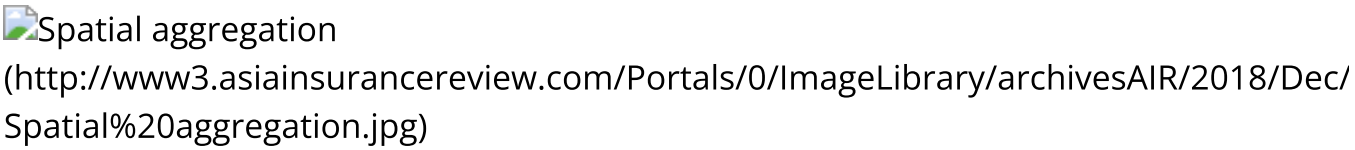
Apart from the most commonly used weather station data, the EMS gives access to gridded data sets, either satellite datasets (remote sensing) or blended datasets (remote sensing and weather stations). The gridded data is aggregated for all administrative hierarchy levels such as district, county and village. It provides the user with data per geographic area rather than individual pixels.

The big data architecture for high-performance data processing enables insurers to monitor weather and climate conditions for risk management, claims management and settlement services in a highly automated way.

From data to insurance product
A variety of graphics, charts and statistical values provide insights into large datasets for all the parameters (see Diagram 1).


From data to insurance product (http://www3.asiainsurancereview.com/Portals/0/ImageLibrary/archivesAIR/2018/Dec/From%20data%20to%20insurance%20product.jpg)

Spatial aggregation
Gridded data is aggregated for all administrative hierarchy levels to provide the user with data per geographic area rather than individual pixels (see Diagram 2). A


Spatial aggregation (http://www3.asiainsurancereview.com/Portals/0/ImageLibrary/archivesAIR/2018/Dec/Spatial%20aggregation.jpg)

Mr Sebastian Glink is director business development and technology at CelsiusPro, a Swiss InsurTech company that specialises in industrialising index insurance solutions to mitigate the effects of adverse weather, climate change and natural catastrophes.

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