GCAT India Flood Model

The India model is the latest addition to Guy Carpenter's robust suite of flood monitoring tools for South Asia. Our models and advisory help clients throughout Asia better understand and manage the flood risks they face.

What are the benefits of Guy Carpenter's India Probabilistic Flood model?

STATE-OF-THE-ART MODELLING

Considers the impact of all major flood events through 2021.

Enhanced methodology to support robust modelling, covering the entire country.

Incorporates data on flood defences and mitigations.

- **Local Conditions**
- **Countrywide Coverage**

BROAD RANGE OF APPLICATIONS

Can be used for underwriting, risk management, and regulatory requirements.

Accumulation, probable maximum losses (PMLs) and scenario modelling to support management decisions, including climate change assessment.

- **Risk Management**
- **Climate Change**

INTEGRATES WITH GC SUITE OF FLOOD MODELS

Correlation across the regions in Asia Pacific with Guy Carpenter's suite of flood models. Allows loss modelling for events that hit multiple countries.

Comprehensive coverage of all countries in Asia with regional and local data support.

- **Complete Coverage of Asia**
- **Local Knowledge and Data**

Overview of India Flood Model Components

The South Asian part of the Global Flood Event Set was developed for Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka simultaneously to account explicitly for cross-border correlation. The model incorporates damage functions linking flood depth to damage ratios for a wide range of risk types. These functions are based on a proprietary database of historical damage and claims data, supported by a catalogue of flood vulnerabilities functions derived from peer reviews, and scientific and engineering studies.

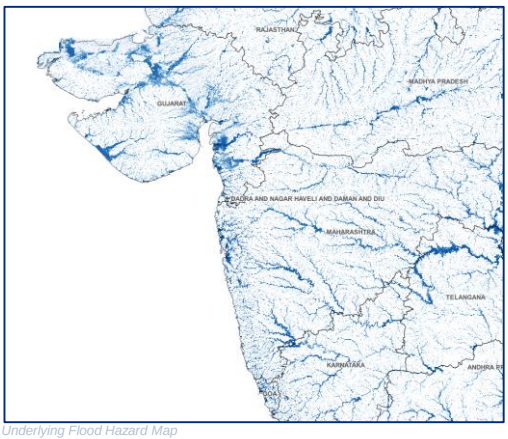
Precipitation

Global Flood Event Set was developed with 10,000 years of simulated daily precipitation and temperature, using a combination of statistical models. It covers both tropical cyclone- and non-tropical cyclone-induced precipitation and includes the effect of the monsoon season.

Water Flow Modelling

The river network covered by the flood hazard maps contains all rivers with a catchment area of 3 square kilometres and above. The flood hazard maps for India were developed using a 1D hydraulic model, and the Intermap's NEXTMAP WORLD 30 Digital Surface Model (DSM) has also been utilized. The WORLD 30 data provides consistent and full global coverage at 30 metres resolution and offers improved accuracy compared to the SRTM and ASTER data.

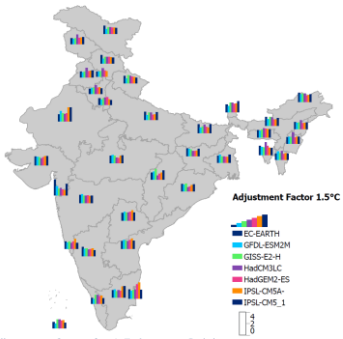
Pluvial flooding is simulated using an in-house methodology accounting for local climate conditions, soil type, land use and topography.



Underlying Flood Hazard Map

Climate Change Adjustment Capability

The India flood model can provide views of climate change impact on portfolio losses in addition to the baseline condition.



Climate change adjustment factor for 1.5 degrees Celsius warming scenario by state

Built Environment

Leveraging land use and land cover data, global human settlement layers, population and Guy Carpenter's proprietary Industrial Park database to create a detailed, built-environment disaggregation engine.

Flood Mitigation

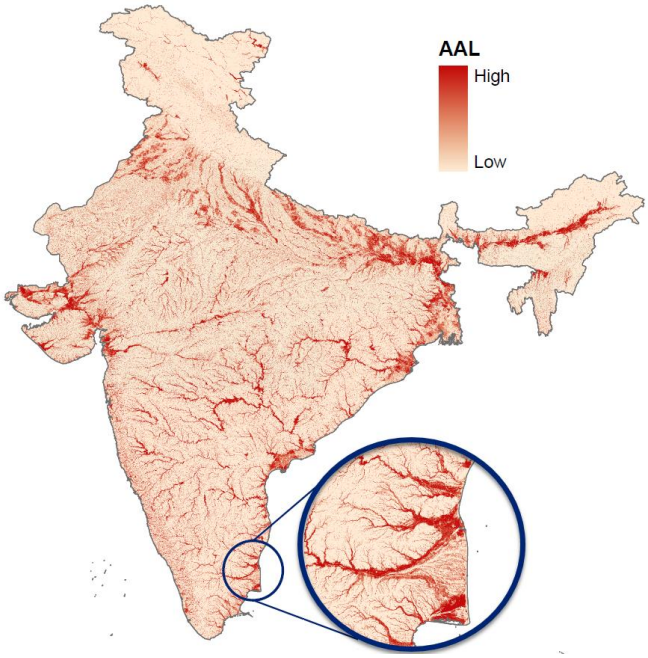
The model incorporates the impact of flood defence and drainage systems on the frequency and severity of inundation, based on available data.

Vulnerability Module

The India flood model supports multiple lines of business, including motor, residential single-family, residential multi-family, commercial, industrial, agricultural and municipality. Modelled flood depth dependent vulnerabilities are calibrated on collections of local data specific for India.

Model Usage

Guy Carpenter's India flood model utilizes the industry-owned, open-source OASIS loss modelling platform and provides various levels of output, including average annual losses (AAL) and event loss tables. The model is suitable for underwriting purposes, with supported data at high resolution.



Contacts

If you are interested in learning more about our India flood model or would like to organize a technical presentation about the details, please contact one of the team members below:

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About Guy Carpenter

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