# The Geospatial Analytics Module in Touchstone

**HIGHLIGHTS**

Effective risk management requires a full understanding of your exposures. But it's impossible to own your risk by looking at millions of locations on a spreadsheet. Touchstone's Geospatial Analytics Module gives you new ways to visualize your entire portfolio and understand your risk with just a glance.

- Analyze your exposure accumulations by country, state, CRESTA zone, postal code—or any other custom boundary of your choice anywhere in the world, and identify high concentrations of risk quickly and easily
- Clearly understand and explain to stakeholders the drivers of risk geographically—in terms of exposure, hazard, and loss
- Visualize stacks of both live and static geographic data layers on top of multiple basemap options
- Account for financial terms when accumulating the risk
- Explore the impact of risk from non-modeled perils and regions
- Develop your own internal view of risk and facilitate regulatory compliance

More than ever before, companies are seeking to visualize their data to better understand and manage their risk. Touchstone®'s award-winning Geospatial Analytics Module is far more powerful than off-the-shelf GIS solutions when it comes to analyzing and developing insights about risk. That's because it lets you seamlessly integrate exposure information, hazard data, and probabilistic loss modeling to enable you to analyze portfolios of risk in new, dynamic ways.

Get a comprehensive view of all your global exposures and see how they break down by geography, construction, occupancy, year-built, and other risk attributes. Visualize risk as it is evolving in real time with live data feeds of hurricanes,

earthquakes, and other perils from organizations such as USGS, NHC, the UK MET Office, EMSC, PAGASA, and many more. Touchstone also provides you with a variety of static hazard information such as landslide and flood zones or liquefaction potential to help you formulate better underwriting guidelines and risk management strategies.

Accumulate exposures—even for non-modeled perils and regions—across multiple databases and take advantage of Touchstone's financial module to apply policy terms, limits, and deductibles to calculate exposed limits. Specify user-defined damage ratios to estimate losses.

In short, Touchstone's Geospatial Analytics Module enables you to go far beyond the exceedance probability (EP) curve to better own your risk. A small selection of the dozens of possible applications is presented here.

Visualize your risk like never before.
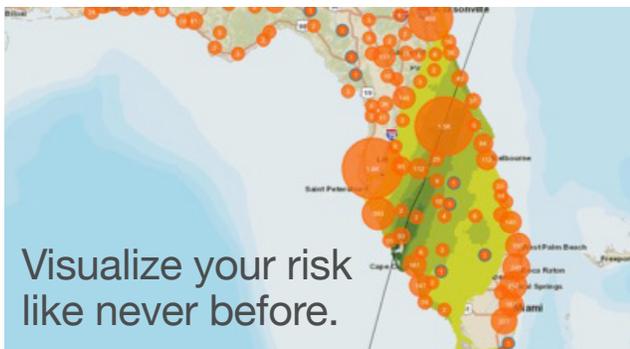
## Estimate An Actual Event's Impact In Real Time

You can visualize which locations are likely to be affected by an event unfolding, obtain a quick estimate of potential losses, and plan risk transfer and claims adjustment strategies accordingly. Live footprints from public reporting organizations, such as NHC best track and cone of uncertainty and USGS ShakeMaps, can be imported and used to analyze risk in real time. AIR also provides custom shapefiles for significant events as part of our ALERT™ postings. Live footprints from public reporting organizations, such as NHC best track and cone of uncertainty and USGS ShakeMaps, can be imported and used to analyze risk in real time.

For example, following hurricanes Harvey, Irma and Maria, AIR published footprints of each storm's wind field and flood footprint to help clients with exposures in the area assess the impact of these event.

## Manage Accumulations and Inform Underwriting Guidelines with Powerful Spatial Capabilities

Manage your accumulations based on AIR-supplied or user-defined zones, such as countries, states, CRESTA zones, or custom-drawn polygons and ellipses, and ensure that your portfolio is not overly concentrated in any specific geographic region. You can easily view accumulations of risk by construction type or by their location relative to potential hazards such as flood zones, fault lines, and coastlines. Such hazard layers can be deployed to support rules or guidelines at the point of underwriting. You can also import your own custom hazard data and geographic boundaries or zones anywhere in the world, enabling you to implement customized risk management strategies.

The powerful Dynamic Ring tool can identify the point location around which there is maximum exposure concentration—information that is required by regulators and some rating agencies. The algorithm automatically identifies the ring that yields the highest accumulation value using a technique that delivers more accurate results than traditional grid-based methods.

Because the Geospatial Analytics Module is supported by Touchstone's full financial module, you can accumulate risk from a range of perspectives, including ground-up, gross, retained, and net of pre-cat.

## Integrate Third-Party Hazard Data

Touchstone's open architecture allows for the seamless integration of third-party data and models, and a growing number of organizations have signed agreements with AIR to make their data available in Touchstone.

Available data providers include sister companies at Verisk, such as Wood Mackenzie and Maplecroft, as well as third-party model and data providers such as Ambiental, ERN, PERILS, Risk Frontiers, in addition to a number of academic institutions. Every one of the Geospatial Analytics Module's capabilities can be applied using third-party data.
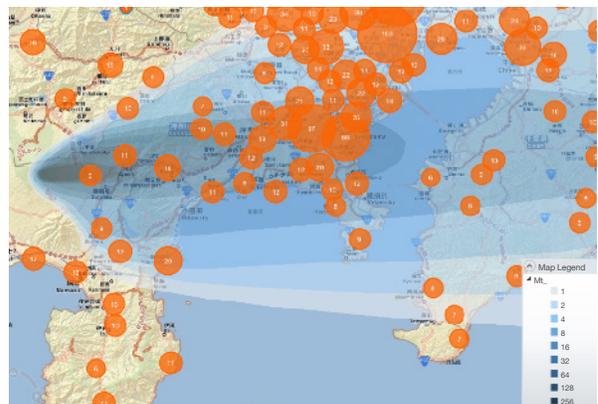


Ashfall depth footprint from the eruption of Mt. Fuji in 1707

## Import Custom Map Layers To Manage Non-Modeled Perils

For non-modeled regions and perils, Touchstone enables you to conduct geospatial analytics based on custom event footprints. For example, you can import third-party flood or tsunami footprints for countries where no models currently exist—and even create your own "gray swan" scenario footprints to test

## Meet Regulatory Requirements

Regulatory regimes like Solvency II require companies to demonstrate an understanding of the models that inform their decision-making. Touchstone delivers the transparency you need. Touchstone's detailed loss analytics gives you insight into loss output by providing an expanded view of event parameters and hazard data and, when combined with geospatial analytics, you can identify the maximum 200-meter accumulation or set a custom radius to fulfill  your reporting requirements.

Touchstone makes satisfying Lloyd's and the Bermuda Monetary Authority's (BMA's) reporting requirements on accumulations within countries or groups of countries more straightforward than ever before by accounting for all the layers and limits written into every policy. Footprints for the global set of Lloyd's Realistic Disaster Scenarios are also provided within Touchstone to simplify analysis and reporting on these events.

## Manage Terrorism Risk

Calculating accumulations within concentric rings is particularly useful for analyzing potential terrorist targets, whether they are high-value locations in your portfolio or from AIR's landmark database of targets in the U.S. And AIR's Dynamic Ring tool will identify your largest exposure concentration without the need to center your analysis on a specific target. By specifying gradually decreasing damage ratios for consecutively larger rings, you can assess potential losses to nearby properties resulting from a terrorist attack at any location worldwide. You can also use



Concentric ring terrorism analysis in Lower Manhattan

Lloyd's Terrorism RDS scenarios to assess potential losses. You can also perform accumulations by importing layers, such as Verisk Maplecroft's sub-national terrorism risk map, which scores locations globally, utilizing data on reported terrorism incidents and their severity.

## Manage Flood Risk

Combined with separately licensable hazard layers, you can view accumulations of U.S. inland flood risk based on 100- and 500-year FEMA flood zones, on AIR's own return period hazard maps, which, unlike FEMA's flood maps, cover the entire continental U.S. and account for risk behind levees.



Verisk Maplecroft terrorism risk score in the Middle East and Asia

AIR has also developed probabilistic flood hazard maps for Austria, Brazil, China, Czech Republic, Switzerland, and Thailand. These maps can help you assess location-level inland flood risk to make better underwriting decisions and manage accumulations.

## Manage Accumulations Of Offshore Assets

Touchstone's Geospatial Analytics Module has the ability to generate accumulations for offshore locations worldwide, including the Gulf of Mexico, the North Sea, and the Persian Gulf. You can also choose to analyze these accumulations using historical event footprints, such as hurricane wind speed bands, for locations within the Gulf of Mexico or by importing data layers for all other offshore regions across the world. Like any other geospatial analysis in Touchstone, the financial module is fully enabled to account for offshore-specific financial terms such as Combined Single Limits (CSLs).

## Analyze Historical Events, Rds, And Eds

The footprints of historical events, Lloyd's Realistic Disaster Scenarios (RDS), and AIR's Extreme Disaster Scenarios (EDS) are available for a growing number of AIR models. You can analyze your accumulations of exposure against the intensity footprints of historical U.S. hurricanes and earthquakes, for example, or European windstorms, or typhoons and earthquakes affecting Japan. And you can modify the damage ratio Touchstone applies to the properties located within each intensity band (e.g., wind speed band or peak ground acceleration) to customize your view of risk.
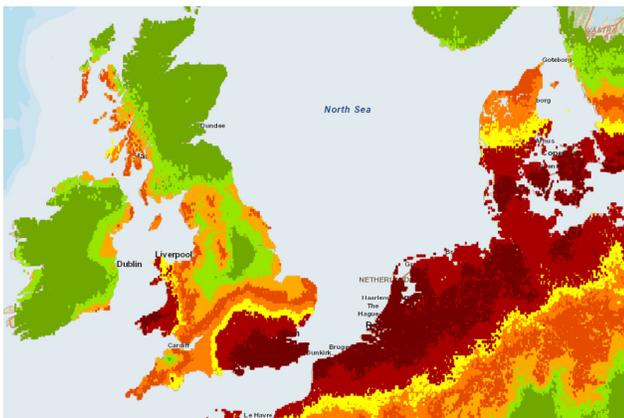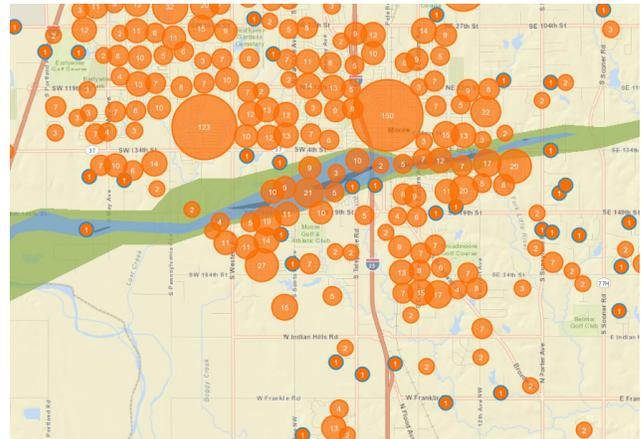

Moore tornado footprint


Lloyd's RDS windstorm

## Combine Modeled Losses With Accumulations

If you've chosen to perform a detailed loss analysis in Touchstone, you can perform a geospatial analysis to accumulate modeled loss results, such as average annual loss (AAL), by hazard and exposure attributes. This helps you understand which portfolio characteristics (by region, construction type, year-built, distance to coast, etc.) are disproportionately driving your risk. And these analyses leverage the full power of AIR's financial model so that you can accurately account for the impact of contract and layer terms.

## Validate Catastrophe Models

You can use Touchstone's geospatial analytics to assist with model validation. For example, you can visualize historical event damage footprints and assess for reasonability against claims data, or validate the reasonability of modeled losses from an event at a policy level. For perils that are highly sensitive to geocode quality, such as storm surge or flood, you can visualize which locations in a multi-location policy experience the most loss and determine if these losses make sense.

## Stress Test Your Portfolio

Import custom loss cost maps, event footprints, or pre-calculated AAL distributions and overlay your exposure.

By applying different damage ratios by zone or event intensity band within these layers, you can test how sensitive your portfolio losses are to varying degrees of damage.

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**FEATURES AT A GLANCE**

Licensing the Geospatial Analytics Module in Touchstone gives you the ability to accumulate:
— Risk counts
— Replacement values
— Exposed limits

Specify accumulations by:
— Existing predefined zones
— Custom zones that can represent either user-defined territories/areas or event footprints for real or simulated events
— Rings around user-specified locations, high-value locations, AIR-defined landmarks, or the highest concentration of exposure anywhere, identified automatically by the software
— Intensity bands for historical, RDS, and EDS events

File Formats Supported:
— Vector-based formats: Shapefile, GeoJSON, GML, SQLite
— Raster-based formats: GeoTiff, Erdas IMG, ENVI, RasterLite, Archinfo ASCII

Projections Supported:
— WGS84, UTM, Lambert, Albers and many more

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**To learn more, please contact your AIR representative or visit us at:**
**http://www.air-worldwide.com/Software-Solutions/Touchstone/**

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