

JBA'S GLOBAL DATASETS

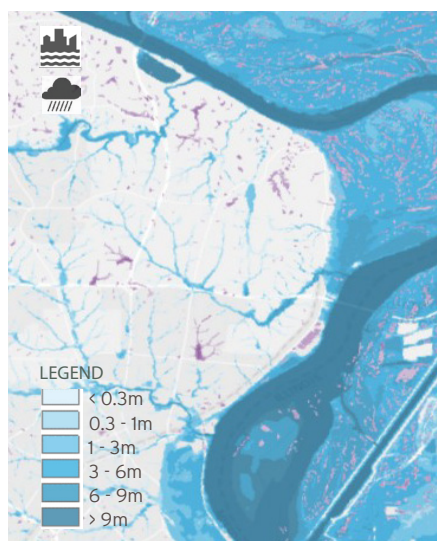
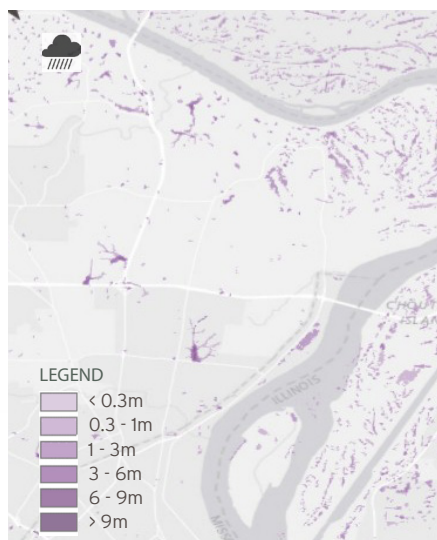
Our global datasets include river and surface water flood maps, flood defence data, hydrological accumulation zones, a flood event set and annual damage ratio data.



River flood



Surface water
flood



THE GLOBAL FLOOD MAP

The Global Flood Map is designed to give a comprehensive view of flood hazard at a national scale. JBA's Global Flood Map provides consistent flood hazard information to help answer questions such as:

- Where do I have significant exposures in my portfolio?
- Where can I write new business without growing my 1/n year flood loss?
- Where should I not write new business?
- Is there a flood risk indicated which may require a more detailed assessment?

Various digital terrain data have been used, aggregated to 30m for consistency. These include high-resolution LIDAR derived data, Radar based data (eg NEXTMap USA) and the global NEXTMap World30 digital surface model.

RIVER FLOOD

The map provides indicative flood extents and banded flood depth information for undefended river flood hazard for four return periods. The modelling provides information for all rivers within a country.

HYDROLOGICAL MODELLING

We have employed an empirically based rainfall-runoff approach linking extreme rainfall to flood flow magnitude. Separate hydrological models have been developed to reflect the different climatic zones and river regimes of the world.

HYDRAULIC MODELLING

JBA has developed two hydraulic models, both of which have been used in creating The Global Flood Map. In high risk urban areas we have used JFlow, our highly acclaimed 2D hydraulic modelling software. JFlow reached the 2012 finals of the UK's most prestigious award for innovation in engineering, The Royal Academy of Engineering's MacRobert Award. Elsewhere a hybrid 1D/2D hydraulic model has been applied.

To the left is a sample of the Global Flood Map, showing an area in St Louis, USA. Surface water flooding is shown (top left), while river and surface water flooding are shown together (bottom left).

MAJOR AREAS OF SURFACE WATER FLOODING

The Global Flood Map also indicates areas which are susceptible to significant surface water flooding. The data consists of banded depth information to indicate flood hazard caused by intense rainfall, which can happen miles from any river.

HYDROLOGICAL MODELLING

We have used statistical analysis of historical daily rainfall data to model typical rainfall totals, for a range of different storms. We accounted for variations in runoff behaviour across different climatic zones and land surfaces, and have incorporated losses in urban areas due to sewer/drainage systems.

HYDRAULIC MODELLING

The surface water layer has been created by applying rainfall directly to the elevation data using JFlow (see hydraulic modelling to the left), which routes flow across the terrain.

OTHER GLOBAL DATA (details overleaf)

DEFENDED AREAS
GLOBAL FLOOD EVENT SET
ANNUAL DAMAGE RATIO DATA
HYDROLOGICAL ACCUMULATION ZONES

OTHER GLOBAL DATA

DEFENDED AREAS

To complement JBA's undefended river flood hazard maps, a dataset of defended areas has been developed. The dataset comprises polygons showing the areas on the floodplain that benefit from river flood defences. Each polygon is attributed with a known or assumed standard of protection expressed as a flood return period.



Available May 2015.

ANNUAL DAMAGE RATIO



Annual Damage Ratio (ADR) data provide the expected annualised cost of flood damage at a specific location, expressed as a proportion of the sum insured. ADR data are derived by combining flood hazard maps with a location-specific event set, information on the built environment and tailored vulnerability functions. Statistical analysis of these data generates the ADR. A worked example showing the benefits of using ADR data is shown on the map below. Estimated flood premiums have

been calculated for the exact same property in three different locations.

ADR data can be developed wherever we have hazard maps. Please get in touch if you would like to receive some sample data.

Available by request.

HYDROLOGICAL ACCUMULATION ZONES



Hydrological Accumulation Zones (HAZ) identify areas that are likely to flood concurrently so they are useful for calculating cumulative flood exposures. Traditionally, administrative boundaries such as postcodes or CRESTA zones would be used for this type of analysis, but these share no relationship with rivers or flooding. HAZs are hydrologically sensible as they are based on river catchment boundaries. They enable a consistent method of visualising flood risk, identifying flood hotspots and defining underwriting caps.

HAZ layers are provided at two levels of detail, based on river catchment area thresholds.

Available now.

FLOOD EVENT SET



The Global Flood Event Set captures the spatial and temporal patterns of extreme precipitation and river flood events. It covers a wide range of possible events in their natural frequencies, including those caused by hurricanes. The event set has been created using advanced statistical analysis of historical precipitation, river and hurricane track data to generate an extensive set of flood events at observation points around the country.

Release schedule continues throughout 2015 and into Q1 2016

ADR values for cells at risk

Cells at risk (mean ADR >0)

100-year river flood return period

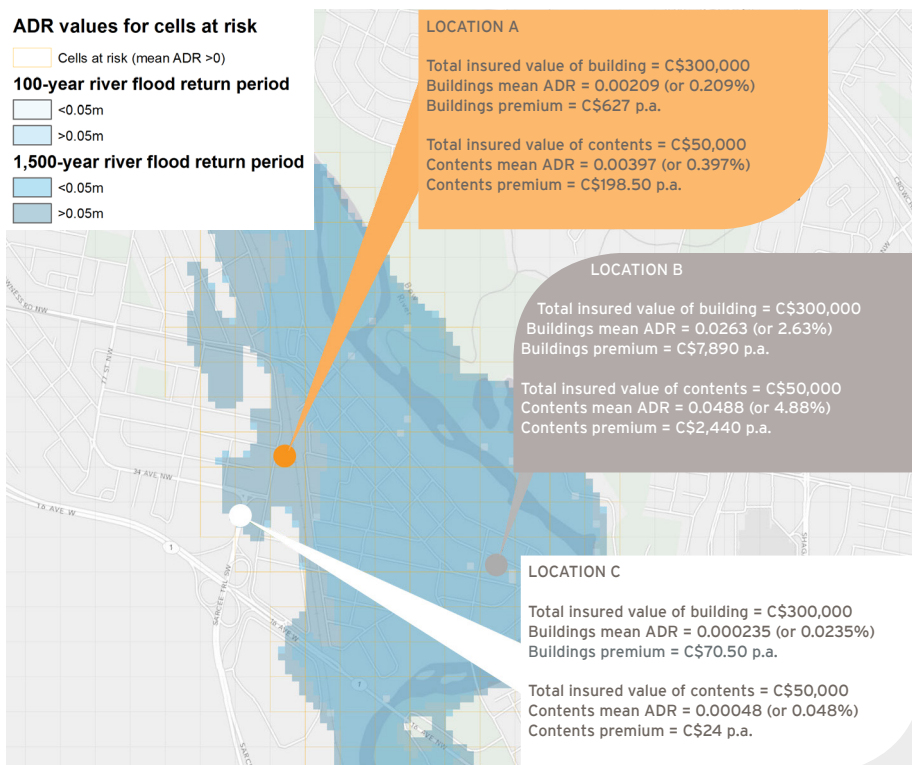
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1,500-year river flood return period

<0.05m

>0.05m



PROBABILISTIC MODEL

We have the capability to generate a probabilistic model for any country. River hazard data, rainfall data and an event set are available or are in development now. Built environment data and appropriate vulnerability functions will be the final components necessary to create a model for each country. The models will be available to run in JCALF (JBA's own cat model) or in other cat modelling platforms.

ANNUAL UPDATES

Our global data will be updated annually.

PLEASE GET IN TOUCH

We'd be happy to talk to you about any of our global datasets. Contact details are at the top of the page.

Legal bit

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