

Location Risk Intelligence

Climate Change Edition.
Don't be surprised by the
impacts of climate change,
but clearly assess the
related risks

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Purpose and advantages of Climate Change Edition

With the Climate Change Edition of Location Risk Intelligence you can bring your analysis and assessment of the physical risks associated with climate change to the next level. Building on one of the world's most comprehensive databases for natural disasters as well as hazard modelling under different climate scenarios, this edition provides detailed information on the physical risk exposure for all locations – worldwide.

Climate Change Edition is an intuitive to use modular SaaS solution, transforming data into clear structures for individual risk assessment. You not only have access to Munich Re's extensive data collection, but can also incorporate your own data. Integrated into your digital workflows, Climate Change Edition supports your spatial exploration, visualisation and evaluation. Accelerate and improve your business processes and support global portfolio control and claims management. From a single asset to multiple assets within a portfolio located in areas prone to acute and chronic climate risks such as extreme temperatures, extreme rainfall, drought, floods, sea-level rise, etc.



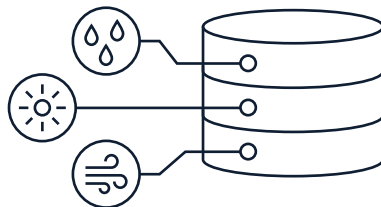
Easy to interpret visualisation

Clear heatmap visualisation of hazards in different climate scenarios.



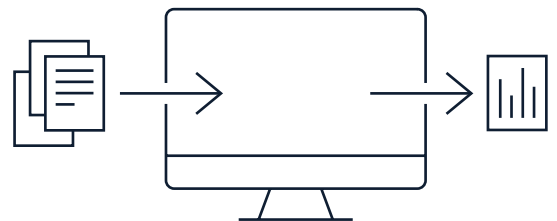
Climate Expert Mode

Climate Expert Mode provides more detailed information about the climatological stress indices and is available via API.



Largest global data collection on climate change

40 years of climate experience and data collection from Munich Re combined with scientific data sets for future-relevant risk scores due to climate change in different RCPs (Representative Concentration Pathways). SSP (Shared Socioeconomic Pathway) scenarios will follow in 2023.



Easy input & output

Climate Change Edition can be accessed via a web application as well as via an API. Because various export formats can be selected, it adapts completely to your needs.

Maximum flexibility	<ul style="list-style-type: none"> – Standard user – Expert mode – Single location, portfolio (multiple locations) and area & line requests – API (Application Programming Interface) – 100% browser based, no plugin or download needed
Search options	<ul style="list-style-type: none"> – Postal address – Regions, e.g. states – Geo-coordinates (latitude/longitude)
Tools	<ul style="list-style-type: none"> – Filter by custom attributes – Drawing tools for filtering a portfolio or for scoring a drawn object: polygon, circle, line – GeoJSON upload
Portfolio management	<ul style="list-style-type: none"> – Easy management and organisation of the locations – Uploading your own portfolio from CSV or Excel (templates available)
Available content	<ul style="list-style-type: none"> – Peril-specific evaluations with 7 future hazards and 12 current – RCPs (2.6, 4.5, 8.5) – Current and future projection years 2030, 2050, 2100 – Different event families (geophysical, meteorological, hydrological, climatological)
Analytics	<ul style="list-style-type: none"> – Portfolio filtering (based on attributes or polygons) – KPI selection for visualisation (e.g. count or total sum insured) – Result visualisation: charts of KPIs, KPIs in map (heatmap, cluster, grid, regions)
Areas and lines scoring	<ul style="list-style-type: none"> – Scoring of geographical areas and lines for improved risk management of e.g. large sites or infrastructure assets – Exposure comparisons between the present and the future under multiple emission scenarios – Comparison of scored areas and lines
Map views	<ul style="list-style-type: none"> – Map views for multiple time points and scenarios (hazards) – Hazard maps for multiple time horizons and scenarios – Base map views for streets, (dark) grey, hybrid, satellite, topography, terrain
Elevation profile	<ul style="list-style-type: none"> – Line profile of height differences between two locations displayable
Reports and results	<ul style="list-style-type: none"> – Download as CSV, Excel or PDF – API access for downstream processing of the data – Clear visualisation of results (e.g. sum insured in different risk zones) in pie charts, tables and coloured heatmaps – Peril-specific exposures for individual locations as well aggregated across portfolios – Export unlimited aggregated reports for subsets of the portfolio by filtering for user-provided custom attributes – Events filter to show how recent and ongoing wildfires, earthquakes and tropical cyclone affect your portfolio

Scores at a glance

NATHAN risk scores are a powerful tool which enable you to gain an overview of your risk situation and quickly identify high-risk assets. They aggregate the risk of each asset in the portfolio for geophysical, hydrological, meteorological and climatological hazards by drawing on data from Munich Re's long years of claims experience and expertise in natural catastrophe modelling. NATHAN hazard scores describe the hazard level of a location for all hazards.

Climate hazard scores

The climate hazard scores cover the RCPs of 4.5 and 8.5 as well as the projection years 2030, 2050, and 2100.

*Also covers the RCP of 2.6



River flood

Munich Re models the future river flood hazard using the river flood model for current atmospheric conditions as a basis and estimating changes in flood risk using an ensemble of climate and hydrological models.



Tropical cyclone

Munich Re creates the future hazard scores by combining its proprietary tropical cyclone model with a high-atmospheric-resolution climate model to incorporate projected changes in the intensity and frequency of tropical cyclones.



Sea level rise*

The sea level rise score shows the areas with elevated risk of flooding due to rising sea levels in 2100. The model is based on storm surge hazard zones, IPCC data on sea-level rise and elevation information.



Fire weather stress*

The fire weather stress index describes meteorological fire conditions based on the Fire Weather Index (FWI), combining the probability of ignition, the speed and likelihood of fire spread and the availability of fuel.



Drought stress*

The drought stress index is based on the Standardized Precipitation Evapotranspiration Index (SPEI), a multiscalar drought index which is used to determine the onset, duration and magnitude of drought conditions.



Heat stress*

The heat stress index combines information on increasing temperatures, extreme heat and heat waves in a single score.



Precipitation stress*

The precipitation stress index describes the meteorological threat from high precipitation, combining data on precipitation duration, intensity and frequency.

NATHAN hazard scores



River flood

The river flood hazard score is based on a global flood model from JBA, describing flood extents for return periods of 100 and 500 years, and is available in an undefended as well as defended view, i.e. taking flood protection into account.




Flash flood


The flash flood hazard score describes the hazard level, based on meteorological data, soil sealing information as well as terrain and hydrographic data (slope and flow accumulation).





Storm surge


Storm surges are coastal floods caused by storms such as tropical cyclones and extratropical storms. The storm surge hazard score reflects the inundation area for return periods of 100, 500 and 1000 years.


 **Tropical cyclone** The tropical cyclone hazard score is derived from globally consistent, basin-specific models for tropical cyclones, and is based on probable maximum wind intensities with a return period of 100 years.


 **Extratropical storm** The hazard score shows the probable maximum wind intensity occurring during storms in the extratropical region (approx. 30 – 70° north and south of the equator) for a 100-year return period.


 **Tornado** The tornado hazard score is based on the annual frequency of tornadoes, interpolated from meteorological data.


 **Hail** The hail hazard score describes the hail potential by combing meteorological data, elevation and the global distribution of lightning activity.

 **Lightning** The hazard score shows the global frequency of lightning strikes per km² and year recorded by satellites and ground-based lightning detection networks.


 **Earthquake** The score is graded according to the probable maximum intensity of earthquakes on the Modified Mercalli Intensity (MMI) scale for an event with a return period of 475 years.


 **Volcano** This hazard score is based on volcanic activities, which are classified depending on their VEI (Volcano Explosivity Index) and annual return periods.


 **Tsunami** The tsunami hazard score reflects the inundation areas for return periods of 100, 500 and 1000 years.


 **Wildfire** The wildfire hazard score describes the hazard of wildfire, based on climatological data and land cover data.

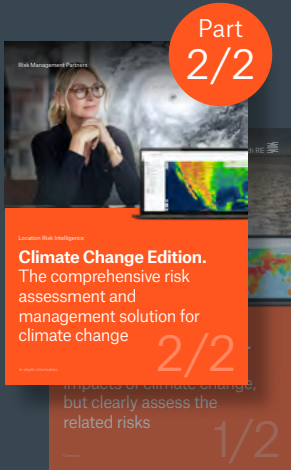
NATHAN risk scores

 **Overall** The overall risk score can be used as a primary identifier of red flags. It combines the earthquake, storm and flood risks scores, while also taking wildfires into account.

 **Storm** The storm risk score can be used to identify storm-related risks and includes tropical cyclone, extratropical storm, hail, tornado and lightning risk.

 **Flood** The flood risk score can be used to identify flood-related risks and includes river flood, flash flood and storm surge risk.

 **Earthquake** The earthquake risk score can be used to identify earthquake-related risks and includes earthquake, volcano and tsunami risk.



Want to know more? Get part 2/2 of our Climate Change Edition brochure for more in-depth information

[Download part 2/2](#)

Please contact our team:

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See our other editions as part of our Location Risk Intelligence Platform at munichre.com/rmp for:

Natural Hazards Edition
Wildfire HD Edition
Climate Financial Impact Edition