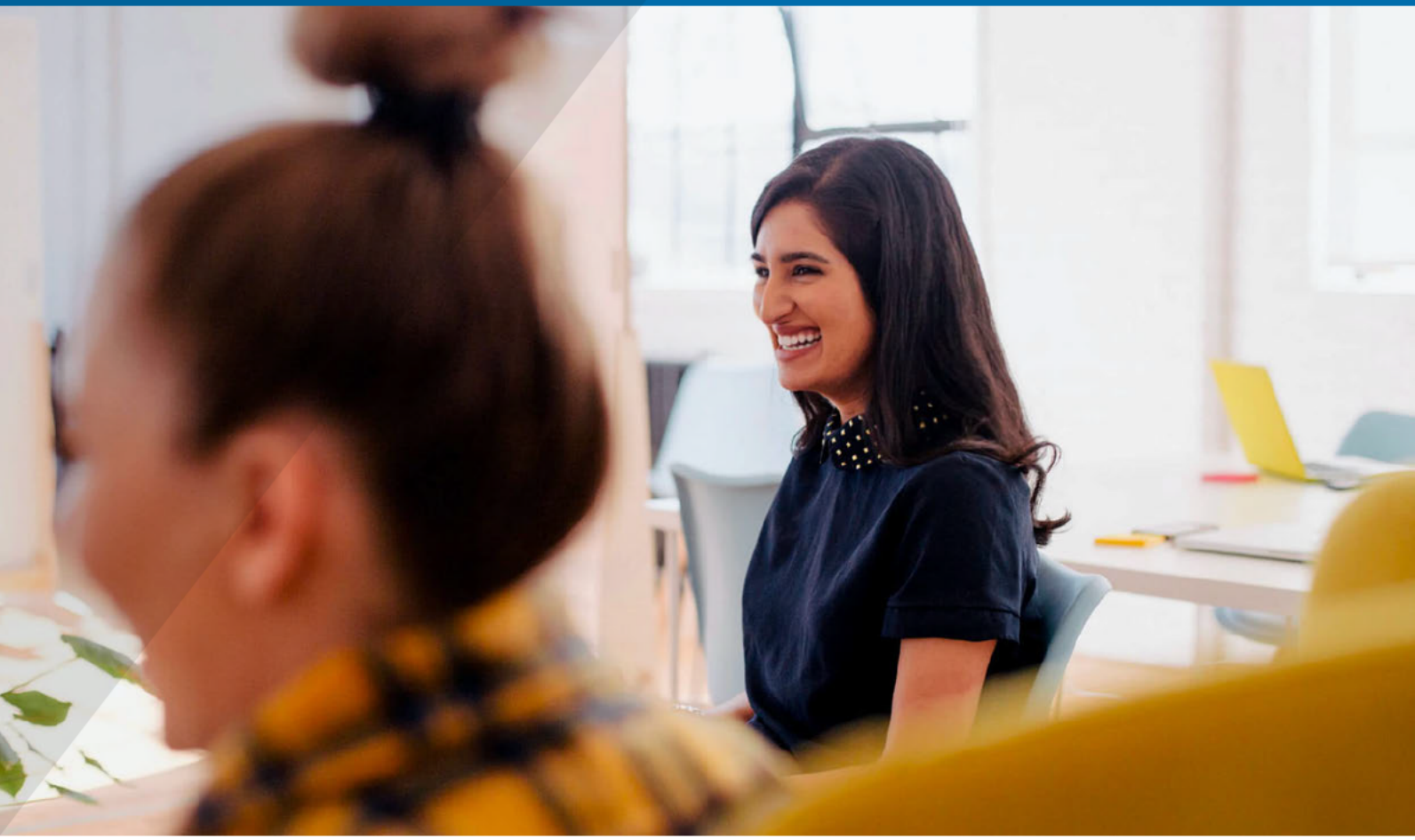
iProfileRisk

Risk Hazard and Natural Catastrophe Report

Farming - Cash Grains
Glanmire NSW 2795, Australia



25 November 2023

Section 1.0

Introduction to Steadfast iProfileRisk

Steadfast Risk Group's Framework

What is iProfileRisk?

Objective of this report

Section 2.0

Risk Hazard and Natural Catastrophe Summary

Section 2.1

Risk Hazard Detailed Descriptions

Section 2.2

Natural Catastrophe Detailed Descriptions

Important Notice

iProfileRisk is provided by Steadfast Risk Group Pty Ltd ABN 24 104 693 183.

This report includes information from you and other sources we believe to be correct. The advice in our report relies on this information.

If any of the information is wrong or incomplete, this may affect our advice. Please tell us immediately of any errors or omissions in this information either from you or to your knowledge from other sources.

iProfileRisk hazard ratings are linked to specific industries. These ratings are our opinion after collaboration with recognised data organisations in the insurance industry.

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Introduction to Steadfast iProfileRisk

Steadfast Risk Group's Framework

Steadfast offers an end-to-end risk framework for brokers and their clients based on the internationally recognised ISO 31000 standard.

Steadfast Risk Group provides a spectrum of in-house services and solutions ranging from enterprise risk management, risk and natural catastrophe hazard identification, property engineering consultation/services and alternative risk transfer.

Framework diagram

What is iProfileRisk?

iProfileRisk is a data driven and online accessible platform aimed at simplifying risk hazard identification and providing natural catastrophe high level summaries for brokers and their clients.

It empowers proactive risk identification and risk centred conversations between brokers and their clients, through enabling data driven risk decisions and mature financial acumen for insurance risk considerations.

Objective of this report

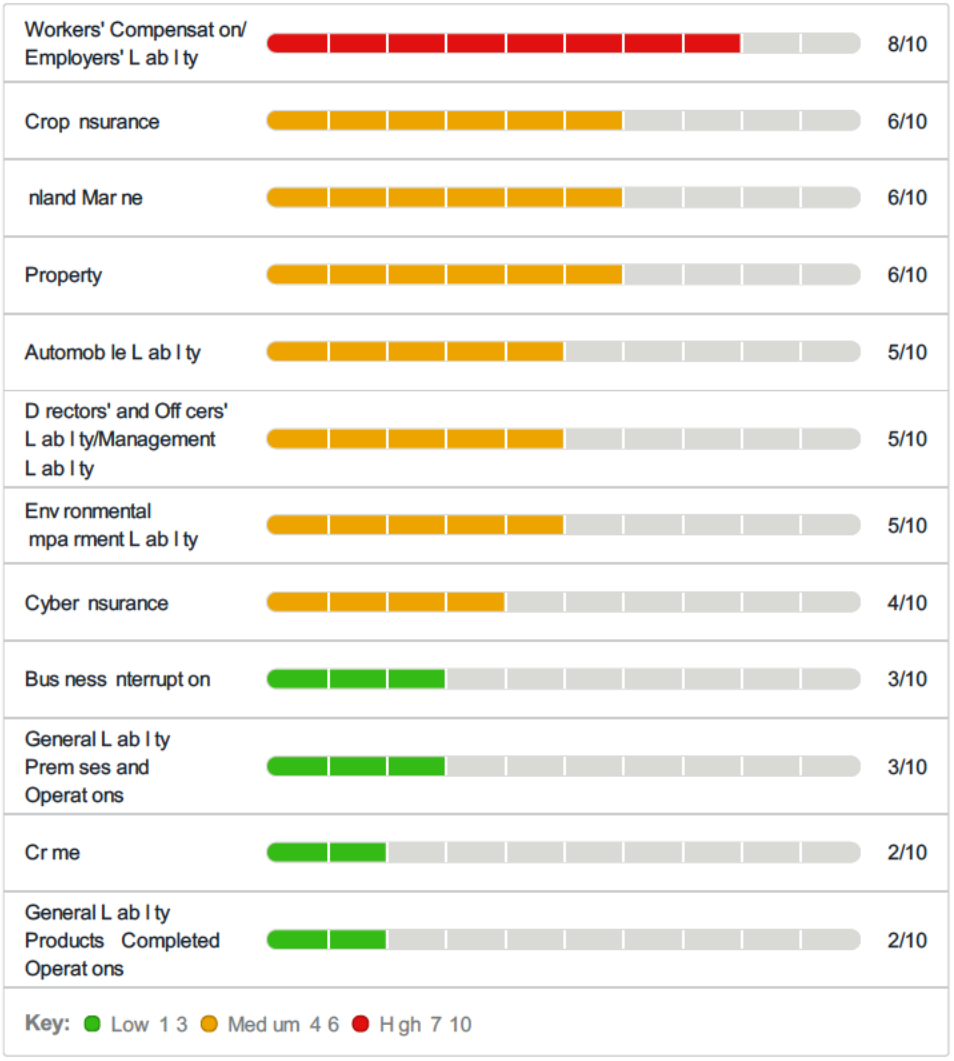
Utilising iProfileRisk in conjunction with other Steadfast Risk Group offerings enables easy identification of the most prominent risks impacting an industry and SwissRe's natural catastrophe summary for a specific location.

Risk Hazard and Natural Catastrophe Summary

Identifying hazards in the workplace involves finding things and situations that could potentially cause harm to the organization. The following chart is a graphical representation or the likelihood and severity of a loss occurring within any of the classes of insurance listed in the chart.

YOUR SEARCH RESULTS

Risk Hazard rating



Natural Catastrophe

- Ha lstorms — H gh (0 6 0 8)
- Bushf re/W ldf re — S gn f cant
- L ghtn ng — S gn f cant (7 10)
- Earthquake — Very Low (0 014 0 045)
- Landsl de — Very Low
- Tornado — Very Low (< 0 1)
- W nd Speed/Cyclone — Low (25 30 m/s)

RISK HAZARD DETAILED DESCRIPTIONS

Workers' Compensation/ Employers' Liability

High risk: 8/10

R sk exposure s typ ca y h gh due to the nature of ra s ng crops, orchards, farm ng and hand ng vestock.

Risk exposure is typically high due to the nature of raising crops, orchards, farming and handling livestock. Farming industries may expose employees to office, technology, and labour-intensive hazards. Potential hazards can include cuts or burns, slipping or tripping over furniture, wet surfaces or equipment, falling over or falling from heights, electrocution, injuries from repetitive movements, back and neck strain, injuries from falling items, or mobile equipment. Employees may face injuries while handling livestock, including trampling, crushing or goring. Employees may become entangled or entrapped. Farmers are at higher risk of respiratory infections and diseases, including chronic lung infections, bronchitis, asthma, and cancers from inhalation and exposure to methane and high volumes of dust particles in grain silos and exposure to pesticides and fungicides. Biohazards may include exposure to pathogens and infectious diseases or reactions to cleaning products. Mental health exposures may include burnout, high stress from job activities, and increased fatigue, particularly during droughts. Employers should make OH&S policies a priority and enforceable, always placing the safety of employees central to business operations. Larger operations may employ young or migrant workers, where their primary language is non-native.

Workers may need to drive company-owned vehicles, carrying exposure in the case of a road accident. These hazards are best managed by appropriate employee training to avoid injuries, guidance in client management when on-premises, and good hygiene and distribution of protective equipment practices. Technology and machines associated with the business must be appropriately set up to avoid further exposures. For industries requiring manual labour, muscular or skeletal issues from excessive strain may arise, incurring rehabilitation costs, particularly if the employee can no longer work due to their injuries. Machinery and equipment may be very hazardous to operate, so clear instructions should be given and strong preventative measures employed to avoid serious injury. Prolonged used of machinery may cause Raynaud’s disease or other chronic vibration conditions. Occupational health and safety regulations should be strictly followed at all times to prevent exposures. Hearing protection devices should be distributed when there is a risk of hearing damage or loss due to high noise hazards associated with farming processes. Additionally, correct and regulation approved personal protective equipment is often required in these industries.

Crop Insurance

Medium risk: 6/10

Ma n exposures for these farms nc ude severe weather, nc ud ng excess ve ra n, ha , w nd, drought, f ood ng, or f re.

Main exposures for these farms include severe weather, including excessive rain, hail, wind, drought, flooding, or fire. Natural causes may consist of crop failure due to pests, insects, animals, weeds and other plant infections. Large-scale losses may occur. Due to the size of the operation, crop exposure is assessed as moderate. Employee fidelity could be an exposure managed through careful staff selection procedures. Whilst it would be difficult for theft to occur from employees, inadequate care or destruction of the trees could be an exposure. Preventative measures should be in place to avoid crop losses during the season, such as using pesticides to ensure the quality of tree growth. Keeping water tanks on the property may be beneficial, assisting in cases of fire or drought. Lower crop yield in the season or crop losses could affect the insureds expected sales and reputation. These losses could also see potential clients opting for competitors in the future. As farms tend to have a predominantly seasonal business, losses are only likely to affect one season, reducing the severity of exposures and allowing time for recovery. Crop insurance typically does not cover crops after harvesting but rather when plants are grown or standing in fields.

Inland Marine

Medium risk: 6/10

In and mar ne exposure s moderate due to stock, produce and equ pment trans t sh pment r sks wh ch may be requ red for the nsured.

Inland marine exposure is moderate due to stock, produce and equipment transit shipment risks which may be required for the insured. Replacement of crops may be covered here. Main exposures include:

- Theft;
- Damage to crops, stock, machinery, or client records;
- Crushing damage and insufficient packaging of supplies;
- Vehicle collisions
- Bailee exposure for crops owned by third parties but raised by the insured

Contaminated crops may cause legal and reputational liabilities, or third party damage may arise due to high impact collisions on busy major roads during transit. Goods may be expensive in time and financial cost to replace. Exposures will be lower for companies that engage in subcontracted delivery practices of crops to market, categorised under contract where the carrier is liable for loading, unloading, imports and exports. In that case, carriers may be responsible for loss or damage to materials, equipment and deliveries. These practices also apply to the transit of other raw materials. Cover may need to include stock transfer between insured premises. Theft of machinery, produce, or stock during transit and non-delivery of high value shipments are of significant risk exposure. Additional exposures include loss of mobile equipment, records and papers that may be of high value. This is particularly critical if confidential and sensitive client information is lost, damaged or stolen during transit. Strong security measures should be installed to deter potential criminals from premises where shipments are handled, including video surveillance and well-trained security. Alarm systems should be considered. The insured should train employees in appropriate handling processes to prevent damage to goods. Vehicles should be stored in secure facilities.

Property

Medium risk: 6/10

Depend ng on the type of fac t es owned and operated by the nsured, prem ses vary n rep aceab ty subject to ava ab ty of a ternat ve spaces to conduct bus ness operat ons.

Depending on the type of facilities owned and operated by the insured, premises vary in replaceability subject to availability of alternative spaces to conduct business operations. For farming industries, alternative premises are easier to locate particularly in rural areas. Additionally, spaces may be large enough that the business can safely conduct operations in a different portion of the property. Farming operations may be affected for one season of business, or interruptions may be prolonged where it is difficult to obtain necessary machinery. Furthermore, loss of reputation may occur during the relocation and setup process. Exposures that lead to property damage include malfunctioning equipment, space heaters, faulty electrical wires, lightning strikes, and smoking hazards. Large volumes of grain may cause debris and dust particle explosions. Fire load includes livestock feed, hay, fences, fuels and chemicals, loss of livestock, crop losses, floor coverings and bedding, equipment, and wooden structures. Damage may incur to displays, furniture, office furnishings, office technological equipment, debris, waste, automated equipment, stock, livestock, crops, and important documents. Premises with kitchen equipment carry further ignition sources, including stoves, microwaves, ovens, grills, etc. Natural weather disasters, particularly bushfires, storms, strong winds and floods may also cause significant property damage.

Automobile Liability

Medium risk: 5/10

The agr cu tura ndustry s heav y re ant on veh c es as part of the r operat ons, ead ng to bus ness nterrupt ons n the case of exposure.

The agricultural industry is heavily reliant on vehicles as part of their operations, leading to business interruptions in the case of exposure. Larger operations that own vehicles for pick-ups and transport of livestock and supplies have increased exposure. Many larger operations in this category may own a van or fleet of vehicles and trucks, carrying significant exposure. Businesses that contract produce carriers or do not haul produce or livestock will have reduced exposure. Vehicles primarily carry heavy farm machinery, supplies, produce, logged wood, poultry, or livestock. Vehicles should be properly assessed to be safe to carry heavy items. Other vehicles may carry precious goods, such as client documents, equipment for operations and stock, which may burden significant losses if not transported appropriately. Vehicles used for transportation of livestock should consider ethics standards.
Vehicles generally used for short-distance transport carry lower risks than those used for long-distance transport of passengers, livestock, produce, services in case of emergency, or equipment. Ongoing and high standard of fleet management and OH&S policies is essential. Long haul vehicles are prone to high accident rates, in addition to the extensive amount of time on the road, the size and radius of operations, driver fatigue and vandalism at the depot. Traffic congestion may reduce service efficiency and increase the risk of crashes and exposure to other hazards. Driving at night increases risk as roads may not be well lit and visibility reduced, hazards may be less visible, and headlights from nearby vehicles may affect driving. Weather conditions such as rain, fog or snow may increase driving difficulty. Drivers should be experienced and qualified, with young drivers avoided. The nature of goods and safe storage and handling of the same are also important considerations. The use of employee vehicles could create indirect liability exposure.

Directors' and Officers' Liability/Management Liability

Medium risk: 5/10

Med um ab ty.

Medium liability.The insured may have administrators who have a direct influence over the business operations. There is also considerable risk to employee and third party damage or injury, especially in labour intensive or manufacturing related business operations. There may be increase exposure to unforeseen actions or wrongful acts during business operations, especially where there is a lack of clear and well maintained documentation or on-going employee and business management training. Size and scale of business operations, may impact risk exposure and liability. Management should ensure that business operations, practices and culture remain compliant to industry and government regulations.

Environmental Impairment Liability

Medium risk: 5/10

Env ronmenta mpa rment s a moderate r sk for th s ndustry.

Environmental impairment is a moderate risk for this industry. Risk exposures from larger-scale operations could include the excretion of pollutants from livestock, produce, and farm facilities, mismanagement of general waste and associated liabilities. Strong waste and pollutant management processes should be considered to reduce risk potential. Biohazards may also be applicable and must be disposed of appropriately to avoid further liability. Due to runoff, soil may be contaminated on adjacent properties, though this is less likely to occur in larger paddocks, or businesses with larger distances from other owned properties. Nearby water sources may become polluted from operations. Contaminated wastewater and/or polluted water is a significant environmental threat and should be managed accordingly. Surety bonds may be required. Pesticides, fungicides, medicines, and other chemicals may cause environmental liabilities from improper application, storage and handling. Extra care must be taken when cultivating controlled crops. Emissions from vehicles owned by the company should be considered. Environmental laws and guidelines should be followed accordingly to avoid exposure, particularly for industries that often produce large quantities of carbon emissions.

Cyber Insurance

Medium risk: 4/10

Cyber hacks cou d resu t n secur ty and pr vacy breaches.

Cyber hacks could result in security and privacy breaches. There is potential for large volumes of sensitive personal or corporate data to be leaked. This can be prevented by substantial training and compliance protocols for employees, background checks, and strong cyber protection policies and infrastructure. Business interruptions may be significantly increased as a result of cyber attacks, potentially damaging to the insured's reputation.
The risk of cyber threats, hacks and compromise of IT-related breaches are considerable. The nature of work and business operations can be dependent on IT and/or cloud platforms and systems with copious amounts of insured and client-sensitive data.
• Data breach: through electronic devices connected to insured networks. Access to confidential information through human error, lost devices etc.
• External cyber attacks through internal system vulnerabilities/negligence or deliberate acts or external attacks
• Electronic data/software loss/ replacement cost following a cyber attack
• Business interruption/increased in cost of working following a cyber-attack
• Businesses held to ransom before systems are released;
• Cyber-threat from interconnected supply chain business partners/outsourced services providers
• Internal control and other issues – e.g. non-segregation of sensitive data, inadequate user access control/password protection, outdated POS software applications, absence of up to date antivirus software/firewalls, unencrypted data/information/lack of end-to-end encryption
• Possible presence of older devices/computer systems with outdated operating systems and unsupported software
• Inadequate training for employees on data security/privacy/cyber risk. No or inadequate background checks conducted on employees/various service providers/suppliers etc.
• Compliance and control issues - possible lapses on policies, procedures and protocols on cybersecurity and related matters (if applicable)
• Cyber threat relating to - Bring your own devices, download and install personal or unauthorised software, use of USB or other media devices etc.
• Extra expenses following a cyber incident, including forensic investigation costs, crisis management expenses, notification and monitoring expenses, remediation/other extra expenses
• Brand and reputational damage following a cyber-attack/data breach
• Security lapses in company websites – cyber threat to own hardware and software; cyber threat to visitors of the website
• Lack of security measures including a combination of technology (e.g. IT security) and physical security at the premises.

Business Interruption

Low risk: 3/10

Loss of insured's premises, or tools may create a business interruption as they are important to everyday operations. Vehicles are generally not covered by property or business interruption insurance, though nonetheless may interfere with operations in the event of a loss. However, exposure is assessed as low due to the unspecialised nature of equipment and location of premises. Equipment can be easily replaced, and alternative premises in the case of relocation are likely to be easily sourced. Furthermore, contractors may not have permanent professional premises, which reduces this interruption. Avoiding loss of records can be managed with solid backup and storage practices. Industries with high levels of competition need to consider retention of reputation through expert service, following a loss.

General Liability: Premises and Operations

Low risk: 3/10

Depending on the size and location of the operation, in most cases, public liability is low risk due to the unlikelihood of large numbers of visitors to the premises. Exceptions would include training programs, meetings, or seminars, where the average number of visitors and frequency of those events may need to be taken into account. Most businesses in this industry will have a regular clientele which assists in managing the risk.

Crime

Low risk: 2/10

The main source of loss is petty cash, tools or equipment. However, for most businesses, invoices will be paid by cheque or direct debit, limiting the cash kept on premises. Employee fidelity could be an exposure managed through careful staff selection procedures.

General Liability: Products - Completed Operations

Low risk: 2/10

Industries in this category are often services based with a tendency for low product liability exposure. Main exposures relate to third parties and overseas suppliers.

NATURAL CATASTROPHE DETAILED DESCRIPTIONS

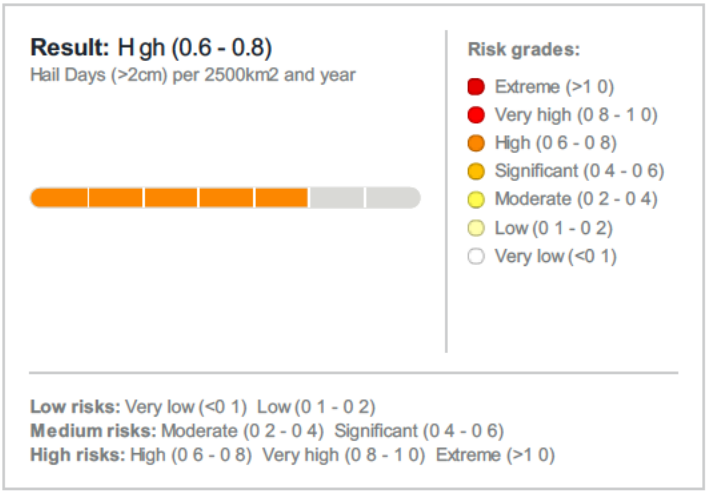
Hailstorm

High risk

The expected number of hail days per year with a hail diameter larger than 2 centimeters related to an area 50km x 50km is shown.

Sources:

Sc ent f c terature about the g oba and reg ona c mato og ca d str but on of ha frequency and sever ty; Sw ss Re's nterna c a ms and ha mode data; reports of severe ha events; expert judgement of Sw ss Re's Atmospher c Per Spec a sts



Bushfire/Wildfire

Medium risk

The Wildfire Map shows the likelihood for the occurrence of wildfires in a certain area, depending on the intrinsic characteristics of the region. The layer resolution is 300m at the equator. The measure of land susceptibility to fire for this model is based on historic fire frequency per unit area (2001-2019), trend in climate change as a proxy for fire danger levels (2001-2020) and wildland-urban interface (WUI). Burned area and fire danger levels integrate event frequency, while WUI focus on the variable of interest from a damage perspective. Property in the wildland-urban interface (WUI), or regions adjacent to or within undeveloped natural areas, is particularly more susceptible to wildfire hazard given the proximity to vegetative fuels and the adopted set of predisposing factors.

Sources:

- MODIS MCD64CMQ C mate Mode ng Gr d Burned Area Product (MCD64A1 User's Gu de (umd.edu). Accessed from Un vers ty of Mary and fuoco SFTP (former y FTP) server.
- Da y F re Weather Index (FWI) data (https://eff s.jrc.ec.europa.eu/about-eff s/data- cense). Accessed from Copern cus C mate Change Data Store (https://cds.c mate.copern cus.eu/cdsapp#!/home).
- ESA-CCI Land cover v2.1.1 Epoch 2019 (https://cds.c mate.copern cus.eu/ap /v2/terms/stat c /sate te- and-cover.pdf). Accessed from Copern cus C mate Change Serv ce (Land cover c ass f cat on gr dded maps from 1992 to present der ved from sate te observat ons (copern cus.eu))

Result: S gn f cant

Risk grades:

- Very Extreme
- Extreme
- Very High
- High
- Significant
- Moderate
- Low
- Very Low
- Negligible

Low risks: Negligible Very Low Low
Medium risks: Moderate Significant
High risks: High Very High Extreme Very Extreme

Lightning

Medium risk

The global lightning hazard layer shows the mean annual flash rate per square kilometer.

Sources:

- NASA Earth Sc ence Data and Informat on System (ESDIS) Project
- G oba Hydro ogy Resource Centre (GHRC)
- D str buted Act ve Arch ve Centre (DAAC)

Result: S gn f cant (7-10)

Annual flash rate per km2

Risk grades:

- Extreme (>50)
- Very high (36-50)
- Very high (26-35)
- High (21-25)
- High (16-20)
- Significant (11-15)
- Significant (7-10)
- Moderate (4-6)
- Low (1-3)
- Very low (<1)

Low risks: Very low (<1) Low (1-3)
Medium risks: Moderate (4-6) Significant (7-10) Significant (11-15)
High risks: High (16-20) High (21-25) Very high (26-35) Very high (36-50) Extreme (>50)

Earthquake

Low risk

The earthquake hazard layer is a global map of Peak Ground Acceleration (PGA) in units of g for a return period of 475 years at 1-kilometer spatial resolution for reference site condition. Additional information provided in Modified Mercalli Intensity (MM). The data are provided by the Global Earthquake Model (GEM) Global Seismic Hazard Map (version 2018.1)

Sources:

- Global Earthquake Model (GEM) Global Seismic Hazard Map (version 2018.1)

Result: Very Low (0.014 - 0.045)
MM & PGA (g)

Risk grades:

- Very extreme (> 0 750)
- Extreme (0 551 - 0 750)
- Very high (0 401 - 0 550)
- High (0 291 - 0 400)
- Significant (0 161 - 0 29)
- Moderate (0 085 - 0 160)
- Low (0 046 - 0 084)
- Very low (0 014 - 0 045)
- Negligible (< 0 014)

Low risks: Negligible (< 0 014) Very low (0 014 - 0 045) Low (0 046 - 0 084)
Medium risks: Moderate (0 085 - 0 160) Significant (0 161 - 0 29)
High risks: High (0 291 - 0 400) Very high (0 401 - 0 550) Extreme (0 551 - 0 750) Very extreme (> 0 750)

Landslide

Low risk

The global landslide layer reflects both the landslide susceptibility and landslide runout risk. As a result, the likelihood of terrain failure, the propagation of risk down slope and deposition areas of possible landslides are depicted in the layer, whereby primarily earthquake-induced landslide processes are considered. In this model, the term 'landslide' refers to mass movement processes including rockfall, debris flow sand mud slides(Varnes1978). While the visualization provides information on the overall landslide risk, the risk lookups enable the user to get details on the underlying susceptibility and runout hazard values. The layer has global coverage (upto +59.9°N) at 1 second of arc of resolution (~30m at the equator).

Result: Very Low
Landslide

Risk grades:
- Very high
- High
- Moderate
- Low
- Very low

Low risks: Very low Low
Medium risks: Moderate High
High risks: Very high

Sources:

Data Set		Description	Vintage	Source
Global Landslide nventory	Global Disastrous Landslides	Landslide data collected by NASA	2007 and younger	Nasa Data
	Global Landslide Polygons	Dataset created by Emanuel Büechi	Regularly updated	Dave Petley's Landslide Blog
Local Landslide nventory	Nepal 2015	Landslides which happened after the Gorkha Earthquake 2015	2015 or Younger	Landslide Blog
	Japan 2016	Landslides which happened after the Kumamoto earthquake 2016	2016 or younger	Landslide Blog
	El Salvador 2001	Landslides that happened after an earthquake in February 2001	2010	Ministerio de Medio Ambiente y Recursos Naturales
	Cordillera Blanca	Peruvian Lanskide inventory of Cordillera Blanca as established by Emmanuel for his Master Thesis	2018	Bueechi et al 2018
	Austria Hora	Landslide inventory of the Natural Hazard Overview & Risk assessment Austria (HORA)	reguarly updated	HORA
Slope	nterMap 30 m DEM	The ntermap DEM with 30m resolution was used for computation		intermap

Geology	GLiM	Glim Global Lithology Map University of Hamburg	2015	GLiM hosted by CGMW
Earthquake Risk	nternal EQ-Layer	Model developed internally	2015	Catnet
Rainfall Risk	Open Weather Map	Relevant since water-content in soil can be a decisive triggering factor		nternal Layer can be found here

Tornado

Low risk

The hazard map consists of three parts with different data granularity:

United States & Canada

Data represents the average yearly tornado occurrence (F2-F5) within a grid cell of 50km x 50km based on 64 observation years and 30 years respectively

Rest of the world

Data for the calculation was derived from numerous scientific documentations, observations and expert knowledge

Sources:

- **USA:** data from NOAA's Storm Pred ct on Center (SPC), NOAA's Nat ona Hurr cane Center
- **Canada:** Paper from 'Env ronment Canada' (Dav d S s)
- **Rest of the World:** comb nat on of the know edge of Sw ss Re's Atmospher c Per s Spec a sts, own nterpretat ons of tornado mode s, recent event observat ons

Result: Very Low (< 0.1)

F2-F5 Tornadoes / Year

Risk grades:

- Very high (> 0 75)
- High (0 5 - 0 75)
- Significant (0 35 - 0 5)
- Moderate (0 2 - 0 35)
- Low (0 1 - 0 2)
- Very low (< 0 1)
- No observation

Low risks: No observation Very low (< 0 1) Low (0 1 - 0 2)
Medium risks: Moderate (0 2 - 0 35) Significant (0 35 - 0 5)
High risks: High (0 5 - 0 75) Very high (> 0 75)

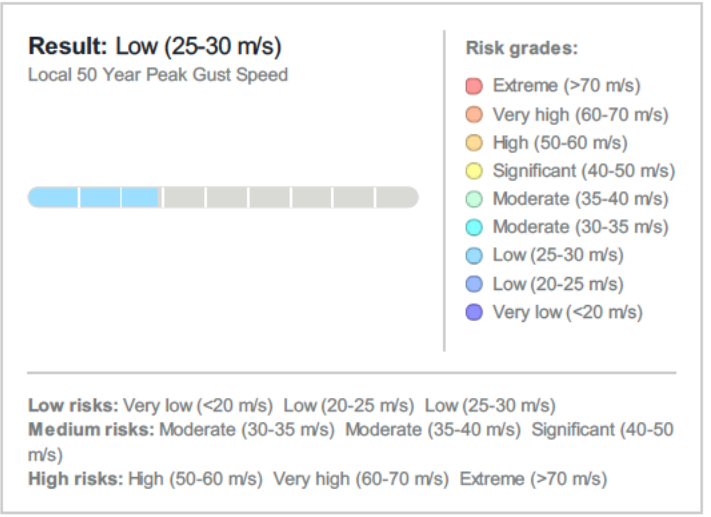
Wind Speed/Cyclone

Low risk

The wind speed data shows the 3 seconds peak gust with a return period of 50 years.

Sources:

- Hazard modu e of Sw ss Re's propr etary w nd oss mode s; G oba reana ys s dataset
- '20th century reana ys s project' des gned by the Phys ca Sc ences D v s on of the Earth System Laboratory of NOAA



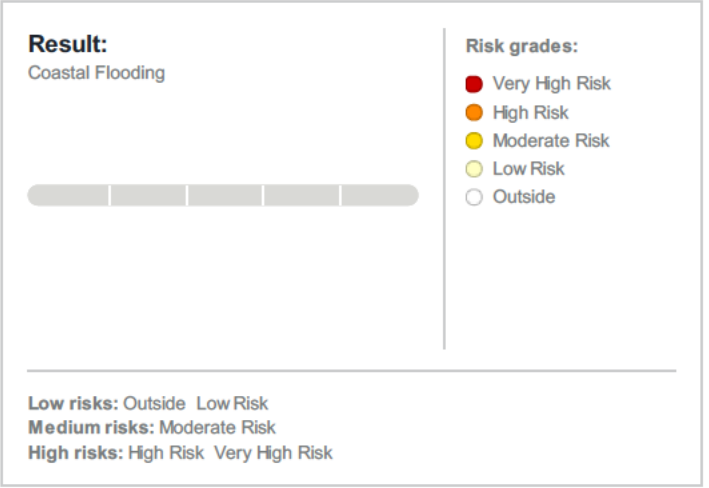
Coastal Flood

No risk data

Swiss Re's Coastal Flood Layer depicts coastal regions that are potentially affected by storm surges or tsunami, defined by the 'distance to the coast' and the 'elevation above mean sea level'.

Sources:

- 90 m reso ut on SRTM DTED1 d g ta e evat on mode ;
- SRTM Water Body Data Set



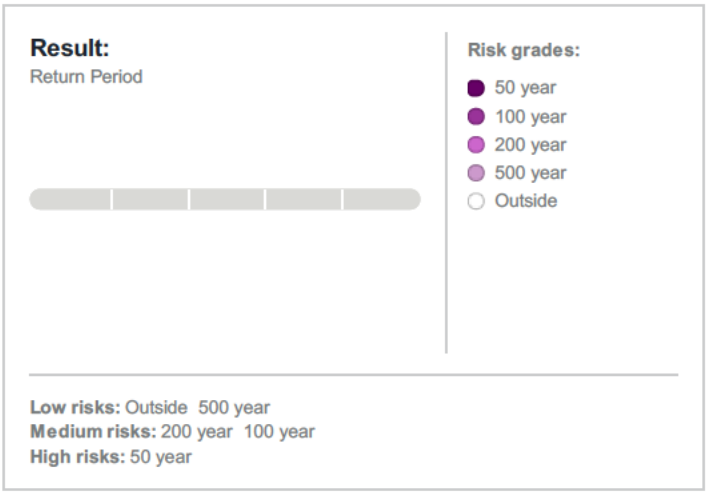
Pluvial Flood

No risk data

Swiss Re's Global Pluvial Flood Zones provide information about the extent and frequency of flooding due to direct rainfall, minor channel and flash flooding. The zones are available worldwide (from 60°S to 60°N) at the high resolution of 10 meters in USA and Europe and 30 meters for the rest of the world.

Sources:

- Copern cus C mate Change Serv ce (C3S) (2018): *ERA5: Fifth generation of ECMWF atmospheric reanalyses of the global climate*. Copern cus C mate Change Serv ce C mate Data Store (CDS), accessed June 2020, https://cds.c mate.copern cus.eu/cdsapp#!/home
- Gu do n, M., Chen, A. S., Gh m re, B., Keedwe , E. C., Djordjev c, S., & Sav c, D. A. (2016). A we ghted ce u ar automata 2D nundat on mode for rap d f ood ana ys s. *Environmental Modelling & Software* 84, 378-394.
- Intermap 10 and 30m d g ta e evat on mode .
- NOAA At as 14 (2018): *Precipitation-Frequency Atlas of the United States*. NOAA's Nat ona Weather Serv ce, accessed June 2020, https://www.nws.noaa.gov/oh/hdsc/ ndex.htm
- Ross, C.W., L. Pr hodko, J.Y. Anchang, S.S. Kumar, W. J , and N.P. Hanan. 2018. G oba Hydro og c So Groups (HYSOGs250m) for Curve Number-Based Runoff Mode ng. ORNL DAAC, Oak R dge, Tennessee, USA. https://do .org/10.3334/ORNLDAAC/1566
- U.S. Geo og ca Survey. *National Hydrography Dataset*.



River Flood

No risk data

River flood zones are based either on Swiss Re Global Flood Zones™ (based on Swiss Re's proprietary and patented multiple regression approach) or on flood zones that are officially used or developed by the insurance industry (available for Austria, Czech Republic, Hungary, Italy, Luxemburg, Poland, Romania, Slovenia, Slovakia, Switzerland, UK, and USA).

Sources:

- *Swiss Re GFZ:* Sw ss Re's patented Geomorph Approach us ng ntermap's NEXTMap Wor d 30 d g ta surface mode terra n data
- *Official Flood Zones:*
- Sw ss Re's patented Geomorph Approach us ng MMC's 10m terra n data; CZE, SVK BAFU, CHE
- FEMA's NFHL f ood zones prov ded by FEMA; USA
- G oba Water Body Data:EC JRC/Goog e: Jean-Franco s Peke , Andrew Cottam, Noe Gore ck, A an S. Be ward, H gh-reso ut on mapp ng of g oba surface water and ts ong-term changes. Nature 540, 418-422 (2016). (do :10.1038/nature20584)
- UK Env ronment Agency
- Natura Resources Wa es
- Inst tuto Super ore per a Protez one e a R cerca Amb enta e (ISPRA)
- Adm n strat on de a gest on de 'eau - D v s on de 'hydro og e (AGE), Luxemburg
- Nat ona Author ty for Water adm n strat on - Po and(Wody.gov.p)
- Nat ona Author ty for Water Adm n strat on - Hungary(OVF)
- The data be ongs to the Nat ona Adm n strat on "Roman an Waters" http://www.rowater.ro/defau t.aspx - Roman a (ROWATER)
- Inst tute of Water S oven a - S oven a (eVode)

Result:
Official River Flood Zones

Risk grades:

- 5 years
- 10 years
- 20 years
- 30 years
- 50 years
- 100 years
- 200 years
- 250 years
- 500 years
- >500 years
- No Data

Low risks: No data > 500 years 500 years
Medium risks: 250 years 200 years 100 years
High risks: 50 years 30 years 20 years 10 years 5 years

Storm Surge

No risk data

Swiss Re's Global Storm Surge Zones provide information about the frequency of flooding due to storm surge from the ocean. The zones are available worldwide (from 60°S to 60°N) and cover all the ocean coastlines (except for the Black Sea and the Caspian Sea)

Sources:

- Intermap 30m d g ta terra n mode
- C-GLORS G oba Ocean Reana ys s, us ng E.U. Copern cus Mar ne Serv ce Informat on
- G oba Water Occurrence Layer (Jean-Franco s Peke , Andrew Cottam, Noe Gore ck, A an S. Be ward,
- H gh-reso ut on mapp ng of g oba surface water and ts ong-term changes. Nature 540, 418–422 (2016). (do :10.1038/nature20584))

Result:
Return period

Risk grades:

- 50 years
- 100 years
- 250 years
- 500 years
- 1000 years
- No data

Low risks: No data 1000 years 500 years
Medium risks: 250 years 100 years
High risks: 50 years

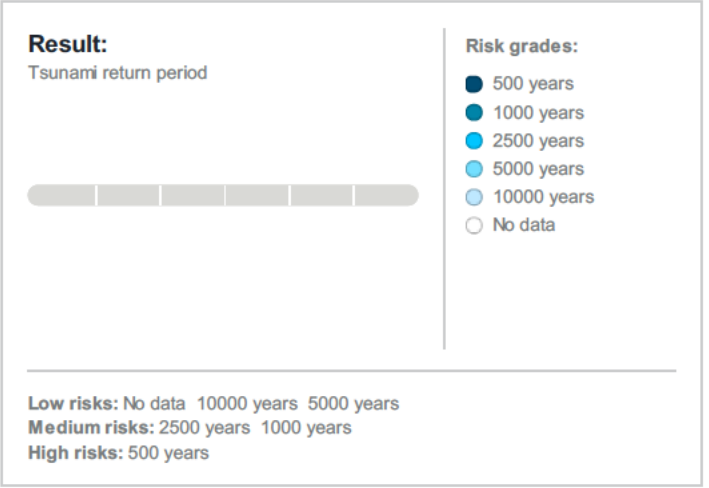
Tsunami

No risk data

Calculated Swiss Re tsunami hazard zones in CatNet® are available for all countries in the pacific basin on a 30 meter resolution, reflecting the Tsunami hazard in a near-global consistent manner.

Sources:

- Sw ss Re propr etary mode s; NCTR Propagat on Database by the NOAA Center for Tsunam Research
- H stor c earthquake cata ogues (NEIC, Centenn a); Sw ss Re g oba 30 m reso ut on d g ta e evat on mode and the G oba Surface Water dataset (Jean-Franco s Peke , 2016)



Volcano

No risk data

The global map shows the volcanic hazard, represented as the local ash thickness around volcanoes (150km) from a major eruption with a return period of 475y.

Sources:

- SR Mode s Sw ss Re propr etary
- G oba Vo can sm Program, 2013. Vo canoes of the Wor d, v. 4.4.1. Venzke, E (ed.).
- Sm thson an Inst tut on. Down oaded 9th Ju y 2015. (http://vo cano.s .edu/)
- Gonza ez-Me ado, A. O., & Cruz-Reyna, S. (2010): A s mp e sem -emp r ca approach to mode th ckness of ash-depos ts for d fferent erupt on scenar os. Natura Hazards and Earth System Sc ence, 10(11), 2241-2257.
- Jenk ns, S., Mag , C., McAneney, J., &B ong, R. (2012): Reg ona ash fa hazard l: a probab st c assessment methodo ogy. Bu et n of vo cano ogy, 74(7), 1699-1712.
- Lough n, S., Sparks, S., Brown, S., Jenk ns, S., & Vye-Brown, C. (Eds.). (2015). G oba Vo can c Hazards and R sk. Cambr dge Un vers ty Press.
- Mast n, L. G., Guffant , M., Servranckx, R., Web ey, P., Barsott , S., Dean, K., ... & Waythomas, C. F. (2009): A mu t d sc p nary effort to ass gn rea st c source parameters to mode s of vo can c ash-c oud transport and d spers on dur ng erupt ons. Journa of Vo cano ogy and Geotherma Research, 186(1), 10-21.
- Mead, S., & Mag , C. (2014): Determ n ng change po nts n data comp eteness for the Ho ocene erupt on record. Bu et n of Vo cano ogy, 76(11), 1-14.
- Newha , C. G., & Se f, S. (1982): The vo can c exp os v ty ndex/VEI/ - An est mate of exp os ve magn tude for h stor ca vo can sm. Journa of Geophys ca Research, 87(C2), 1231-1238.

Result:

Return Period 475y

Risk grades:

- Extreme (> 100cm)
- Very high (50 - 100 cm)
- Very high (40 - 50 cm)
- High (30 - 40 cm)
- High (20 - 30 cm)
- Significant (10 - 20 cm)
- Moderate (5 - 10 cm)
- Moderate (2 - 5 cm)
- Low (1 - 2 cm)
- Low (0 1 - 1 cm)

Low risks: Low (0 1 - 1 cm) Low (1 - 2 cm)
Medium risks: Moderate (2 - 5 cm) Moderate (5 - 10 cm) Significant (10 - 20 cm)
High risks: High (20 - 30 cm) High (30 - 40 cm) Very high (40 - 50 cm) Very high (50 - 100 cm) Extreme (> 100cm)

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