Asset Risk Report

Sample Report - Asset Genova, Italy

29 October 2024

Latitude:	44.3958
Longitude:	8.93783
Geocoding quality:	100 (Coordinates)

LOCATION RISK INTELLIGENCE

Table of Contents

	Elevation	19	Class: 11 - 50 m
	Worldcover 2020	10	Tree cover
	Population Density	5	Class 5: ≥ 200
	World Settlement Footprint Evolution	0	No Coverage (transparent)
	Distance to Coast	15	Class: <= 100 m
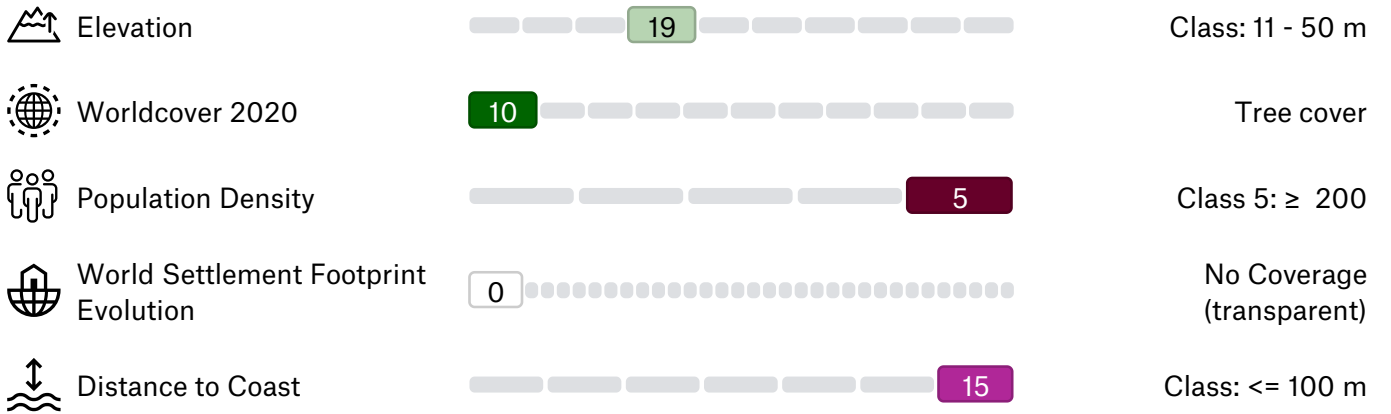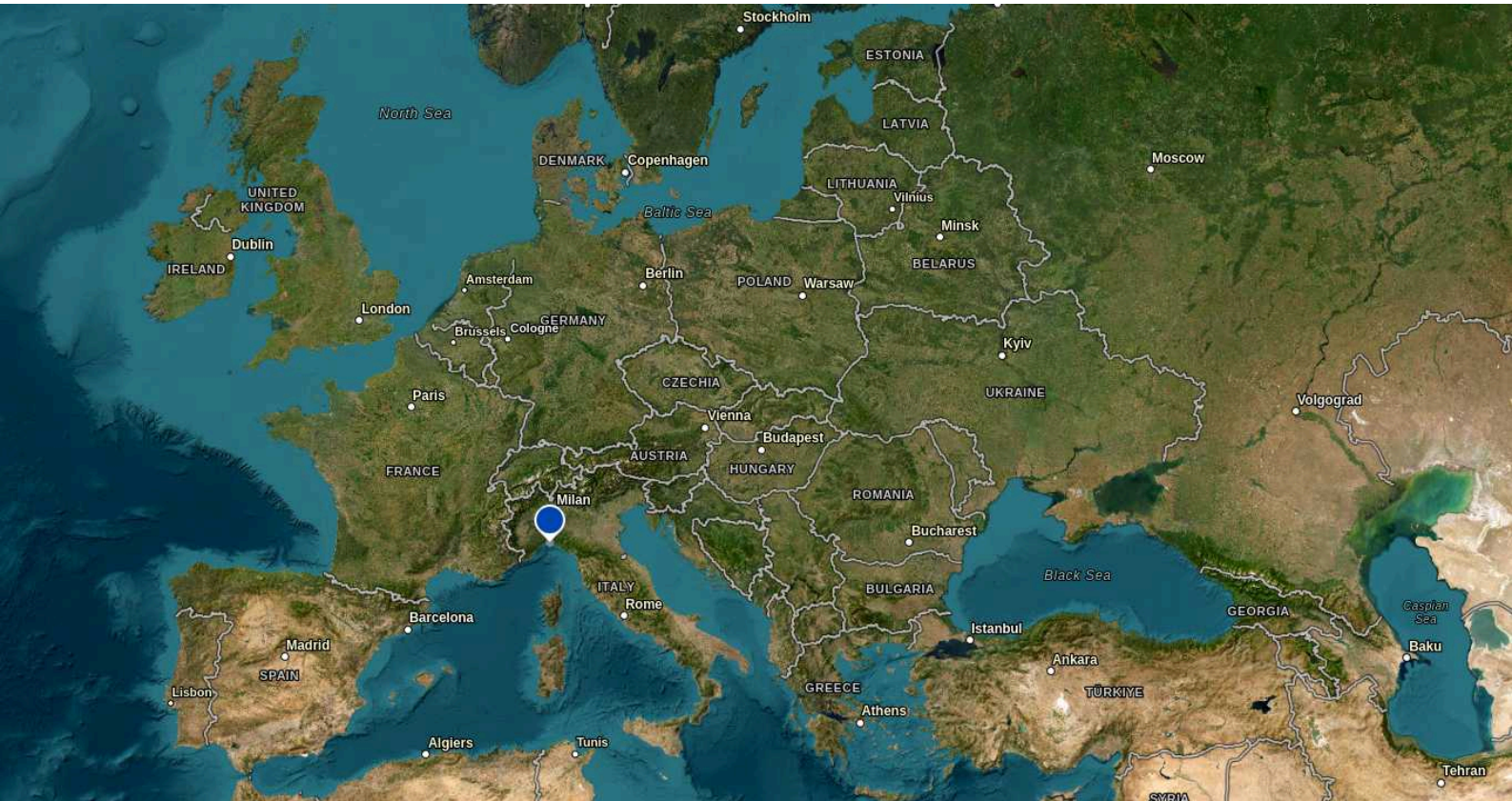
Climate Change Scenarios

In its latest Assessment Report (AR6), the Intergovernmental Panel on Climate Change (IPCC) analyses the results of climate models participating in the Coupled Model Intercomparison Project Phase 6 (CMIP6), which include improved representations of physical processes and higher resolutions compared to the CMIP5 generation of climate models. One of the key changes: CMIP6 models make use of climate change scenarios based on "Shared Socioeconomic Pathways" (SSPs), which include socio-economic factors, instead of the previous "Representative Concentration Pathways" (RCPs). The SSP framework provides a novel set of detailed narratives describing different paths society could take during the 21st century in response to climate change, with regard to economic, technological, social and geopolitical factors. As these narratives are used to derive development pathways, not only for greenhouse gas (GHG) emissions but also for economic measures such as population growth and per capita GDP, they can help companies anticipate risks to their business in an integrated, holistic manner.

The release of additional GHGs affects the atmosphere's level of radiative forcing (a metric which describes the change in the Earth's energy balance due to factors like greenhouse gases) and therefore the extent of global warming. SSP-based scenarios are referred to as SSPx-y, where 'SSPx' refers to the Shared Socioeconomic Pathway describing the socioeconomic trends underlying the scenarios, and 'y' refers to the level of radiative forcing (in watts per square metre, W/m² resulting from the scenario by the year 2100[i] (like in the RCP scenarios). For example, in the SSP1–2.6 scenario, humanity must work together to forge a more equitable, sustainable future, which results in additional radiative forcing of 2.6 W/m² by 2100, like in the RCP2.6 scenario.

As not all of the underlying data required as model inputs is currently available for SSP scenarios, we still offer future projections based on RCP scenarios for selected perils. Accordingly, we use a naming convention that includes both the SSP and corresponding RCP scenario. However, it's important to note that while the SSP and RCP scenarios are based on the same radiative forcing by 2100, the pathways differ across time and could result in different risk levels. Therefore, the available climate change scenarios are denoted on the individual peril level.

Scenario descriptions

SSP1-/ RCP2.6: SSP1, known as the "Sustainability" or "Taking the Green Road" pathway, describes an increasingly sustainable world. Global commons are preserved and the limits of nature are respected. The focus is more on human well-being than on economic growth. Income inequalities between and within states are reduced. Consumption is oriented towards minimising material resource and energy usage. These efforts result in the net-zero CO_2 emissions target being reached by around 2075. The SSP1–2.6 scenario is associated with radiative forcing of 2.6 W/m² by 2100, while global mean surface temperature is estimated to increase by 1.8°C (1.3–2.4°C).[ii] For the corresponding RCP2.6 scenario, the CMIP5 models estimate a mean temperature increase of 1.6°C by 2100.[iii]

SSP2-/ RCP4.5: SSP2, called the "Middle of the Road" or medium pathway, extrapolates the past and current global development into the future. Income trends in different countries diverge significantly. Though there is a certain degree of cooperation between states, it barely improves. Global population growth is moderate, levelling off in the second half of the century. Environmental systems are somewhat degraded. CO_2 emissions remain around current levels until 2050, then decline but fail to reach net zero by 2100. The SSP2–4.5 scenario is associated with radiative forcing of 4.5 W/m² by 2100 and a rise in global mean surface temperature is estimated to increase by 2.7°C (2.1–3.5°C).[ii] For the corresponding RCP4.5 scenario, the CMIP5 models estimate a mean temperature increase of 2.4°C by 2100.[iii]

SSP3-/ RCP7.0: SSP3, known as the "Regional Rivalry" or "A Rocky Road" pathway, sees a revival of nationalism and regional conflicts that push global issues into the background. Policies increasingly focus on questions of national and regional security. Over time, the gap widens between an internationally connected society that contributes to knowledge- and capital-intensive sectors of the global economy, and a fragmented collection of lower-income, poorly educated societies that work in a labour-intensive, low-tech economy. Investments in education and technological development decrease. Inequalities worsen. Some regions suffer drastic environmental damage and CO_2 emissions are expected to double by 2100 compared to 2015. The SSP3–7.0 scenario is associated with radiative forcing of 7.0 W/m² by 2100 and an increase in global mean surface temperature is estimated to increase by 3.6°C (2.8–4.6°C).[ii,iv]

SSP5-/ RCP8.5: In SSP5, known as the "Fossil-Fuelled Development" or "Taking the Highway" pathway, global markets are increasingly integrated, leading to innovations and technological progress. This social and economic development, however, is based on an intensified exploitation of fossil fuel resources with a high percentage of coal use and the prevalence of energy-intensive lifestyles worldwide, leading CO_2 emissions to triple by 2075 compared to 2015. The SSP5–8.5 scenario is associated with radiative forcing of 8.5 W/m² by 2100 and a rise in global mean surface temperature is estimated to increase by 4.4°C (3.3–5.7°C).[ii] For the corresponding RCP8.5 scenario, the CMIP5 models estimate a mean temperature increase of 4.3°C by 2100.[iii]

---

[i] IPCC, 2023: Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, p.9.

[ii] Compared to the reference period 1850–1900 with very likely range in parentheses, based on AR6 Climate Change 2021: The Physical Science Basis — IPCC.

IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[iii] Compared to the reference period 1850–1900, based on AR5 Climate Change 2013: The Physical Science Basis — IPCC.

Collins, M., R. Knutti, J. Arblaster, J.-L. Dufresne, T. Fichefet, P. Friedlingstein, X. Gao, W.J. Gutowski, T. Johns, G. Krinner, M. Shongwe, C. Tebaldi, A.J. Weaver and M. Wehner, 2013: Long-term Climate Change: Projections, Commitments and Irreversibility. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[iv] Note: The RCP framework does not include a scenario corresponding to SSP3–7.0.

Temperature-related

Acute

Hazard		Scenario	Current	2030	2040	2050	2100
🌡️A	Heat Wave	● SSP1-/ RCP2.6	1 - Very Low	2 - Low	2 - Low	2 - Low	2 - Low
		● SSP2-/ RCP4.5		2 - Low	2 - Low	2 - Low	3 - Medium
		● SSP3-/ RCP7.0		2 - Low	2 - Low	2 - Low	4 - High
		● SSP5-/ RCP8.5		2 - Low	2 - Low	2 - Low	4 - High
🌡️A	Cold-Frost	● SSP1-/ RCP2.6	2 - Low	2 - Low	2 - Low	1 - Very Low	1 - Very Low
		● SSP2-/ RCP4.5		2 - Low	2 - Low	2 - Low	1 - Very Low
		● SSP3-/ RCP7.0		2 - Low	1 - Very Low	1 - Very Low	1 - Very Low
		● SSP5-/ RCP8.5		2 - Low	2 - Low	1 - Very Low	1 - Very Low
🌡️A	Wildfire	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
		● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
		● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
		● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Chronic

Hazard		Scenario	Current	2030	2040	2050	2100
🌡️C	Changing Temperature	● SSP1-/ RCP2.6	Not Applicable	3 - Medium	3 - Medium	3 - Medium	4 - High
		● SSP2-/ RCP4.5		3 - Medium	3 - Medium	3 - Medium	4 - High
		● SSP3-/ RCP7.0		3 - Medium	4 - High	4 - High	5 - Very High
		● SSP5-/ RCP8.5		3 - Medium	3 - Medium	4 - High	5 - Very High
🌡️C	Heat Stress	● SSP1-/ RCP2.6	3 - Medium	3 - Medium	3 - Medium	3 - Medium	3 - Medium
		● SSP2-/ RCP4.5		3 - Medium	3 - Medium	3 - Medium	3 - Medium
		● SSP3-/ RCP7.0		3 - Medium	3 - Medium	3 - Medium	4 - High
		● SSP5-/ RCP8.5		3 - Medium	3 - Medium	3 - Medium	4 - High
🌡️C	Temperature Variability	● SSP1-/ RCP2.6	2 - Low	2 - Low	2 - Low	2 - Low	2 - Low
		● SSP2-/ RCP4.5		2 - Low	2 - Low	2 - Low	2 - Low
		● SSP3-/ RCP7.0		2 - Low	2 - Low	2 - Low	2 - Low
		● SSP5-/ RCP8.5		2 - Low	2 - Low	2 - Low	2 - Low
🌡️C	Permafrost Thawing	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
		● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
		● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
		● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low

Reporting Physical Climate Risk - Overview

Wind-related

Acute

Hazard	Scenario	Current	2030	2040	2050	2100
Cyclone-Hurricane-Typhoon	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		1 - Very Low	Scenario/Year Not Available	1 - Very Low	1 - Very Low
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		1 - Very Low	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Storm	● SSP1-/ RCP2.6	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Tornado	● SSP1-/ RCP2.6	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Chronic

Hazard	Scenario	Current	2030	2040	2050	2100
Changing Wind Patterns	● SSP1-/ RCP2.6	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
	● SSP2-/ RCP4.5		1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
	● SSP3-/ RCP7.0		1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
	● SSP5-/ RCP8.5		1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low

Water-related

Acute

Hazard	Scenario	Current	2030	2040	2050	2100
Drought	● SSP1-/ RCP2.6	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		3 - Medium	3 - Medium	3 - Medium	3 - Medium
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		3 - Medium	3 - Medium	3 - Medium	5 - Very High
Heavy Precipitation	● SSP1-/ RCP2.6	5 - Very High	5 - Very High	5 - Very High	5 - Very High	5 - Very High
	● SSP2-/ RCP4.5		5 - Very High	5 - Very High	5 - Very High	5 - Very High
	● SSP3-/ RCP7.0		5 - Very High	5 - Very High	5 - Very High	5 - Very High
	● SSP5-/ RCP8.5		5 - Very High	5 - Very High	5 - Very High	5 - Very High
Flood	● SSP1-/ RCP2.6	5 - Very High	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		5 - Very High	Scenario/Year Not Available	5 - Very High	5 - Very High
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		5 - Very High	Scenario/Year Not Available	5 - Very High	5 - Very High
Glacial Lake Outburst	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Chronic

Hazard	Scenario	Current	2030	2040	2050	2100
Changing Precipitation Patterns	● SSP1-/ RCP2.6	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
	● SSP2-/ RCP4.5		1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
	● SSP3-/ RCP7.0		1 - Very Low	1 - Very Low	1 - Very Low	2 - Low
	● SSP5-/ RCP8.5		1 - Very Low	1 - Very Low	1 - Very Low	2 - Low
Precipitation Variability	● SSP1-/ RCP2.6	3 - Medium	4 - High	4 - High	4 - High	4 - High
	● SSP2-/ RCP4.5		4 - High	4 - High	4 - High	4 - High
	● SSP3-/ RCP7.0		4 - High	4 - High	4 - High	4 - High
	● SSP5-/ RCP8.5		4 - High	4 - High	4 - High	4 - High
Ocean Acidification	● SSP1-/ RCP2.6	Not Applicable	2 - Low	Scenario/Year Not Available	2 - Low	2 - Low
	● SSP2-/ RCP4.5		2 - Low	Scenario/Year Not Available	2 - Low	3 - Medium
	● SSP3-/ RCP7.0		2 - Low	Scenario/Year Not Available	2 - Low	3 - Medium
	● SSP5-/ RCP8.5		2 - Low	Scenario/Year Not Available	2 - Low	4 - High

# Reporting Physical Climate Risk - Overview

Hazard	Scenario	Current	2030	2040	2050	2100
Saline Intrusion	● SSP1-/ RCP2.6	2 - Low	2 - Low	2 - Low	2 - Low	3 - Medium
	● SSP2-/ RCP4.5		2 - Low	2 - Low	2 - Low	3 - Medium
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		2 - Low	2 - Low	2 - Low	3 - Medium
Sea Level Rise	● SSP1-/ RCP2.6	Not Applicable	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	3 - Medium
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	3 - Medium
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	4 - High
Water Stress	● SSP1-/ RCP2.6	3 - Medium	4 - High	4 - High	4 - High	4 - High
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		4 - High	4 - High	4 - High	5 - Very High
	● SSP5-/ RCP8.5		4 - High	4 - High	4 - High	5 - Very High

Solid Mass-related

Acute

Hazard	Scenario	Current	2030	2040	2050	2100
Avalanche	● SSP1-/ RCP2.6	No Information	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Landslide	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Subsidence	● SSP1-/ RCP2.6	3 - Medium	4 - High	4 - High	4 - High	4 - High
	● SSP2-/ RCP4.5		4 - High	4 - High	4 - High	4 - High
	● SSP3-/ RCP7.0		4 - High	4 - High	4 - High	4 - High
	● SSP5-/ RCP8.5		4 - High	4 - High	4 - High	4 - High

Chronic

Hazard	Scenario	Current	2030	2040	2050	2100
Coastal Erosion	● SSP1-/ RCP2.6	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	4 - High	4 - High
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	4 - High	4 - High
Soil Degradation	● SSP1-/ RCP2.6	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
	● SSP2-/ RCP4.5		No Model Available	No Model Available	No Model Available	No Model Available
	● SSP3-/ RCP7.0		No Model Available	No Model Available	No Model Available	No Model Available
	● SSP5-/ RCP8.5		No Model Available	No Model Available	No Model Available	No Model Available
Soil Erosion	● SSP1-/ RCP2.6	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
	● SSP2-/ RCP4.5		Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
	● SSP3-/ RCP7.0		Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
	● SSP5-/ RCP8.5		Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Solifluction	● SSP1-/ RCP2.6	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
	● SSP2-/ RCP4.5		No Model Available	No Model Available	No Model Available	No Model Available
	● SSP3-/ RCP7.0		No Model Available	No Model Available	No Model Available	No Model Available
	● SSP5-/ RCP8.5		No Model Available	No Model Available	No Model Available	No Model Available

Reporting Physical Climate Risk - Scenario Overview

Scenario: SSP1-/ RCP2.6

Hazard	Current	2030	2040	2050	2100
Temperature (Acute)					
Heat Wave	1 - Very Low	2 - Low	2 - Low	2 - Low	2 - Low
Cold-Frost	2 - Low	2 - Low	2 - Low	1 - Very Low	1 - Very Low
Wildfire	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Temperature (Chronic)					
Changing Temperature	Not Applicable	3 - Medium	3 - Medium	3 - Medium	4 - High
Heat Stress	3 - Medium	3 - Medium	3 - Medium	3 - Medium	3 - Medium
Temperature Variability	2 - Low	2 - Low	2 - Low	2 - Low	2 - Low
Permafrost Thawing	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Wind (Acute)					
Cyclone-Hurricane-Typhoon	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Storm	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Tornado	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Wind (Chronic)					
Changing Wind Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Water (Acute)					
Drought	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Heavy Precipitation	5 - Very High	5 - Very High	5 - Very High	5 - Very High	5 - Very High
Flood	5 - Very High	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Glacial Lake Outburst	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Water (Chronic)					
Changing Precipitation Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
Precipitation Variability	3 - Medium	4 - High	4 - High	4 - High	4 - High
Ocean Acidification	Not Applicable	2 - Low	Scenario/Year Not Available	2 - Low	2 - Low
Saline Intrusion	2 - Low	2 - Low	2 - Low	2 - Low	3 - Medium
Sea Level Rise	Not Applicable	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	3 - Medium
Water Stress	3 - Medium	4 - High	4 - High	4 - High	4 - High
Solid Mass (Acute)					
Avalanche	No Information	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Landslide	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Subsidence	3 - Medium	4 - High	4 - High	4 - High	4 - High
Solid Mass (Chronic)					
Coastal Erosion	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Soil Degradation	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
Soil Erosion	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Solifluction	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available

Reporting Physical Climate Risk - Scenario Overview

Scenario: SSP2-/ RCP4.5

Hazard	Current	2030	2040	2050	2100
Temperature (Acute)					
Heat Wave	1 - Very Low	2 - Low	2 - Low	2 - Low	3 - Medium
Cold-Frost	2 - Low	2 - Low	2 - Low	2 - Low	1 - Very Low
Wildfire	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Temperature (Chronic)					
Changing Temperature	Not Applicable	3 - Medium	3 - Medium	3 - Medium	4 - High
Heat Stress	3 - Medium	3 - Medium	3 - Medium	3 - Medium	3 - Medium
Temperature Variability	2 - Low	2 - Low	2 - Low	2 - Low	2 - Low
Permafrost Thawing	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Wind (Acute)					
Cyclone-Hurricane-Typhoon	1 - Very Low	1 - Very Low	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Storm	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Tornado	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Wind (Chronic)					
Changing Wind Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Water (Acute)					
Drought	2 - Low	3 - Medium	3 - Medium	3 - Medium	3 - Medium
Heavy Precipitation	5 - Very High	5 - Very High	5 - Very High	5 - Very High	5 - Very High
Flood	5 - Very High	5 - Very High	Scenario/Year Not Available	5 - Very High	5 - Very High
Glacial Lake Outburst	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Water (Chronic)					
Changing Precipitation Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low
Precipitation Variability	3 - Medium	4 - High	4 - High	4 - High	4 - High
Ocean Acidification	Not Applicable	2 - Low	Scenario/Year Not Available	2 - Low	3 - Medium
Saline Intrusion	2 - Low	2 - Low	2 - Low	2 - Low	3 - Medium
Sea Level Rise	Not Applicable	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	3 - Medium
Water Stress	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Solid Mass (Acute)					
Avalanche	No Information	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Landslide	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Subsidence	3 - Medium	4 - High	4 - High	4 - High	4 - High
Solid Mass (Chronic)					
Coastal Erosion	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	4 - High	4 - High
Soil Degradation	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
Soil Erosion	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Solifluction	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available

Scenario: SSP3-/ RCP7.0

Hazard	Current	2030	2040	2050	2100
Temperature (Acute)					
Heat Wave	1 - Very Low	2 - Low	2 - Low	2 - Low	4 - High
Cold-Frost	2 - Low	2 - Low	1 - Very Low	1 - Very Low	1 - Very Low
Wildfire	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Temperature (Chronic)					
Changing Temperature	Not Applicable	3 - Medium	4 - High	4 - High	5 - Very High
Heat Stress	3 - Medium	3 - Medium	3 - Medium	3 - Medium	4 - High
Temperature Variability	2 - Low	2 - Low	2 - Low	2 - Low	2 - Low
Permafrost Thawing	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Wind (Acute)					
Cyclone-Hurricane-Typhoon	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Storm	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Tornado	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Wind (Chronic)					
Changing Wind Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low

Sample Report - Asset Genova, Italy
Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Water (Acute)					
Drought	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Heavy Precipitation	5 - Very High	5 - Very High	5 - Very High	5 - Very High	5 - Very High
Flood	5 - Very High	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Glacial Lake Outburst	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Water (Chronic)					
Changing Precipitation Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	2 - Low
Precipitation Variability	3 - Medium	4 - High	4 - High	4 - High	4 - High
Ocean Acidification	Not Applicable	2 - Low	Scenario/Year Not Available	2 - Low	3 - Medium
Saline Intrusion	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Sea Level Rise	Not Applicable	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Water Stress	3 - Medium	4 - High	4 - High	4 - High	5 - Very High
Solid Mass (Acute)					
Avalanche	No Information	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Landslide	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Subsidence	3 - Medium	4 - High	4 - High	4 - High	4 - High
Solid Mass (Chronic)					
Coastal Erosion	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Soil Degradation	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
Soil Erosion	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Solifluction	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available

Reporting Physical Climate Risk - Scenario Overview

Scenario: SSP5-/ RCP8.5

Hazard	Current	2030	2040	2050	2100
Temperature (Acute)					
Heat Wave	1 - Very Low	2 - Low	2 - Low	2 - Low	4 - High
Cold-Frost	2 - Low	2 - Low	2 - Low	1 - Very Low	1 - Very Low
Wildfire	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Temperature (Chronic)					
Changing Temperature	Not Applicable	3 - Medium	3 - Medium	4 - High	5 - Very High
Heat Stress	3 - Medium	3 - Medium	3 - Medium	3 - Medium	4 - High
Temperature Variability	2 - Low	2 - Low	2 - Low	2 - Low	2 - Low
Permafrost Thawing	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Wind (Acute)					
Cyclone-Hurricane-Typhoon	1 - Very Low	1 - Very Low	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Storm	3 - Medium	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Tornado	2 - Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Wind (Chronic)					
Changing Wind Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	1 - Very Low

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Water (Acute)					
Drought	2 - Low	3 - Medium	3 - Medium	3 - Medium	5 - Very High
Heavy Precipitation	5 - Very High	5 - Very High	5 - Very High	5 - Very High	5 - Very High
Flood	5 - Very High	5 - Very High	Scenario/Year Not Available	5 - Very High	5 - Very High
Glacial Lake Outburst	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Water (Chronic)					
Changing Precipitation Patterns	Not Applicable	1 - Very Low	1 - Very Low	1 - Very Low	2 - Low
Precipitation Variability	3 - Medium	4 - High	4 - High	4 - High	4 - High
Ocean Acidification	Not Applicable	2 - Low	Scenario/Year Not Available	2 - Low	4 - High
Saline Intrusion	2 - Low	2 - Low	2 - Low	2 - Low	3 - Medium
Sea Level Rise	Not Applicable	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	4 - High
Water Stress	3 - Medium	4 - High	4 - High	4 - High	5 - Very High
Solid Mass (Acute)					
Avalanche	No Information	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available
Landslide	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available

Reporting Physical Climate Risk - Scenario Overview

Hazard	Current	2030	2040	2050	2100
Subsidence	3 - Medium	4 - High	4 - High	4 - High	4 - High
Solid Mass (Chronic)					
Coastal Erosion	Scenario/Year Not Available	Scenario/Year Not Available	Scenario/Year Not Available	4 - High	4 - High
Soil Degradation	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available
Soil Erosion	1 - Very Low	Scenario/Year Not Available	Scenario/Year Not Available	1 - Very Low	1 - Very Low
Solifluction	No Model Available	No Model Available	No Model Available	No Model Available	No Model Available

Legend		1 - Very Low	2 - Low	3 - Medium	4 - High	5 - Very High
		1	2	3	4	5

Heat Wave — The Heat Wave Score combines information on the annual number of days in heatwaves and hot periods as categorised average.

Cold-Frost — The Cold / Frost Score is the categorised average of the annual number of days with minimum temperatures below freezing (frost days) and annual number of days with maximum temperatures below freezing (ice days).

Wildfire — The Wildfire Score describes the hazard of wildfire, based on climatological data and land cover data, capturing wildland urban interfaces in high resolution in high-risk areas.

Changing Temperature — The Changing Temperature Score combines the chronic and gradual change of mean daily maximum and minimum near-surface air temperatures relative to the reference period 1995-2014.

Heat Stress — The Heat Stress Index combines the annual maximum with the annual mean near-surface air temperature as well as annual number of tropical nights as categorised average.

Temperature Variability — The Temperature Variability Score combines several temperature-variability metrics which capture fluctuations of near-surface air temperatures over timescales ranging from diurnal to seasonal.

Permafrost Thawing — The Permafrost Thawing Score depicts the existence of permafrost and the future melting hazard of permanently frozen soil by combining ground temperatures with ground properties that affect permafrost stability.

Cyclone-Hurricane-Typhoon — The Tropical Cyclone Score is derived from globally consistent, basin-specific proprietary models for tropical cyclones (known as hurricanes and typhoons in some regions), and is based on probable maximum windspeeds with a return period of 100 years. The future projections incorporate a high-atmospheric-resolution climate model to quantify projected changes in the intensity and frequency of tropical cyclones.

Storm — The Storm Score is derived from probable maximum wind intensities occurring during extratropical storms with a return period of 100 years and the hazard posed by sand and dust storms.

Tornado — The Tornado Score is based on the annual frequency of tornadoes over an area of 10,000 km², derived from meteorological data (Unit: Tornadoes per 10,000 km² and year).

Changing Wind Patterns — The Changing Wind Pattern Score combines climatological parameters describing gradual shifts in the characteristics of wind and its variability relative to the reference period 1995-2014 due to global warming.

Drought — The Drought Score is based on the Standardised Precipitation Evapotranspiration Index (SPEI) and dry-spell conditions. SPEI is a multi-scalar drought index that is used to determine the onset, duration and magnitude of drought conditions.

Heavy Precipitation — The Heavy Precipitation Score describes the meteorological threat from high precipitation, combining data on precipitation duration, intensity and frequency, together with the hail potential based on meteorological data, elevation and the global distribution of lightning activity.

Flood — The Flood Score describes the hazard of flooding by storm surges (coastal flooding), river floods (fluvial flooding) and flash floods (pluvial flooding) using a weighting scheme to aggregate the hazard scores of the underlying flood models.

Glacial Lake Outburst — The Glacial Lake Outburst Score identifies regions at risk of glacial lake outburst floodings using information on glacial lakes, glaciers and hydrological systems.

Changing Precipitation — The Changing Precipitation Patterns Score describes the difference in the annually accumulated precipitation amount relative the reference period 1995-2014.

Legend

1 - Very Low	2 - Low	3 - Medium	4 - High	5 - Very High
1	2	3	4	5

Patterns

	Precipitation Variability	The Precipitation Variability Score describes fluctuations of precipitation on timescales ranging from daily to annual. It combines information on variability of daily precipitation amount, monthly precipitation ranges, and precipitation seasonality.
	Ocean Acidification	The Ocean Acidification Score describes the magnitude of pH changes in the surface waters of the oceans, relative to the reference period 1995-2014, due to the uptake of atmospheric carbon dioxide into the ocean.
	Saline Intrusion	The Saline Intrusion Score describes the hazard of saltwater intruding into coastal freshwater aquifers. It takes into account both the threat posed by coastal flooding and chronic intrusion occurring as groundwater tables decline due to prolonged excessive groundwater extraction.
	Sea Level Rise	The Sea Level Rise Score depicts the areas with elevated risk of flooding due to rising sea levels in 2100. It combines coastal topography modelled on high resolution elevation models with the IPCC SROCC (Special Report on the Ocean and Cryosphere in a Changing Climate) sea level rise projections.
	Water Stress	Water stress measures the ratio of total water demand to available renewable surface and groundwater supplies, considering water demand from domestic, industrial, irrigation, and livestock uses. Water stress is an indicator of competition for water resources and higher values indicate more competition among users.
	Avalanche	The Avalanche Score describes the threat posed by avalanches and is derived from potential avalanche starting zones and likely flow paths considering elevation and land-use data.
	Landslide	The Landslide Score is based on the World Bank's "Global landslide hazard map", which describes the landslide hazard at a global scale, combining rainfall-triggered and earthquake-triggered landslide hazard. While rainfall-triggered landslide is modelled using rainfall data, the earthquake-trigged landslide hazard considers the peak ground acceleration of seismic events with a return period of 475 years.
	Subsidence	The Subsidence Score describes the hazard of gradual sinking or sudden collapse of the ground. It accounts for natural shrink-swell subsidence in clay soils due to seasonal variations in soil moisture and water balance as well as anthropogenic subsidence due to groundwater depletion, groundwater depletion-related sinkholes and ground collapses in mining areas.
	Coastal Erosion	The Coastal Erosion Score is derived from potential erosion of maritime coastlines over time, considering three key factors: the geomorphologic coast type, incoming wave energy, and the proximity of a location to the coastline.
	Soil Degradation	No Hazard Model Available
	Soil Erosion	The Soil Erosion Score describes the hazard of soil being worn away by natural forces such as water and wind and is based on the soil erosion rate (Unit: mean rate of soil erosion in tons per hectare per year).
	Solifluction	No Hazard Model Available

Reporting Physical Climate Risk	Data Source
Heat Wave	Munich Re (MR)
Cold-Frost	Munich Re (MR)
Wildfire	Munich Re (MR)
Changing Temperature	Munich Re (MR)
Heat Stress	Munich Re (MR)
Temperature Variability	Munich Re (MR)
Permafrost Thawing	European Space Agency - Climate Change Initiative (ESA)
Cyclone-Hurricane-Typhoon	Munich Re (MR)
Storm	Munich Re (MR), United Nations Convention to Combat Desertification (UNCCD)
Tornado	Munich Re (MR)
Changing Wind Patterns	Munich Re (MR)
Drought	Munich Re (MR)
Heavy Precipitation	Munich Re (MR)
Flood	Munich Re (MR), JBA Risk Management Limited (JBA)
Glacial Lake Outburst	Munich Re (MR)
Changing Precipitation Patterns	Munich Re (MR)
Precipitation Variability	Munich Re (MR)
Ocean Acidification	Intergovernmental Panel on Climate Change (IPCC)
Saline Intrusion	Munich Re (MR)
Sea Level Rise	Munich Re (MR)

Data Sources

Reporting Physical Climate Risk	Data Source
Water Stress	World Resources Institute - Aqueduct Water Risk Atlas (WRI)
Avalanche	Munich Re (MR)
Landslide	World Bank Group (WBG)
Subsidence	Munich Re (MR)
Coastal Erosion	Munich Re (MR)
Soil Degradation	no source
Soil Erosion	Munich Re (MR)
Solifluction	no source

General Information	Data Source
Elevation	Japan Aerospace Exploration Agency (JAXA), United States Geological Survey (USGS)
Worldcover 2020	European Space Agency (ESA)
Population Density	Oak Ridge National Laboratory
World Settlement Footprint Evolution	German Aerospace Center (DLR), Earth Observation Center (EOC)
Distance to Coast	Munich Re (MR)

Confidentiality Notice

Munich Re invests substantial time and financial resources in developing its proprietary applications, models, and data.

Information concerning Munich Re applications, models, and data is protected under trade secret laws, among other intellectual property rights. Recipients of this documentation and materials contained herein are subject to the restrictions of the confidentiality provisions contained in applicable license agreements or any other applicable nondisclosure terms. Except to the extent permitted by the terms of a license agreement or non- disclosure agreement with Munich Re, no part of this document may be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form without prior written consent from Munich Re.

Warranty Disclaimer and Limitation of Liability

This document was prepared to assist users of the Munich Re products. Information in this document is subject to change without notice and does not represent a commitment on the part of Munich Re. The material contained herein is supplied "as-is" and without representation or warranty of any kind. By using the Information in this Document the user acknowledges that such Information shall not take the place of Customer's own judgement or experience, particularly regarding the analysis and assessment of loss and/ or insurance risks. Munich Re assumes no responsibility and shall have no liability of any kind arising from the supply or use of this document or the material contained herein.

Map Screenshot Attributions:

'Grey', 'Dark Grey': Esri, HERE, Garmin, ©OpenStreetMap contributors, GIS user community
'Satellite': Esri, Maxar, Earthstar Geographics, GIS user community
'Hybrid': Esri, Maxar, Earthstar Geographics, TomTom, Garmin, FAO, NOAA, USGS, ©OpenStreetMap contributors, GIS user community
'Dark': ©OpenStreetMap contributors, ©CARTO
'OpenStreetMap': ©OpenStreetMap contributors
'OpenStreetMap-Hot': ©OpenStreetMap contributors, Tiles style byHumanitarian OpenStreetMap Team hosted byOpenStreetMap France
'OpenTopoMap': Map data: ©OpenStreetMap contributors,SRTM | Map style: ©OpenTopoMap
 (CC-BY-SA)
'Hillshade' and 'Hillshade Dark': Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community
'Ocean': Esri, Garmin, GEBCO, NOAA NGDC, and other contributors
'Earth@Night': imagery provided by services from GIBS, operated by the NASA/GSFC/ESDIS, funding by NASA/HQ
Administration & Postcodes: GfK
CRESTA: GfK/PERILS
HydroBasins: HydroSHEDS
NUTS: EU Eurostat

Send us Your Feedback
Location Risk Intelligence Support