Climate Insights

Property Climate Risk Report: Residential

Including Variables:

(1) Climate Zone
(2) Earthquake Risk
(3) Tsunami Risk
(4) Cyclone Risk
(5) Monthly Precipitation and Mean Temperature
(6) Monthly Mean Relative Humidity
(7) Daily Extreme Precipitation
(8) Extreme Wind Speed
(9) Aridity
(10) Heat Wave Days
(11) Number of Days Max Temperature > 35 °C
(12) Number of Days Min Temperature < 2 °C
(13) Cooling Degree Days
(14) Heating Degree Days
(15) Wildfire
(16) Annual Mean Sea Level Rise
(17) Extreme Water Level at the Coast

For Property at:

Street

Town/Suburb

City

State/Province
Queensland

Country
Australia

Latitude

Longitude

Elevation
11m

Units
metric

CLIMsystems

Climate Insights

Property Climate Risk Report: Overview

The report includes five sections. The first is background information that reflects the information provided on the property's location. A general climatic region is identified for the property, along with an earthquake risk rating and description of perceived shaking effects for your property's rating.

The detailed report is presented on a variable-by-variable basis. First, the baseline information for the specific climate variable is provided, depicting the historical climate for your property's location. Secondly, the report presents future scenarios for the climate variable for the years 2030, 2050, 2070 and 2100. Thirdly, the risk dashboards are presented, based on the historical and future risk scores. The risk scores are calculated by applying a global data grid for each variable.

Your property report is designed to alert you to current and potential future climate risks. The property owner/investor should consider the information provided in the context of their experience and the characteristics of their property.

Considering the risks identified, the property owner/investor may wish to consider taking action to reduce risks. Some options are provided for consideration. The risk factors and adaptation options provided are not exhaustive. We strongly advise the property owner/investor to obtain additional advice before investing in adaptation planning and implementation of any plan.

We refer you to the following website for additional information on data and methods applied and the underlying approaches to climate data development:

https://climateinsights.global/faq

Climate Zone

Köppen–Geiger Climate Classification System: Tropical Savannah - Dry Winter

Class Aw climates have a pronounced dry season in winter, with the driest month having precipitation less than 60 mm and less than 1/25 of the total annual precipitation.

Earthquake Risk

The 475-year return period Instrumental Intensity: 4

Intensity	1	2	3	4	5	6	7	8	9	10
Shaking	Not felt	Weak	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme

Perceived shaking: Light

Description (Damage): Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls may make a creakiing sound. Standing motor cars rocked noticeably.

The intensity presented represents a 475-year return period (or 10 percent probability of exceedance in 50 years) event. This is the most common standard used forassessing seismic risk. It is also the basis for many building codes for seismic design.

Potential responses: Injuries in earthquakes stem from heavy items and objects falling on people. Access your local earthquake authority for detailed information for your location; evaluate the safety of your home; prepare an earthquake safety kit; secure wall hangings, bookcases, appliances, electronics like TVs and water heaters; move breakable valuables to lower shelves and secure; prune trees near your home; and, strap chimneys and anchor foundations and bracing walls. Secure equipment, particularly any gas, water or electrical equipment or contaminants that could spill. Additionally, prepare earthquake safety kits that are accessible in case of injury.

Tsunami Risk

Tsunami Risk Score: 2

According to the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (IOC-UNESCO), Tsunami Maximum Inundation Height (MIH) is defined as the highest elevation of a tsunami runup above still water level. The MIH in this report was calculated based on the data of the World Bank Think Hazard! portal.

1 in 500 Year Return Period Maximum Inundation Height (MIH) and Risk Scores

Risk Score	1	2	3	4	5
MIH (meter)	0.01-1.58	1.59-4.68	4.69-8.76	8.77-14.90	14.91-22.44

The impacts of a tsunami on a coastal area can range from unnoticeable to devastating. Much depends on the seismic event's characteristics, the distance from its point of origin, its magnitude, and the local bathymetry (water depth in relation to the seafloor's topography just off the shore of a location).

The initial wave of a giant tsunami can be exceptionally tall; however, most damage is not sustained by this wave. Instead, damage is often caused by the vast mass of water behind the initial wavefront, as the seawater keeps rising quickly and floods into the coastal area. Surging potentially multiple waves of a tsunami can lead to a rapid inundation of a shoreline that can be impactful to coastal and near-coastal settlement and the natural and built environments in their path.

Mitigation measures against a tsunami:

(1) The soft mitigation measures can include increasing public awareness, installing an early warning system, and defining and practising evacuation plans for specified evacuation sites and egress pathways for communities situated in potential inundation areas.

(2) Vertical evacuation: the evacuation sites should be higher than the estimated tsunami inundation depth at that location. Such areas must be identifiable, and evacuation routes made clear with well-maintained signage.

(3) Protective physical structures to reduce the impact on coastal facilities: Typically, these tsunami barriers are of one of two types: vertical or inclined concrete walls or compacted earth embankments lined with concrete slabs. However, such protective structures should not obviate the need to consider the previous noted educational and evacuation planning approaches.

Cyclone Risk

Cyclone Category: III

Cyclone Frequency: 1

Devastating damage could occur: Well-built framed homes may incur major damage or removal of the roof. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.

Depending on its location and strength, a tropical cyclone is referred to by different names including, hurricane, typhoon, tropical storm, tropical depression, or simply cyclone.

The tropical cyclone intensity (based on wind speed) and frequency risk levels have been calculated from IBrACS (International Best Track Archive for Climate Stewardship) data from 1980 to 2020.

Saffir–Simpson scale Category and Extreme Wind Speed

Cyclone Category	I	II	III	IV	V
Speed (kph)	119-153	154-177	178-208	209-251	≥ 252
Speed (mph)	74-95	96-110	111-129	130-156	≥ 157

Cyclone frequency is related to how often a specific location may experience a tropical storm

Frequency Scale	1	2	3	4	5
Return Year	One in 10 years	One in 2 years	Every year	Several in one year	More than 5 in one year

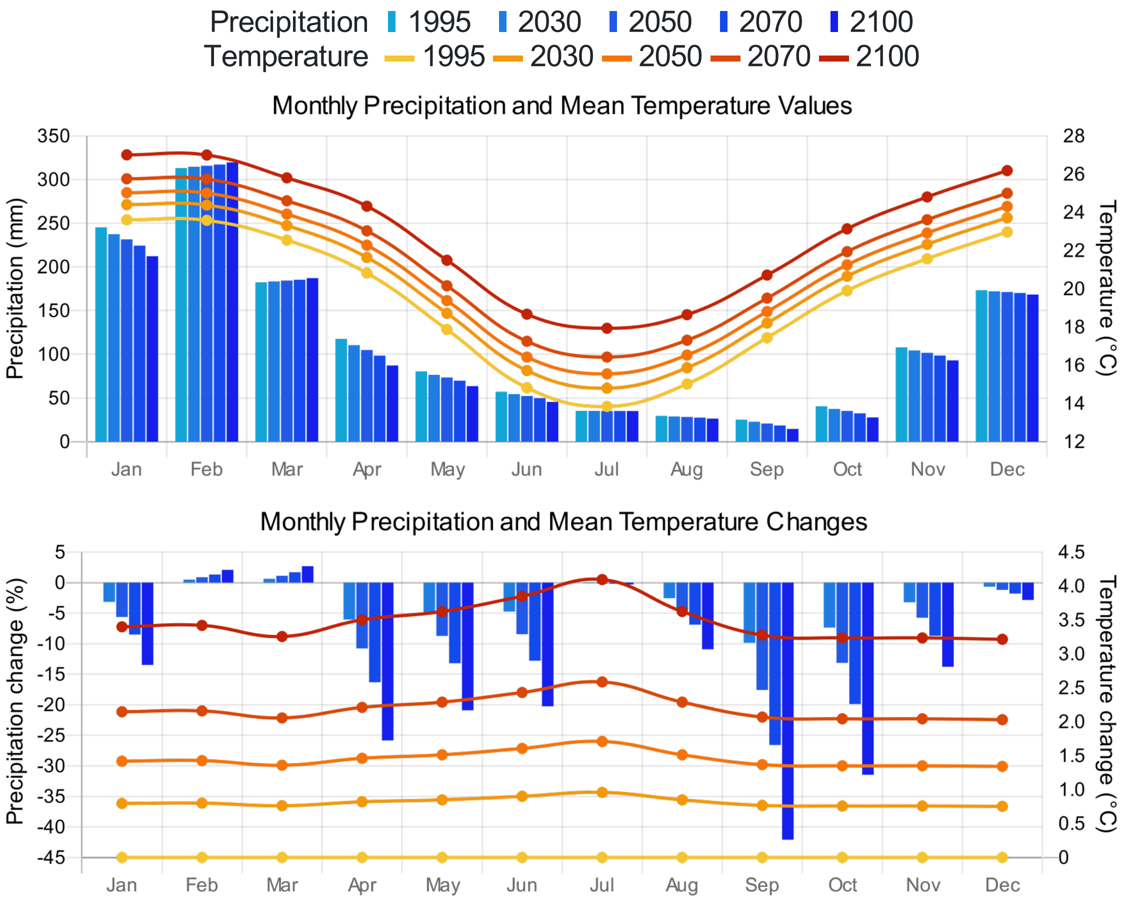
Warming of the surface ocean from anthropogenic (human-induced) climate change is likely fueling more powerful cyclones. Rising sea levels amplify the destructive power of individual storms through flooding. Cyclone induced precipitation rates are projected to increase due to enhanced atmospheric moisture associated with anthropogenic global warming.

Tropical cyclones have expanded their tracks poleward since the 1970s, associated with a widening of the tropical zone, a poleward shift of storm tracks, and shifting jet streams. Thus, cyclone intensity and frequency could increase in currently low frequency and intensity zones as climate changes. Mitigation measures can be considered prior to the impact of a disaster to minimise its effects.

Mitigation means measures taken prior to the impact of a disaster to minimise its effects. Building codes and good site selection are critical. Armoured cyclone shelters may be accessible and should be well known to the property’s occupants. Flood management from land-based rainfall and storm surge need to be considered. Vegetative barriers such as mangroves and intact dune systems may help to mitigate flooding. Levees and stopbanks may also be required. Pumps may be considered for property management of flood waters.

Monthly Precipitation and Mean Temperature

The monthly mean temperature is the degrees Celsius or Fahrenheit of the location for baseline (1995) and future time slices. The monthly precipitation is in millimetres (mm) or inches (in) for the location for baseline (1995) and future timeslices.



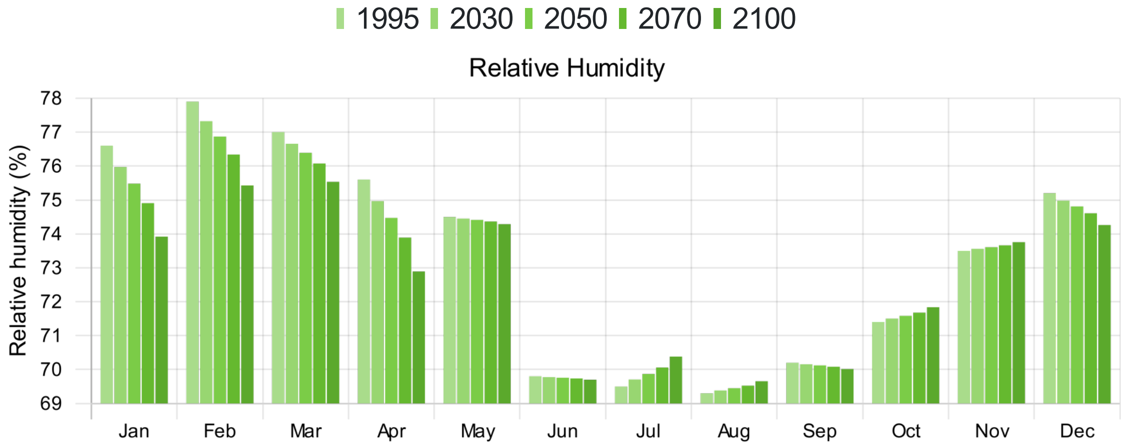
Monthly changes in temperature and precipitation represent slow onset potential changes in climate. In some months, precipitation models could show an increase, while in other months, there could be a decrease. This then can be viewed as potential changes in the seasonality of precipitation for your property.

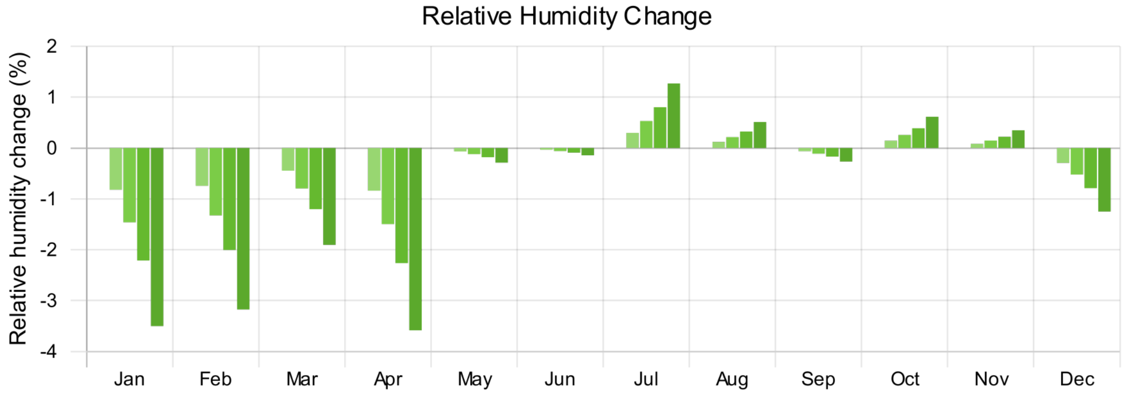
The combination of changes in seasonal precipitation and temperature changes lead to wetter and warmer or drier and warmer shifts in climate.

It is important to note that warmer temperatures can lead to increased evaporation from soils. In some cases, even when your climate at your property's location is projected to get wetter through increased precipitation, it could become drier owing to the impact of higher temperatures that can lead to a potential evapotranspiration deficit.

Monthly Mean Relative Humidity

The monthly mean changes in relative humidity in percent for baseline (1995) and future time slices.





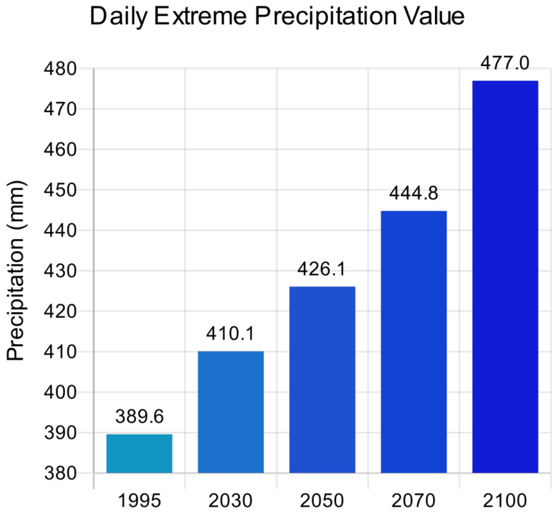
Monthly changes in humidity represent slow onset potential changes in climate. In some months, humidity could show a slight increase, while in other months, there could be a slight decrease. While changes in relative humidity over time may appear marginal, the relationship of changes in humidity, temperature and wind can impact physical asset efficiency and thermal comfort and over healthy indoor air quality of the property.

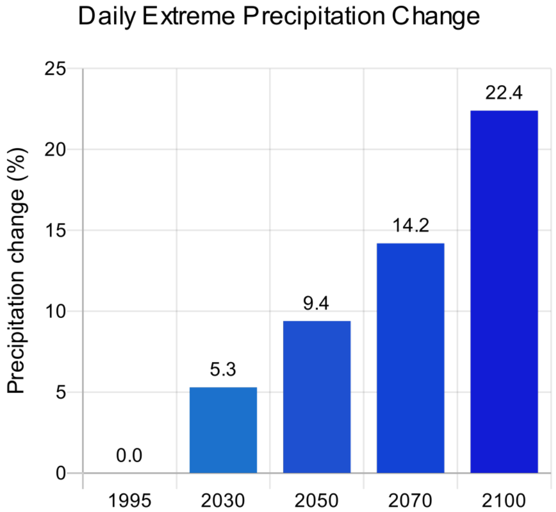
Relative humidity plays a significant role in the comfort of household occupants. Low humidity can cause health issues, including itchy and dry skin, sore eyes, and a blocked nose. Alternatively, high humidity makes it difficult for occupants to remain cool, as sweat is not quickly evaporated. Lifestyle can also be impacted negatively by either too dry or humid an indoor environment.

Indoor air quality for bacteria, viruses, fungi, mites, respiratory infections, allergic rhinitis and asthma, chemical interactions, and production can become problematic. Changes in relative humidity can also influence the efficiency of HVAC (heating, ventilation and air conditioning) systems. The recommended property relative humidity can range between 40 and 60%. Indoor environments within this range offer occupants comfortable and healthy indoor air quality.

Daily Extreme Precipitation

This section represents 24-hour extreme rainfall in mm or inches for your property for baseline (1995) and 100-year return period with future year time-steps.





The result represents the statistical 50th percentile derived from daily future rainfall models (GCMs - see glossary). A return period, also known as a recurrence interval or repeat interval, is an average time or an estimated average time between events. Note that just because a 1 in 100-year event occurs in a particular year does not mean that same or a greater event could not occur the following year. This is why statistical results need to be updated regularly as climates change.

Daily Extreme Precipitation Risk Scores

Improving the resilience of a property to extreme precipitation is essential. If the risk score for extreme rainfall is expected to rise, consider historical extreme rainfall events and their pressures on the property. With increasing risk improving the resilience of the property to extreme precipitation is essential.

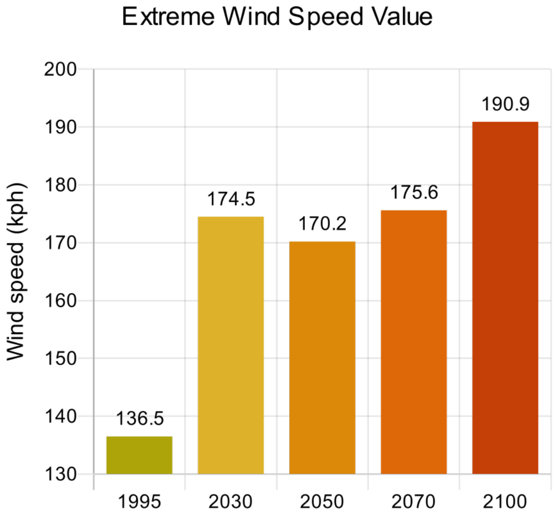
Firstly, at the foundational scale, raising buildings or living spaces above ground level could provide an adequate buffer from any excess, pooled precipitation. Secondly, implement additional drains to limit any still water and maintaining drains through the regular clearing of debris and overgrowth.

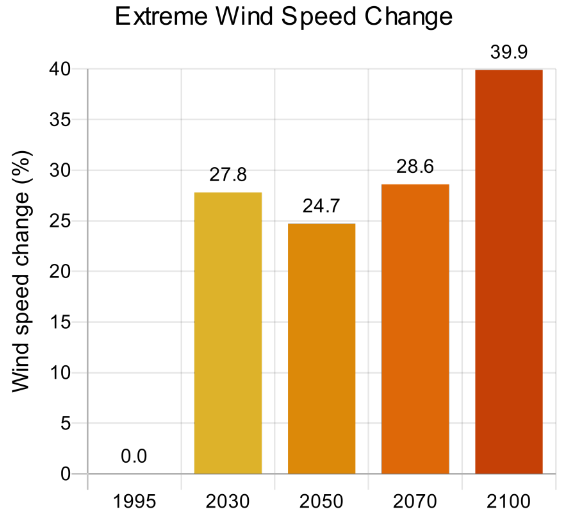
Other structural measures include sealing outer walls, opting for resilient building materials, and channeling water away from the property where risks may be exacerbated. Wind-driven rain also covered under extreme winds can be impactful in terms of cladding integrity and leakage at joints, facades, and joinery (doors and windows).

The roof drainage and spouting can be undersized and facilitate water ponding on flat services leading to roof buckling and even collapse with catastrophic water damage possible.

Extreme Wind Speed

Extreme wind speeds, as presented in this report, could be derived from hurricanes, typhoons and other tropical depressions, downslope or derecho winds BUT NOT tornado-related winds. Extreme wind speeds can occur during any of the aforementioned wind events. However, extreme wind speed changes may not increase linearly over time for some locations with increasing temperatures.





The extreme daily wind speed is in kilometres or miles per hour from the baseline (1995) with 100-year return periods and future year time-steps for your location.

Extreme Wind Speed Risk Scores

Extreme wind speeds can increase up to 2100. There are numerous considerations to make when attempting to improve a property's 's resilience to extreme wind.

Structural adaptation measures include ensuring that the roof sheathing and framing is built to transfer lateral loads to the structure's shear walls. Roof overhang's should be avoided, particularly those facing the prevailing winds. The proximity of nearby hazards, including mature trees and overhead cables, should also be increased.

Extreme winds can cause power outages. Considering the importance of continuous power supply with backup generators or renewable site-generated electricity.

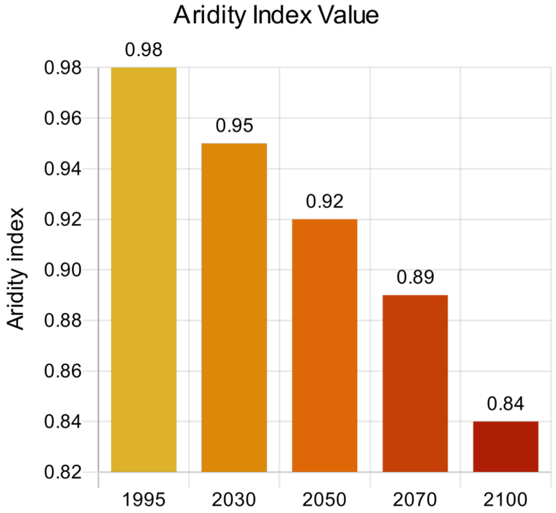
Wind-driven rain is a risk that can influence water penetration of vertical walls and subsequently on dampness in buildings. Extreme wind can also damage above-ground power lines and poles servicing a property.

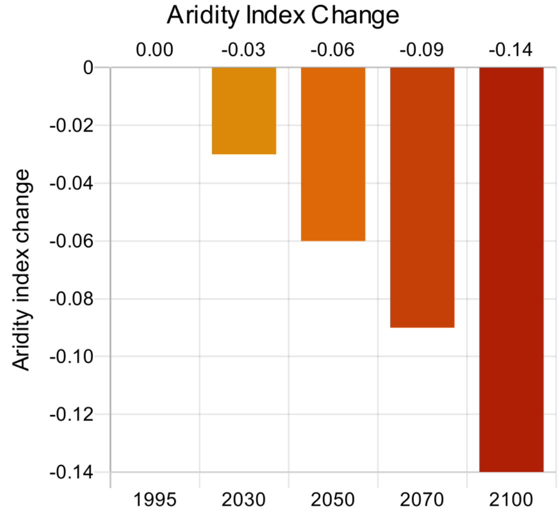
Extreme winds can also impact on flexibly design exteriors of buildings and lead to vibrations and serious structural damage as well as impacting on the comfort of occupants. Window damage is also possible, as well as the loss of integrity of roofing materials.

Aridity

The Aridity Index is an indicator of the dryness/wetness of the climate and resulting available water at your location. It is determined by the relationship between the amount of rain, temperature and evaporation that may occur.

Aridity Index	< 0.05	0.06 - 0.20	0.21 - 0.50	0.51 - 0.65	0.66 - 0.75	> 0.75
Climate Classification	Hyper-arid	Arid	Semi-arid	Dry sub-humid	Humid	Hyper-humid





The result is either a surplus of water or a deficit which translates to an aridity index number. Examine the trend in the aridity index and assess the rate of change. Minor changes (less than a few percent) in percentage from baseline for the index need not be a major concern.

Aridity Risk Scores

There are several adaptation measures that can be adopted to improve the resilience of this site if water availability becomes limited.

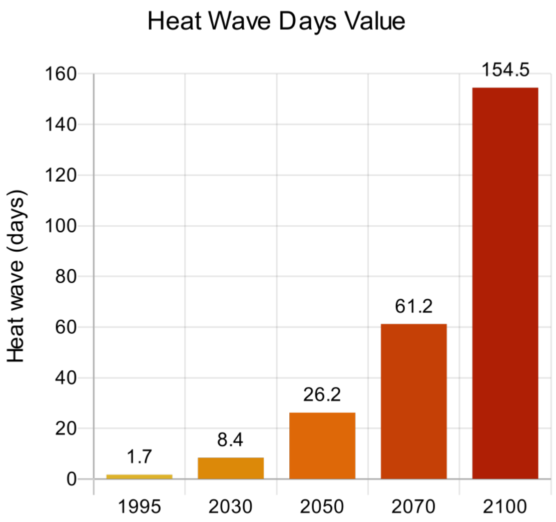
One option is to adopt a rainwater collection system. Monitoring the supply and use of water with meters can also be an effective measure to reduce the chance of running out of water.

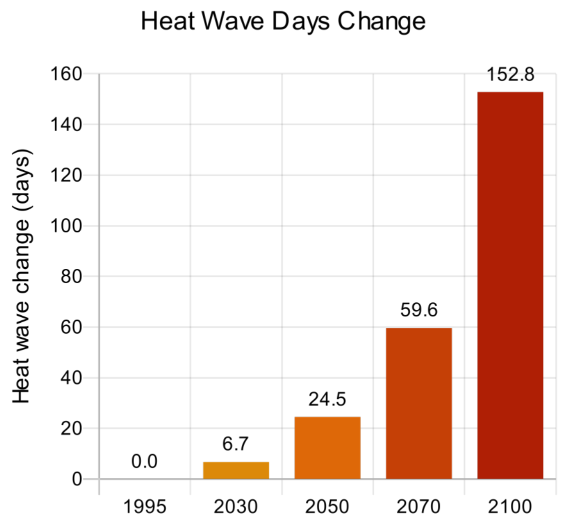
Use water-efficient appliances and bathroom fixtures such as toilets and shower heads that are water saving.

Install a grey-water recycling system. Xeriscape the exterior gardens so that native less water demanding vegetation dominates.

Heat Wave Days

A heatwave event is defined as daily maximum and minimum temperature simultaneously exceeding their respective 90th percentiles of time series in the baseline period for at least three consecutive days. Heatwave days are the total number of days that occur in heatwave events. As a 30-year baseline period is applied, the heatwave days are presented as a multiple-year average.





In most locations, heatwave days will increase over time. At each future time slice year, heatwave days represent the number of days that may occur in heatwave events under future climatic conditions, while the change presented is the number of days compared to the historical (1995) period.

Heat Wave Days Risk Scores

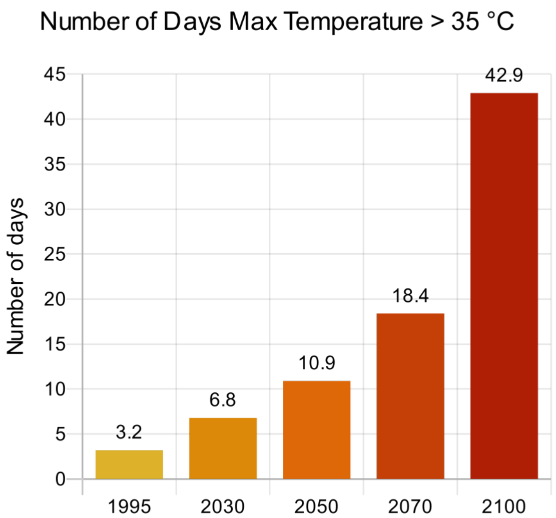
The number of heatwave days may increase. Heatwave days are those which breach the daily maximum and minimum historical 90th percentile ranges. Hence, their changes in air temperature could cause issues with maintaining the appropriate temperatures required at this distribution facility. Nevertheless, adaptation measured can reduce the risks associated with heatwave days.

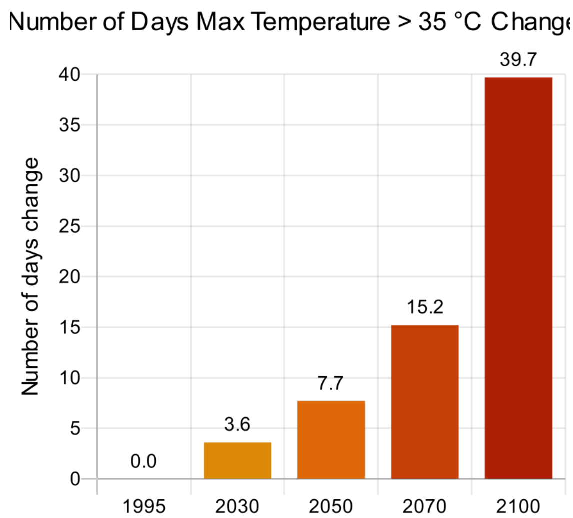
Firstly, ensuring that the building is well-insulated is vital. The efficiency and availability of HVAC (heating, ventilation, and air conditioning) systems can significantly contribute to maintaining ideal temperatures during heatwave days. Hence, the availability of power supply for HVAC systems is necessary to reduce the risks associated with heatwave days. Another measure is to install double-glazed windows with shutters and blinds, and solar chimneys.

Furthermore, invest in roof materials and reflective colours and plant more vegetation to shade your property and surrounding property, if feasible. Another adaptation measure is to paint external walls with light colours to reduce solar heat absorption.

Number of Days Max Temperature > 35 °C

Intensification of hot extremes has continued unabated in recent decades, posing a threat to human health and bringing forth a raft of other socio-economic effects, plus intensifying the degradation of building fabric integrity and thus building service life and its components.





In most locations, days > 35 °C will increase over time. Hot days and changes represent the number of days at each future time slice year that may exceed the historical (1995) 35 °C local daily temperature.

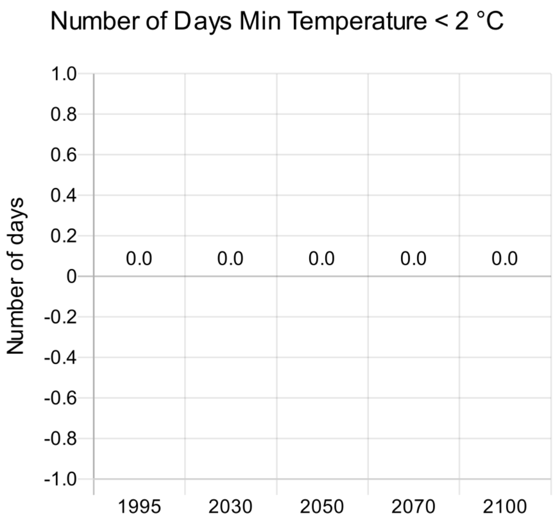
Number of Days Max Temperature > 35 °C Risk Scores

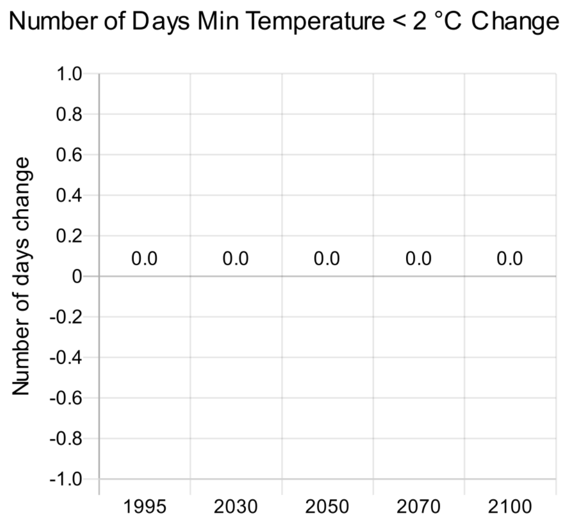
More days above 35 °C will reduce the durability of a property's building materials and affect the indoor climate. Heat changes the expansion dimensions of materials, some are more affected than others, leading misaligned joins during construction, usually with interiors. The direct effect of heat on materials is most apparent in concrete. Preparing concrete on hot days without factoring in additional water requirements will lead to weaker applications. Bricks are also adversely affected in heat and can become brittle. When applied during heat, paint might lead to crinkles and cracks and discolour in intense heat.

Metal, glass, and concrete can be changed slightly to meet specific locational demands. Wood and hot melt adhesives pose a special challenge. They are more prone and susceptible to climate changes and adverse conditions. They need to adhere to different surfaces and withstand various conditions while maintaining their structural integrity. This requirement is aggravated when exposed to climate temperature changes.

Number of Days Min Temperature < 2 °C

Changes in the number of cold days have continued to lessen in recent decades, which may change the functionality and requirements of heating systems in a property. However, extreme cold spells will not end. Therefore, planning for impacts of cold events needs to continue despite a warming climate.





In most locations, days < 2 °C will decrease over time. Therefore, cold days and changes represent the number of days at each future time slice year that will fall below 2 °C the historical (1995) 2 °C local daily temperature.

Number of Days Min Temperature < 2 °C Risk Scores

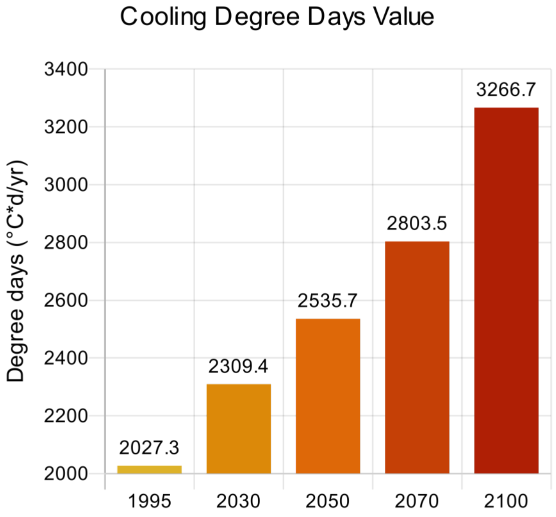
One of the most challenging climates to build for is a cold one. Differences between the outside temperature and the surface temperature can mean that walls, roof and floors form condensate in-between them, thus leading to degradation of the building materials and potentially create hidden sources of fungi and bacteria, leading to an unhealthy indoor environment.

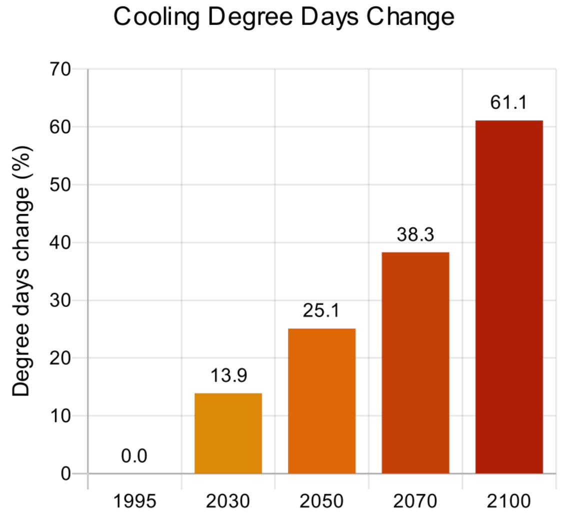
Colder climates benefit from a very low thermal transmittance, thus benefiting from insulation and other designs limiting transmittance. However, such materials may become a maladaptation with warmer winters and significantly warmer hot seasons when heat dissipation can become problematic. Thermal contraction and expansion with changes in cold and hot cycles can also influence the lifecycle of materials.

Even if the average number of cold days decrease in the future, cold spells can still cause sudden interruptions of power systems and snowfalls. They could be damaging to the property.

Cooling Degree Days

Cooling degree days (CDD) is a measure of annual cumulative degrees above a certain temperature threshold. In this report, 22 °C (72 °F) for European countries, and 18 °C (65 °F) for the rest of the world. It is an indicator of the energy demand for cooling buildings. Historical CDD was calculated based on historical daily temperature series data from 1981-2010. Future changes of HDD were calculated based on the ensemble median changes of daily temperature.





With global temperature increase, in most locations, the CDD will increase with time. This may lead to increased costs for summer cooling. The risk score may be increased to reflect the increase of CDD.

Cooling Degree Days Risk Scores

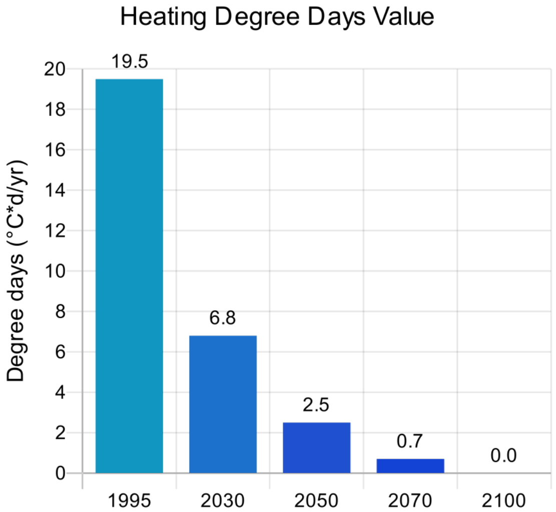
CDD is likely to increase over time at your property. One adaptation option for your property regarding CDD is to invest in naturally ventilating materials. These materials moderate internal temperatures and humidity while reducing the accumulation of moisture and other contaminants. Another adaptation suggestion is to consider the use of renewable energy options (solar, wind) or energy-efficient air conditioning.

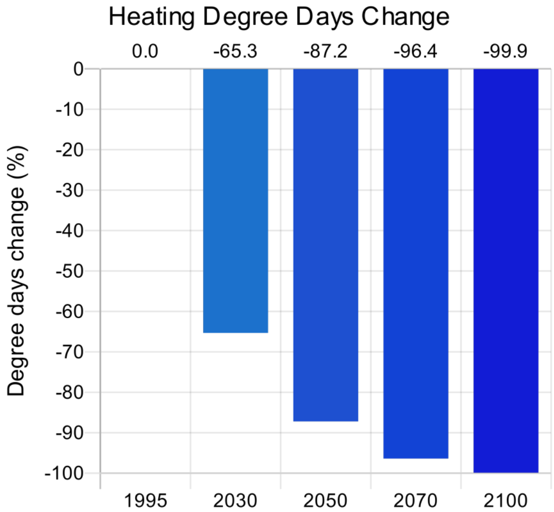
Additional options include using window shades during the day, opening the property's windows, and turning on fans at night to create cross ventilation and encourage the cooler air to enter the building. Vegetation, including gardens, can reduce the property's temperature significantly. Another innovative option is to cover cardboard in aluminium foil and press it into window frames to reflect light and heat during the day.

CDD may suggest an increase in the use of cooling systems and energy demands to maintain the appropriate temperature for the comfort and health of the occupants.

Heating Degree Days

Heating degree days (HDD) is a measure of annual cumulative degrees below a certain temperature threshold. In this report, 15.5 °C (60 °F) for European, countries and 18 °C (65 °F) for the rest of the world. It is an indicator of the energy demand for heating buildings. Historical HDD was calculated based on historical daily temperature series data from 1981 to 2010. Future changes of HDD were calculated based on the GCM ensemble median changes of daily temperature.





With global temperature increase, in most locations, the HDD will decrease with time. This may lead to reduced costs for winter heating. However, this may also result in additional costs for summer cooling. The risk score may be reduced to reflect the decrease of HDD.

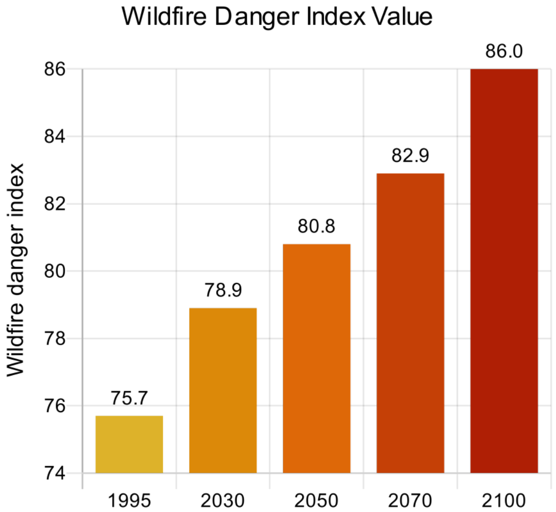
Heating Degree Days Risk Scores

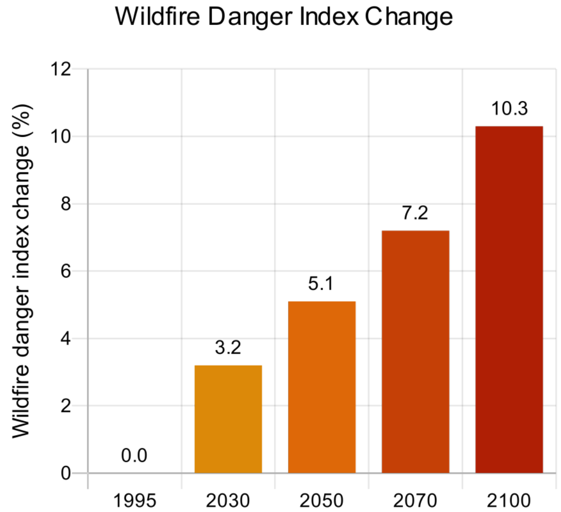
However, with the general degree trend of HDD, cold spells could still cause a sudden and short term heating demand. One possible adaptation option for the unlikely increase in heating degree days for a property may include investment in energy-efficient heating—secondly, is the insulation of the site's walls, floors, and roof.

The installation of double-glazed windows with shutters and blinds and use of heat-absorbing materials will also minimise the effects of heating degree days.

Wildfire

Otherwise known as bushfire, wildland fire, or rural fire are unplanned, unwanted, uncontrolled fires in an area of combustible vegetation starting in rural or urban areas, potentially causing the loss of life and materials.





The probability of wildfire is driven by the combination of dryness, presence of fuel, ambient weather and ignitions (human-caused or natural, such as lightning). Fire weather is typically expressed through some combination of surface air temperature, precipitation, relative humidity, and wind speed. The fire risk values presented represent the probability and change in probability of a wildfire occurring overtime.

Wildfire Risk Scores

Fire may pose a significant threat to a residential property.

With an increasing risk of wildfire, the property owner/investor could ensure that fire protection measures are in place to reduce the risks associated with these events. Fire protection can include actions such as providing adequate fire detection equipment and fire-fighting equipment, including fire hydrants. These measures will improve the protection systems for the occupants and the property.

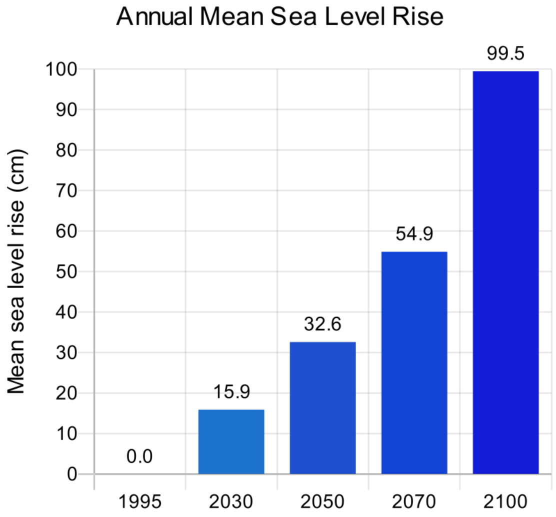
Other adaptation options include the use of appropriate roof vents and lines. Substituting combustible materials such as wood with non-combustible materials like aluminum is also effective.

Further actions include keeping combustible vegetation away from buildings, removing wooden fences, leaf debris and mulch, and selecting drought-resistant plants. Furthermore, install non-combustible siding and store water on-site in case of an emergency or risk reticulated water being available during an extreme event.

Have critical documents and possessions in fireproof storage and easily accessible for removal from the property if evacuation is required.

Annual Mean Sea Level Rise

This measure of slow-onset sea level rise varies across world's coastlines and includes the effects of land ice melt, thermal expansion, and changes in the vertical movement of land (some areas are rising, and others are sinking), among other factors. The rate of sea-level rise, therefore, can vary considerably from one coastal location to another.



The results represent the monthly median sea-level rise in centimeters or inches for your location for future time slices. There are no baseline values as 1995 is considered zero, and all future values represent changes from that year. The result represents the statistical median derived from the ocean GCM monthly median changes in projected sea level.

Annual Mean Sea Level Rise Risk Scores

In an attempt to minimise sea-level rise risks, you may consider a range of adaptation options.

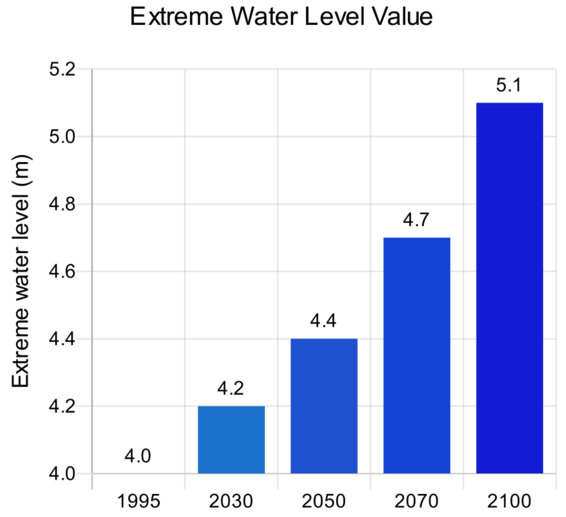
For example, building on elevated land and raising buildings with pier foundations where risk scores become elevated across the time series steps. Other measures include building ditches and other drainage infrastructure and using building materials that can withstand flooding.

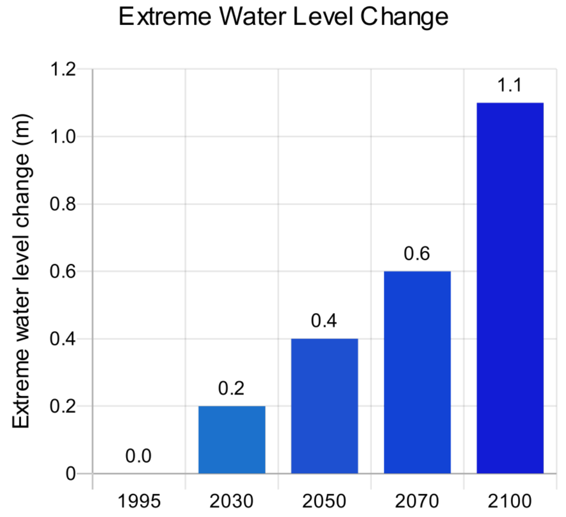
Additionally, place electrical appliances above the flood level. Investing in revegetation and dune restoration can also mitigate the effect of sea level rise on nearby facilities. Finally, prepare for flooding in advance by upgrading resources and emergency supplies and have an evacuation plan for household occupants.

Have critical documents and possessions in fireproof storage and easily accessible for removal from the property if evacuation is required.

Extreme Water Level at the Coast

Extreme water level height from storm tides, sea level rise and change in land movement (either rising, falling or stable), also known as Still High-Water Level at the coast, is the technical term for the potential height of ocean water levels during storms. These high-water events then have the potential to move inland and impact the built and natural environment through what is commonly referred to as a storm surge.





The coastal extreme sea-level elevations (in addition to sea-level rise) often arise with a confluence of events such as exceptional seasonal high tides, wind and waves associated with tropical depressions or extratropical low-pressure systems and coastal bathymetry (the depth to the ocean floor).

Extreme Water Level at the Coast Risk Scores

If the property's risk score steadily increases over the time series steps, you might consider several adaptation actions.

One option is to build physical barriers such as seawalls and green infrastructure (dunes with native sand binding plant species) that will slow the flow of water. Another option is to install flood vents into foundation walls. Perhaps a more extreme alternative is to relocate the property to a higher elevation.

Have well thought out evacuation routes and civil defense kits with fresh water and non-perishable food that is checked and refreshed regularly.

Have critical documents and possessions in fireproof storage and easily accessible for removal from the property if evacuation is required.

Report Glossary and Acronyms

Adaptation: An adjustment that is either planned or unplanned (autonomous) within human and natural systems in response to climatic impacts experienced in the present or anticipated in the future. The adjustment is expected to either reduce the harmful effects or use the climatic impacts' beneficial opportunities.

Baseline: A reference period against which future change is measured. The baseline may refer to climatic or non-climatic conditions and can represent an historical baseline (e.g., 1986-2005), a current baseline (including observable present-day conditions), or a future baseline (that excludes that driver factor of interest). Therefore, multiple baselines are possible, depending on how they are defined.

Climate sensitivity: The amount of global temperature rise that would occur (to a new equilibrium) when atmospheric carbon dioxide concentrations are doubled above pre-industrial levels. In climate impact assessments, the climate sensitivity can be represented as Low, Medium, or High, when generating future climate projections.

Ensemble: A group of climate simulations from multiple climate models used to generate future climate projections. The variations across the various simulations in the ensemble, represented by a range, also estimate the future projections' uncertainty. Ensembles can be made with multiple climate models (to test climate model differences) or by varying the initial conditions for a single climate model (to test internal climate variability).

General Circulation Models (GCMs) (or Global Climate Models): A numerical representation of the global climate system based on the physical, chemical, and biological properties of its components, their interactions and feedback processes, and accounting for all or some of its known properties. Models of varying complexity are in use. Coupled Atmosphere-Ocean General Circulation Models (AOGCMs) represent the climate system near the most comprehensive end of the spectrum currently available. Climate models are applied as a research tool to study and simulate the climate, and for operational purposes, they include monthly, seasonal and inter-annual climate predictions.

Impacts: The manifested effects of climate change on natural and human systems. 'Potential' impacts refer to the total effects that are likely to occur for a given projection of climate change. In contrast, 'residual' impacts are the impacts after considering the effect of adaptation measures to reduce harm or exploit benefits of a projected climate change.

Projection: A possible future evolution of a measurable variable that is typically computed with a model's aid. Projections are different to predictions since they are subject to the inherent uncertainty associated with underlying assumptions about socio-economic and technological developments at global and regional scales in the future, for instance, which are not fully known at present.

Scenario: A plausible, though often simplified narrative, storyline, or description of how the future may develop. This narrative is based on assumptions about driving forces of change and the key relationships, and which must be internally consistent with one another. Future projections can be used to develop these scenarios in addition to other information.

Vulnerability: A measure of the degree to which a natural or human system cannot cope with the projected adverse impacts of climate variability and change. It is a function of the magnitude and rate of climate change and other factors that influence the sensitivity or exposure of the systems and their capacity to adapt to the anticipated changes.

ARI – Annual Recurrence Interval

CMIP5 – Coupled Model Intercomparison Project 5

GCM – General Circulation Model

GHG – Greenhouse gases

IPCC – Intergovernmental Panel on Climate Change

RCP – Representative Concentration Pathway

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About CLIMsystems

CLIMsystems has assembled an excellent team of climate change adaptation and risk assessment experts with a combined experience of over 200 years with projects in over 50 countries.

Our experience includes iconic projects in Australia, Africa, the Middle East, the United States and Canada.

Six members of the extended team (Staff, Associates, and Science Advisors) were part of the large team named as part of the UNFCCC (United Nations Framework Convention on Climate Change) Nobel Peace Prize award in 2007 and, as such, represent the strong scientific underpinning of the CLIMsystems suite of data products, software and services.

CLIMsystems is also a registered member of CTCN (Climate Technology Centre & Network). The CTCN is the operational arm of the UNFCCC Technology Mechanism, hosted by the UN Environment Programme (UNEP) and the UN Industrial Development Organization (UNIDO).

Team members are registered in the United Nations Development Program (UNDP) National Communications Support Programme (NCSP) Roster of Experts, Replace with “the UNFCCC Nairobi Work Programme recognizes our products and services.

CLIMsystems maintains an impressive list of international associates and a scientific advisory panel Chaired by Emeritus Professor Tom Wigley of the University of Adelaide and NCAR (National Center for Atmospheric Research, Boulder, Colorado).

We work to IPCC standards in all our data preparation and validation. We have also contributed to IPCC guidelines as part of much larger scientific teams where peer review is always occurring. For example, our sea-level rise methodology is widely referenced in the IPCC’s publication Constructing Sea-Level Scenarios for Impact and Adaptation Assessment of Coastal Areas: A Guidance Document.

We maintain comprehensive documentation of all of our data applied and processing methods that are all based on peer-reviewed literature.