Glossary

Abrupt Climate Change

The non-linearity of the climate system may lead to abrupt climate change, sometimes called rapid climate change, abrupt events or even surprises. The term "abrupt" often refers to time scales faster than the typical time scale of the responsible forcing. Some possible abrupt events that have been proposed include a dramatic reorganization of the thermohaline circulation, rapid deglaciation and massive melting of permafrost or increases in soil respiration leading to fast changes in the carbon cycle. Others may be truly unexpected (IPCC, 2007a).

Adaptation

Adjustment in natural or human systems in response to actual or expected effects of climate change and variability, which moderates harm or exploits beneficial opportunities. Various types of adaptation exist (e.g. anticipatory and reactive, private and public, autonomous and planned) (IPCC, 2007a).

Adaptation Benefits

The avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures (IPCC, 2007a).

Adaptation Costs

Costs of planning, preparing for, facilitating and implementing adaptation measures, including transition costs (IPCC, 2007a).

Adaptation Mainstreaming

Integrating climate change adaptation considerations and information into policies, programs and operations at all levels of decision making rather than creating new policies or policy instruments. The goal is to make the adaptation process an essential component of existing decision-making and planning frameworks (Adapted from UNDP, 2005).

Adaptive Capacity

The ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences (IPCC, 2007b).

Aerosols

A collection of airborne solid or liquid particles with a typical size of 0.01 to 10 mm that reside in the atmosphere for at least several hours. Aerosols may be of either natural or anthropogenic origin. Aerosols may influence climate in two ways: directly through scattering and absorbing radiation, and indirectly through acting as condensation nuclei for cloud formation or modifying the optical properties and lifetime of clouds (IPCC, 2001).

Air Mass

Synoptic meteorological characterization of the entire body of air and its qualities. Air masses can be determined empirically using a combination of meteorological variables, which include temperature, relative humidity, wind speed, wind direction and barometric pressure (McMichael et al., 2003).

Air Quality Index

The AQI is a communications tool used to report upon current and near term air quality conditions. Some of the pollutants captured in currently reported Canadian AQIs are: sulphur dioxide, ozone, nitrogen dioxide, total reduced sulphur compounds, carbon monoxide and fine and coarse particulate matter. AQI advisories, and the health messages associated with them, are reported to the public and the media at set intervals each day by provinces, territories and some regional districts or municipalities. With this information, individuals can then decide how to reduce the risk to their health, as well as reduce their own personal contribution to air pollution (Health Canada, 2006).

Albedo

The fraction of solar radiation reflected by a surface or object, often expressed as a percentage. Snow-covered surfaces have a high albedo; the surface albedo of soils ranges from high to low; vegetation-covered surfaces and oceans have a low albedo. The Earth's planetary albedo varies mainly through differences in cloudiness, snow, ice, leaf area and land cover changes (IPCC, 2007a).

All-Hazards Approach

Ensures that disaster planning achieves its aims efficiently by collecting information on the full range of threats so subsequent risk management decisions can be made appropriately (Adapted from F/P/T Network on Emergency Preparedness and Response, 2004).

Anthropogenic

Resulting from or produced by human activity (IPCC, 2007a).

Atmosphere

The gaseous envelope surrounding the Earth. The dry atmosphere consists almost entirely of nitrogen and oxygen, together with a number of trace gases such as argon, helium and radiatively active greenhouse gases such as carbon dioxide and ozone. In addition, the atmosphere contains water vapour, clouds and aerosols (McMichael et al., 2003).

AURAMS

A Unified Regional Air-quality Modelling System developed by the Meteorological Service of Canada, Environment Canada (NARSTO, 2004).

Autonomous Adaptation

Adaptation that does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. Also referred to as spontaneous adaptation (IPCC, 2001).

Baseline/Reference

Any datum against which change is measured. "Current baseline" represents observable, present-day conditions. A "future baseline" is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines (IPCC, 2007a).

Botulism

Botulism is a neuroparalytic (muscle-paralyzing) disease caused by a nerve toxin produced by the bacterium *Clostridium botulinum.* There are three forms of naturally occurring botulism: food-borne botulism, caused by ingestion of pre-formed toxin; infant botulism, caused by ingestion of the bacterium which secretes toxin in the intestine; and wound botulism caused by wound infection with the bacterium (CDC, 2005b).

Brucellosis

An infectious disease caused by bacteria of the genus *Brucella,* which is transmitted to humans by ingestion of products from infected animals (i.e. unpasteurized milk products from cows, goats or pigs), by direct contact with infected animals or by inhalation of the bacterium. The symptoms include fever, headache, profuse sweating and chills (PHAC, 2003).

Campylobacter

Genus of bacteria that causes campylobacteriosis, an acute bacterial infection that attacks the digestive system. The bacterium is contracted through ingestion of undercooked meat products contaminated with *Campylobacter,* ingestion of contaminated water or close contact with infected animals. The illness is characterized by vomiting and diarrhea; globally 5 to 14% of reported cases of diarrhea are caused by infection with *Campylobacter* (PHAC, 2003).

Canada-wide Standards (PM and Ozone)

Canada-wide Standards (CWSs) refer to environmental quality and human health goals agreed upon by provinces, territories and the federal government through the Canadian Council of Ministers of the Environment. The health impacts attributed to PM and O_3 have been observed at low concentrations and the CWSs attempt to reduce concentrations of these chemicals to safer levels (CCME, 2000).

Carbon Dioxide (CO_2)

A naturally occurring gas, also a by-product of burning fossil fuels and biomass, as was well as from land use changes and other industrial processes. It is the principal anthropogenic greenhouse gas that affects the Earth's radiative balance. It is the reference gas against which other greenhouse gases are measured and therefore has a Global Warming Potential of 1 (IPCC, 2001).

Cholera

An intestinal infection, caused by the bacterium *Vibrio cholerae,* which results in frequent watery stools, cramping abdominal pain and eventual collapse from dehydration. It is thought that zooplankton in cold waters may carry a large number of cholera vibrios on their bodies. Zooplankton feed by grazing on phytoplankton, which bloom with sunshine and warm conditions. Thus, a phytoplankton (algal) bloom may lead to an increase in the population of zooplankton that carry the vibrios (McMichael et al., 2003).

Climate

Climate in a narrow sense is usually defined as the average weather, also defined in statistical terms as the mean and variability of relevant variables and over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization (WMO). Variables taken into account most often include surface temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system (IPCC, 2007a).

Climate Change

Climate change refers to a change in the state of the climate that can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use. Note that the United Nations Framework Convention on Climate Change (UNFCCC), in its Article 1, makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes (IPCC, 2007a).

Climate Model

A numerical representation of the 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. Coupled Atmosphere–Ocean General Circulation Models (AOGCMs) provide a representation of the climate system that is the most comprehensive currently available. Climate models are applied as a research tool to study and simulate the climate, and for operational purposes, including monthly, seasonal and interannual climate predictions (IPCC, 2007a).

Climate Prediction (or Climate Forecast)

The result of an attempt to produce an estimate of the actual evolution of the climate in the future (e.g. at seasonal, interannual or long-term time scales) (IPCC, 2007a).

Climate Projection

A projection of the response of the climate system to emission or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based upon simulations by climate models. The use of emission/concentration/radiative forcing scenarios and attendant assumptions about, for example, future socio-economic and technological developments that may or may not be realized introduce substantial uncertainty in climate projections and distinguish them from climate predictions (IPCC, 2007a).

Climate Scenario

A plausible and often simplified representation of the future climate, based on an internally consistent set of climatological relationships and assumptions in radiative forcing, which has been constructed for explicit use in investigating the potential consequences of anthropogenic climate change, often serving as input to impact models. Climate projections are often the raw material for constructing climate scenarios, but climate scenarios usually require additional information, such as about the observed current climate. A “climate change scenario” is the difference between a climate scenario and the current climate (IPCC, 2007a).

Climate Variability

Variations in the mean and other statistics (e.g. standard deviations, the occurrence of extremes) of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system or to variations in natural or anthropogenic external forcing (IPCC, 2007a).

Cold Wave

Period of unusually high atmospheric-related cold stress (Environment Canada, 2002a) that may have adverse health consequences for the affected population.

Coping Ability

Short-term capacity or ability to manage an event or hazard (Smit and Wandel, 2006).

Coping Range

The variation in climatic stimuli that a system can absorb without producing significant impacts. Also known as coping ability or capacity (IPCC, 2001).

Coping Resources

The individual and community skills, materials, equipment or services that can be used to meet the demands created by an incident. Also can include municipal departments, emergency services, private companies, volunteers, and other formal and informal sources (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Critical Infrastructure

Physical and information technology facilities, networks, services and assets which, if disrupted or destroyed, would have a serious impact on the health, safety, security or economic well-being of a population or the effective functioning of governments in Canada (Public Safety and Emergency Preparedness Canada (PSEPC), 2007b).

Cryosphere

The component of the climate system consisting of all snow, ice and frozen ground (including permafrost) on and beneath the surface of the Earth and ocean (IPCC, 2007a).

Cryptosporidium

A genus of parasites of the intestinal tracts of fishes, reptiles, birds and mammals. A particular species isolated in humans has been identified as *Cryptosporidium parvum.* Cryptosporidiosis, or cryptosporidium infection, is today recognized as an important opportunistic infection, especially in immunocompromised hosts (McMichael et al., 2003).

Dengue Fever

An infectious viral disease spread by mosquitoes, often called breakbone fever because it is characterized by severe pain in joints and back. Subsequent infections of the virus may lead to dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS), which may be fatal (IPCC, 2001).

Determinants of Health

At every stage of life, health is determined by complex interactions between social and economic factors, the physical environment and individual behaviour. These factors are referred to as 'determinants of health'. Key determinants include income and social status, social support networks, education and literacy, employment/working conditions, social environments, physical environments, personal health practices and coping skills, healthy child development, biology and genetic endowment, health services, gender and culture. It is the combined influence of the determinants of health that determines health status (PHAC, 2007).

Disaster

An event that exceeds the ability of the local community to cope with the harmful effects and requires extraordinary response and recovery measures (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Disaster Mitigation

Prevention of natural hazards from becoming natural disasters. It includes policies and actions taken before or after a disaster to reduce the impacts on people and property, such as building public awareness and support; development of local and regional plans for land use to prevent inappropriate development in hazardous areas; and changing building codes and standards to protect people, property and infrastructure from extremes (PSEPC, 2007a).

Diurnal Temperature Range

The difference between the maximum and minimum temperature during a day (IPCC, 2001).

Dose–Response

Association between dose and the incidence of a defined histological effect in an exposed population. Dose-response relationships are used to determine the probability of a specific outcome or disease, or risk of a disease, by extrapolating from high doses to low doses and from laboratory animals to humans, and using mathematical models that define risk as a function of exposure dose (McMichael et al., 2003).

Downscaling

A method that derives local- to regional-scale (10 to 100 km) information from larger scale models or data analyses (IPCC, 2007a).

Drought

Agricultural drought relates to moisture deficits in the topmost 1 metre or so of soil (the root zone) that affect crops; meteorological drought is mainly a prolonged deficit of precipitation; and hydrologic drought is related to below-normal streamflow, lake and groundwater levels (IPCC, 2007a).

Ecological Study

An epidemiological study which seeks to find population- or community-level associations between exposure and the occurrence of disease (Coggon et al., 1997).

Ecosystem

The interactive system formed from all living organisms and their abiotic (physical and chemical) environment within a given area. Ecosystems cover a hierarchy of spatial scales and can comprise the entire globe, communities of plants and animals corresponding to specific environmental conditions at the continental scale or small, well circumscribed systems such as a small pond (IPCC, 2007a).

Ecosystem Approach (Ecosystem-Based Management)

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. It applies appropriate scientific methodologies focussed on the essential structure, processes, functions and interactions among organisms and their environment, and recognizes that humans, with their cultural diversity, are an integral component of many ecosystems. The ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Priority targets are conservation of biodiversity and of the ecosystem structures and functioning, in order to maintain ecosystem services (IPCC, 2007a).

Ecumene

Generally refers to land where people have made their permanent home, and to all work areas that are considered occupied and used for any economic purpose (Statistics Canada, 2007).

El Niño-Southern Oscillation

The term "El Niño" was initially used to describe a warm-water current that periodically flows along the coast of Ecuador and Peru, but now refers to a basin-wide warming of the tropical Pacific east of the dateline. This oceanic event is associated with fluctuation of a global-scale tropical and subtropical surface pressure pattern, in an event called the Southern Oscillation. This coupled atmosphere-ocean phenomenon, with preferred time scales of 2 to about 7 years, is collectively known as El Niño-Southern Oscillation, or ENSO. During an ENSO event, the prevailing trade winds weaken, reducing upwelling and altering ocean currents such that the sea surface temperatures warm, further weakening the trade winds. This event has great impact on the wind, sea surface temperature and precipitation patterns in the tropical Pacific, with effects throughout the Pacific region and in many other parts of the world, through global teleconnections. The cold phase of ENSO is called La Niña (IPCC, 2007a).

Emergency

Serious mishaps that involve more people, as victims and responders, than accidents, but do not overwhelm the community to the point of being a disaster (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Emergency Mandate

Organizations with an emergency mandate consist of those with emergency relief services as part of their constitutional mission and/or their established tradition of community service delivery (Canadian Red Cross et al., n.d.).

Emergency Response

Actions taken in anticipation of, during and immediately after an emergency to ensure that its effects are minimized and that people affected are given immediate relief and support (Canadian Red Cross et al., n.d.).

Emission Scenario

A plausible representation of the future development of emissions of substances that are potentially radiatively active (e.g. greenhouse gases, aerosols), based on a coherent and internally consistent set of assumptions about driving forces (e.g. demographic and socio-economic development, technological change) and their key relationships. Concentration scenarios, derived from emission scenarios, are used as input to a climate model to compute climate projections. Since 1992, IPCC has published two series of emission scenarios, most recently in the IPCC *Special Report on Emission Scenarios* (Nakicenovic and Swart, 2000; IPCC, 2007a).

Epidemiology

The science of public health and preventative medicine that studies the distribution and determinants of health-related states or events in specific populations, and that applies study findings to control and/or mitigate health problems (Coggon et al., 1997).

Escherichia coli (E. coli)

A bacterium that produces infection characterized by acute bloody diarrhea and abdominal cramps. Food-borne transmission occurs via contaminated meat or produce and unpasteurized products. Water-borne transmission occurs through swimming in contaminated bodies of water or drinking inadequately chlorinated water (CDC, 2005b), as was the case with the widely reported *E. coli* outbreak in Walkerton, Ontario, in 2000.

Evaporation

The process by which a liquid becomes a gas (IPCC, 2001).

Evapotranspiration

The combined process of water evaporation from the Earth's surface and transpiration from vegetation (IPCC, 2007a).

Exposure

The amount of a factor to which a group or individual was exposed; sometimes contrasted with dose (the quantity of material entering an exposed person). Dose is not the same as exposure (McMichael et al., 2003).

Extirpation

The disappearance of a species from part of its range; local extinction (IPCC, 2007a).

Extreme Event

An occurrence that can cause severe damage within a community, including property destruction, personal injury and death (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Extreme Weather Events

An event that is rare within its statistical reference distribution at a particular place. Definitions of "rare" vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile. Examples of extreme weather events include floods and droughts (IPCC, 2007a).

Feedback

An interaction mechanism between processes in a system, which results when an initial process triggers changes in a second process and that in turn influences the initial one. A positive feedback intensifies the original process, and a negative feedback reduces it (IPCC, 2007a).

Food-Borne Diseases

Diseases that are infectious, parasitic or toxic in nature and that are acquired through the ingestion of contaminated food (CDC, 2005a).

Food-Bourne Illnesses

See food-borne diseases.

Food Security

A situation that exists when people have secure access to sufficient amounts of safe and nutritious food for normal growth, development and an active and healthy life. Food insecurity may be caused by the unavailability of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level (IPCC, 2007a).

Gastroenteritis

Inflammation of the stomach and small and large intestines. Viral gastroenteritis is an infection caused by a variety of viruses that results in vomiting or diarrhea. The pathogens that cause gastroenteritis may be spread through direct or indirect contact with an infected individual, as well as through the ingestion of contaminated food or beverages (CDC, 2005b).

General Circulation Model

A numerical representation of the 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. The climate system can be represented by models of varying complexity (i.e. for any one component or combination of components a hierarchy of models can be identified, differing in such aspects as the number of spatial dimensions; the extent to which physical, chemical or biological processes are explicitly represented; or the level at which empirical parameterizations are involved) (IPCC, 2001).

Giardia

A protozoan parasite that causes giardiasis, also known as beaver fever. Symptoms include chronic diarrhea and abdominal cramps. Transmission occurs person-to-person where personal hygiene may be poor, or through the ingestion of *Giardia* cysts in fecally contaminated water or food (PHAC, 2003).

Glacier

A mass of land ice flowing downhill (by internal deformation and sliding at the base) and constrained by the surrounding topography (e.g. the sides of a valley or surrounding peaks); the bedrock topography is the major influence on the dynamics and surface slope of a glacier. A glacier is maintained by accumulation of snow at high altitudes, balanced by melting at low altitudes or discharge into the sea (IPCC, 2001).

Global Positioning System (GPS)

A hand-held radio navigation system that allows land, sea and airborne users to determine their exact location, velocity and time 24 hours a day, in all weather conditions, anywhere in the world (McMichael et al., 2003).

Greenhouse Effect

The process in which the absorption of infrared radiation by the atmosphere warms the Earth. In common parlance, the term "greenhouse effect" may be used to refer either to the natural greenhouse effect, due to naturally occurring greenhouse gases, or to the enhanced (anthropogenic) greenhouse effect, which results from gases emitted as a result of human activities (IPCC, 2007a).

Greenhouse Gas (GHG)

Gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere itself, and by clouds. Water vapour (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere. A number of entirely human-made greenhouse gases in the atmosphere exist, such as the halocarbons and other chlorine- and bromine-containing substances (IPCC, 2007a).

Ground-Level Ozone (O_3)

Ground-level (tropospheric) ozone (O_3) is a colorless and highly irritating gas that forms just above the earth's surface when nitrogen oxides (NOx) and volatile organic compounds (VOCs) react in sunlight and stagnant air. Exposure to O_3 has been linked to premature mortality and a range of morbidity health end-points such as hospital admissions and asthma symptom days, as well as negative impacts on vegetation and synthetic materials (Environment Canada, 2006b). *See also ozone.*

Hantavirus

A virus in the family Bunyaviridae that causes a type of haemorrhagic fever. It is thought that humans catch the disease mainly from infected rodents, either through direct contact with the animals or by inhaling or ingesting dust that contains their dried urine (IPCC, 2001).

Hazard

The potential for a negative interaction between extreme events (of a natural or technological origin) and the vulnerable parts of the population. Three factors combine to create a hazard: the events that can impact on a community, the vulnerability of a population to such impacts, and the resources of the community to cope with those impacts (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Heat Island Effect

The effect whereby a region within an urban area is characterized by ambient temperatures higher than those of the surrounding area because of the absorption of solar energy by materials like asphalt (IPCC, 2001).

Heat Wave

A period of unusually high atmospheric-related heat stress (Environment Canada, 2002a) that may have adverse health consequences for the affected population. Environment Canada considers a heat wave to occur when there are 3 consecutive days when the maximum temperature is 32°C or higher.

Humidex Advisory

Advisory issued by Environment Canada when temperatures are expected to reach or exceed 30°C and the humidex values are expected to exceed 40°C. Humidex values are intended to represent the effect that high humidity and high temperatures have on the human body. Comfort levels for humidex readings are: 20–29 (comfortable), 30–39 (varying degrees of discomfort), 40–45 (almost everyone is uncomfortable), and +45 (many types of work and exercise should be restricted) (Environment Canada, 2006a).

Ice Dam

An accumulation of broken river or sea ice caught in a narrow channel. Also known as an ice jam (IPCC, 2001).

Impact

The adverse and beneficial effects of climate change (and variability) on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts: potential impacts are those that may occur given a projected change in climate, without considering adaptation; residual impacts are the impacts of climate change that would occur after adaptation is taken into account (IPCC, 2007a).

Infectious Diseases

Any disease that can be transmitted from one person to another. This may occur by direct physical contact, by common handling of an object that has picked up infective organisms, through a disease carrier, or by spread of infected droplets coughed or exhaled into the air (IPCC, 2001).

Infrastructure

The basic equipment, utilities, productive enterprises, installations and services essential for the development, operation and growth of an organization, city or nation (IPCC, 2001).

Intergovernmental Panel on Climate Change (IPCC)

A panel established by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) in 1988 to assess scientific, technical and socio-economic information relevant for the understanding of climate change, its potential impacts and options for adaptation and mitigation. It has three working groups (climate science; vulnerability, impacts and adaptation; mitigation) and a task force (on national greenhouse gas inventories) (IPCC, 2007a).

Invasive Species

An introduced species that invades natural habitats (IPCC, 2001).

Ixodes scapularis

Hard tick belonging to the family Ixodidae. These organisms transmit Lyme disease, a zoonotic bacterial infection. *See also Lyme disease* (McMichael et al., 2003).

Landslide

A mass of material that has slipped downhill by gravity, often assisted by water when the material is saturated; rapid movement of a mass of soil, rock or debris down a slope (IPCC, 2001).

Legionella

See Legionnaire's disease.

Legionnaire's Disease

The more severe form of legionellosis infection, caused by the bacterium *Legionella pneumophila.* Symptoms are consistent with pneumonia, and include fever, chills and cough. Infection occurs through the inhalation of mist or vapour contaminated with the bacterium, which thrives in hot-water environments like those found in hot tubs, hot water tanks, or parts of the air conditioning systems in large buildings (CDC, 2005b).

Leptospirosis

Bacterial infection of humans by the genus *Leptospira.* Symptoms include high fever, jaundice, severe muscular pains and vomiting. Transmission is associated with contact with infected animals or water contaminated with rat urine. Also known as Weil's disease (McMichael et al., 2003).

Literature Review

A comprehensive survey of publications in a specific field of study or related to a particular line of research, usually in the form of a list of references or an in-depth review of key works. The first section of most research articles is usually devoted to a review of the previously published literature on the topic addressed in the article (Kovats et al., 2003).

Lyme Disease

A zoonotic bacterial infection caused by the spirochaete *Borrelia burgdoferi* and transmitted by hard ticks of the genus *Ixodes*. The main animal reservoir hosts for Lyme disease are wild deer as well as domesticated pets (McMichael et al., 2003).

Maladaptation

Any deliberate adjustments in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead (IPCC, 2001).

Malaria

Endemic or epidemic parasitic disease caused by four species of the protozoan genus *Plasmodium* that are transmitted to humans by the bite of female *Anopheles* mosquitoes. Disease is characterized by high fever attacks and systemic disorders and is responsible for approximately two million deaths every year, 90% of which occur in Sub-Saharan Africa. Malaria is the most serious vector-borne disease in the world (McMichael et al., 2003).

Meta-Analysis

The process of using statistical methods to combine the results of different independent studies (McMichael et al., 2003).

Methane

A hydrocarbon that is a greenhouse gas produced through anaerobic (without oxygen) decomposition of waste in landfills, animal digestion, decomposition of animal wastes, coal production and incomplete fossil-fuel combustion. It is one of the six gases to be mitigated under the Kyoto Protocol (WHO, 2003).

Microclimate

In climatology: localized climate, incorporating physical processes in the atmospheric boundary layer. The boundary layer is the lowest 100 to 200 m of the atmosphere and the part of the troposphere that is directly influenced by the Earth's surface. For example, atmospheric humidity is influenced by vegetation, ambient air temperatures by buildings and roads etc. In ecology: climatic conditions in the environmental space occupied by a species, a community of species or an ecosystem. For example, on mountain slopes, temperatures experienced by plants differ depending on the direction of the slope. Similarly, in forests, air temperature varies according to canopy cover and height. In many cases, such differentials are crucial for species survival and longevity (McMichael et al., 2003).

Mitigation (climate change)

In the context of climate change, mitigation is an anthropogenic intervention to reduce the sources or enhance the sinks of greenhouse gases (IPCC, 2001).

Morbidity

Rate of occurrence of disease or other health disorder within a population, taking account of the age-specific morbidity rates. Health outcomes include chronic disease incidence/prevalence, rates of hospitalization, primary care consultations, disability-days (i.e. days when absent from work) and prevalence of symptoms (IPCC, 2001).

Mortality

Rate of occurrence of death within a population within a specified time period; calculation of mortality takes account of age-specific death rates, and can thus yield measures of life expectancy and the extent of premature death (IPCC, 2001).

National Framework for Health Emergency Management

In 2001, the Federal, Provincial and Territorial Ministers of Health recognized the necessity for a more integrated and coordinated strategic plan for emergency management in the health and social services sectors across Canada. The Deputy Ministers of Health, through the Advisory Committee on Population Health and Health Security (ACPHHS) and the Federal/Provincial/Territorial Networks for Emergency Preparedness and Response, tasked the Council of Health Emergency Management Directors (CHEMD) to develop a pan-Canadian framework for health emergency management. A key outcome was the development of the National Framework for Health Emergency Management, which provides a set of guiding principles for the development of an integrated and comprehensive health emergency management system in Canada(F/P/T Network on Emergency Preparedness and Response, 2004).

Nitrous Oxide (N_2O)

A powerful greenhouse gas emitted through soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production and biomass burning. One of the six greenhouse gases to be curbed under the *Kyoto Protocol* (McMichael et al., 2003).

Non-Market Impacts

Impacts that affect ecosystems or human welfare, but that are not directly linked to market transactions (e.g. an increased risk of premature death) (IPCC, 2001).

"No Regrets" Policy

A policy that would generate net social benefits whether or not there is anthropogenic climate change (IPCC, 2001).

North Atlantic Oscillation (NAO)

The North Atlantic Oscillation consists of opposing variations of barometric pressure near Iceland and near the Azores. On average, a westerly current, between the Icelandic low pressure area and the Azores high pressure area, carries cyclones with their associated frontal systems toward Europe. However, the pressure difference between Iceland and the Azores fluctuates on time scales of days to decades, and can be reversed at times (IPCC, 2001).

Ozone (O_3)

Ozone, the triatomic form of oxygen, is a gaseous atmospheric constituent. In the troposphere, it is created both naturally and by photochemical reactions involving gases resulting from human activities (photochemical smog). In high concentrations, tropospheric ozone can be harmful to a wide range of living organisms. Tropospheric ozone acts as a greenhouse gas. In the stratosphere, ozone is created by the interaction between solar ultraviolet radiation and molecular oxygen. Stratospheric ozone plays a decisive role in the stratospheric radiative balance. Depletion of the stratospheric ozone, due to chemical reactions that may be enhanced by climate change, results in an increased ground-level flux of ultraviolet (UV) B radiation (IPCC, 2001). *See also ground-level ozone.*

Pandemic

Epidemic occurring over a very wide area, crossing international boundaries and usually affecting a large number of people (McMichael et al., 2003).

Particulate Matter (PM)

Very small solid exhaust particles emitted during the combustion of fossil and biomass fuels. Particulates may consist of a wide variety of substances. Of greatest concern for health are particulates of less than or equal to 2.5 micrometres in diameter, usually designated as $PM_{2.5}$ (IPCC, 2001).

Parts Per Million (ppm)

Parts per million; unit of concentration often used when measuring levels of pollutants in air, water, body fluids, etc. One ppm is one part in one million by volume (McMichael et al., 2003).

Pathogen

An agent that causes disease, such as bacteria, viruses, algae, fungi and protozoa (Health Canada, 2007).

Permafrost

Perennially frozen ground that occurs wherever the temperature remains below 0°C for many years (IPCC, 2001).

Phenology

The study of natural phenomena that recur periodically (e.g. development stages, migration) and their relation to climate and seasonal changes (IPCC, 2007a).

Policy Instruments

The means to address a problem and achieve desired policy goals that governments can use to change socio-economic structures, and individual and collective behaviours. Instruments include provision of information, voluntary guidelines and codes and standards, regulations, and market-based mechanisms (e.g. emissions trading schemes, water pricing and allocation schemes) (UNDP, 2005).

Population Health

A measure of the health status of populations, proposed during the 1990s to selectively replace the use of the terms “human health,” which is more restrictive, and public health which also encompasses preventative and curative measures and infrastructures (McMichael et al., 2003).

Precautionary Principle

Where there are reasonable grounds to believe that exposure to an agent may cause serious or irreversible damage to human health, decision makers should take cost-effective precautionary measures, even if some cause and effect relationships are not fully established scientifically. Where possible, strive to anticipate and prevent health risks rather than merely control those that already exist (Health Canada, 2000).

Preparedness

Developing and readying response and recovery actions to increase the community's ability to respond to future impacts (Adapted from the F/P/T Network on Emergency Preparedness and Response, 2004).

Prevention

A method of averting health problems (e.g. disease, injury) through interventions. Preventing and reducing the incidence of illness and injury may be accomplished through three mechanisms: activities geared toward reducing factors leading to health problems; activities involving the early detection of, and intervention in, the potential development or occurrence of a health problem; and activities focusing on the treatment of health problems and the prevention of further deterioration and recurrence (F/P/T Network on Emergency Preparedness and Response, 2004).

Proactive Adaptation

Adaptation that takes place before impacts of climate change are observed. Also referred to as anticipatory adaptation (IPCC, 2007a).

Rabies

Rabies is a viral disease of mammals often transmitted through the bite of an infected animal. There is a vaccine for the rabies virus, which affects the central nervous system. Early symptoms are non-specific and include fever, headache and malaise, and later symptoms are neurological in nature. Death usually occurs within days of the onset of symptoms (CDC, 2005b).

Recovery

Actions taken after a disaster to restore critical systems and return a community to pre-disaster conditions which involves the physical, social and economic components of the community (F/P/T Network on Emergency Preparedness and Response, 2004).

Recurrence Interval

Also called return period, it is the average time until the next occurrence of a defined event. When the time to the next occurrence has a geometric distribution, the return period is equal to the inverse of probability of the event occurring in the next time period, that is, $T = 1/P$, where T is the return period, in number of time intervals, and P is the probability of the next event's occurrence in a given time interval (AMS, 2000).

Reinsurance

The transfer of a portion of primary insurance risks to a secondary tier of insurers (reinsurers); essentially "insurance for insurers" (IPCC, 2001).

Resilience

Amount of change a system can undergo without changing state (IPCC, 2001).

Resource-Reliant Communities

Resource reliance is a measure of the relative importance of a resource sector (or sectors) to a particular community, specifically in relation to the employment income directly generated by the exploitation, processing and (in some cases) distribution of resources. Based on 2001 Census information and for comparative analysis, categories of resource reliant communities range from "moderately reliant" (30-49.9% of employment income derives from resource activity) to "solely reliant" (80% and above) (Atlas of Canada, 2006).

Response to Natural Hazards

Actions taken immediately before, during and after a disaster to protect people and property and to enhance recovery, such as emergency public communication, search and rescue, and medical assistance (PSEPC, n.d.).

Risk

Risk refers to the uncertainty that surrounds future events and outcomes. It is the level of exposure to uncertainties that an organization must understand and effectively manage. Risk is the expression of the likelihood of a future event occurring as well as its potential to influence the achievement of an organization's objectives (Health Canada, 2005).

Risk Management

Risk management is about making decisions involving uncertain future situations. Risk management is the systematic process – the practices and procedures – that an organization uses to manage the risks it faces. It is about setting a preferred course of action under uncertainty by identifying, assessing, understanding, acting on and communicating risk issues (Health Canada, 2005).

Rodent-Borne Disease

Diseases transmitted by rodents through close contact with humans, either indirectly or directly. Diseases can be spread indirectly to humans by way of ticks, mites and fleas that transmit the infection to humans after feeding on infected rodents. Direct transmission includes bite wounds, consuming food or water that is contaminated with rodent feces, coming into contact with surface water contaminated with rodent urine, or by breathing in germs that may be present in rodent urine or droppings that have been stirred into the air (CDC, 2006).

Salmonella

A group of bacteria that cause acute infectious disease with sudden onset of abdominal pain, diarrhea, nausea and vomiting. Transmission occurs by ingestion of contaminated foods, contact with infected animals (i.e. reptiles and birds), or fecal-oral person-to-person transmission. Most persons recover without treatment (PHAC, 2003).

Scenario

A plausible and often simplified description of how the future may develop based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections, but are often based on additional information from other sources, sometimes combined with a narrative storyline (IPCC, 2007a).

Sea Ice

Any form of ice found at sea that has originated from the freezing of sea water. Sea ice may be discontinuous pieces (ice floes) moved on the ocean surface by wind and currents (pack ice), or a motionless sheet attached to the coast (land-fast ice). Sea ice less than 1 year old is called first-year ice. Multi-year ice is sea ice that has survived at least one summer melt season (IPCC, 2007a).

Sea Level Rise

An increase in the mean level of the ocean. Eustatic sea level rise is a change in global average sea level brought about by an increase in the volume of the world ocean. Relative sea level rise occurs where there is a local increase in the level of the ocean relative to the land, which might be due to ocean rise and/or land level subsidence. In areas subject to rapid land level uplift, relative sea level can fall (IPCC, 2007a).

Sensitivity

Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate-related stimuli. The effect may be direct (e.g. a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g. damages caused by an increase in the frequency of coastal flooding due to sea level rise) (IPCC, 2007a).

Shigella

Family of bacteria that cause shigellosis in humans, which is characterized by fever, stomach cramps and diarrhea that is often bloody. Transmission of *Shigella* occurs through ingestion of contaminated food, by swimming in or drinking contaminated water, or through fecal-oral person-to-person transmission (CDC, 2005b).

Social Capital

The aggregate of actual or potential resources that can be mobilized through social relationships and membership in social networks (Nahapiet and Ghoshal, 1998, as cited in Resilience Alliance, 2007).

SRES Scenarios

The storylines and associated population, Gross Domestic Product (GDP) and emissions scenarios associated with the *Special Report on Emissions Scenarios* (SRES) (Nakicenovic et al., 2000), and the resulting climate change and sea-level rise scenarios. Four families of socio-economic scenarios (A1, A2, B1 and B2) represent different world futures in two distinct dimensions: a focus on economic versus environmental concerns and global versus regional development patterns (IPCC, 2007a).

Stakeholder

A person or an organization that has a legitimate interest in a project or entity, or would be affected by a particular decision (IPCC, 2007a).

Storm Surge

The temporary increase, at a particular locality, in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/or strong winds). The storm surge is defined as being the excess above the level expected from the tidal variation alone at that time and place (IPCC, 2007a).

Stratosphere

Highly stratified region of atmosphere above the troposphere extending from about 10 km (ranging from 9 km in high latitudes to 16 km in the tropics on average) to about 50 km (IPCC, 2001).

Surge Capacity

Refers to a system's ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, and services in the event of large-scale emergencies or disasters (USDHHS, n.d.).

Sustainable Development

Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (IPCC, 2001).

Synoptic

Relating to or displaying atmospheric and weather conditions as they exist simultaneously over a broad area (IPCC, 2001).

Synoptic Air Mass Identification

Assessing the meteorological quality of the entire atmosphere; methods used to analyze relationships between total atmospheric conditions and the surface environment (McMichael et al., 2003).

System

An entity comprised of diverse but interrelated components that function as a complex whole. Examples include the climate system, ecosystems and market economies (Kump et al., 2004).

Threshold

The level of magnitude of a system process at which sudden or rapid change occurs. It is also a point or level at which new properties emerge in an ecological, economic or other system, invalidating predictions based on mathematical relationships that apply at lower levels (IPCC, 2007a).

Tools (for adaptation)

A generic term that refers to methodologies, guidelines and simplified processes that enable stakeholders to assess the implications of climate change impacts and relevant adaptation options in the context of their operating environment. Tools come in a variety of formats and have diverse applications: cross-cutting or multidisciplinary (e.g. climate models, scenario-building methods, stakeholder analysis, decision-support tools, decision-analytical tools) to specific sectoral applications (e.g. crop or vegetation models, methods for coastal zone vulnerability assessment) (Adapted from UNFCCC, n.d.)

Toxoplasma gondii

See toxoplasmosis.

Toxoplasmosis

A disease caused by the single-celled parasite *Toxoplasma gondii,* which is transmitted through ingestion of contaminated food or water, or through contact with cat feces. Most healthy individuals do not exhibit symptoms; however, pregnant women and individuals with compromised immune systems should exhibit caution (CDC, 2005b).

Traditional Knowledge

Various systems of knowledge, practice and belief gained through experience and culturally transmitted among members and generations of a community (ACIA, 2005).

Trichinella

See trichinosis.

Trichinosis

Also called trichinellosis. A disease caused by eating raw or undercooked meat of animals infected with the larvae of the roundworm *Trichinella.* Initial symptoms include nausea, diarrhea, vomiting, fatigue and fever. If infection is heavy, cardiovascular problems and, in severe cases, death may result (CDC, 2005b).

Troposphere

The lowest part of the atmosphere from the surface to about 10 km in altitude in mid-latitudes (ranging from 9 km in high latitudes to 16 km in the tropics on average) where clouds and weather phenomena occur. In the troposphere, temperatures generally decrease with height (IPCC, 2001).

Tropospheric Ozone

See ground-level ozone.

Tularemia

A zoonotic bacterial infection caused by the bacterium *Francisella tularensis,* generally found in animals such as rodents, rabbits and hares. Transmission occurs through ingestion of contaminated food or water, inhalation of the bacteria or from the bite of an infected insect. Symptoms include fever, chills, headache, diarrhea, and, depending on the route of exposure, ulcers on the skin or mouth, and swollen glands and eyes (CDC, 2005b).

Ultraviolet Radiation

Solar radiation within a certain wavelength, depending on the type of radiation (A, B or C). Ozone absorbs strongly in the UV-C range (<280 nm) and solar radiation in these wavelengths does not reach the Earth's surface. As the wavelength is increased through the UV-B range (280 nm to 315 nm) and into the UV-A range (315 nm to 400 nm) ozone absorption becomes weaker, until it is undetectable at about 340 nm (McMichael et al., 2003).

Uncertainty

An expression of the degree to which a value (e.g. the future state of the climate system) is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from quantifiable errors in the data to ambiguously defined concepts or terminology, or uncertain projections of human behaviour. Uncertainty can therefore be represented by quantitative measures (e.g. a range of values calculated by various models) or by qualitative statements (e.g. reflecting the judgment of a team of experts) (IPCC, 2001).

United Nations Framework Convention on Climate Change (UNFCCC)

Convention signed at United Nations Conference on Environment and Development in 1992. Governments that become Parties to the Convention agree to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system (WHO, 2003).

Urban Heat Island Effect

See heat island effect.

Urbanization

Net rural-to-urban migration, resulting in an increasing percentage of the population in any nation or region living in settlements that are defined as urban centres, and the associated conversion of land from a natural state or managed natural state (e.g. agriculture) to cities (IPCC, 2007a).

Vector

An organism, such as an insect, that transmits a pathogen from one host to another (IPCC, 2001).

Vector-Borne Disease

A disease that is transmitted between hosts by a vector organism such as a mosquito or tick (e.g. malaria, dengue fever, leishmaniasis) (IPCC, 2007a).

Vibrio parahaemolyticus

A bacterium in the same family as those that cause cholera. Causes gastrointestinal illness in humans, with symptoms including watery diarrhea, abdominal cramping, nausea, fever and chills. Infection is usually as a result of consumption of raw or undercooked shellfish, though the bacterium may infect open wounds (CDC, 2005b).

Voluntary Agency (Organization)

Organizations are considered to be part of the non-profit and voluntary sector if they are: organized (i.e. have some structure and are institutionalized to some extent, but not necessarily legally incorporated); non-governmental (i.e. are institutionally separate from governments); non-profit-distributing (i.e. do not return any profits generated to their owners and directors); self-governing (i.e. are independent and able to regulate their own activities); and voluntary (i.e. benefits to some degree from voluntary contributions of time or money) (Canadian Red Cross et al., n.d.).

Voluntary Sector

Includes both volunteers and those entities that are neither for-profit nor agencies of the state. It includes incorporated non-profit organizations as well as unincorporated volunteer community groups. It is also known as the community-based-sector, the non-profit sector, the third sector or the public benefit sector. The common feature is their reliance on volunteer boards of directors to govern their activities (Canadian Red Cross et al., n.d.).

Vulnerability

Vulnerability is susceptibility to harm. Vulnerability to climate change is the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability to climate change is a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity (IPCC, 2007a).

Water-Borne Illnesses

Water-borne illnesses result from exposure to pathogenic microorganisms or chemicals in drinking water or recreational water. Contaminated water most often enters the body by ingestion, but contaminants in water can also be inhaled, adsorbed or enter the body through contact with open sores or wounds (Environment Canada, 2001).

Water-Borne Diseases

See water-borne illnesses.

Weather

Weather is the state of the atmosphere at a given time and place with regard to temperature, air pressure, humidity, wind, cloudiness and precipitation. The term "weather" is used mostly for conditions over short periods of time (Environment Canada, 2007).

West Nile Virus

A zoonotic virus transmitted by mosquitoes (normally *Culex*) and maintained in a wildlife cycle involving birds. Occasional spillover to the human population results after virus amplification and can cause large epidemics. Symptoms may be mild and include fever, headache and malaise, while symptoms of severe infection include high fever, neck stiffness, coma and paralysis (McMichael et al., 2003).

Wind Chill

The cooling sensation caused by the combined effect of temperature and wind. The wind chill poses a health hazard because it speeds up the rate at which a body loses heat (Environment Canada, 2002b).

Winter Road

A temporary roadway over frozen ground or a frozen body of water that facilitates transportation to and from communities and resource extraction sites without permanent roads (Manitoba Infrastructure and Transportation, n.d.).

Zoonosis

The transmission of a disease from an animal or non-human species to humans. The natural reservoir is a non-human animal (IPCC, 2001).

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