

GLOSSARY

Adaptation

Adjustment in natural or human systems in response to actual or expected climate stimuli and their effects, which moderates harm or exploits beneficial opportunities. There are various types of adaptation, including anticipatory, autonomous and planned adaptation.^{1*}

Adaptation benefits

The avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures.¹

Adaptation costs

Costs of planning, preparing for, facilitating and implementing adaptation measures, including transition costs.¹

Adaptive capacity

The whole of capabilities, resources and institutions of a country, region, community or group to implement effective adaptation measures.^{2*}

Albedo

The fraction of solar radiation reflected by a surface or object, often expressed as a percentage. Snow-covered surfaces have a high albedo, whereas vegetation-covered surfaces and oceans have a low albedo.^{3*}

Anthropogenic

Resulting from or produced by human activity.^{1*}

Atmosphere-Ocean General Circulation Model

see Climate model

Barrier (to adaptation)

Any obstacle to reaching an adaptation goal that can be overcome or attenuated by a policy, program or measure.^{2*}

Baseline (or reference)

The state against which change is measured. 'Current baseline' represents observable, present-day conditions. A 'future baseline' is a projected future set of conditions that excludes the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.¹

Canada Country Study

Published in 1998, the Canada Country Study: Climate Impacts and Adaptation was the first Canadian assessment of the potential impacts of climate change and variability, including consideration of existing and potential adaptive responses. It focused on reviewing existing scientific and technical literature through a series of commissioned studies and regional workshops.⁴

Capacity building

In the context of adaptation to climate change, capacity building is developing the technical skills and institutional capabilities of stakeholders to enable their participation in all aspects of adaptation to, and research on, climate change.^{1*}

Climate

Climate in a narrow sense is usually defined as the average weather or, more rigorously, as the statistical description in terms of the mean and variability of relevant variables over a period of time ranging from months to thousands or millions of years. 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.^{1*}

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 forcing factors, 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) defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." The UNFCCC thus makes a distinction between climate change attributable to human activities altering the atmospheric composition, and climate variability attributable to natural causes.^{1*}

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. The climate system can be represented by models of varying complexity. Coupled Atmosphere–Ocean General Circulation Models (AOGCMs) provide a comprehensive representation of the climate system. More complex models include active chemistry and biology.^{1*}

Climate normal

Arithmetic calculations based on observed climate values for a given location over a specified time period and used to describe the climatic characteristics of that location. The World Meteorological Organization (WMO) considers 30 years long enough to eliminate year-to-year variations. Thus, the WMO climatological standard period for normals calculations is defined as consecutive periods of 30 years (e.g. January 1 1901 to December 31, 1930) and should be updated every decade.^{5*}

Climate projection

The calculated response of the climate system to emissions or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based on simulations by climate models. Because climate projections are based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized, they are therefore subject to substantial uncertainty.^{1+2*}

Climate scenario

A plausible and often simplified representation of the future climate, based on an internally consistent set of climatological relationships and assumptions of radiative forcing, typically constructed for explicit use as input to climate change impact models. A 'climate change scenario' is the difference between a climate scenario and the current climate.¹

Climate system

The climate system is defined by the dynamics and interactions of five major components: atmosphere, hydrosphere, cryosphere, land surface and biosphere. Climate system dynamics are driven by both internal and external forcing factors, such as volcanic eruptions, solar variations or human-induced modifications to the planetary radiative balance (e.g. via anthropogenic emissions of greenhouse gases and/or land-use changes).¹

Climate variability

Variations in the mean and other statistics (e.g. standard deviations, the occurrence of extremes, etc.) 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.^{1*}

Coping range

The variation in climatic stimuli that a system can absorb without producing significant impacts. Also known as coping ability or capacity.⁶

Critical infrastructure

Physical and information-technology facilities, networks, services and assets that, 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.^{7*}

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.¹

Downscaling

A method that derives local- to regional-scale (10–100 km) information from larger-scale models or data analyses.¹

Drought

The phenomenon that exists when precipitation is significantly below normal recorded levels, causing serious hydrological imbalances that often adversely affect land resources and production systems. Drought has been defined in a number of ways (e.g. agricultural drought, meteorological drought and hydrological drought). A megadrought is a long, drawn-out and pervasive drought, lasting much longer than normal, usually a decade or more.^{1+2*}

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.^{1*}

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 focused 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.¹

Ecosystem services

Ecological processes or functions having monetary or non-monetary value to individuals or society at large. There are 1) supporting services, such as productivity or biodiversity maintenance; 2) provisioning services, such as food, fibre or fish; 3) regulating services, such as climate regulation or carbon sequestration; and 4) cultural services, such as tourism or spiritual and aesthetic appreciation.¹

Ecotone

Transition area between adjacent ecological communities (e.g. between forests and grasslands).¹

El Niño–Southern Oscillation (ENSO)

El Niño was initially used to describe a warm-water current that periodically flows along the coast of Ecuador and Perú, but has since become identified with a basin-wide warming of the tropical Pacific east of the International Dateline. This oceanic event is associated with a fluctuation of a global-scale tropical and subtropical surface pressure pattern, 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 (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.^{2*}

Emergency management

The management of emergencies concerning all hazards (natural and human-induced), including all activities and risk management measures related to prevention and mitigation, preparedness, response and recovery. Mitigation in this context refers to sustained actions taken to eliminate or reduce risks and impacts posed by hazards well before an emergency or disaster occurs, and is generally synonymous with ‘adaptation’ in a climate change context.^{8*}

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 socioeconomic 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.^{1*}

Evapotranspiration

The combined process of water evaporation from the Earth’s surface and transpiration from vegetation.¹

Exposure

The nature and degree to which a system is exposed to significant climatic variations.⁶

Extreme weather event

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. By definition, the characteristics of what is called ‘extreme weather’ may vary from place to place.^{1*}

Extirpation

The disappearance of a species from part of its range; local extinction.¹

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.^{1*}

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.¹

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.¹

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, by the atmosphere itself and by clouds. Water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃) are the primary greenhouse gases in the Earth’s atmosphere. In addition, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine-containing substances.^{2*}

Grey literature

In the context of scientific and technical information, grey literature refers to electronic and print publications not published commercially or indexed by major database vendors. Some grey literature may be ephemeral and of questionable relevance or quality, but it is occasionally the sole source of information for specific research questions. Grey literature is usually not subject to peer review, and must be scrutinized accordingly.^{9*}

(climate change) Impacts

The adverse and beneficial effects of climate change on natural and human systems. Depending on the consideration of adaptation, one can distinguish between potential impacts and residual impacts.^{1*}

Institutions

Rules and norms that guide how people within societies live, work and interact. Formal institutions are codified rules, such as the constitution, organized markets or property rights. Informal institutions are rules governed by social or behavioural norms of a family, community or society.¹⁰

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 socioeconomic

information relevant for the understanding of climate change, its potential impacts, and options for adaptation and mitigation.¹¹

Kyoto Protocol

The Kyoto Protocol was adopted at the Third Session of the Conference of the Parties (COP) to the UN Framework Convention on Climate Change (UNFCCC) in 1997 in Kyoto, Japan. It contains legally binding commitments, in addition to those included in the UNFCCC. The Kyoto Protocol entered into force on February 16, 2005.^{1*}

Mainstreaming

In the context of adaptation, mainstreaming refers to the integration of adaptation considerations (or climate risks) such that they become part of policies, programs and operations at all levels of decision-making. The goal is to make the adaptation process a component of existing decision-making and planning frameworks.¹²

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.^{6*}

Mitigation

In the context of climate change, mitigation is an anthropogenic intervention to reduce the anthropogenic forcing of the climate system; it includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks.¹

'No regrets' policy/measure

A policy or measure that would generate net social and/or economic benefits irrespective of whether or not climate change occurs.^{1*}

North Atlantic Oscillation (NAO)

The North Atlantic Oscillation (NAO) consists of opposing variations of barometric pressure near Iceland and near the Azores. It is the dominant mode of winter climate variability in the North Atlantic region.¹

Pacific Decadal Oscillation (PDO)

A statistical measure of coupled decadal to interdecadal variability of the atmospheric circulation and underlying ocean in the Pacific Basin. It is most prominent in the North Pacific, where fluctuations in the strength of the winter Aleutian Low pressure system covary with North Pacific sea-surface temperatures and are linked to decadal variations in atmospheric circulation, sea-surface temperatures and ocean circulation throughout the Pacific

Basin. Such fluctuations have the effect of modulating the El Niño–Southern Oscillation cycle.^{3*}

Permafrost

Ground (soil or rock and included ice and organic material) that remains at or below 0°C for at least two consecutive years.³

Phenology

The study of natural phenomena that recur periodically (e.g. development stages, migration) and their relation to climate and seasonal changes.¹

Policy instruments

The means to address a problem and achieve desired policy goals that governments can use to change socioeconomic 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, and water pricing and allocation schemes).¹²

Proxy climate indicator

A local record that is interpreted, using physical and biophysical principles, to represent some combination of climate-related variations back in time. Climate-related data derived in this way are referred to as proxy data. Examples of proxies are tree-ring records, characteristics of corals, and various data derived from ice cores.³

Recurrence interval (return period)

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 (i.e. $T = 1/P$, 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).¹³

Resilience

The ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the same capacity for self-organization and the same capacity to adapt to stress and change.¹

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. 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).¹⁴

Risk

A combination of the likelihood (probability of occurrence) and the consequences of an adverse event (e.g. climate-related hazard).¹²

Risk management

A systematic approach to setting the best course of action under uncertainty, by applying management policies, procedures and practices to the tasks of analyzing, evaluating, controlling and communicating about risk issues.¹⁵

Salt-water intrusion

Displacement of fresh surface water or groundwater by the advance of saltwater due to its greater density. This usually occurs in coastal and estuarine areas due to reducing land-based influence (e.g. either from reduced runoff and associated groundwater recharge, or from excessive water withdrawals from aquifers) or increasing marine influence (e.g. relative sea-level rise).¹

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.¹

Sea ice

Any form of ice found at sea that has originated from the freezing of seawater. 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 one year old is called first-year ice. Multi-year ice is sea ice that has survived at least one summer melt season.²

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.¹

Sensitivity

Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or climate change. 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. damage caused by an increase in the frequency of coastal flooding due to sea-level rise).¹

Social capital

The aggregate of actual or potential resources that can be mobilized through social relationships and membership in social networks.¹⁶

SRES Scenarios

The storylines and associated population, GDP and emissions scenarios associated with the Special Report on Emissions Scenarios (SRES), and the resulting climate change and sea-level rise scenarios. Four families of socioeconomic scenario (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.^{1*}

Stakeholder

A person or an organization that has a legitimate interest in a project or entity, or would be affected by a particular action or policy.¹

Storm surge

Generally used to refer to a 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. Negative storm surges also occur and can present significant problems for navigation.^{3*}

System

An entity consisting of diverse but interrelated components that function as a complex whole. Examples include the climate system, ecosystems and market economies.¹⁷

Technologies (for adaptation)

Technologies that, when implemented or applied, work towards adaptation goals. They include ‘hard’ forms (e.g. new irrigation systems or drought-resistant seeds) and ‘soft’ technologies (e.g. insurance schemes or planning processes), or they can be a combination of hard and soft (e.g. early warning systems that combine hard measuring devices with soft knowledge and skills that can raise awareness and stimulate appropriate action).^{18*}

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.^{1*}

Tools (for adaptation)

Methodologies, guidelines and processes that enable stakeholders to assess the implications of climate change impacts and relevant adaptation options in the context of their operating environment. Tools may occur in a variety of formats and have diverse applications: crosscutting 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).

Traditional knowledge

A cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment.¹⁹

Uncertainty

An expression of the degree to which a value 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).^{1*}

United Nations Framework Convention on Climate Change (UNFCCC)

The Convention was adopted on May 9, 1992 in New York and signed at the 1992 Earth Summit in Rio de Janeiro by more than 150 countries and the European Community. Its ultimate objective is the “stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” It contains commitments for all parties. The Convention entered into force in March 1994. See also Kyoto Protocol.^{1*}

Urbanization

The conversion of land from a natural or managed natural state (such as agriculture) to cities; a process driven by net rural-to-urban migration through which an increasing percentage of the population in any nation or region come to live in settlements that are defined as ‘urban centres’.¹

Vector-borne disease

Disease, such as malaria, dengue fever and lyme disease, that is transmitted between hosts by a vector organism (e.g. mosquito or tick).^{1*}

Vulnerability

Vulnerability is the susceptibility to be harmed. Vulnerability to climate change is the degree to which a system is susceptible to, and 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.¹

Water stress

A region is water stressed if the available freshwater supply relative to water withdrawals acts as an important constraint on development. Withdrawal exceeding 20% of renewable water supply has been used as an indicator of water stress. A crop is water stressed if soil-available water, and thus actual evapotranspiration, is less than potential evapotranspiration demands.^{1*}

Weather

State of the atmosphere at a given time and place with regard to temperature, air pressure, humidity, wind, cloudiness and precipitation. The term is mainly used to describe conditions over short periods of time.²⁰

Winter road

A seasonal roadway constructed annually over frozen ground or frozen water bodies that provides access to and from communities and resource extraction sites not connected by permanent roads. Also referred to as seasonal road and, where built exclusively across frozen water bodies, ice road.

- ¹ Intergovernmental Panel on Climate Change (2007): Appendix I: glossary; *in* Climate Change 2007: Impacts, Adaptation and Vulnerability (Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change); (ed.) M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson; Cambridge University Press, Cambridge, United Kingdom, p. 869-883, <<http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-app.pdf>>, [accessed January 9, 2008].
- ² Intergovernmental Panel on Climate Change (2007): Appendix A.2: glossary; *in* Climate Change 2007: Synthesis Report; Cambridge University Press, Cambridge, United Kingdom, p. 869-883, <http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_appendix.pdf>, [accessed January 9, 2008].
- ³ Intergovernmental Panel on Climate Change (2007): Annex I: glossary; *in* Climate Change 2007: The Physical Science Basis (Contribution of Working Group I to the Fourth Assessment report of the Intergovernmental Panel on Climate Change); (ed.) S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller; Cambridge University Press, Cambridge, United Kingdom, p. 941-954, <<http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>> [accessed January 25, 2008]
- ⁴ Environment Canada (2002): Canada Country Study: Climate Impacts and Adaptation: Environment Canada <http://www.msc-smc.ec.gc.ca/airg/research_projects/index_view_e.cfm?IdKey=3> [accessed January 24, 2008]
- ⁵ Environment Canada (no date): WMO standards for "climate normals", <http://www.climate.weatheroffice.ec.gc.ca/climate_normals/climate_info_e.html>, [accessed January 9, 2008]
- ⁶ Intergovernmental Panel on Climate Change (2001): Annex B: glossary of terms; *in* Climate Change 2001: Synthesis Report (Contribution of Working Groups I, II and III to the Third Assessment Report of the Intergovernmental Panel on Climate Change); (ed.) R.T. Watson and the Core Writing Team; Cambridge University Press, Cambridge, United Kingdom and New York, New York, p. 365-389, <<http://www.ipcc.ch/pub/syrgloss.pdf>>, [accessed May 15, 2007].
- ⁷ Public Safety Canada (2007): Description of critical infrastructure protection; Public Safety Canada, <<http://www.ps-sp.gc.ca/prg/em/nciap/about-eng.aspx>>, [accessed January 16, 2008].
- ⁸ Public Safety Canada (2007): An emergency management framework for Canada; Public Safety Canada, <<http://www.publicsafety.gc.ca/prg/em/emfrmwrk-eng.aspx>>, [accessed January 16, 2008].
- ⁹ University of British Columbia (2007): What is Grey Literature?, <<http://toby.library.ubc.ca/subjects/subpage2.cfm?id=878>>, [accessed January 9, 2008]
- ¹⁰ The Resilience Alliance (2007): Assessing and managing resilience in social-ecological systems: a practitioner's workbook, volume 1, version 1.0; The Resilience Alliance, <<http://www.resalliance.org/3871.php>>, [accessed January 16, 2008].
- ¹¹ Intergovernmental Panel on Climate Change (no date): Intergovernmental Panel on Climate Change; <<http://www.ipcc.ch/about/index.htm>>, [accessed January 25, 2008].
- ¹² United Nations Development Programme (2005): Adaptation policy frameworks for climate change; United Nations Development Programme, <http://www.undp.org/gef/undp-gef_publications/publications/apf%20annexes%20a&b.pdf>, [accessed January 16, 2008].
- ¹³ American Meteorological Society (2000): Glossary of Meteorology, <<http://amsglossary.allenpress.com/glossary>>, [accessed January 9, 2008]
- ¹⁴ Natural Resources Canada (2006): All resource-reliant communities, 2001; Natural Resources Canada, Atlas of Canada, <<http://atlas.nrcan.gc.ca/site/english/maps/economic/rdc2001/rdcall>>, [accessed July 11, 2007].
- ¹⁵ Canadian Standards Association (1997): Risk management: guidelines for decision-makers; Canadian Standards Association, CAN/CSAQ850-97.
- ¹⁶ Nahapiet, J. and Ghoshal, S. (1998): Social capital, intellectual capital, and the organizational advantage; *Academy of Management Review*, v. 23, no. 2, p. 242-266 [as referenced in <http://www.resalliance.org/608.php#S>].
- ¹⁷ Kump, L.R., Kating, J.F. and Crane, R.G. (2004): *The Earth System* (second edition); Pearson Prentice Hall, Upper Saddle River, New Jersey, 419 p.
- ¹⁸ Klein, R.J.T., Alam, M., Burton, I., Dougherty, W.W., Ebi, K.L., Fernandes, M., Huber-Lee, A., Rahman A.A., and Swartz, C. (2006): Application of environmentally sound technologies for adaptation to climate change; United Nations Framework Convention on Climate Change Secretariat, Bonn, Germany, Technical Paper FCCC/TP/2006/2, 107 p.
- ¹⁹ Berkes, F., Colding, J., and Folke, C. (2000): Rediscovery of Traditional Ecological Knowledge as adaptive management; *Ecological Applications*, v. 10, p. 1251-1262.
- ²⁰ Environment Canada: Glossary (2008): <<http://www.ec.gc.ca/default.asp?lang=En&xml=7EBE5C5A-D48B-4162-A3E1-A636EFA7AA01#glossaryw>> [accessed January 25, 2008].

* modified from source