GLOSSARY OF TERMS AND DEFINITIONS

Adaptation: the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.

Adaptive Capacity: the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Adverse Side Effects: the negative effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare. Adverse side effects are often subject to uncertainty and depend on local circumstances and implementation practices, among other factors. See also Co-Benefits and Risk.

Afforestation: Planting of new forests on lands that historically have not contained forests. See: *IPCC Special Report on Land Use, Land-Use Change, and Forestry; Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types*.

Agriculture, Forestry and Other Land Use (AFOLU): emissions and removals of greenhouse gases (resulting from direct human-induced land use, land-use change, and forestry activities, which may include or exclude agricultural emissions. AFOLU plays a central role for food security and sustainable development. The main mitigation options within AFOLU involve one or more of three strategies: 1) *prevention*—of emissions to the atmosphere by conserving existing carbon pools in soils or vegetation or by reducing emissions of methane and nitrous oxide; 2) *sequestration*—increasing the size of existing carbon pools and thereby extracting carbon dioxide (CO_2) from the atmosphere; and 3) *substitution*—substituting biological products for fossil fuels or energy-intensive products, thereby reducing CO_2 emissions. Demand-side measures (e.g., reducing losses and wastes of food, changes in human diet, or changes in wood consumption) may also play a role.

Anomaly: a change or departure from a reference value or long-term average. Temperature anomaly is the difference between the long-term average temperature (i.e. reference value) and the temperature that is occurring. The long-term average temperature is one that would be expected; the anomaly is the difference between what you would expect and what is happening. A positive temperature anomaly indicates that the observed temperature was warmer than the reference value, while a negative temperature anomaly indicates that the observed temperature was cooler than the reference value. A climate anomaly is the difference of a future climate compared to the present climate.

Anthropocene: the current geologic age, used to describe the most recent period in Earth's history when human activity started to have significant impact on the planet's climate and ecosystems.

Baseline: baseline (or reference) is the state against which change is measured. A baseline period is the period relative to which anomalies are computed. In the context of transformation pathways, the term baseline scenarios refer to scenarios that assume that no mitigation policies or measures will be implemented beyond those that are already in force and/or are legislated or planned to be adopted. Baseline scenarios are not intended to be predictions of the future, but rather counterfactual constructions that can serve to highlight the level of emissions that would occur without further policy effort. Baseline scenarios can be compared to mitigation scenarios that are constructed to meet different goals for greenhouse gas (GHG) emissions, atmospheric concentrations or temperature changes. The term baseline scenario is used interchangeably with

reference scenario and no policy scenario. In much of the literature the term is also synonymous with the term business-as-usual (BAU) scenario.

Biodiversity: Variety of plant and animal life in the world or in a habitat or ecosystem.

Climate: the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classic period for averaging these variables is 20 to 30 years. The relevant quantities are most often surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

Climate Change: A change in the state of the climate that can be identified (for example, 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 such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere or in land use.

Climate Change Induced Migration: In this report, climate change-induced migration is migration that can be attributed largely to the slow-onset impacts of climate change on livelihoods owing to shifts in water availability and crop productivity, or to factors such as sea level rise or storm surge.

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 some of its known properties. The climate system can be represented by models of varying complexity; that is, for any one component or combination of components a spectrum or 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 parametrizations are involved. Coupled Atmosphere–Ocean General Circulation Models (AOGCMs) provide a representation of the climate system that is near or at the most comprehensive end of the spectrum currently available. Climate models are typically applied as a research tool to study and simulate the climate and for operational purposes, including monthly, seasonal and interannual climate predictions.

Climate Prediction: is a probabilistic statement about future climate conditions on timescales ranging from seasons to decades. It is based on conditions that are known at present and assumptions about the physical processes that will determine future changes. When a projection is branded "most likely" it becomes a prediction and outputs of which can enable some level of confidence to be attached to projections.

Climate Projection: the simulated response of the climate system to a scenario of future emission or concentration of greenhouse gases (GHGs) and aerosols, generally derived using climate models. Projections provide a potential future evolution of a quantity or set of quantities, often computed with the aid of a model. Climate *projections* are distinguished from climate *predictions* by their dependence on the emission/concentration/radiative forcing scenario used, which is in turn based on assumptions concerning, for example, future socio-economic and technological developments that may or may not be realized. Unlike predictions, projections are conditional on assumptions concerning, for example, future socio-economic and technological developments that may or may not be realized.

Climate-Resilient Pathways: the iterative processes for managing change within complex systems in order to reduce disruptions and enhance opportunities associated with climate change.

Climate Risk: potential for consequences from climate variability and change where something of value is at stake and the outcome is uncertain. Often represented as the probability that a hazardous event or trend occurs multiplied by the expected impact. Risk results from the interaction of vulnerability, exposure, and hazard.

Climatology: the study of the atmosphere and weather patterns over a time period, focused on the natural and artificial forces that influence long-term weather patterns.

Coastal Erosion: erosion of coastal landforms that results from wave action, exacerbated by storm surge and sea level rise.

Coastal Zone: in this report, the coastal zone is land area within 10 kilometers of the coastline.

Climate System: the highly complex system consisting of five major components: the atmosphere, the hydrosphere, the cryosphere, the lithosphere and the biosphere and the interactions between them. The climate system evolves in time under the influence of its own internal dynamics and because of external forcings such as volcanic eruptions, solar variations and anthropogenic forcings such as the changing composition of the atmosphere and land-use change.

Climate Variability: variations in the mean state and other statistics (i.e., standard deviations, occurrence of extremes, etc.) of the climate across all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability).

Coupled Model Inter-comparison Project, Phase 5 (CMIP5): the CMIP is a standard experimental framework for studying the output of coupled atmosphere-ocean general circulation models. This facilitates assessment of the strengths and weaknesses of climate models which can enhance and focus the development of future models. For example, if the models indicate a wide range of values either regionally or globally, then scientists may be able to determine the cause(s) of this uncertainty. CMIP5 is the most current and extensive of the CMIPs. It is defined by experiment suites divided into three categories: 1) Decadal Hindcasts and Predictions simulations; 2) "long-term" simulations; and 3) "atmosphere-only" (prescribed SST) simulations for especially computationally-demanding models. CMIP5 builds the database for the global climate change projections presented in the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). See *World Climate Research Programme, CMIP5*.

Co-Benefits: the positive effects that a policy or measure aimed at one objective might have on other objectives, irrespective of the net effect on overall social welfare. Co-benefits are often subject to uncertainty and depend on local circumstances and implementation practices, among other factors. Also referred to as ancillary benefits.

Confidence: the validity of a finding based on the type, amount, quality and consistency of evidence (e.g., mechanistic understanding, theory, data, models, expert judgment) and on the degree of agreement.

Cost-Effectiveness: a policy is more cost-effective if it achieves a given policy goal at lower cost. Integrated models approximate cost-effective solutions, unless they are specifically constrained to behave otherwise. Cost-effective mitigation scenarios are those based on a stylized implementation approach in which a single price on carbon dioxide and other greenhouse gases is applied across the globe in every sector of every country and that rises over time in a way that achieves lowest global discounted costs.

Decarbonization: the process by which countries or other entities aim to achieve a low-carbon economy, or by which individuals aim to reduce their consumption of carbon.

Deforestation: conversion of forest to non-forest. See *IPCC Special Report on Land Use, Land-Use Change, and Forestry; Definitions and Methodological Options to Inventory Emissions from Direct Human-induced Degradation of Forests and Devegetation of Other Vegetation Types.*

Disaster: severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery. See *UNISDR Global Assessment Report on Disaster Risk Reduction 2015.*

Displacement: forced removal of people or people obliged to flee from their places of habitual residence.

Drought: a period of abnormally dry weather long enough to cause a serious hydrological imbalance. Drought is a relative term; therefore, any discussion in terms of precipitation deficit must refer to the particular precipitation-related activity that is under discussion. For example, shortage of precipitation during the growing season impinges on crop production or ecosystem function in general (due to soil moisture drought, also termed agricultural drought) and during the runoff and percolation season primarily affects water supplies (hydrological drought). Storage changes in soil moisture and groundwater are also affected by increases in actual evapotranspiration in addition to reductions in precipitation. A period with an abnormal precipitation deficit is defined as a meteorological drought. A megadrought is a very lengthy and pervasive drought, lasting much longer than normal, usually a decade or more.

Early Warning System: the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare to act promptly and appropriately to reduce the possibility of harm or loss.

Earth System Model (ESM): a coupled atmosphere–ocean general circulation model in which a representation of the carbon cycle is included, allowing for interactive calculation of atmospheric CO_2 or compatible emissions. Additional components (i.e., atmospheric chemistry, ice sheets, dynamic vegetation, nitrogen cycle, but also urban or crop models) may be included.

Ecosystem: an ecosystem is a functional unit consisting of living organisms, their non-living environment and the interactions within and between them. The components included in a given ecosystem and its spatial boundaries depend on the purpose for which the ecosystem is defined. Ecosystem boundaries can change over time. Ecosystems are nested within other ecosystems and their scale can range from very small to the entire biosphere. In the current era, most ecosystems either contain people as key organisms, or are influenced by the effects of human activities in their environment.

El Niño-Southern Oscillation (ENSO): the term El Niño was initially used to describe a warm-water current that periodically flows along the coast of Ecuador and Peru, disrupting the local fishery. It has since become identified with a basin-wide warming of the tropical Pacific Ocean east of the 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 two to approximately seven years, is known as the El Niño-Southern Oscillation (ENSO). It is often measured by the

surface pressure anomaly difference between Tahiti and Darwin or the sea surface temperatures in the central and eastern equatorial Pacific. 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 a great impact on the wind, sea surface temperature and precipitation patterns in the tropical Pacific. It has climatic 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.

Emission Scenario: a plausible representation of the future development of emissions of substances that are potentially radiatively active (i.e., greenhouse gases, aerosols) based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socio-economic development, technological change, energy and land use) and their key relationships. Concentration scenarios, derived from emission scenarios, are used as input to a climate model to compute climate projections. In IPCC (1992) a set of emission scenarios was presented which were used as a basis for the climate projections in IPCC (1996). These emission scenarios are referred to as the IS92 scenarios. In the IPCC Special Report on Emissions Scenarios (IPCC, 2000a) emission scenarios, the so-called SRES scenarios, were published, some of which were used, among others, as a basis for the climate projections presented in Chapters 9 to 11 of IPCC WGI TAR (IPCC, 2001a) and Chapters 10 and 11 of IPCC WGI AR4 (IPCC, 2007) as well as in the IPCC WGI AR5 (IPCC, 2013b). New emission scenarios for climate change, the four Representative Concentration Pathways, were developed for, but independently of, the current IPCC assessment, AR5.

Ensemble: a collection of model simulations characterizing a climate prediction or projection. Differences in initial conditions and model formulation result in different evolutions of the modeled system and may give information on uncertainty associated with model error and error in initial conditions in the case of climate forecasts and on uncertainty associated with model error and with internally generated climate variability in the case of climate projections.

Evapotranspiration: the process of transferring moisture from the earth into the atmosphere. Evaporation occurs when water vapor leaves the soil or a plant's surface. Transpiration involves the passage of water through a plant, from its roots through its vascular system. The sum of evaporation and transpiration is evapotranspiration.

Exposure: the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected.

External Forcing: external forcing refers to a forcing agent outside the climate system causing a change in the climate system. Volcanic eruptions, solar variations and anthropogenic changes in the composition of the atmosphere and land-use change are external forcings. Orbital forcing is also an external forcing as the insolation changes with orbital parameters eccentricity, tilt and precession of the equinox.

Extreme Heat Event: three or more days of above-average temperatures, generally defined as passing a certain threshold (for example, above the 85th percentile for average daily temperature in a year).

Extreme Weather Event: an extreme weather event is an event that is rare at a particular place and time of year. Definitions of rare vary, but an extreme weather event would normally be as rare as or rarer than the 10th or 90th percentile of a probability density function estimated from observations. By definition, the characteristics of what is called extreme weather may vary from place to place in an absolute sense. When a pattern of extreme

weather persists for some time, such as a season, it may be classed as an extreme climate event, especially if it yields an average or total that is itself extreme (i.e., drought or heavy rainfall over a season).

Flood: the overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods and glacial lake outburst floods.

Food Security: a state that prevails when people have secure access to sufficient amounts of safe and nutritious food for normal growth, development and an active and healthy life.

Forest: a vegetation type dominated by trees. Many definitions of the term forest are in use throughout the world, reflecting wide differences in bio-geophysical conditions, social structure and economics.

Global Warming: the gradual increase, observed or projected, in global surface temperature, as one of the consequences of radiative forcing caused by anthropogenic emissions.

Hazard: the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources. Here, hazard usually refers to climate-related physical events or trends or their physical impacts.

Heat Wave: while there is no universally accepted definition, heat waves are understood to be periods of unusually hot and dry or hot and humid weather that have a subtle onset and cessation, a duration of at least two–three days, usually with a discernible impact on human and natural systems. Because there is no absolute universal value, such as a given temperature that defines what is extreme heat, heatwaves are relative to a location's climate: the same meteorological conditions can constitute a heatwave in one place but not in another.

Holocene: the geological epoch that covers the last 11,000 years.

Hydrological Cycle: the cycle in which water evaporates from the oceans and the land surface, is carried over the Earth in atmospheric circulation as water vapor, condenses to form clouds, precipitates over ocean and land as rain or snow, which on land can be intercepted by trees and vegetation, provides runoff on the land surface, infiltrates into soils, recharges groundwater, discharges into streams and ultimately flows out into the oceans, from which it will eventually evaporate again. The various systems involved in the hydrological cycle are usually referred to as hydrological systems.

Impacts: effects on natural and human systems from extreme weather and climate events and of climate change. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services and infrastructure due to the interaction of climate changes or hazardous climate events occurring within a specific time period and the vulnerability of an exposed society or system. Impacts are also referred to as consequences and outcomes. The impacts of climate change on geophysical systems, including floods, droughts and sea level rise, are a subset of impacts called physical impacts.

Integrated Coastal Zone Management (ICZM): an integrated approach for sustainably managing coastal areas, considering all coastal habitats and uses.

Köppen-Geiger Climate Classification: a classification system that categorizes climate zones throughout the world based on local vegetation. The system divides the world into five climate zones based on criteria, such as temperature, which allows for different vegetation growth. The zones are: Zone A (tropical or equatorial zone), Zone B (arid or dry zone), Zone C (warm/mild temperate zone), Zone D (continental zone), and Zone E (polar zone). Each zone is further subdivided based on temperature and dryness.

Land Use and Land-Use Change: land use refers to the total of arrangements, activities and inputs undertaken in a certain land cover type (a set of human actions). The term land use is also used in the sense of the social and economic purposes for which land is managed (i.e., grazing, timber extraction and conservation). In urban settlements it is related to land uses within cities and their hinterlands. Urban land use has implications on city management, structure and form and thus on energy demand, greenhouse gas emissions and mobility, among other aspects.

Likelihood: the chance of a specific outcome occurring, where this might be estimated probabilistically.

Meridional Overturning Circulation (MOC): Meridional (north–south) overturning circulation in the ocean quantified by zonal (east–west) sums of mass transports in depth or density layers. In the North Atlantic, away from the subpolar regions, the MOC (which is in principle an observable quantity) is often identified with the thermohaline circulation, which is a conceptual and incomplete interpretation. It must be borne in mind that the MOC is also driven by wind and can also include shallower overturning cells such as occur in the upper ocean in the tropics and subtropics, in which warm (light) waters moving poleward are transformed to slightly denser waters and subducted equatorward at deeper levels.

Migration: movement that requires a change in the place of usual residence and that is longer term. In demographic research and official statistics, it involves crossing a recognized political/administrative border.

Mitigation: a human intervention to reduce the sources or enhance the sinks of greenhouse gases. Human interventions can also reduce the sources of other substances which may contribute directly or indirectly to limiting climate change, including, for example, the reduction of particulate matter emissions that can directly alter the radiation balance (e.g., black carbon) or measures that control emissions of carbon monoxide, nitrogen oxides, Volatile Organic Compounds and other pollutants that can alter the concentration of tropospheric ozone which has an indirect effect on the climate.

Mitigation scenario: a plausible description of the future that describes how the (studied) system responds to the implementation of mitigation policies and measures.

Paleoclimate: the study of previous climates that have existed during Earth's different geologic ages.

Precipitation: water released from clouds in the form of rain, freezing rain, sleet, snow, or hail. It is the primary connection in the water cycle that provides for the delivery of atmospheric water to the Earth.

Projection: a potential future evolution of a quantity or set of quantities, often computed with the aid of a model. Unlike predictions, projections are conditional on assumptions concerning, for example, future socio-economic and technological developments that may or may not be realized.

Radiative Forcing: the change in energy flux caused by a driver and is calculated at the tropopause or at the top of the atmosphere. Radiative forcing is watts per square meter (W/m^2).

Rainfed Agriculture: agricultural practice relying almost entirely on rainfall as its source of water.

Rapid-Onset Event: event such as cyclones and floods which take place in days or weeks (in contrast to slow-onset climate changes that occur over long periods of time).

Representative Concentration Pathways (RCPs): scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases and aerosols and chemically active gases, as well as land use/land cover. *Representative* signifies that each RCP provides only one of many possible scenarios that would lead to the specific radiative forcing characteristics. *Pathway* emphasizes that not only the long-term concentration levels are of interest, but also the trajectory taken over time to reach that outcome. RCPs usually refer to the portion of the concentration pathway extending up to 2100, for which Integrated Assessment Models produced corresponding emission scenarios. New emission scenarios for climate change, the four Representative Concentration Pathways, were developed for, but independently of, the current IPCC assessment, AR5. See *RCP Database*. Four RCPs produced from Integrated Assessment Models were selected from the published literature and used in the current IPCC Assessment as a basis for the climate predictions and projections presented in WGI AR5:

- **RCP2.6** One pathway where radiative forcing peaks at approximately 3 watts per meter^2 (W/m^2) before 2100 and then declines (the corresponding ECP assuming constant emissions after 2100).
- **RCP4.5** and **RCP6.0** Two intermediate stabilization pathways in which radiative forcing is stabilized at approximately 4.5 W/m^2 and 6.0 W/m^2 after 2100 (the corresponding ECPs assuming constant concentrations after 2150).
- **RCP8.5** One high pathway for which radiative forcing reaches >8.5 W/m^2 by 2100 and continues to rise for some amount of time (the corresponding ECP assuming constant emissions after 2100 and constant concentrations after 2250).

Resilience: the capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.

Risk: potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk is often represented as probability or likelihood of occurrence of hazardous events or trends multiplied by the impacts if these events or trends occur. In this report, the term risk is often used to refer to the potential, when the outcome is uncertain, for adverse consequences on lives, livelihoods, health, ecosystems and species, economic, social and cultural assets, services (including environmental services) and infrastructure.

Sea Level Rise: increases in the height of the sea with respect to a specific point on land. Eustatic sea level rise is an increase in global average sea level brought about by an increase in the volume of the ocean as a result of the melting of land-based glaciers and ice sheets. Steric sea level rise is an increase in the height of the sea induced by changes in water density as a result of the heating of the ocean. Density changes induced by temperature changes only are called thermosteric; density changes induced by salinity changes are called halosteric.

Sequestration: the uptake (i.e., the addition of a substance of concern to a reservoir) of carbon containing substances, in particular carbon dioxide (CO_2), in terrestrial or marine reservoirs. Biological sequestration includes direct removal of CO_2 from the atmosphere through land-use change (LUC), afforestation,

reforestation, revegetation, carbon storage in landfills and practices that enhance soil carbon in agriculture (cropland management, grazing land management). In parts of the literature, but not in this report, (carbon) sequestration is used to refer to Carbon Dioxide Capture and Storage (CCS).

Slow-Onset Climate Change: changes in climate parameters—such as temperature, precipitation, and associated impacts, such as water availability and crop production declines—that occur over long periods of time (in contrast to rapid-onset climate hazards, such as cyclones and floods, which take place in days or weeks).

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.

Stressor: event or trend that has important effect on the system exposed and can increase vulnerability to climate-related risk.

Sustainable Livelihood: livelihood that endures over time and is resilient to the impacts of various types of shocks including climatic and economic.

System Dynamics Model: a model which decomposes a complex social or behavioral system into its constituent components and then integrates them into a whole that can be easily visualized and simulated.

Temperature: the expected temperature in degrees, valid for the indicated hour. Global temperature is an average of air temperature recordings from weather stations on land and sea as well as some satellite measurements. Extreme temperature events (i.e. maximum, minimum) may have short-term durations of a few days with temperature increases of over 5°C above the normal temperatures.

Tipping Element: subsystems of the Earth system that are at least subcontinental in scale and can be switched—under certain circumstances—into a qualitatively different state by small perturbations.

Tipping Point: a level of change in system properties beyond which a system reorganizes, often abruptly, and does not return to the initial state even if the drivers of the change are abated. For the climate system, it refers to a critical threshold when global or regional climate changes from one stable state to another stable state. The tipping point event may be irreversible.

Transformation Pathway: the trajectory taken over time to meet different goals for greenhouse gas emissions, atmospheric concentrations, or global mean surface temperature change that implies a set of economic, technological and behavioral changes. This can encompass changes in the way energy and infrastructure are used and produced, natural resources are managed, and institutions are set up and, in the pace, and direction of technological change.

Uncertainty: a state of incomplete knowledge that can result from a lack of information or from disagreement about what is known or even knowable. It may have many types of sources, from imprecision in the data to ambiguously defined concepts or terminology, or uncertain projections of human behavior. Uncertainty can therefore be represented by quantitative measures (i.e., a probability density function) or by qualitative statements (i.e., reflecting the judgment of a team of experts).

Vulnerability: the propensity or predisposition to be adversely affected. Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt.

Watershed: a land area, also referred to as drainage basin or catchment, that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoir, bays, and the ocean.

REFERENCES

IPCC Fifth Assessment Report. 2014. AR5 Synthesis Report - Glossary. URL: https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_Annexes.pdf

Hallegatte, Stephane; Vogt-Schilb, Adrien; Bangalore, Mook; Rozenberg, Julie. 2017. Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters. Climate Change and Development. Washington, DC: World Bank. URL: https://openknowledge.worldbank.org/handle/10986/25335

J.L. Hatfield, J.H. Prueger, 2015. Temperature extremes: effect on plant growth and development. Weather Clim Extrem., 10 (2015), pp. 4-10, 10.1016/j.wace.2015.08.001

Mastrandrea, M.D., C.B. Field, T.F. Stocker, O. Edenhofer, K.L. Ebi, D.J. Frame, H. Held, E. Kriegler, K.J. Mach, P.R. Matschoss, G.-K. Plattner, G.W. Yohe, and F.W. Zwiers, 2010: Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties. Intergovernmental Panel on Climate Change (IPCC). URL: http://www.ipcc.ch/pdf/supporting-material/uncertainty-guidance-note.pdf.

Moss, R., J. A., Edmonds, K. A. Hibbard, M. R. Manning, S. K. Rose, D. P. van Vuuren, T. R. Carter, S. Emori, M. Kainuma, T. Kram, G. A. Meehl, J. F. B. Mitchell, N. Nakicenovic, K. Riahi, S. J. Smith, R. J. Stouffer, A. M. Thomson, J. P. Weyant and T. J. Wilbanks, 2010: The next generation of scenarios for climate change research and assessment. Nature, 463, 747–756. URL: https://www.nature.com/articles/nature08823

NOAA, 2018. Global Surface Temperature Anomalies. National Centers for Environmental Information – NOAA. URL: https://www.ncdc.noaa.gov/monitoring-references/faq/anomalies.php

Rigaud, Kanta Kumari; de Sherbinin, Alex; Jones, Bryan; Bergmann, Jonas; Clement, Viviane; Ober, Kayly; Schewe, Jacob; Adamo, Susana; McCusker, Brent; Heuser, Silke; Midgley, Amelia. 2018. Groundswell: Preparing for Internal Climate Migration. World Bank, Washington, DC. URL: https://openknowledge.worldbank.org/handle/10986/29461

UCAR, 2018. CMIP (Climate Model Intercomparison Project) Overview. Climate Data Guide. URL: https://climatedataguide.ucar.edu/climate-model-evaluation/cmip-climate-model-intercomparison-project-overview

University of California Davis, 2018. Science & Climate. Climate Change Terms and Definitions. URL: https://climatechange.ucdavis.edu/science/climate-change-definitions/

van Vuuren, D.P., Edmonds, J., Kainuma, M. et al. The representative concentration pathways: an overview. Climatic Change (2011) 109: 5. DOI: https://doi.org/10.1007/s10584-011-0148-z

WMO and WHO, 2016. Use of Climate Predictions to Manage Risks. Global Framework for Climate Services. WMO-No. 1174. URL: https://library.wmo.int/doc_num.php?explnum_id=3310

World Bank Group. 2014. Turn Down the Heat: Confronting the New Climate Normal. Washington, DC: World Bank. URL: https://openknowledge.worldbank.org/handle/10986/20595