

GLOSSARY OF TERMS

Confidence- The level of confidence in the correctness of a result

Discontinuities-events or consequences that cannot be extrapolated from prior actions or events and are unpredictably new

Drivers- Underlying causes of system change that are external from the system of analysis. They come from higher scales and are not affected by what happens within the system (Walker et al. 2012)

Foresight-Set of methods to better understand the range of possible futures (Mietzner and Reger 2005); gathering anticipatory intelligence from a wide range of knowledge sources in a systematic way and linking it to today's decision making to meet future challenges proactively. Scenario planning is one foresight approach.

GCM-General Circulation Models represent physical processes in the atmosphere, ocean, cryosphere and land surface and are currently the most advanced tools currently available for simulating the response of the global climate system to increasing greenhouse gas concentrations

IPCC-Intergovernmental Panel on Climate Change

Irreducible uncertainty- Sources that cannot be controlled. This includes non-deterministic responses (aleatory uncertainty), such as unpredictable variation in systems over space and time (environmental) and chance events affecting individuals (demographic), respectively. Also includes actions and outcomes based on human choices that are typically considered difficult if not virtually impossible to predict (e.g. related to social, economic, and technological choices; Shearer 2005, Bengston et al. 2012) and other driving forces external to the system.

Likelihood-The likelihood of an occurrence, an outcome or a result, where this can be estimated probabilistically. The IPCC developed a standard for their reports:

<u>Terminology</u>	<u>Likelihood of the occurrence / outcome</u>
Virtually certain	>99% probability of occurrence
Very likely	>90% probability
Likely	>66% probability
More likely than not	>50% probability
About as likely as not	33 to 66% probability
Unlikely	<33% probability
Very unlikely	<10% probability
Exceptionally unlikely	<1% probability

Monitorable Indicators (for scenarios)-variables that can be tracked through time to determine the occurrence of regimes, triggers, cascading events, discontinuities, and wild cards.

Non-linear response- a system for which the effects or responses (outputs) are not proportional to their causes (inputs) and cannot be modeled with linear equations

Prediction/Forecast-A statement about what will happen in the future with some degree of certainty often associated with probability distribution; focus on one future, considered most likely.

Projection-A potential future evolution of a quantity or set of quantities, often computed with the aid of a model. Projections are distinguished from predictions in order to emphasize

that projections involve assumptions concerning, for example, future socio-economic and technological developments, future socio-economic and that may or may not be realized, and are therefore subject to substantial uncertainty.

Reducible uncertainty- Sources that could, feasibly, be controlled or refined to reduce or eliminate the particular uncertainty (epistemic and linguistic uncertainty). Includes measurement error, sampling error, systematic error or bias (from measurement, sample selection, etc.), model uncertainty (potentially reducible), and reliance on subjective judgment. Note that these sources may or may not be reducible within a given timeframe and may need to be treated as irreducible in some decision contexts.

Regimes- the persistent status of a system

Risk-The probability of an event occurring and magnitude of the consequences

Risk Management-Deciding what to do (how to reduce risk) in light of imperfect knowledge

Scenarios (for scenario planning)-Plausible futures of a system under different conditions

Scenario dimensions-Uncertainties around which scenarios are constructed, represented as axes in some methods

Scenario logics-Methods for structuring the relationships between different drivers and assumptions in scenarios

Scenario planning-Comprehensive process for strategic planning that involves the development scenarios, consideration of their impacts, and implications for strategy and action choices

System-defined by (composed of) its state variables, and it is the relationships among them that are of central interest. The system changes as a consequence of both these internal relationships and the effects of external drivers (Walker et al. 2012)

Storyline and simulation-Combination of qualitative narrative development and quantitative modeling (scenario construction-sensu Mahmoud et al. 2009, Wollenberg et al. 2000)

Thresholds-conditions in time and space that produce notably different experiences in a system's state or response

Triggers-particular combination of conditions that lead to a change in a system's regime

Uncertainty- An expression of the degree to which a value or outcome is unknown. Uncertainty can result from lack of information or from disagreement about what is known or even knowable. It may have many sources, from quantifiable errors in the data or limited ability to characterize/ model system, to ambiguously defined concepts or terminology, or uncertain *projections* of human behavior, environmental variation and stochasticity.

Wild Cards-major surprises that have high impacts

Sources: Regan et al. 2002, IPCC 4th Assessment 2007, Refsgaard et al. 2007, Dessai and van der Sluijs 2007, Coreau et al. 2009, NRC 2011, Williams and Brown 2012, Rounsvell and Metzger 2011, Varum and Melo 2010, Bishop et al. 2007, Liu et al. 2008.