Creating a measure of climate change...

economic terms. Nearly 90% of 2011's events were weather-related.



project the potential human and economic costs of risks of all kinds including natural catastrophes and other weather-related events. Over the past several decades researchers have discovered that changes are occurring to the Earth's climate system that exceed what would be expected from natural climate variability alone. There is a need to quantify the risk posed by these changes in climate to human health and capital. In response, actuaries are creating a global index to quantitatively track the changes. The focus of this index will be effects to humans either on human health or mortality or property and capital.

The American Academy of Actuaries, Canadian Institute of Actuaries, Casualty Actuarial Society, and Society of Actuaries are collaborating to create two new major indices: the Actuaries Climate Index TM (ACITM) and the Actuaries Climate Risk Index ™ (ACRI™). The ACI™ will be a basic index for use by the general public and will quantitatively summarize climate research to assist individuals, policymakers, and stakeholders in managing the potential impacts of climate change. The ACRI™ will be a more targeted index illustrating the specific risks of climate change to the insurance industry. These indices will be global with regional sub-indices for regions with sufficient data. Both indices will likely be annual and updated quarterly by season. They are not designed to predict the future.

The first phase of the project, completed by Solterra Solutions, reviews the latest developments in climate science and was published in the report "Determining the Impact of Climate Change on Insurance Risk and the Global Community, Phase I: Key Climate Indicators." The information from this report, in addition to other published climate data, will be used to calculate and undate these climate indices

Six components are planned for the ACCI

- Temperature (average and extremes) Precipitation extremes
- Floods/droughts
- Ice cover (sea ice and land-hased ice). Sea level
- Tropical Cyclones

Additional components have been contemplated, such as storm severity, wildfire frequency and/or severity, and location of disease vectors.

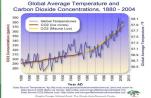
Each component will likely be normalized such that 1.00 is no change, >1 is a change that could increase risk. At this time, all six components are equally weighted, though the relative weightings are still under consideration. If the components are to be combined multiplicatively the relativities of change must be similar in all components. If one component varies between 0 and 1000 while another has the potential only to vary between 0 and 2 than the former would essentially outweigh the latter even if there was no explicit unequal weighting between the two.

Another issue what base period should be used to calculate the average from which any deviation would be measured. Different components vary on different scales. While most of the components have seasonal cycles, cycles such as the ENSO cycles or decadal cycles or even longer cycles. In addition to the variation in the cyclical nature of the components, there is variation in the amount of data and the number of years for which data is available for each component

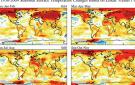
Unless otherwise indicated, information is from "Determining the Impact of Climate Change on Insurance Risk and the Global Community, Phase I: Key Climate Indicators" prepared for The Index Working Group of the Society of Actuaries, Casualty Actuarial Society, Canadian Institute of Actuaries and the American Academy of Actuaries prepared by Solterra Solutions.

The Actuaries Climate Index

TEMPERATURE







FLOODS AND DROUGHTS

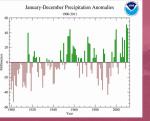




COMPOSITE INDICIES

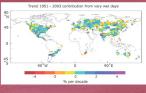


PRECIPITATION

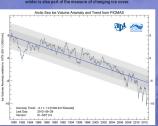




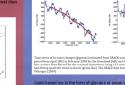


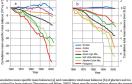


ICE COVER

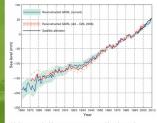


LAND-BASED ICE

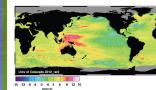




SEA LEVEL

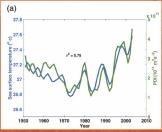


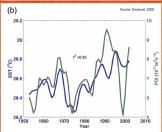
Pattern of regional, absolute sea level rise over the global ocean obtained via



TROPICAL **CYCLONES**







re sea surface temperature (blue) for the main development re ions of the (a) Atlantic and (b) western North Pacific. (See text or definitions of regions.) The time series have been smoothed ability and highlight fluctuations on time scales of 3 yr and longer