Global Seasonal Climate Update (GSCU):

A New Initiative for Consensus-Based Real Time Monitoring and Prediction of Seasonal Climate of the World

World Meteorological Organization
Weather • Climate • Water

Introduction

Socio-economic decisions can benefit substantially from better knowledge of both contemporary and near-future climate conditions. Consensus-based climate outlook products which take advantage of the recent advances in climate science help improve climate services with a user focus. WMO successfully established a consensus mechanism for the well-known El Niño/La Niña Update, which has been well-received worldwide and has been instrumental in improving consistency, terminology and uptake of climate products. Building upon the success of the WMO El Niño/La Niña Updates for over a decade, WMO has taken up a new initiative, endorsed by the Sixteenth World Meteorological Congress in 2011, to develop a much broader Global Seasonal Climate Update (GSCU) that includes other large-scale climate indices having important regional impacts on seasonal climate. The objective of the GSCU is to provide the world community global-scale expert assessments of the ongoing and upcoming seasonal climate along with information on robustness of the available forecast signals. The GSCU is also a means to strengthen international collaboration and information flow between global, regional and national level operational climate monitoring and prediction centres – thereby contributing to the goals of the Global Framework for Climate Services (GFCS) which was established by the World Climate Conference-3. While the GSCU is intended primarily for use in the operational generation of regional and national climate updates, the requirements of global user communities will also be addressed and in this context the GSCU will contribute to application of science-based climate information in climate risk management.

The GSCU at a glance

GSCU summarizes the current status (monitoring) and the expected future behaviour (prediction) of the seasonal climate including major general circulation features and large-scale oceanic anomalies around the globe (e.g., El Niño/Southern Oscillation, North Atlantic Oscillation, Indian Ocean Dipole, etc.) and their likely impacts on continental-scale surface temperature and precipitation patterns. It is being designed to be used primarily by Regional Climate Centres (RCCs), Regional Climate Outlook Forums (RCOFs) and National Meteorological and Hydrological Services (NMHSs) in order to elaborate regional and national climate Updates. Additionally, it also caters to the global user needs such as the Early Warning Early Action Reports of the Inter Agency Standing Committee (IASC), etc. It is proposed to be regularly issued a few days ahead of each of the standard seasons.

The proposed GSCU Content

1. Global-scale climate monitoring (current season)
    - Observed temperature
    - Observed precipitation
    - Climate anomalies and events
2. Potential evolution of the state of the climate (coming season)
    - Predicted mid-troposphere circulation
    - Predicted temperature
    - Predicted precipitation
3. How to use the Global Seasonal Climate Update

Appendices

- Observed large-scale sea surface temperature indices
- Observed large-scale surface pressure indices
- Predicted large-scale sea surface temperature indices
- Predicted variables with the two-month lead time

The GSCU Implementation Strategy

A prototype of GSCU for operational implementation (Mark 1) has been developed by an international task team under the WMO Commission for Climatology. Monitoring information for Mark 1 will be contributed by global climate data and monitoring centres. Outlook information will be contributed principally by the 12 WMO Global Producing Centres for Long-range Forecasts (GPCs) with data collected, processed and displayed by the WMO Lead Centre for Long-range Multi-Model Ensembles (LC-LRFMME). Example products incorporated in Mark 1 are shown in the Annex. It includes a schematic depiction of the main climate events which are leading to potential vulnerabilities. Example prediction products incorporated in Mark 1 are also shown in the Annex. In addition to the example products shown, monitoring and prediction information will also include selected climate indices. Maps showing the prediction skill of the prediction products will also be provided. Both monitoring and prediction information will be synthesized in the form of text summaries based on expert consensus involving a globally extensive network of experts.

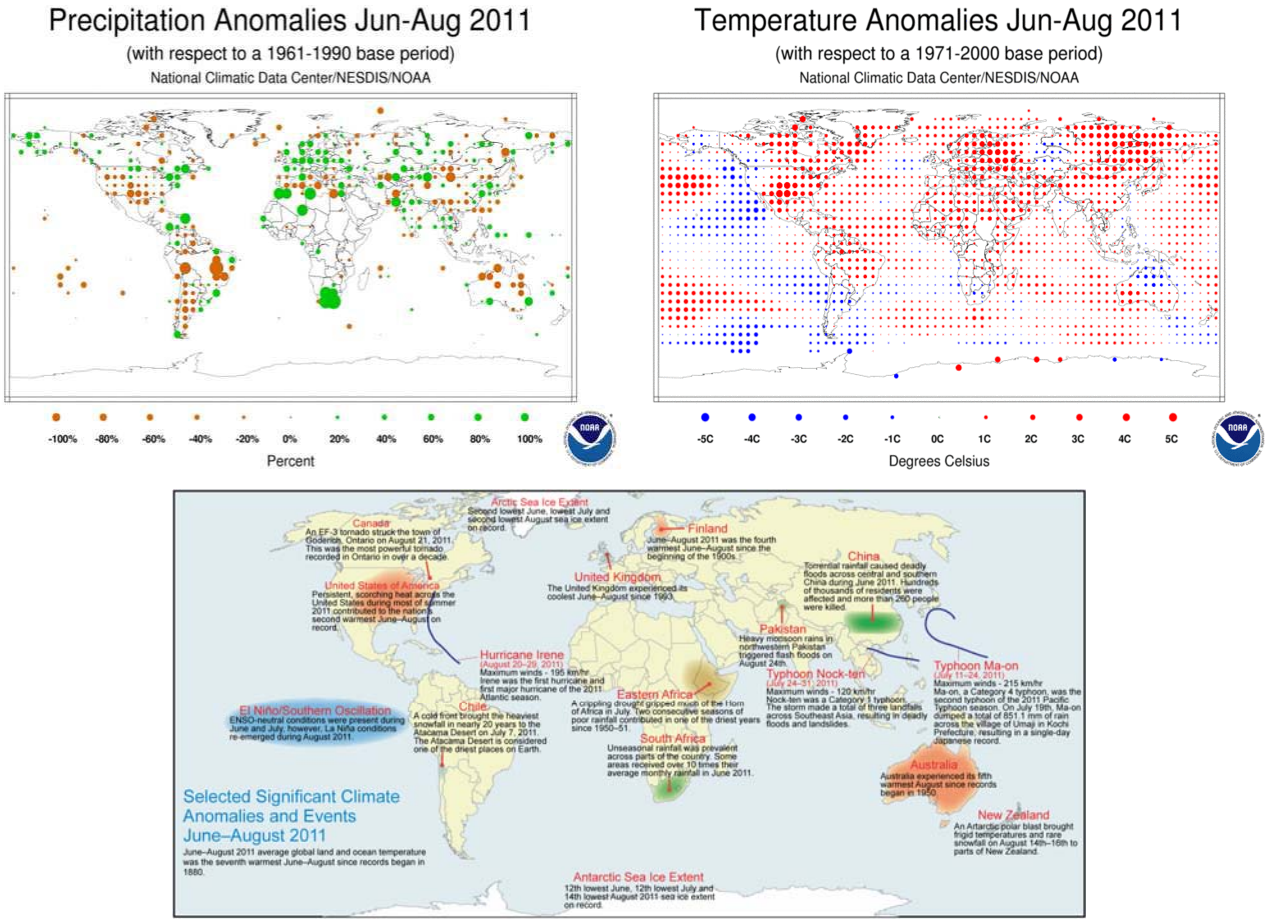
Trials of the Mark 1 GSCU will be organized in real time, under the guidance of WMO Commission for Climatology, with the target users for a period of at least one year starting in the first quarter of 2012. Peer review of the content and feedback on its usefulness will then be used to effect improvements and develop a final version to be considered for operational implementation.

GSCU Implementation Challenges

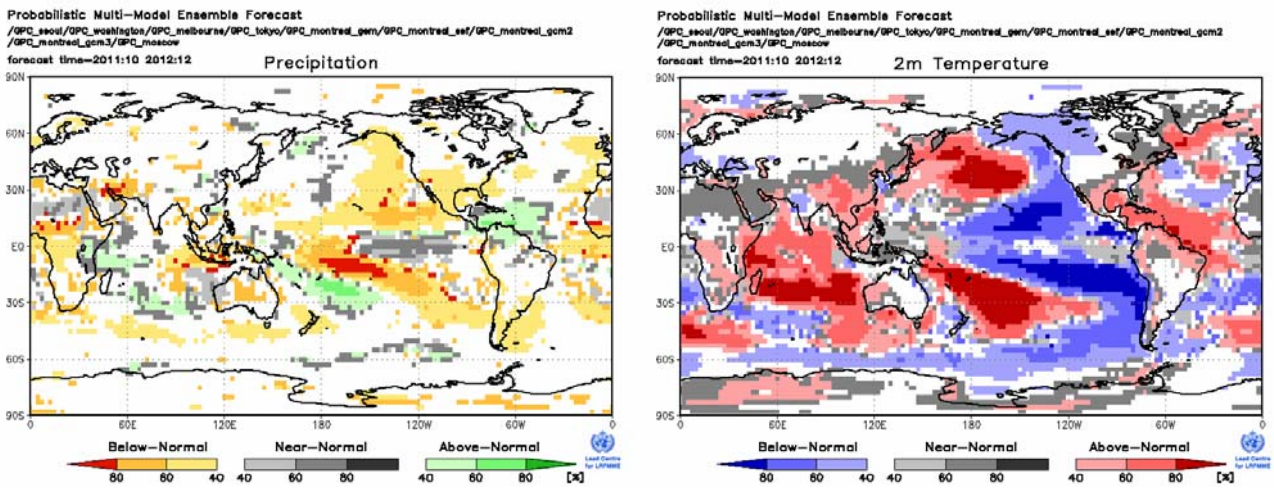
WMO recognizes that the science and practice of seasonal forecasting is a developing area. This gives rise to a number of challenges for the GSCU which will be addressed during the trial phase. These include, *inter alia*:

- *Production schedule*: Text input will be generated through an international consensus, and this will need to be done on a very tight production schedule;
- *Developing consistency in presentation*: Forecast products typically use a tercile format: monitoring centres typical use an absolute anomaly format;
- *Priority Climate indices*: The GSCU cannot be all-inclusive; it must focus on a limited but useful set of climate indices which provide a sufficient description of the past and future global climate state;
- *Geographical variations in prediction skill*: Regions and indices for which prediction skill is generally low (e.g., extratropics) must be made clear;
- *Expert interpretation*: Experience has shown that expert interpretation of forecast information (e.g. predicted seasonal circulation patterns) can improve on direct model predictions of temperature and rainfall. The key question in this context is how and to what extent this semi-subjective information should be incorporated into the GSCU.
- *Communication*: The communication of the key messages, especially toward global user community, is a crucial point to avoid any misinterpretation and to facilitate the best possible use of the GSCU.

Annex



Examples of monitoring products provided showing global climate anomalies and the associated climate events leading to potential vulnerabilities



Examples of Multi-Model Ensemble forecasting products available showing the most likely evolution of the climate system for the next 3 months and its consequences in terms of rainfall and temperature