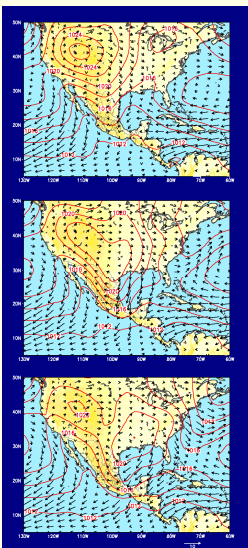


High impact weather in Mexico



During the summer (May-Oct), nearly 80% of the total annual precipitation is observed in the region. Tropical cyclones are the most frequent high-impact weather phenomena. Other high impact weather types are related to the dynamics of easterly waves, the North American monsoon system, the inter-tropical convergence zone meridional displacement, orographic precipitation and local convection.

During the winter (Nov-Apr), severe weather conditions occur as sudden decreases in surface temperature, strong winds at low tropospheric levels and heavy rainfall. These meteorological features are mainly related to cold air mass passages from mid-latitudes to the tropics. Even though these are commonly observed systems, their occurrence might result in extreme impacts to economy and society, especially when it is combined with human-induced vulnerability. Therefore, SERA activities require a multidisciplinary approach to gather natural and social scientists under a holistic approach.



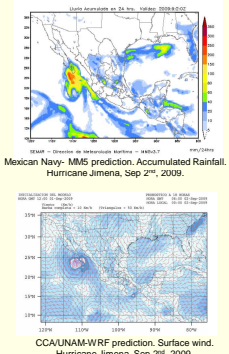
Composites of a winter weather type related to high socioeconomic impacts. Three-day sequences of SFC pressure and 825 hPa winds (From Vazquez-Aguirre, 2000)



Some real examples of extreme weather impacts in the region are shown in the following photos:

Availability of weather forecasts

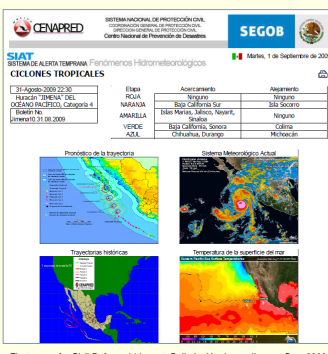
Several forecast systems are available in Mexico, though none of them uses ensemble predictions yet. Community mesoscale models such as MM5 and WRF have been implemented in various institutions and are run operationally as single-model runs. However, NWP in the country is still on its way to make the most of it. At present, operational weather prediction in Mexico mainly relies on forecasters' empirical expertise, the use of satellite images and traditional meteorological charts. An Early Warning System to cope with tropical cyclone impacts is in place at the Civil Defense headquarters.



Mexican Navy- MMS prediction. Accumulated Rainfall. Hurricane Jimena, Sep 2nd, 2009.



Different WARNING stages of the EWS for Tropical Cyclones.



First page of a Civil Defense hydromet. Bulletin. Hurricane Jimena, Sep. 2009.

User involvement from weather and climate communities

Most of societal and economic research in relation to atmospheric sciences has been developed for seasonal and monthly time-scales. This resulted in a well conformed group of climate information users: the Climate Prediction Forum community that meets twice a year to discuss possible applications of seasonal forecasts. A new group has been conformed in 2009, aimed to use information on extremes into decision-making processes. Recent studies on the economics of climate change could provide a base platform for SERA in shorter time-scales.



Participants from various socioeconomic sectors. Climate Prediction Forum, 2007.



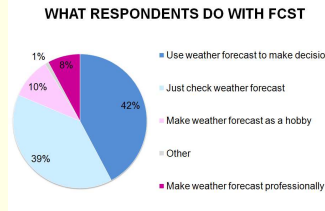
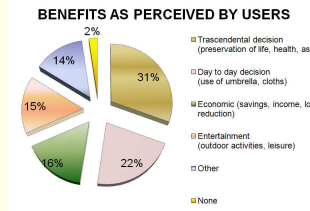
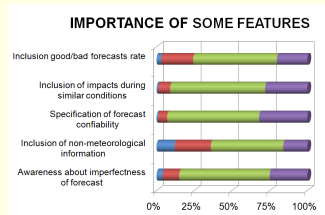
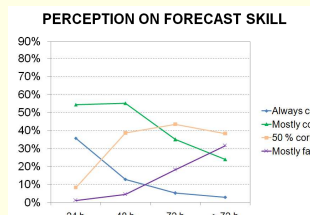
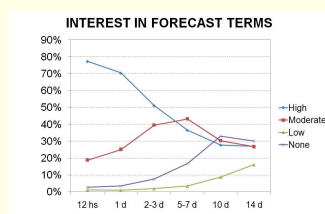
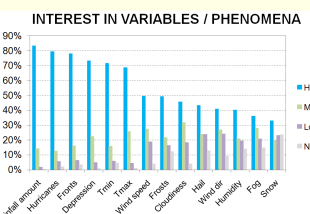
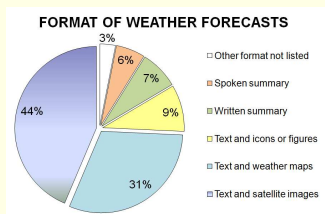
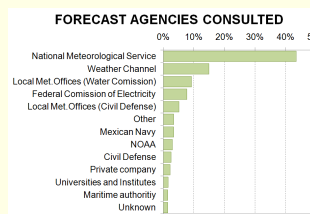
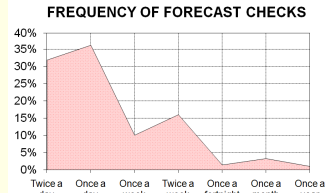
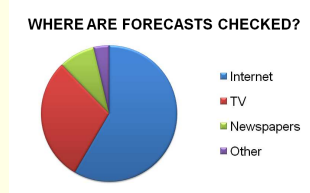
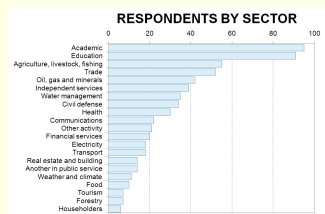
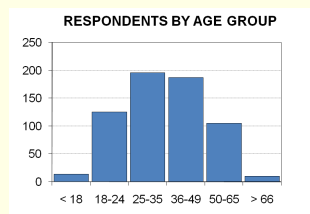
ETCCDI Workshop on detection of changes in the climate extremes of Mexico. March, 2009.



Report on the Economics of Climate Change in Mexico. Galindo, 2009

Use and perception of weather forecasts

At the end of winter 2008-2009, an electronic survey was conducted on how weather-forecast information is perceived and used in Mexico. Twenty questions were published in the National Meteorological Service (SMN) webpage which were answered by people across all the Federal States in Mexico with the exception of two (Zacatecas and Tlaxcala). Respondents were 32% female and 68% male; 57% hold a bachelor's degree. One of the questions revealed that 48% of the sample hardly makes a difference between the terms 'weather' and 'climate'. More survey results are shown in the graphics



Next THORPEX-SERA steps in Mexico

- Capacity building activities in cooperation with U.S. and Canadian institutions.
- Design and execution of the Implementation Plan for Mexico.
- Prediction enhancements by using TIGGE/NAEFS products operationally.
- Demonstration projects, research and operational developments.
- Exploration of linkages between weather and climate communities.
- Incorporation of the SERA framework (Morss et al, 2007) in various initiatives.

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