

Motivation and structure

Since the TOGA (Tropical Ocean and Global Atmosphere) program, significant progress has been made in understanding, observing, modeling and predicting ENSO (El Niño-Southern Oscillation). Yet, the arrival (15 years after the 1982-83 El Niño) and the intensity of the 1997-98 El Niño were a surprise to the scientific community (McPhaden, 1999). Over the last two decades, El Niño behaved differently from the canonical El Niño as described by Rasmusson and Carpenter (1982), and this has been related to the 1976 Pacific decadal climate shift (Wang and An, 2002). The basic 2 to 7-year ENSO oscillation is in fact modulated by natural decadal and multidecadal oscillations and warming trends. Research on decadal and long-term variability is more advanced in midlatitudes than in the tropics, and it has been the subject to various investigations, conferences and workshops (see <http://www.DecVar.org>). The low-frequency modulation of ENSO is a more recent research topic, but undeniably important as it makes ENSO difficult to understand and predict. As a result, within the last 5 years more than a hundred publications have been devoted to this topic (see section 5 of Wang and Picaut, 2004). Hence, a workshop was held in Toulouse on 22-25 September 2003 to bring together observationalists and modelers in order to exchange information on this topic, discuss the need for new observations, evaluate various mechanisms and stimulate collaborative efforts.

The CLIVAR international program is made up of three sub-programs, GOALS (Global Ocean-Atmosphere-Land System), DecCen (Decadal-to-Centennial) and ACC (Anthropogenic Climate Change), which are all related to the low-frequency modulation of ENSO. The U.S. CLIVAR is initiating the Pacific Basin Extended Climate Study (PBECS), with focus on the decadal modulation of ENSO (Kessler et al., 2001). Within France, the PNEDC (Programme National d'Etudes de la Dynamique du Climat) supports the recent interest in this topic of the French scientists working on ENSO. Obviously, there is a need for a coordinated effort for the study on low-frequency modulation of ENSO within Europe, the U.S.A., and other nations.

The goals of the workshop were to assess the recent progress in measuring, modeling, analyzing and understanding the natural and anthropogenic low-frequency modulations of ENSO. As such, the discussions were centered on the best way to use direct historical and recent observations (in situ and satellite data) and proxies (e.g., coral data) in conjunction with

modeling activities (idealized, forced and coupled models). Plans for assembling and improving measurements, and assessing the various mechanisms (internal to the tropics and/or involving tropical-extratropical connections) were discussed within three working groups.

The workshop consisted of two days of plenary sessions with invited keynote and contributed presentations (oral and poster), provided by a mix of top scientists, graduate students and young scientists. On total, 24 oral presentations and 13 posters were presented to 80 scientists from Australia, Chili, France, Germany, Japan, Netherlands, New Caledonia, Russia, United Kingdom, United States, and Peru. Most originated from the oceanographic and atmospheric community, but a number of paleo-climate scientists (hydrologists, glaciologists, geologists...) participated enthusiastically to this workshop. The last day was dedicated to three working groups on “data analysis: modern, historical and proxies” chaired by Alexandre Ganachaud, “ENSO decadal variability and subtropical/tropical interactions” chaired by Julian P. McCreary, and “self-sustained low-frequency variability in the tropics” chaired by Axel Timmermann. The three chairmen provided their conclusion during the final plenary session.

References:

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