

# Report of the 3rd Session of the CLIVAR VAMOS Panel

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### **1. Introduction**

The meeting was opened by Prof. Carlos Roberto Mechoso, chairman of the CLIVAR VAMOS panel and Dr. Andreas Villwock, representative of the International CLIVAR Project Office. 27 participants attended (see Appendix 1). Dr. Villwock gave a short report on the progress of CLIVAR during the last year, with special emphasis on VAMOS related items. A summary can be found in Appendix 2.

In his introduction Prof. Mechoso placed this third panel meeting in the context of the previous ones to highlight the progress that has been made since 1997, when scientists convened first time for the Conference on American Monsoons in Mexico City. The overarching themes of the previous meetings can be stated as following in reference to the American monsoon systems:

1. Is there science to be done (CONAM, 1997)
2. What science will be done (VPM1, 1998)
3. How will the science effort be focused (VPM2, 1999)

As a natural progressing the third panel meeting of the panel now dealt with implementation issues. Prof. Mechoso underpinned the urgency to flash out the plans for observational studies if they should be realised within the planning horizon.

The objectives of this meeting were:

- Review the status of PACS (substantial changes within the last year) and GAPP
- Finalise the ALLS program
- Define VEPIC and outline an implementation plan
- Define NAME and outline an implementation plan
- Introduce PLATIN
- Discuss a strategy for establishing and maintaining a long-term climate monitoring system in the Americas.

Future panel meetings would re-evaluate the state of the programme and discuss the need for future revision and for expansion. The ultimate goal of VAMOS is the improvement of climate predictions, together with an assessment of the societal impact of such improvements.

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### **2. Report from related programmes and projects**

#### **2.1 Low Level Jets (LLJ)**

Dr. Julia Paegle reviewed the status of the LLJ project and the draft implementation plan (available <http://www.met.utah.edu/jnpaegle/research/ALLS.html>).

Thereafter Dr. M. Douglas presented the implementation plan for the field component of the LLJ experiment to be carried out in 2002/03 (see [Appendix 2](#)). Various aspects of the instrumentation (raingauges / vs satellite measurements, aircraft operations) were discussed thereafter in greater detail.

## **2.2 PACS**

The chair of the PACS steering group, Dr. Steve Esbensen reported about recent changes in the US-CLIVAR organisational structure. The US-CLIVAR effort is now led by a steering committee (SSC) which has created a number of panels: Atlantic, Pacific, Seasonal-to-Interannual Prediction and PACS. The project management is carried out by a Project Office, located in Washington DC. Dr. David Legler (FSU) is the director (<http://www.usclivar.org>).

PACS is now heading more towards an interagency approach with NOAA leading. More details can be found in the [Appendix 2](#).

## **2.3 LBA**

Dr. Silva Dias gave a progress report on the LBA wet season experiment. The LBA campaign during the rainy season onset is planned for Sept.-Dec. 2002, which overlaps partly with the start of the LLJ experiment. A co-ordination and possible co-operation must be considered since the LBA domain partly overlaps with the domain of the LLJ experiment.

## **2.4 CEOP/GAPP**

Dr. R. Lawford presented the plans for the GEWEX CEOP Phase in 2002-03 and the envisioned transformation of GCIP into GAPP that should run from 2001-07 and deal with the quantification of the water and energy budget in the Mississippi River basin. Although GCIP was originally a data analysis programme, GAPP is now working towards distinct field studies. One reason for this strategy is that radar rainfall data was not as good as expected.

## **2.5 VEPIC**

Dr. Bruce Albrecht reviewed the current status in the planning of the VEPIC project. The overall goal of this project is to better understand the processes related to the formation, evolution and climate impact of the low level (stratocumulus) cloud decks off the coast of South America. There are already some ongoing and planned activities, such as

- IMET mooring (October 1999)
- Enhanced TAO instrumentation (ongoing)
- Satellite analysis (July 1999)
- TAO tender and Chilean cruises (Fall 1999)
- EPIC 2001 Stratus cruise (Oct. 2001)

Dr. Tony Busalacchi encouraged efforts leading to give more visibility to the non-US VAMOS component of VEPIC.

## 2.6 PLATIN

On the last VAMOS meeting a study of the Rio de la Plata basin had been mentioned as a possible integrative, interdisciplinary CLIVAR - GEWEX project. The LLJ experiment could be regarded as a first stage of such a project since it directly addresses the moisture influx to the basin.

It was pointed out that the project has a potential for strong societal interest in the MERCOSUR area (200 Mio. people) with strong historical scientific collaborations among countries in the basin (Argentina, Bolivia, Brazil, Paraguay, and Uruguay).

An in depth discussion took place in the working groups.

## 2.7 VAMOS data

Dr. José Meítin reported on the progress made by the data management component of VAMOS. In particular, a VAMOS data information site will become accessible soon (<http://www.joss.ucar.edu/vamos/>). A mirror site in South America is also planned.

## 2.8 Pacific buoys / CPPS

Dr. Rodrigo Nuñez gave an update on the Chilean buoy programme. This may become part of a larger effort, OSEPA, which is coordinated by CPPS. OSEPA is a joint effort of the countries in the south Pacific west of South America (Colombia, Peru, Ecuador and Chile) and its domain extends south of 10°S. The possibility of a funding OSEPA through GEF is being explored. The Chilean contribution to this project would be in the order of \$25M / 5 years.

## 2.9 NAME

Dr. Wayne Higgins introduced a new VAMOS/PACS/GAPP initiative called NAME (North American Monsoon Experiment). The initiative focuses on the North American warm precipitation regime.

NAME will link CLIVAR/VAMOS, which has an emphasis on ocean-atmosphere interactions and GEWEX/GAPP, which has an emphasis on land-atmosphere interactions in order to determine the relative importance of the coupled interactions between the ocean, land and atmosphere as they relate to the monsoon. NAME will benefit from linkages to other ongoing projects within GEWEX/GAPP, including the CEOP, LDAS and the NCEP Regional Reanalysis and from linkages to other field programs within CLIVAR/PACS and CLIVAR/VAMOS, such as the American Low-level Jets (ALLS) and EPIC.

Some anticipated benefits from NAME include (i) a better understanding of the key components of the North American Monsoon System (NAMS) and their variability; (ii) a better understanding of the role of the NAMS in the global water cycle; (iii) improved observational data sets and (iv)

improved simulation and monthly-to-seasonal prediction of the monsoon and regional water resources.

NAME is designed using a 3 tiered approach involving different spatial scales (Figure 1). Each tier has a scientific focus aimed at improved warm season precipitation prediction, and activities related to each tier will proceed concurrently. NAME studies presume that the general nature of the warm season evolution of the atmospheric circulation and precipitation regimes over North America is reasonably well known from previous studies.

Tier I focuses on mesoscale-features in the core monsoon region over southwestern North America. The goal of activities in this region is to improve the monitoring and modelling of the diurnal heating cycle and its influence on convection as a necessary step towards improved warm season precipitation prediction. Of primary interest are relationships between the low-level circulation features (including the land breeze / sea breeze circulation and Gulf of California low-level jet) and the diurnal cycle of convection. Enhanced observations will be required to validate models and analyses, including sea-surface temperatures along the Gulf of California, transects from the Gulf of California to the Sierra Madre Occidental (wind, surface temperature, sea-level pressure, and precipitation. from automated weather stations), pilot balloons and possibly NOAA-P3 flights. Regional mesoscale models and the Eta Model Data Assimilation System (EDAS) will be used to guide the enhanced monitoring activities.

Tier II focuses on regional-scale features over southwestern North America and the warm pool region to the southwest of Mexico. The goal of activities in this region is an improved description and understanding of intraseasonal aspects of the monsoon. A key question concerns the importance of interactions between Tropical Easterly Waves (TEWs) and GC moisture surges in the prediction of monsoon precipitation. Related questions include: (1) What fraction of TEWs produce GC surge events?; (2) What is the physical setting for the pronounced double peak structure in monsoon precipitation?; (3) How strong are relationships between the Madden-Julian Oscillation, tropical cyclone activity, and monsoon precipitation?; and (4) What role do energy sources over the InterAmerica Sea / Gulf of Mexico play in Great Plains low-level jet (GPLLJ) variability? These activities will benefit from linkages to EPIC, which emphasises variability in the ITCZ-cold tongue complex of the eastern tropical Pacific.



*Fig. 1: Schematic diagram of the 3 foci of the North American Monsoon Experiment*

Tier III focuses on aspects of the continental-scale monsoon circulation. Here the goal is an improved description and understanding of spatial / temporal linkages between warm season precipitation, circulation parameters and the dominant boundary forcing parameters. Among the questions that will be addressed by NAME are the following: (1) How is the evolution of the warm season precipitation regime over North America related to the seasonal evolution of the boundary conditions?; (2) What are the interrelationships between year-to-year variations in the boundary conditions, the atmospheric circulation and the continental hydrologic regime?; (3) Can coupled models reproduce the observed summer precipitation in average years and years with ENSO/PDO influence?; (4) What is the relative importance of tropical cyclones and extra-tropical systems for warm season precipitation over the continent? These studies will be carried out in tandem with land surface model experiments and land data assimilation experiments, and will benefit from multi-year regional reanalyses and retrospective soil moisture analyses.

## **2.10 IAI**

Dr. Victor Magaña reported about the project "VEPIC Mex-Experiment", which is funded through IAI and that will investigate the mid summer drought (MSD) in Central America. The hypothesis is that the MSD relates to air-sea interaction in the Mexican warm pool in the eastern Pacific. A field campaign is planned for May - Sept. 2001 with support from IAI, which is in the amount of \$180,000. A more detailed description can be found in the [Appendix 2](#).

*Thereafter, the panel met in executive session (see [Appendix 3](#)).*

## **2.11 HELP**

Dr. Jim Shuttleworth reported about a new UNESCO International Hydrology Programme (IHP) and the WMO Hydrology and Water Resource Programme (HWRP) initiative called HELP (Hydrology for the Environment, Life and Policy). The overarching purpose of HELP is to deliver social, economic, and environmental benefit to stakeholders through the sustainable and appropriate use of water by deploying hydrological science in support of improved integrated catchment management. (More details can be found in the [Appendix 2](#)).

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## **3. Reports from the Working Groups**

### **3.1 Low Level Jet Experiment**

Michael Douglas reported on behalf of the ALLS working group. A slightly revised map of stations was presented. In addition, the group discussed possibilities to better match with the LBA experiment in western Amazonia. There could be an initial observing period in late fall (2001?) followed by a break over Christmas with a short IOS in early 2002. In total, about 60-90 sounding dates are envisaged. A preliminary cost estimate for this experiment was about \$1.5M.

### **3.2 VEPIC**

Bruce Albrecht reported about the discussions in the VEPIC group. The project is not as sharply defined as the LLJ experiment. Further work has to be completed to support the hypothesis of the connection between the convection area over the Andes and the stratocumulus decks off South America. Pending clarification of these issues an IOP is planned for 2003. In addition to the observations a strong model component with a hierarchy of models should be added.

### **3.3 NAME**

The panel endorsed the NAME project as a very valuable contribution to VAMOS. Although the project is clearly a mix of GEWEX and CLIVAR interests with a lot of land processes but also ocean / land interactions, one programme should take the lead in this initiative.

The panel recommended to start with a smaller project in the Gulf of California to study the diurnal cycle and the intraseasonal variability of the convection associated with the monsoonal circulation over North America. A mesoscale model should be used to test hypothesis.

Wayne Higgins announced a special session of NAME at the next Climate Diagnostic Workshop to be held in October 2000 hosted by IRI, Palisades, USA.

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to [Appendix 1](#)

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Last update: 29.11.2002 by [Andreas Villwock](#)