

## CLIVAR Monsoon Roadmap

In the context of AAMP, VAMOS, VACS  
Wang, Higgins, Vera, Washington, Waliser

This roadmap *highlights only the highest priority items* – see additional panel documents for more discussion. In part, it is driven by the Monsoon Prediction Roadmap given below and in addition is primarily directed towards summer/rainy-season conditions.

**Phenomena:** Cutting across nearly all monsoon sectors are requests to have better understanding and model representations of the **diurnal cycle**, tropical **intraseasonal variability** and tropical **mean** state. In regards to the diurnal cycle, addressing the shortcomings in this area – particularly in our global climate/weather models – is thought to be a tractable way and potentially necessary means to address more generalized convective/cloud parameterization issues and their rectification from short to longer time scales, including the mean. Intraseasonal variability is an intrinsic and fundamentally important mode of variability in the A-A sector with important remote impacts - and in some cases plausibly intrinsic modes - in the American and African sectors. The shortcomings in our model representations of the mean are thought to both negatively impact and derive from the poor representation of these higher frequency variabilities.

### **Modeling & Prediction:**

AAMP – DUANE/BIN all phenomena above, MME for subseasonal and seasonal prediction

VAMOS – HIGGINS/VERA PLEASE FILL IN - **brief**

VACS – to capitalize on AMMA field observations and process studies for improved simulations and predictability of WAM particularly on SIP, multi-decadal to centennial time scales. In eastern and southern Africa, VACS aims to encourage and partly facilitate modeling efforts and model post-processing appropriate to the complex gradients of rainfall, topography and land cover of both regions. Evaluating additional predictability derived from Benguela Ninos, the IOD and other recently revealed atmosphere-ocean modes important to climate variability are encouraged through regional modeling as are ongoing efforts with ENSO and Indian Ocean modes.

**Field/Process studies:** VOCALS is recognized as the leading candidate for the next field/process study for VAMOS, an ocean-atmosphere campaign planned for the 2008 time frame. The already underway AMMA program is the principal field campaign for VACS which focuses on the west Africa monsoon. The Atlantic Panel's TACE effort is likely to have tangible benefits to VACS. A future focus for VACS will be on planning an east Africa campaign. In addition, efforts to reverse the decaying climate observing system in Africa through GCOS, G8 and COP processes have been and will continue to be an important contribution of VACS. The principal AAMP-related field effort is the development and implementation of the Indian Ocean Observing System (IOOS). Future more focused field campaigns are likely to focus on air-sea interaction processes in equatorial Indian Ocean, in part to better observe and understand the development and amplification region of the MJO/ISO, although this is likely to not be before 2010. Specific contributions to the target phenomena discussed above are as follows:

Diurnal Cycle: NAME, SALJEX, MESA? AMMA, GEWEX/CEOP

MJO/ISO: Genesis/Active regions: Other than IOOS, nothing specific.

MJO/ISO: Remote effects: NAME, MESA?, AMMA.

Mean State: Combined VAMOS efforts, AMMA, TACE, IOOS

**Near-Term Workshops:**

AAMP is considering a workshop in 2007 that may be joint with APCC/CLIPAS and the US CLIVAR Subseasonal/MJO Working Group with a considerable focus on intraseasonal variability.

VAMOS The 9th Session of the VAMOS panel (VPM9) will take place on 22-23 April 2006. The objectives of VPM9 are: Advance the Science and Implementation plans for VOCALS, discuss MESA Restructuring, review NAME 2004 preliminary results, discuss new directions for VAMOS. The first meeting of the LPB CSE Implementation steering Group is being planned for middle 2006 in one of the countries of the Basin. The 8<sup>th</sup> NAME Science Working Group meeting will be held in conjunction with the CPPA PI meeting during August 2006. A parallel meeting of the NAME Hydrometeorology Working Group is also planned.

VACS is planning a workshop in Tanzania for July 2006 to address issues relating to the Prediction and Predictability of the Climate of Southern and Eastern Africa. Capacity building is a prime requirement for progress in African climate and a series of workshops partly planned through VACS is envisaged through 2010 and beyond.

**Other Monsoon/Region/Panel Specific**

VACS sees the integration of climate information, particularly that relating to interannual variability, in health, food security and water management as a prime requirement for sustainable climate science (including observations) in Africa.

**Monsoon Prediction Roadmap**

2007

<b>Monsoon Prediction Matrix</b>	Empirical Atm or Hydrol	GCM	RM Hydrology	RM or GCM Earth System
MJO	S			
Subseasonal<->Synoptic*				
Seasonal/Interannual	S**	S**	S**	
Decadal				

2010

<b>Monsoon Prediction Matrix</b>	Empirical Atm or Hydrol	GCM	RM Hydrology	RM or GCM Earth System
MJO	SA	S		
Subseasonal<->Synoptic*				
Seasonal/Interannual	SA**	SA**		
Decadal				

2013

<b>Monsoon Prediction Matrix</b>	Empirical Atm or Hydrol	GCM	RM Hydrology	RM or GCM Earth System
MJO	SA	SA	SA	
Subseasonal<->Synoptic*				
Seasonal/Interannual	SA**	SA**	SA**	
Decadal				

\* Multi-scale interactions, modulation of hurricanes/typhoons, higher-order wave interactions

\*\* Some skill under strong ENSO conditions, strongly dependent on monsoon region.

<b>Prediction Activity / Fidelity</b>	
Virtually None	
Research	
Experimental	
Operational	
With Skill	S
With Applications	A