

# CAPT Update

Jerry Potter

Project leader: Steve Klein

Project Team:

Jim Boyle

Shaocheng Xie

Tom Phillips

Jay Hnilo

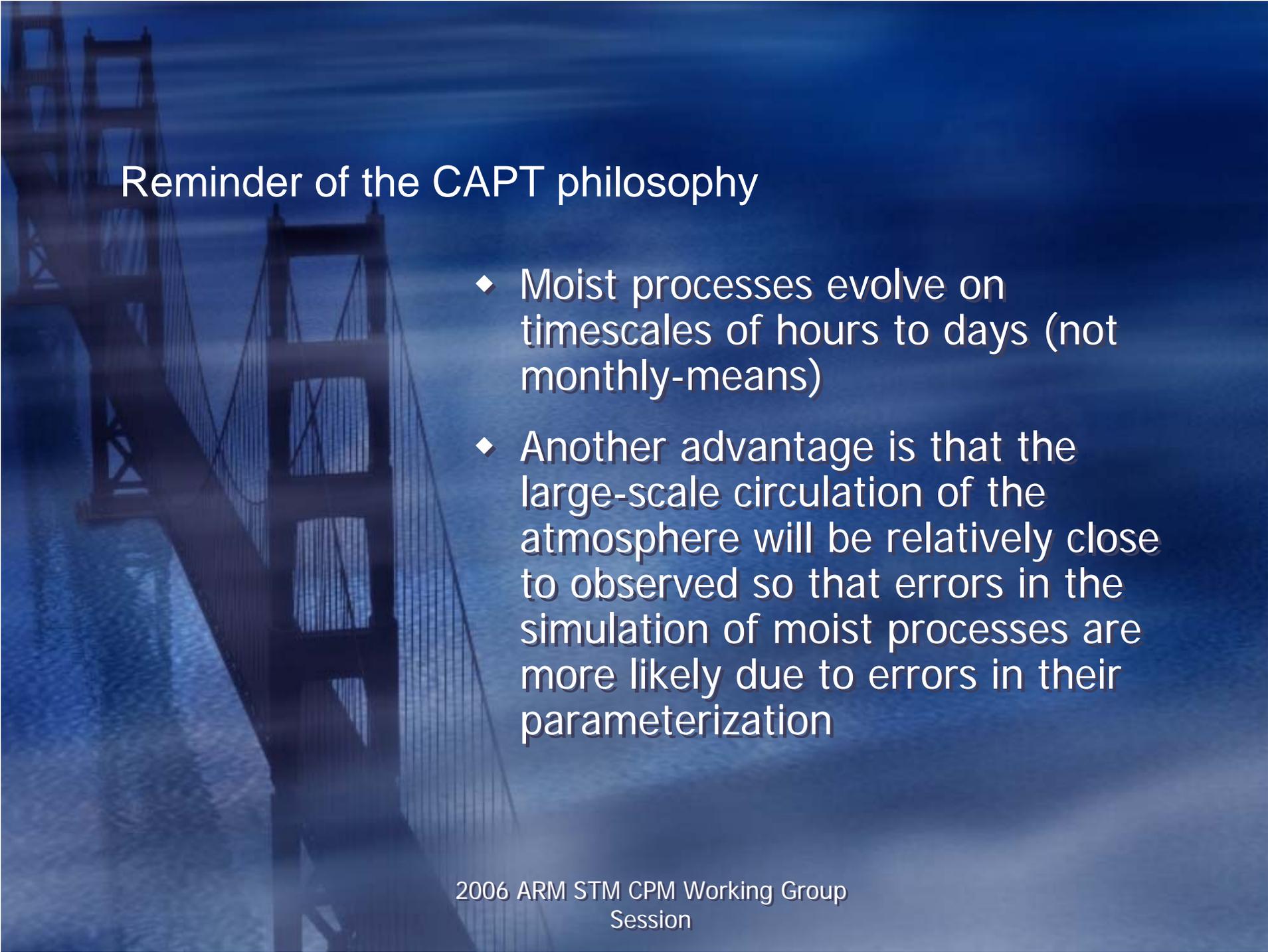
Mike Fiorino

Dave Williamson

Jerry Olson

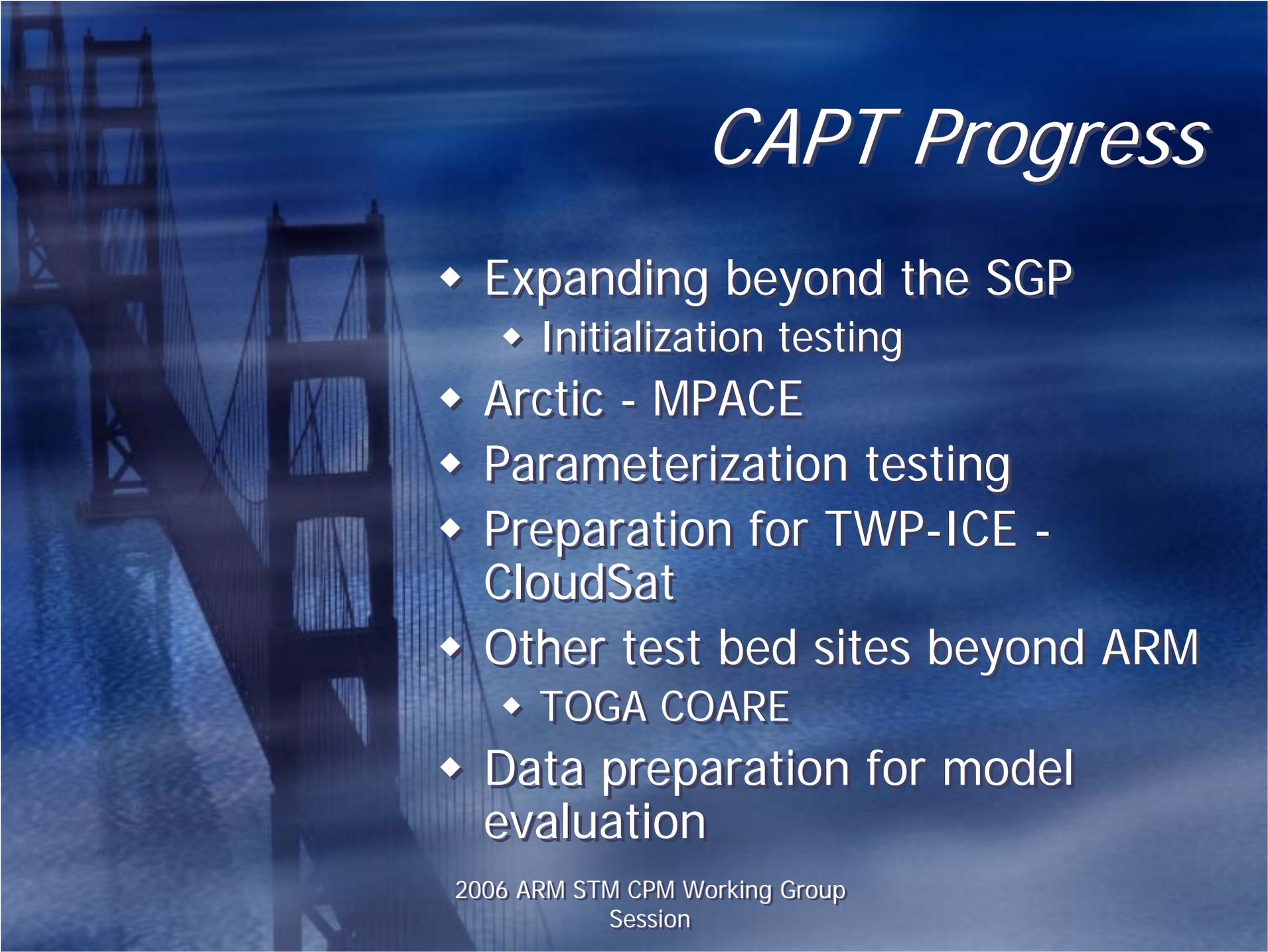
## The LLNL CAPT Project

- ◆ Natural way to compare climate models to the data is to run climate models in weather forecast mode
- ◆ At LLNL, we initialize climate models with analyses of the atmosphere from weather prediction centers and perform short integrations (<10 days) (i.e. 'hindcasts'). The results are compared to the detailed ARM and other observations at the grid-points of the model closest to their fixed sites
- ◆ We use the climate models of the National Center for Atmospheric Research (NCAR) and the Geophysical Fluid Dynamics Laboratory (GFDL)



## Reminder of the CAPT philosophy

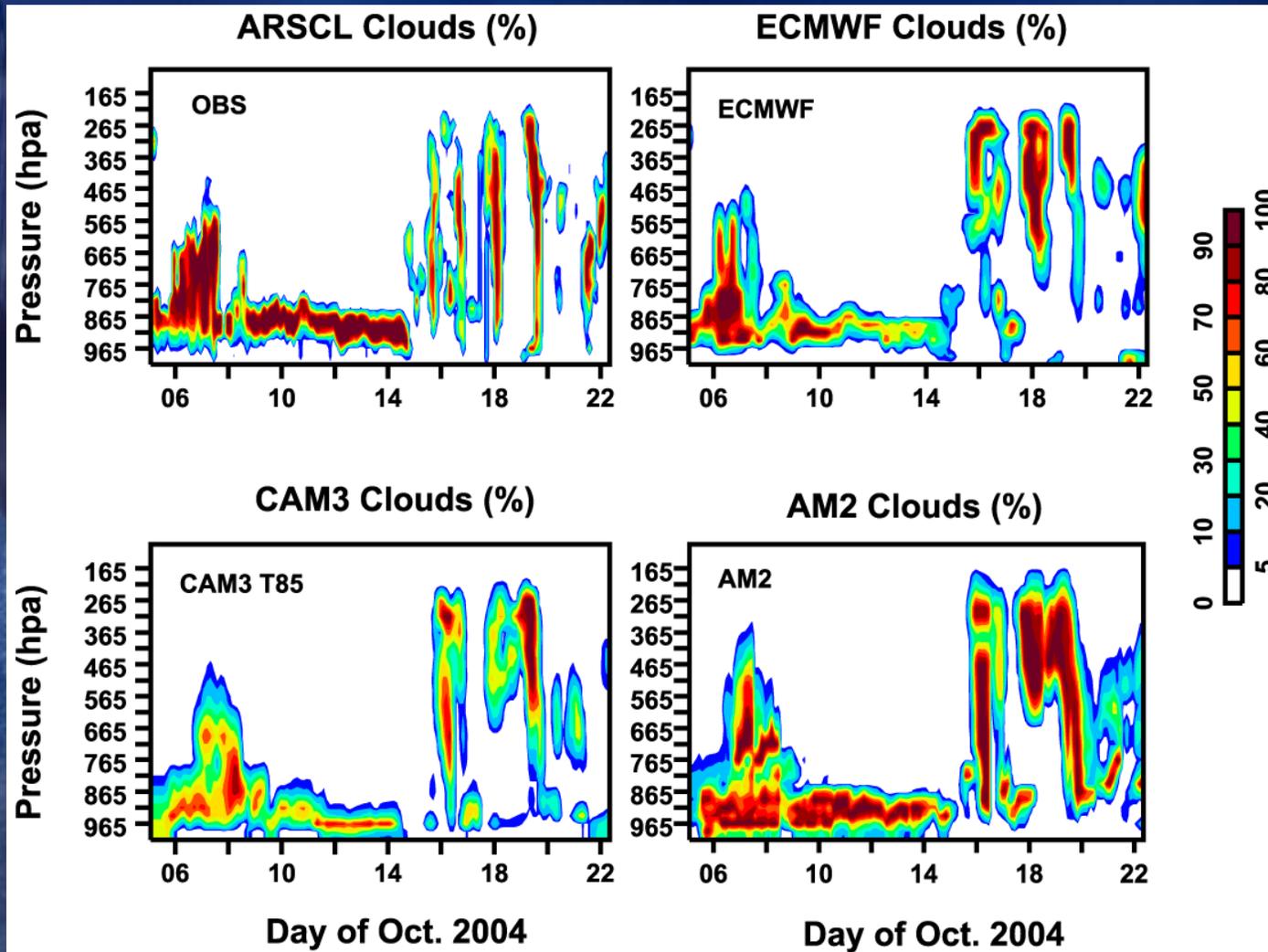
- ◆ Moist processes evolve on timescales of hours to days (not monthly-means)
- ◆ Another advantage is that the large-scale circulation of the atmosphere will be relatively close to observed so that errors in the simulation of moist processes are more likely due to errors in their parameterization



# *CAPT Progress*

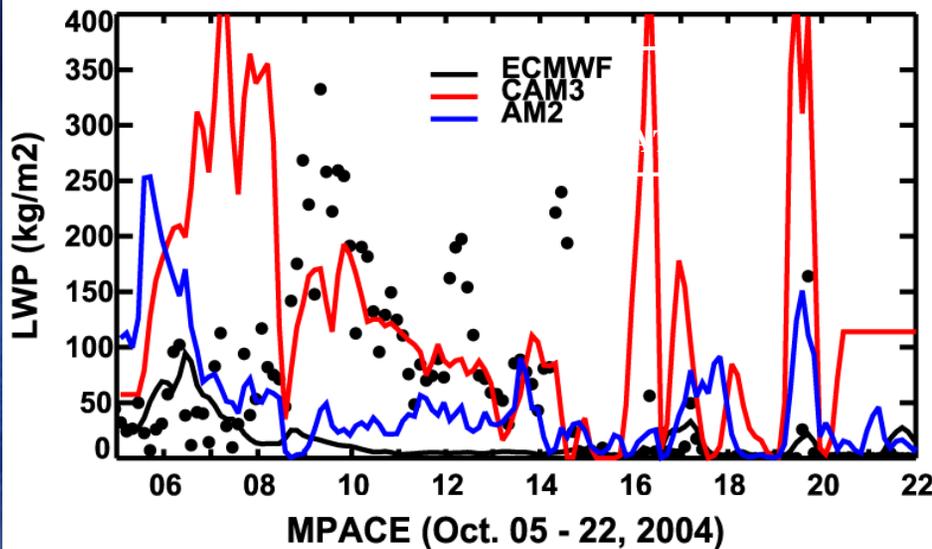
- ◆ Expanding beyond the SGP
  - ◆ Initialization testing
- ◆ Arctic - MPACE
- ◆ Parameterization testing
- ◆ Preparation for TWP-ICE - CloudSat
- ◆ Other test bed sites beyond ARM
  - ◆ TOGA COARE
- ◆ Data preparation for model evaluation

# MPACE forecasts show promise forecasting cloud occurrence

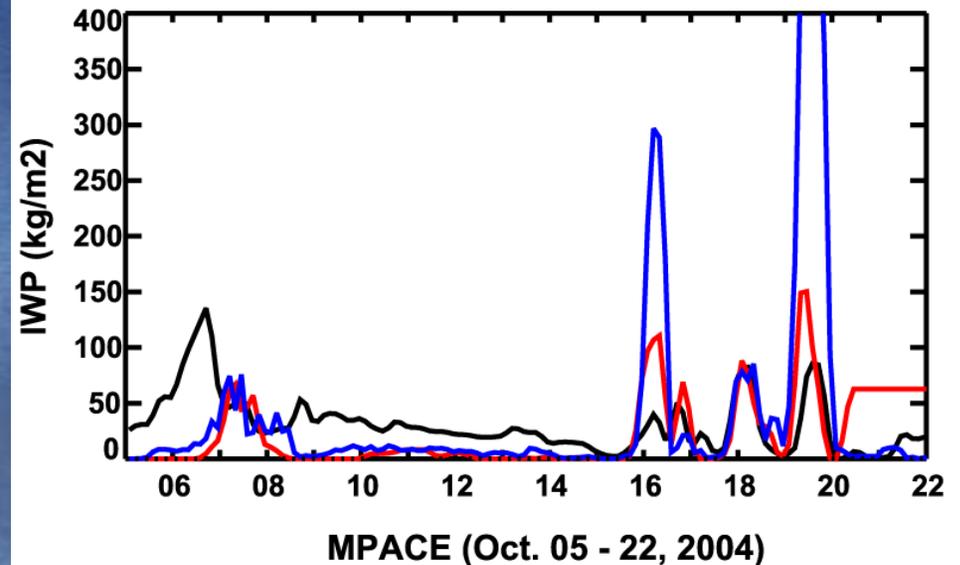


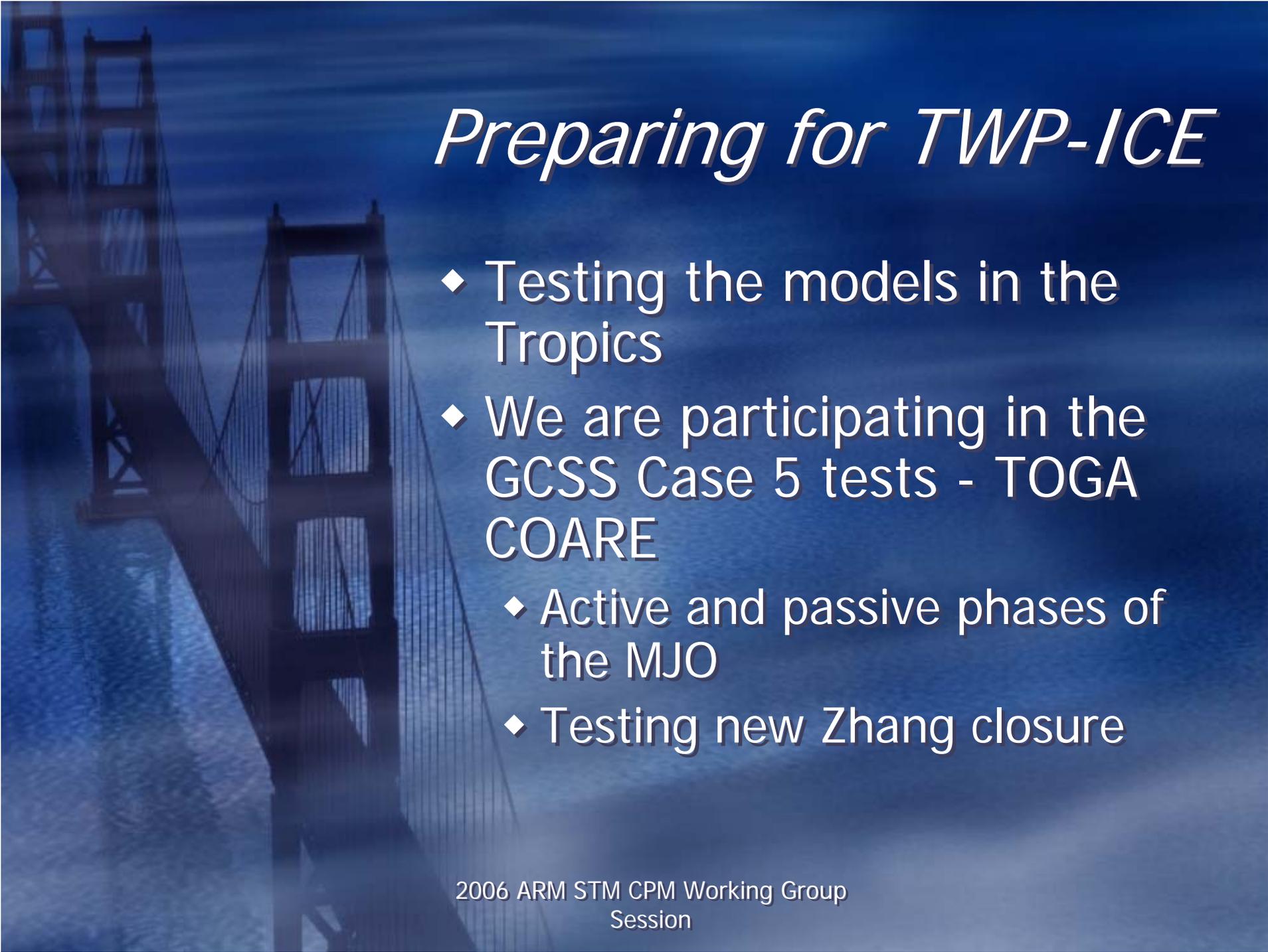
*Objective of MPACE is to isolate and document systematic errors in mixed phase clouds*

**Cloud Liquid Water Path at Barrow**



**Cloud Ice Water Path at Barrow**



A photograph of the Golden Gate Bridge at night, illuminated by city lights, with a dark blue sky and water. The bridge's towers and suspension cables are visible, extending from the left side of the frame towards the center.

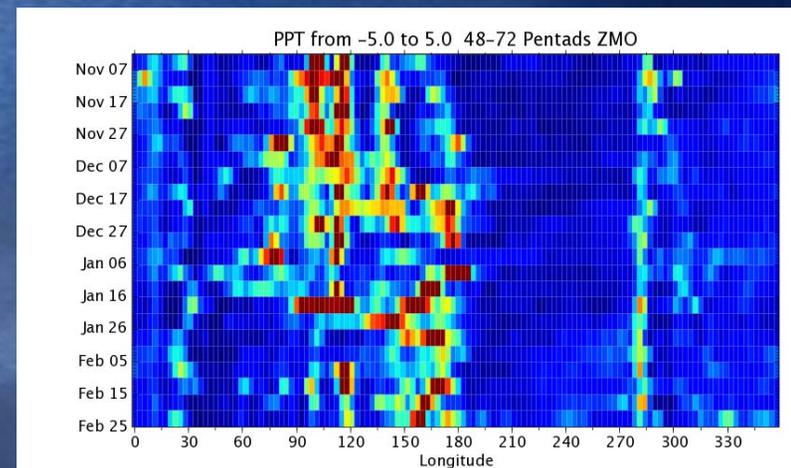
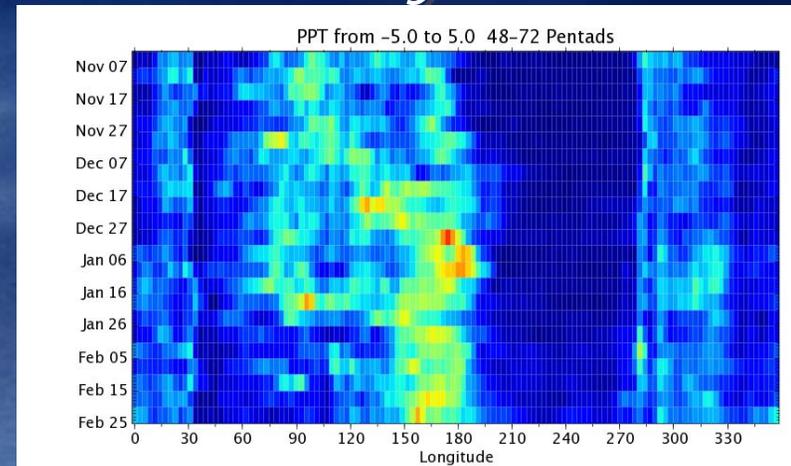
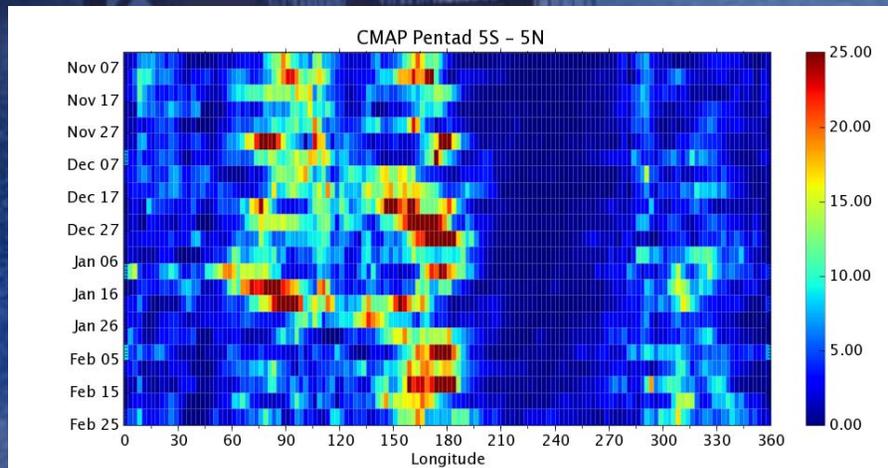
# *Preparing for TWP-ICE*

- ◆ Testing the models in the Tropics
- ◆ We are participating in the GCSS Case 5 tests - TOGA COARE
  - ◆ Active and passive phases of the MJO
  - ◆ Testing new Zhang closure

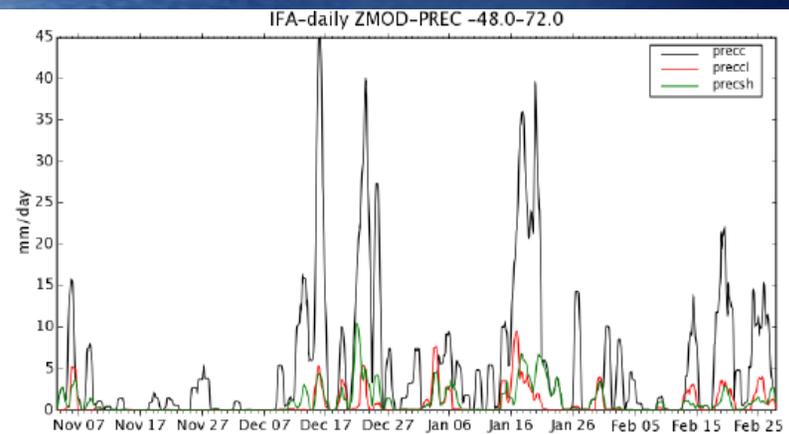
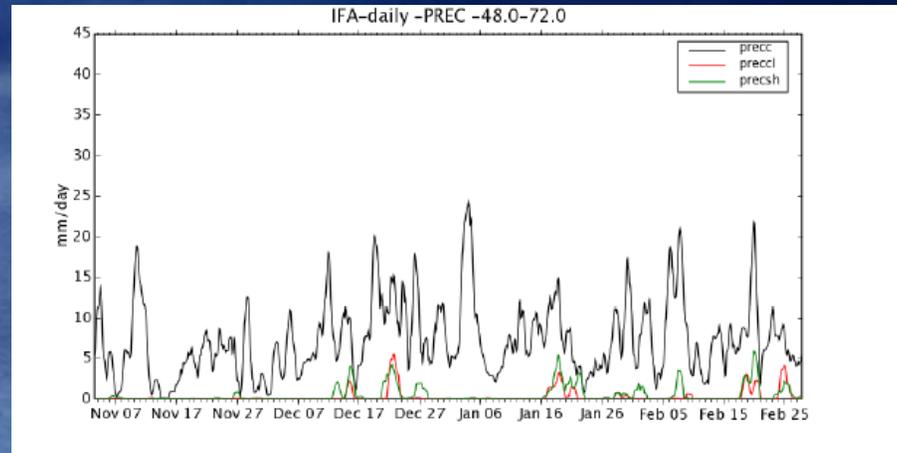
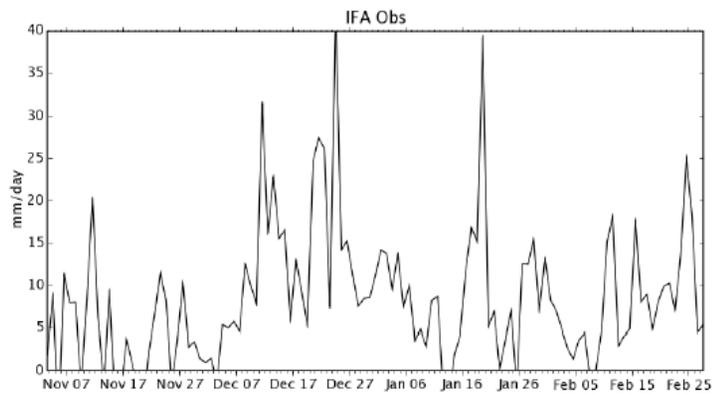
*Representing the active and passive phases of the MJO is a special problems for many models*

*Precipitation averaged over 5-day intervals from 5N to 5S between November 1992 and February 1993*

**Satellite observations**



# *Precipitation improved with new closure*



2006 ARM STM CPM Working Group  
Session

# We have developed a catalogue of the simulations and associated ARM data - this will be available to our ARM collaborators

CAPT Internal Pages file:///Users/jerry\_potter/Desktop/capt.html

---

## CAPT Internal Pages

[DATA](#)  
[PRESENTATIONS](#)  
[INTERNAL MEETING NOTES](#)

**DOCUMENTATION OF SELECTED OBS/MODEL DATA**

*\* Note: A general remapping of mount points on PCMDI's servers was implemented in 9/2005. Old directory paths that are still listed in the data documentation linked below should be modified according to the following key:*

<u>Old Location</u>	<u>Current Location</u>
/pcmdi/capt1/dat/fc -->	/pcmdi/CAPT1/dat/fc
/pcmdi/capt2 -->	/pcmdi/CAPT2
/pcmdi/capt1/dat/amip, an, ic, ob, pp -->	/pcmdi/CAPT3/dat/amip, an, ic, ob, pp

[Other PCMDI data mount point remappings](#)

**General Info:**

- [CAPT data tasks \(Steve Klein--> Mike Fiorino\)](#)
- [CAPT dataset review \(Mike Fiorino\)](#)
- [CAPT data recommendations \(Mike Fiorino\)](#)
- [Guide to consistently processed Model/Obs MOLTS: data paths/files, documentation, plots, scripts \(Mike Fiorino\)](#)
  - Data: /pcmdi/CAPT2/dat/fc/cam/molts/
  - Documentation: /pcmdi/CAPT2/dat/fc/cam/molts/doc/
  - Plots: /pcmdi/CAPT2/dat/fc/cam/molts/pli/
  - Scripts: /pcmdi/CAPT2/dat/fc/cam/molts/prc/

**CAM3 Data Conventions/Information:**

- [CAM3 forecast protocol and output variables](#)
- [CAM3 MOLTS: dimensions/variables](#)
- [CAM3 budget terms](#)
- [Locations of history files of CAM3 AMIP simulation at NCAR](#)

**CAM2 5-Day Global Forecasts**

1 of 5 3/13/06 7:53 PM

CAPT MOLTS Variables: Dictionary Information file:///Volumes/Data/Users/potter2/Desktop/vars\_moltsplots.html

## MOLTS Variables: Dictionary Information

Last update: 27 February 2006

Please report errors/problems to [Tom Phillips](#)

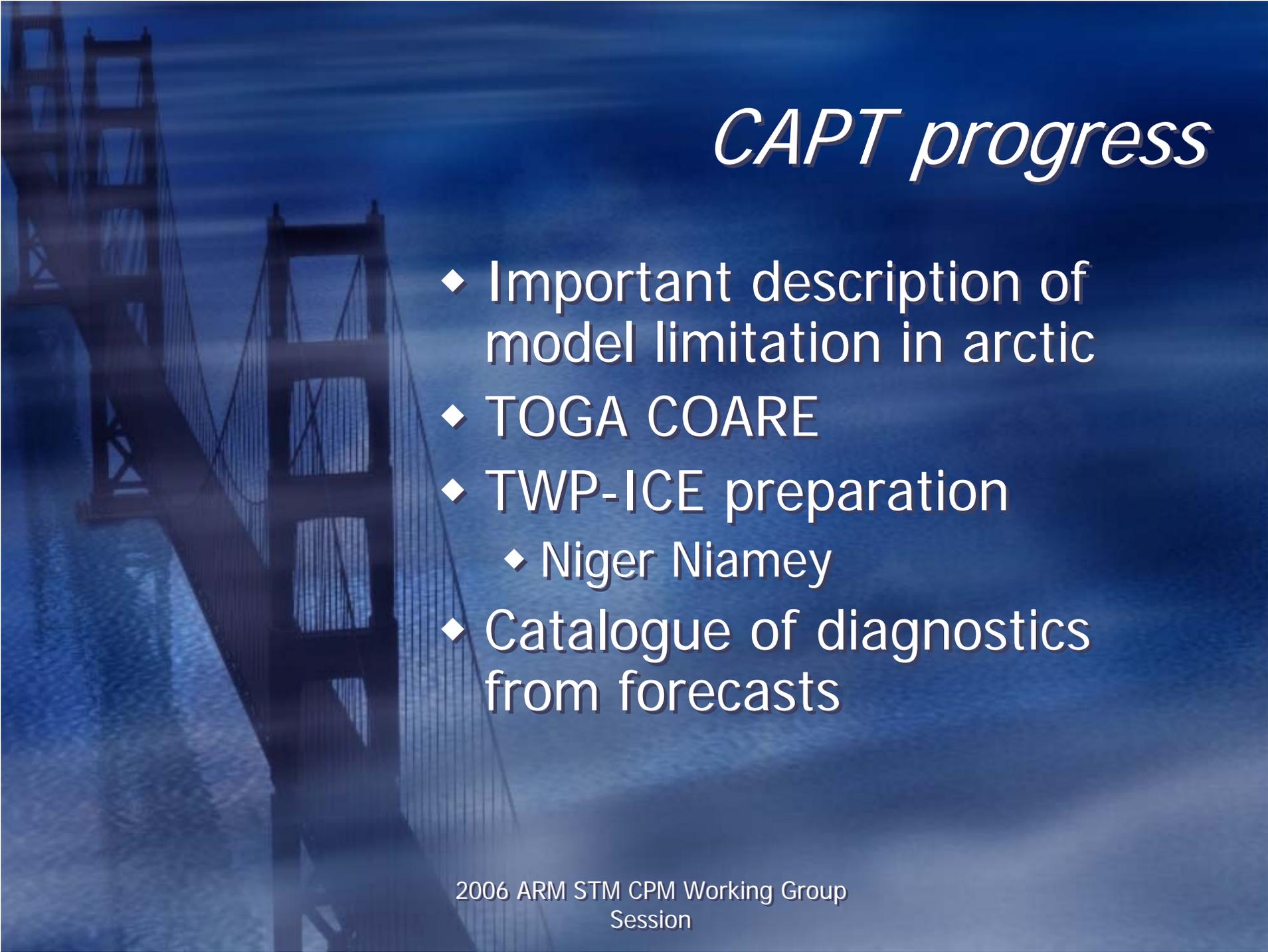
[All Observational and Model Variables](#)

- [ARM Observational Variables](#)
- [ISCCP Observational Variables](#)
- [AM2 Model Variables](#)
- [ARM Observational vs. AM2 Model Variables](#)
- [CAM3 Model Variables](#)
- [ARM Observational vs. CAM3 Model Variables](#)
- [ISCCP Observational vs. CAM3 Model Variables](#)

**All Observational and Model Variables**

Variable	Description	Units
cl	cloud area in atmospheric layers	fraction
clh	cloud area in high troposphere	fraction
clhis	model isccp-type cloud area in high troposphere	fraction
cli	model cloud ice mass fraction kg/kg	kg/kg
clisccp	isccp cloud area in atmospheric layers	fraction
cll	cloud area in low troposphere	fraction
cllis	model isccp-type cloud area in low troposphere	fraction
clm	cloud area in mid troposphere	fraction

1 of 10 3/14/06 1:07 PM



# *CAPT progress*

- ◆ Important description of model limitation in arctic
- ◆ TOGA COARE
- ◆ TWP-ICE preparation
  - ◆ Niger Niamey
- ◆ Catalogue of diagnostics from forecasts

# Examples of the data plots available

