

Distributed Model Intercomparison Project and HMT-West

**HMT-West Annual Meeting
October 6-8, 2010**

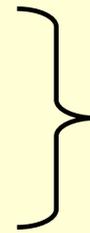
Hydrologic Applications & Surface Processes Session

**Mike Smith, Victor Koren, Ziya Zhang, Naoki Mizukami,
Zhengtao Cui, Brian Cosgrove, Feng Ding, Yu Zhang,
Eric Anderson, and David Kitzmiller**

DMIP: Purpose

- Broad intercomparison of lumped and distributed hydrologic models
- Guide NWS use of distributed models:
 - for river, flash flood, and water resources forecasting
- OHD provide data for test basins
- Participants set up and run models

Distributed Model Intercomparison Project (DMIP)



Phase 2 Scope



Tests with Complex Hydrology

1. Snow, Rain/snow events
2. Soil Moisture
3. Lumped and Distributed
4. Mountainous terrain

Additional Tests in DMIP 1 Basins

1. Lumped and Distributed
2. Soil Moisture
3. Routing

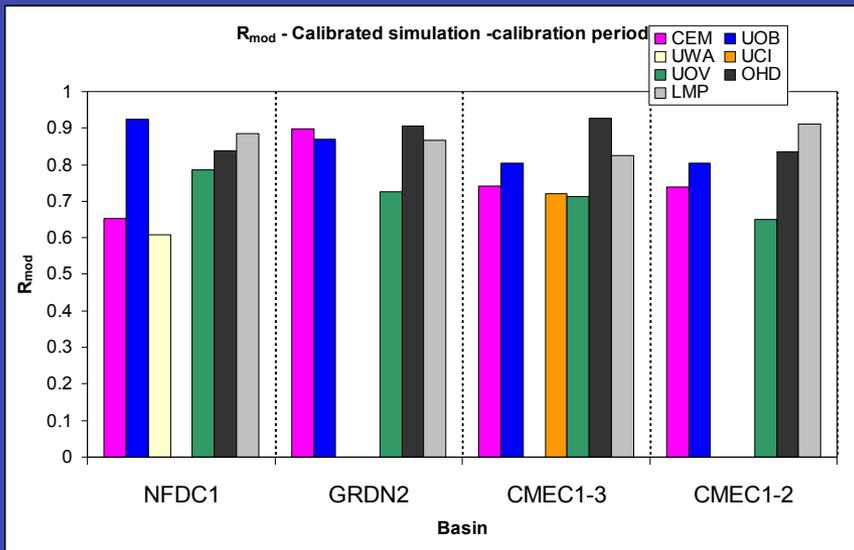
Distributed Model Intercomparison Project

Phase 2: American and Carson Rivers

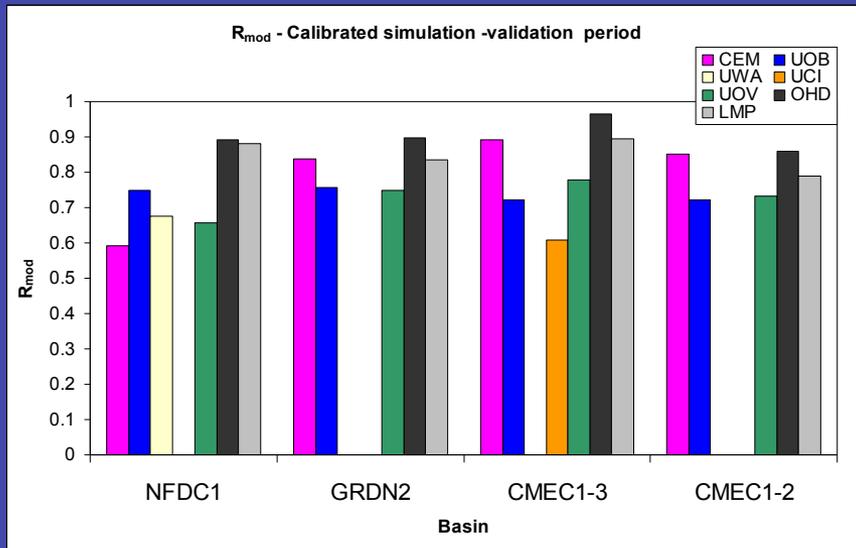
- Data
 - QPE: hourly 4km grid from MPE (gauge only)
 - QTE: hourly 4km grid
- Tests
 - Hourly simulations of stream flow
 - Calibrated and uncalibrated
 - At gauge and interior point
 - Simulations of SWE
 - Compare to benchmark lumped model
- Participants
 - U. Bologna
 - U. Valencia
 - CEMAGREF
 - U. Washington
 - U. Ca. Irvine
 - OHD
 - NCEP/EMC
 - HRC

DMIP 2 Results

Stream flow simulations:
Hourly Modified Correlation Coefficient



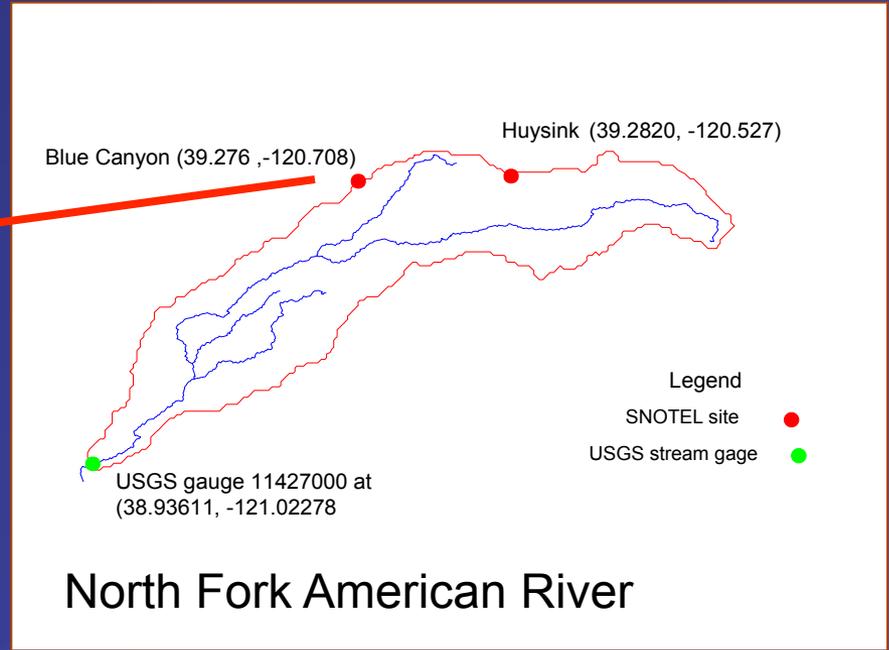
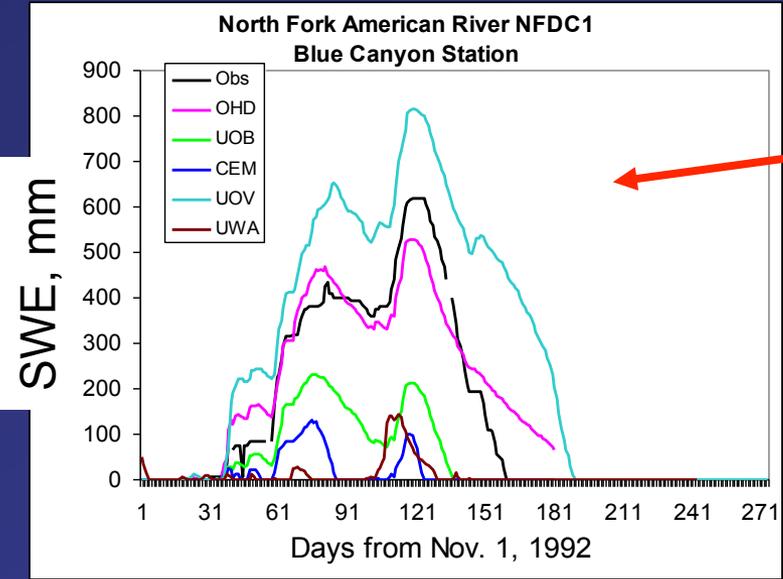
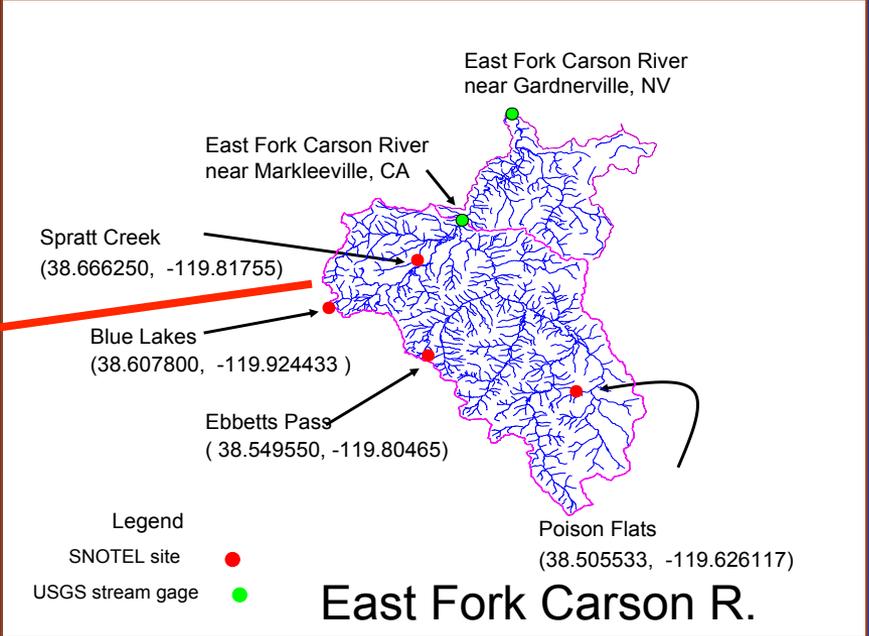
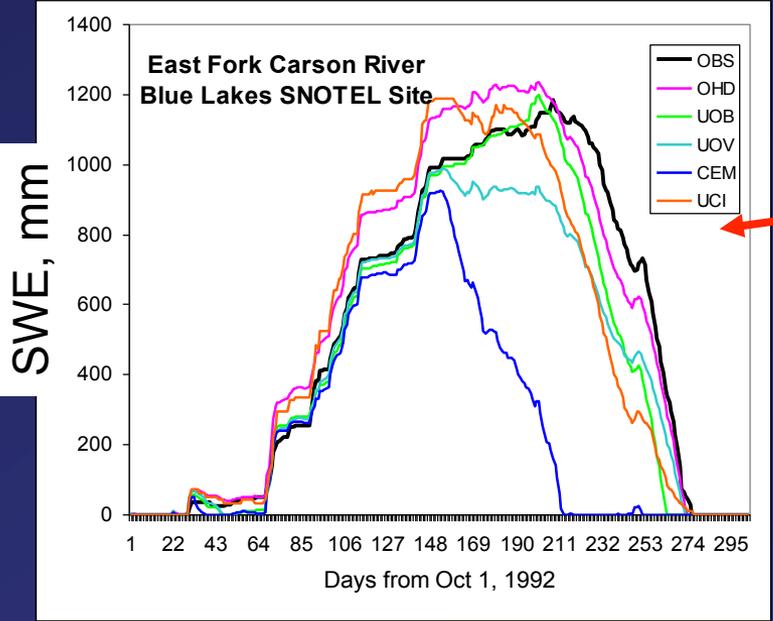
Calibration Period 1987 - 1997



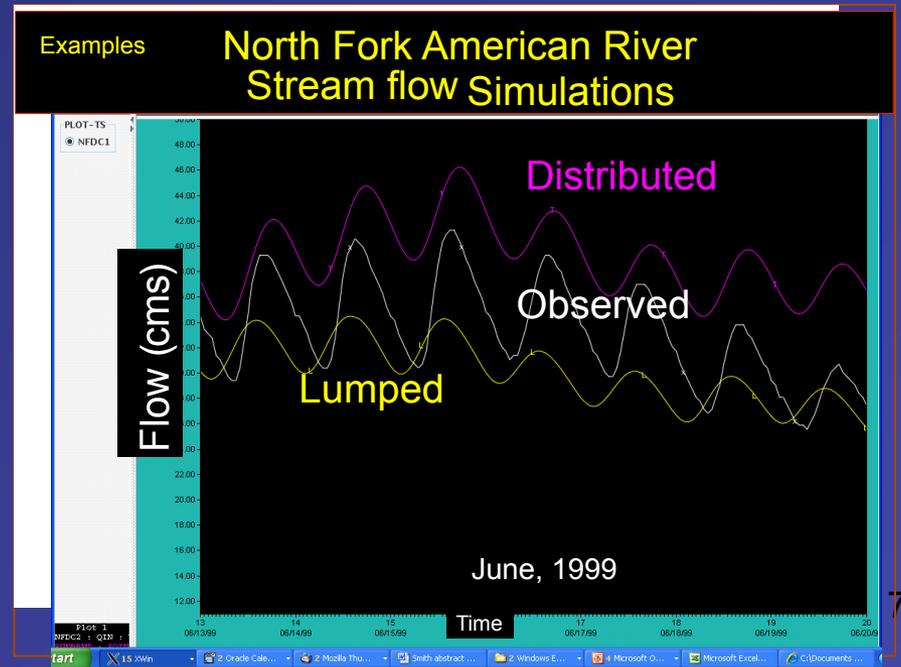
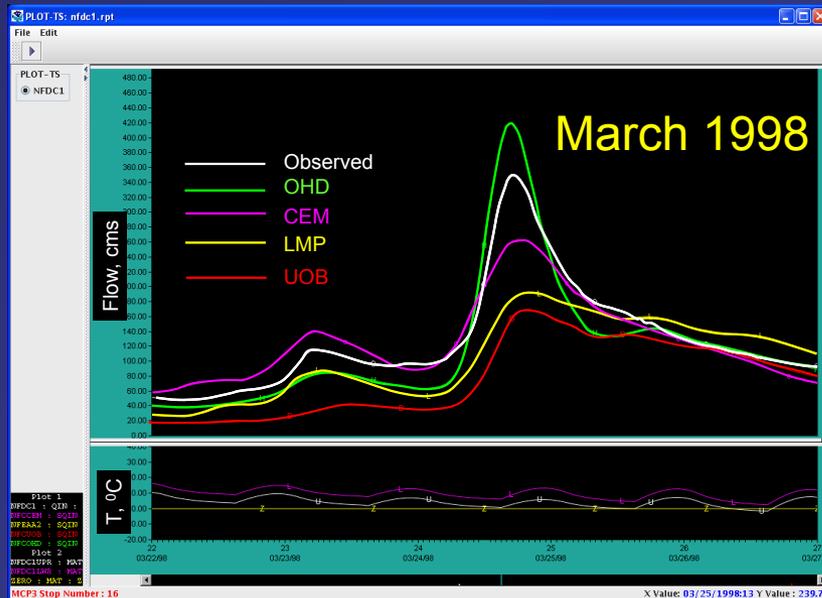
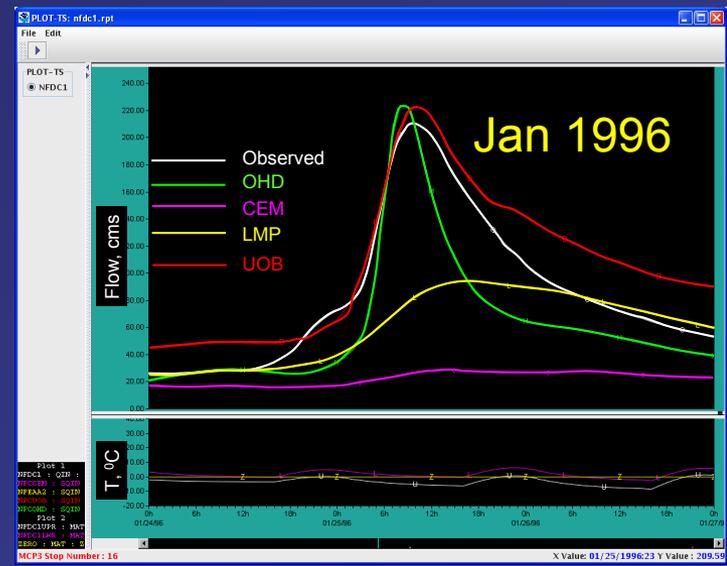
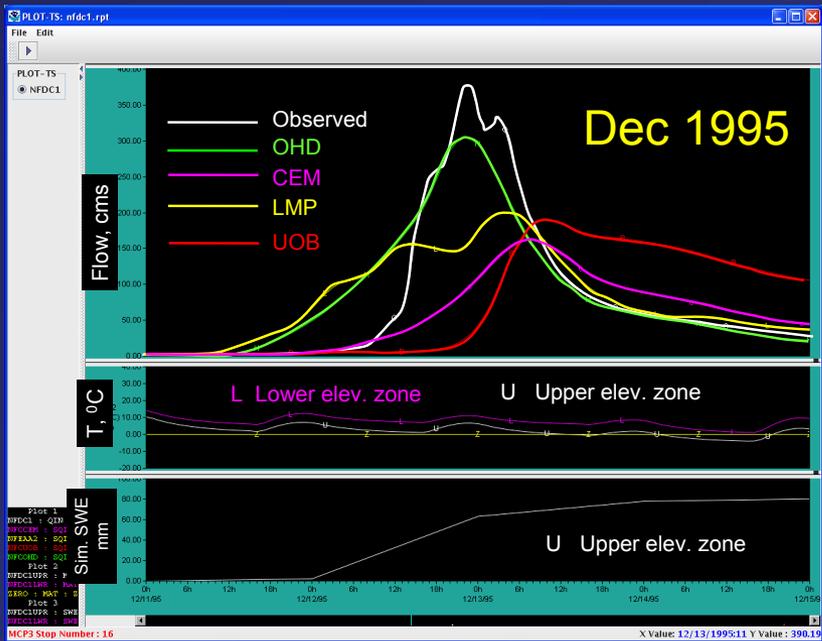
Validation Period 1997-2006

- CEM
- UWA
- UCI
- UOV
- LMP
- OHD
- UOB

Results: SWE



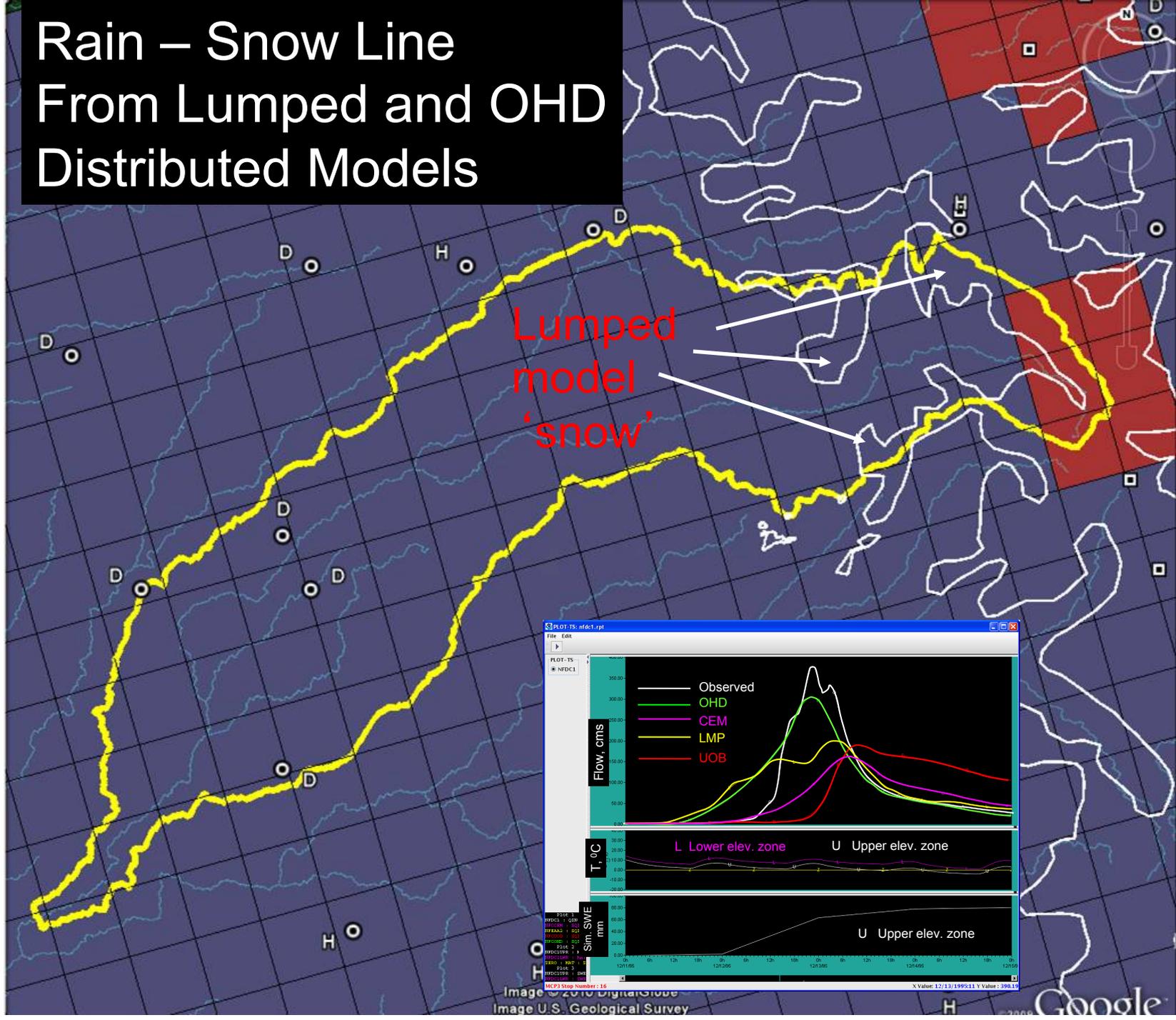
Results: Hydrographs – North Fork



Rain – Snow Line From Lumped and OHD Distributed Models

12/12/1995
18Z

-  = Rain
-  = Snow
-  = 6938 ft Contour



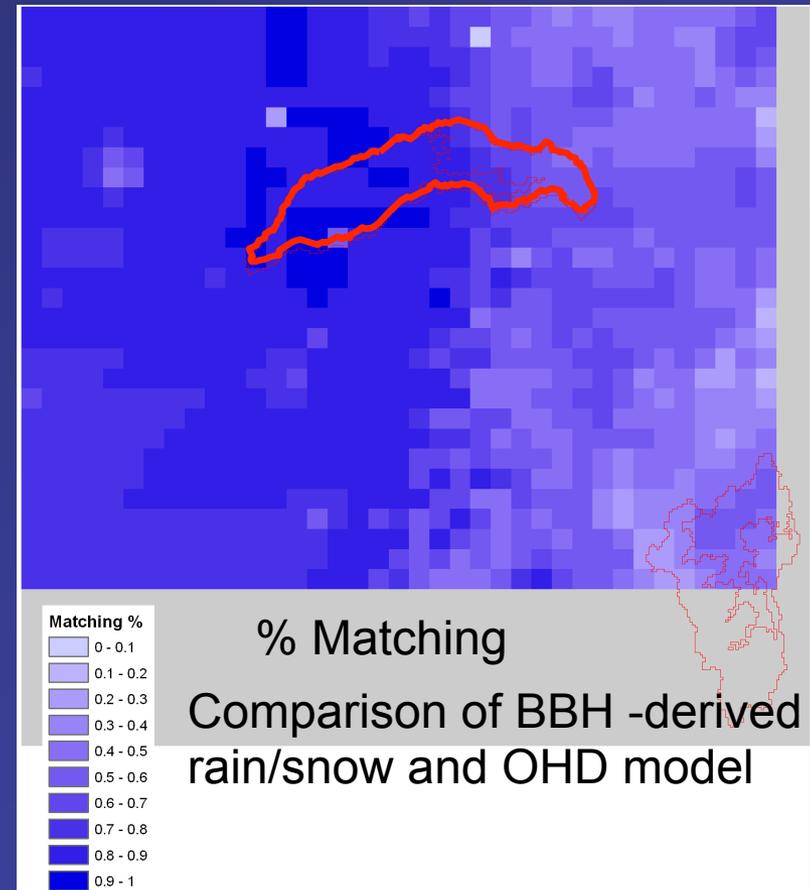
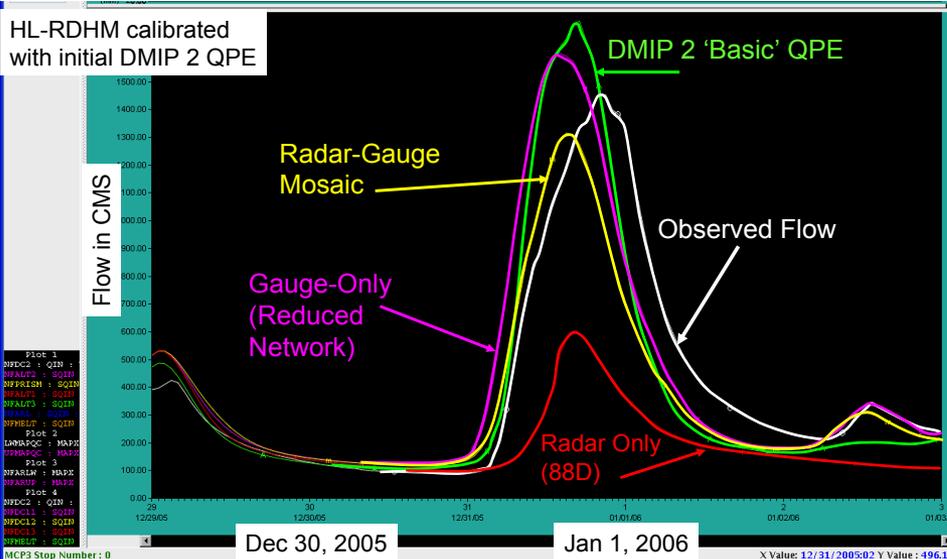
Further Work With HMT-West

- Formulate Specific Tests
 - Freezing level
 - QPE
 - Soil Moisture

Preliminary Results

HL-RDHM Simulated Hydrographs for HMT West IOP 4 using Four QPE Inputs

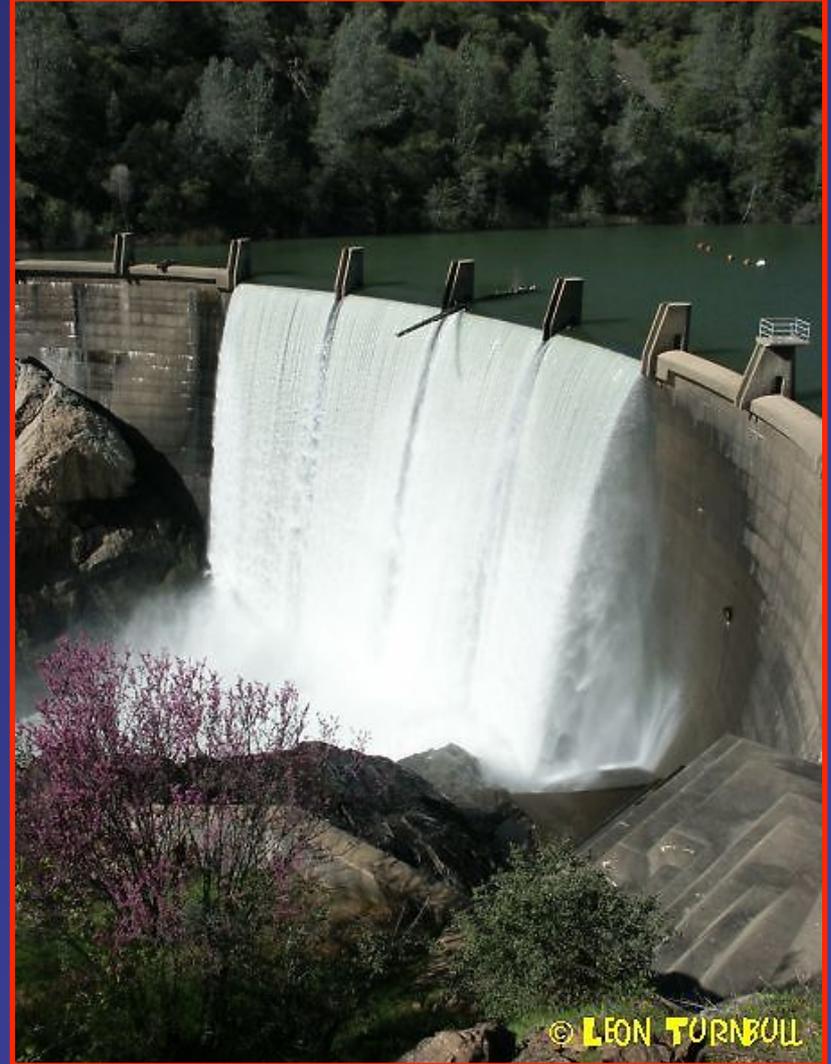
HL-RDHM calibrated with initial DMIP 2 QPE



Acknowledgements

- NSSL
 - Amy Arthur, Ken Howard, Jian Zhang
- CNRFC
 - Rob Hartman, Pete Fickenscher, Art Henkel, Scott Staggs
- NWRFC
 - Don Laurine, Ray Fukunaga, Harold Opitz
- ESRL
 - Marty Ralph, Dave Kingsmill, Tim Schneider, Rob Cifelli

Thank you!



HMT Data Processing for Use in Distributed Model Tests

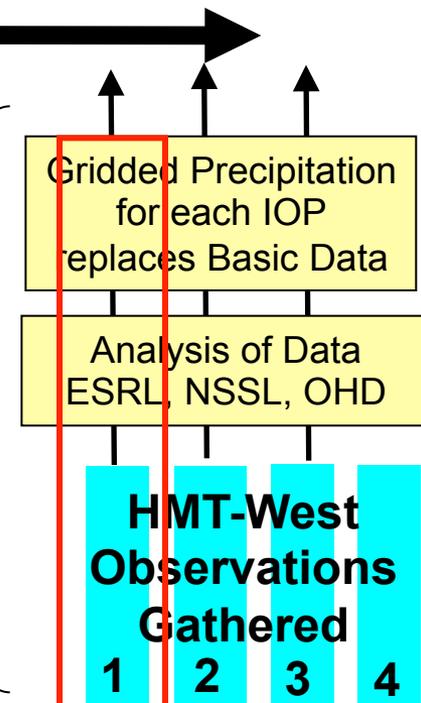
Step 1:

'Basic' DMIP 2 Data: Time series of gridded precipitation and temperature from NCDC, Snotel sites to Sept 2007.

- Represent what the RFC uses
- Used for the lumped and distributed DMIP 2 simulations in the western basins

Note: the time scale describes the attributes of the time series, not the schedule for processing the HMT data. The HMT observations will be processed after each campaign and inserted into the Basic Data time series.

Step 2



DMIP 2 Participants for Oklahoma

- NOAA OHD
- NOAA NCEP
- U. Ca Irvine
- Imperial College of London
- Vrije U. of Brussels
- CEMAGREF
- ARS
- Wuhan U. China
- U. Arizona
- U. Oklahoma
- U. Nebraska
- Danish Hydraulics Institute
- U. Alberta



Overview

- DMIP 2
 - Purpose
 - Results
- Links to HMT-West

