

# Summary of Meeting Proceedings

Prepared by the INFORM Core Office, HRC-GWRI

## FIFTH OVERSIGHT AND IMPLEMENTATION COMMITTEE MEETING OF THE INFORM PROJECT

**29 JUNE 2006, Sacramento, California**

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### PARTICIPANTS

#### *Agency Representatives*

John Andrew	California Department of Water Resources
Paul Fujitani,	Central Valley Operations, U.S. Bureau of Reclamation
Robert Hartman,	California Nevada River Forecast Center, National Weather Service, NOAA
Claudia Nierenberg,	NOAA Office of Global Programs ( <i>through a conference call</i> )
Joe O'Hagan	California Energy Commission
Lloyd Peterson	U.S. Bureau of Reclamation
Eric Strem,	California Nevada River Forecast Center, National Weather Service, NOAA

#### *INFORM Co-PIs and INFORM Project Scientists*

Aris Georgakakos,	Georgia Water Resources Institute
Kosta Georgakakos,	Hydrologic Research Center
Nick Graham,	Hydrologic Research Center
Robert Jubach,	Hydrologic Research Center
Huaming Yao,	Georgia Water Resources Institute

### LOCATION AND TIME

The meeting consisted of two sessions, a morning presentations session, and an afternoon OIC discussion session. Both sessions were held at the Joint Operations Center (3310 El Camino Ave.) in Sacramento on the 29<sup>th</sup> of June 2006. The morning session started at 10:00AM and ended at 12:15PM, and the afternoon session started at 1:30PM and ended at 3:30PM.

### PURPOSE AND INFORMATIONAL MATERIAL

The meeting served as a second critical review meeting for INFORM (Integrated Forecast and Reservoir Management), mandated by the California Energy Commission and CALFED funding agencies. Documents with a discussion of the INFORM system implementation was submitted to participants prior to the meeting by the INFORM Core Office Staff. The morning session meeting consisted of the presentation of the INFORM project final report and assessments by the Co-PIs, followed by open discussion, and the afternoon session consisted of a discussion of

INFORM results and potential future collaborative directions. The PDF forms of the meeting presentations are available at the HRC web site:

[http://www.hrc-lab.org/projects/dsp\\_projectSubPage.php?subpage=inform](http://www.hrc-lab.org/projects/dsp_projectSubPage.php?subpage=inform).

## INFORM STATUS PRESENTATION

The Co-PIs summarized the technical activities of the three-year first phase of INFORM. The final report is being produced and will be submitted for review to funding agencies in July. The Co-PIs discussed the design and implementation of the real time GFS data ingest, dynamic downscaling components to produce gridded and subsequently watershed areal-average surface precipitation and temperature, bias adjustment of the watershed precipitation and temperature, and snow, soil, and channel modeling with bias adjusted forcing to produce ensemble flow forecasts at various watershed locations including reservoir inflow for the four largest reservoirs in Northern California, and the off-line climate forecast processing of INFORM for input to the decision component. Discussion of the INFORM decision component included (a) the design of the DSS model hierarchy comprising interlinked models for long range planning, mid range management, short range management, and near real time operations; (b) the management concerns incorporated as part of the decision modeling both at reservoir sites and downstream, and (c) the strategy for potential use of this component by management agencies to develop risk-based policies for water resources management. Assessments of the INFORM forecasts during the “dry run” of the wet season 2005-2006, and of the benefits of using uncertain forecasts for water management were also presented and discussed. The Co-PIs recommend that during the following two to three years (2006-2009) INFORM funding continues (as originally proposed) to support the system demonstration on the basis of the protocols defined during the “dry run” experiment of winter 2005-2006.

## DISCUSSION

The afternoon INFORM session was devoted to group discussion. Important issues discussed were (a) the need for continuation of the INFORM assessments with real time data from 2 to 3 future wet and dry seasons for reliable results; (b) the links between the operational forecast and management agencies of California and the INFORM system input and output components; and (c) the necessary improvements in current INFORM system design to better fit operational forecast and management agency objectives in water resources prediction, planning, and management.

1. Rob Hartman said, and other agency representatives agreed, that the INFORM system is a useful tool for operational forecast and management.
2. Rob Hartman suggested, and the Co-PIs concurred, that for the next phase of INFORM a representative from NCEP should be included in the Oversight and Implementation Committee to provide input and to receive feedback as to the utility of climate forecast system (CFS) operational three-dimensional fields and to facilitate communication with NCEP on data issues and products.
3. Rob Hartman also suggested that for CNRFC it would be very useful to use the INFORM coastal range estimates of precipitation for real time streamflow prediction there (e.g., the Smith and Navarro Rivers). This region is within the precipitation and temperature

downscaling grid of the INFORM forecast component, but no hydrologic model computations are effected at present for the coastal streams that drain into the Pacific Ocean.

4. The participants discussed the need for enhancing the ensemble size of the INFORM ensemble forecasts. Due to HRC machine limitations (8-processor computer platform), the current design of INFORM produces an 8-member ensemble of real time precipitation, temperature and flow forecasts, four times daily, out to 16 days with 6-hourly resolution. It was suggested that funds be included in the next phase funding to accommodate at least a 16-processor machine to accommodate the current 15-member ensemble size of the ingested global forecast system (GFS) forecasts from NCEP.
5. Paul Fujitani mentioned that at present the large reservoirs in Northern California are operated individually without significant co-ordination (except for the case of Oroville on the Feather River and New Bullards Bar on the Yuba River). A significant INFORM contribution is that it coordinates the operating policies of all these large reservoirs.
6. Lloyd Peterson suggested that a significant application of the INFORM system would be to support the management of reservoirs within the San Joaquin River drainage, especially the Friant Dam and New Melones reservoir (on the Stanislaus River tributary). He further asserted that, with respect to operational management difficulty, the Trinity and Friant reservoirs rank high due to their modest release capacity.
7. Lloyd Peterson and Paul Fujitani also emphasized that the INFORM DSS could be used to support the management of the San Luis reservoir, the Tracy pumping facility, and the water export to the south. The project co-PIs noted that, although some model modifications are needed to support this management objective, such INFORM DSS operational refinements could be carried out as part of the next INFORM phase.
8. There was consensus among the participants that the INFORM demonstration project should continue to provide information to forecast and management agencies through a next phase. Toward this end, it was decided that the Co-PIs develop a draft proposal as a discussion document and a meeting of the OIC be convened near the end of July 2006 to develop objectives and plans for the next phase of INFORM that reflect the interests of the participating agencies.