

# Observing system simulation experiments at NCEP and JCSDA

Michiko Masutani1# , John S. Woollen1+ , Yuchen Song1% , Russ Treadon1, John F. LeMarshall2, Zoltan Toth1, G. David Emmitt3, Stephen Lord1

(1) NOAA/NWS/NCEP/EMC, Camp Springs, MD, (2) JCSDA, Camp Springs, MD, (3) Simpson Weather Associates, Charlottesville, VA, # RS Information Systems, +Science Applications International Corporation, % I. M. Systems Group

Data assessment using simulation experiments is the only method able to provide a quantitative evaluation of future observing systems and instruments. These experiments are known as Observing System Simulation Experiments (OSSEs). The National Centers for Environmental Prediction (NCEP) have demonstrated that carefully conducted OSSEs are able to provide useful recommendations which influence the design of future observing systems.

Through the OSSEs, future observing systems will be designed to optimize the use of data assimilation systems and forecast models to improve weather forecasts. By using OSSEs, current operational data assimilation systems can be prepared to handle data from new sources and the operational use of data from future instruments and observing systems can be accelerated. Preparations include handling the volume of future data and the development of database, data processing (including formatting), and quality control systems. All of this development will accelerate the operational use of the data.

OSSEs conducted at NCEP focused on evaluating data impacts on a global scale from the use of National Polar-orbiting Operational Environmental Satellite System (NPOESS) candidate instruments, particularly Doppler Wind Lidar (DWL). The current NCEP system demonstrated that OSSEs are able to provide critical information for assessing observational data impacts. The OSSE results have been often different from theoretical explanations or speculation. Extended international collaboration within meteorological community is essential for timely and reliable OSSEs

The OSSE effort will be continued by the Joint Centers for Satellite Data Assimilation (JCSDA) which will conduct sets of experiments that will have implications for NPOESS, GOES-R and other plans for future observing systems and instrument types. Various collaborations with NWS/NCEP, NASA/GSFC, NESDIS/ORA, OAR, and DOD are conducted by the JCSDA. Future plans for JCSDA OSSEs include the use of a new higher resolution nature run, as well as coordination with THORPEX research activities.