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Progress in Joint OSSEs - Three Nature Runs are completed and distributed

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Data assessments using simulation experiments are able to provide a quantitative evaluation of future observing systems and instruments. These experiments are known as Observing System Simulation Experiments (OSSE). The OSSE results have often been different from theoretical explanations or speculation. The OSSE proxy of the true atmosphere is called a Nature Run (NR), and when a NR is produced by a free forecast run different from the forecast model used for the data assimilation system (DAS) it is called a full OSSE. An internationally collaborative effort for full OSSEs, called Joint OSSEs, has been formed over the last two years.

OSSEs are very labor intensive projects. It has been realized that the preparation of a NR including evaluation, simulation of observations, and distribution of the data consumes a significant amount of effort. In Joint OSSEs a common NR will by used by the various DAS at many institutes. The first Joint OSSE NRs have been produced by the European Center for Medium-Range Weather Forecasts (ECMWF). A NR with a 13 month long period from May 2005-May 2006 with three hourly dumps, T511 horizontal resolution, and 91 vertical levels using daily SST was produced to study global data impacts. The T511NR showed remarkably good cyclone statistics and a realistic tropics. During hurricane season and the US severe storm season, two 35 days long runs with hourly dumps at T799 horizontal resolution and 91 levels (T799NR) have been produced.

It is very important that these NRs were accompanied by an additional data set of low resolution pressure and isentropic level data, also provided by ECMWF, to speed

up the diagnostic and evaluation processes. The design of the NR was based on discussions within the Joint OSSE. The complete NR data is available from ECMWF to ECMWF member states and from NASA/SIVO in the US. It is also available at NCEP and ESRL. Verification data are available from the NCAR/CISL Research Data Archive and JMA.

The research community for data assimilation and designing future observing systems is able to participate in internationally collaborative OSSEs using the same NR. By using the same NR, simulated observations can be shared and the results can be compared. Extended international collaboration within the meteorological community is essential for timely and reliable OSSEs.

Basic data are being simulated and precursor assimilations are being performed. These analyses will be used for preliminary calibrations, where the data impact of real and simulated data will be compared. Full calibrations require funding for the simulation and assimilation of radiance data. Then data impact for the new instruments will be evaluated.