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Reanalysis activities at ECMWF

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ECMWF has produced several generations of reanalysis products, beginning in 1981 with a reanalysis of observations collected for the First GARP Global Experiment (FGGE) conducted in 1979. The ECMWF reanalysis covering the longest period (1957-2001) so far is ERA-40, which has been and still is widely used. ERA-Interim is a much improved (but shorter) reanalysis starting from 1989, which is now being continued in near-real time. Reanalysis data from ERA-Interim as well as ERA-40 are available for download from the ECMWF Data Server at http://data.ecmwf.int/data.

ERA-Interim was conducted in part to prepare for an ambitious next-generation ECMWF reanalysis to replace ERA-40. The main objective was to address some difficult problems in reanalysis, such as the consistency of the hydrological cycle, the quality of the stratospheric circulation, and handling data biases and changes in the observing system that can affect the representation of climate signals. We will show evidence of progress in each of these areas.

We then describe current plans for carrying out the next ECMWF reanalysis, which will extend back in time to the beginning of the 20th century. Pending EU funding, these plans include a significant data recovery effort focussing on upper-air data from the first half of the 20th century, in collaboration with ACRE, NCDC, and various partners in Europe, Russia, and Chile. We will describe how recent developments in data assimilation methodology have vastly improved the potential for extracting geophysical information from such observations. We will also discuss ways in which reanalysis can help assess and improve the observational record, by providing information about data quality to a large user community.