

Jeffrey Howard Copeland Ph.D.

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EDUCATION

Ph.D. Atmospheric Science, Colorado State University, Fort Collins, 1994
M.S. Atmospheric Science, University of California, Los Angeles, 1989
B.S. Physics, McGill University, Montreal, 1986

PROFESSIONAL EXPERIENCE

Since 2013 Chief Scientist, WeatherFlow Inc., Fort Collins, CO

Provides scientific and technical guidance for many of WeatherFlow's programs and projects. Oversees WeatherFlow's in-house modeling capabilities for both day-to-day operations and research applications. Transitioned existing RAMS based weather-modeling capabilities to a WRF based system. Integrated WeatherFlow's observational network into a WRF 3D-variational data assimilation system, including other conventional, satellite, and radar observations. Developed an operational data quality control system for surface and upper-air observations.

2006-2013 Chief Scientist, Science and Technology in Atmospheric Research (STAR) Institute, Boulder, CO

Chief Scientist for the Pentagon Shield project Building Protection System (transferred from NCAR in 2006). Implemented and optimized an integrated multi-scale wind analysis system that combined data from NWP models and Doppler radar and lidar wind retrieval systems. Developed a system for real-time validation and verification of 3-dimensional wind retrievals that provided confidence estimate to end-users. Led development and implementation of a GPU based Lagrangian particle model for urban transport and dispersion emergency response prediction. Implemented real-time algorithms to diagnose boundary layer stability from surface measurements for use in emergency response transport and dispersion models. Developed and implemented techniques to determine in real-time the quality of Doppler sensor wind retrievals.

2004-2013 Project Scientist II, National Center for Atmospheric Research, Research Applications Laboratory, Boulder, CO

Managed project schedules, deliverables, budgets, and reporting. Developed strategies to prioritize tasks among diverse components of scientifically and technically challenging projects. Organized, coordinated, and directed the allocation of project staff and resources to accomplish project objectives. Integrated research activities with operational development and deployment. Planned and executed observational field campaigns. Participated in proposal grant submissions.

Project Lead for the Global Climate Analysis Toolkit project. Developed artificial neural network techniques to automatically identify weather patterns and frequency of occurrence from high-resolution climate re-analysis.

Lead Scientist for the Pentagon Shield Building Protection System. Developed and implemented a multi-scale wind analysis and forecasting system. Implemented and optimized an operational version of the QUIC diagnostic building-aware flow and Lagrangian transport models. Developed incident source models in QUIC for chemical and biological releases, and algorithms to initialize and run QUIC automatically via standoff detector alarms.

2000-2004 Scientist/Engineer, Mission Research Corporation, Fort Collins, CO

Duties included research and development to improve boundary layer wind forecasts in mesoscale NWP models and to provide uncertainty estimates with primary application for input into transport and dispersion models. Extended Meteorological Data Server (MDS) functionality to take advantage of weather uncertainty and new meteorological data sources. Developed and implemented algorithms to incorporate new high-resolution data types (SST, NDVI, NEXRAD, soil properties, and building morphology) into RAMS. Developed data compression algorithms to reduce model output while retaining necessary information to support transport and dispersion calculations. Participated in governmental research grant proposal writing. Acted as liaison with DTRA Program Managers. Provided meteorological support for DTRA weapons tests, events, and mission critical operations.

1996-2001 Project Leader/Scientist, National Institute of Water and Atmospheric Research (NIWA), Wellington, NZ

Project leader of interdisciplinary team that conducted research into coupled atmospheric-hydrologic processes in regions of complex terrain. Developed applications of direct and coupled mesoscale NWP output for hydro-electric catchment level prediction, energy demand forecasting, ocean wave prediction, river level and flood forecasting, high resolution near surface winds, urban air quality, regional methane transport, and operational meteorological forecast support. Participated in governmental grant proposal and commercial contract writing processes.

1994-1996 Electric Power Research Institute Postdoctoral Fellow, U.S. Geological Survey, Lakewood, CO

Primary responsibilities were to integrate mesoscale models to drive Water Resource Division's snowpack melt/runoff models, develop simplified orographic precipitation models for use with climatic data, and conduct studies into the effects of climate change on snowpack at the catchment level.

1989-1994 Graduate Research Assistant, Colorado State University, Fort Collins, CO

Conducted research on four-dimensional mesoscale data assimilation (adjoint methods) and studied the impact of historical vegetation change on regional climate. Ph.D. dissertation title: *Impact of soil moisture and vegetation change on July 1989 climate using a regional climate model.*

PUBLICATIONS & PRESENTATIONS

Available upon request.