MEMORANDUM OF UNDERSTANDING (MoU)

This document constitutes a Memorandum of Understanding between the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Predictions (NCEP) Environmental Modeling Center (EMC), and the Barcelona Supercomputing Center - Centro Nacional de Supercomputación (BSC-CNS), Spain.

NOAA/NWS/NCEP/EMC W/NP2
5200 Auth Road, Room 207
Camp Springs, MD 20746

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

The NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'S (NOAA) NATIONAL CENTERS FOR ENVIRONMENTAL PREDICTIONS (NCEP) ENVIRONMENTAL MODELING CENTER (EMC), (hereinafter referred to as NOAA/NCEP/EMC), whose registered office is located at 5200 Auth Road Camp Springs, Maryland 20746, represented for the purpose of the signature of this agreement by Stephen Lord, Director of the EMC.

Stephen Lord

NOAA/NWS/NCEP/EMC W/NP2
5200 Auth Road, Room 207
Camp Springs, MD 20746

Barcelona Supercomputing Center
Centro Nacional de Supercomputación

on one part

The BARCELONA SUPERCUMPUTING CENTER - CENTRO NACIONAL DE SUPERCOMPUTACIÓN (hereinafter referred to as BSC-CNS), whose registered office is located at Calle Jordi Girona, 31, Barcelona 08034, Spain, represented for the purpose of the signature of this agreement by Dr. Mateo Valero Cortés, Director according to the Consejo Rector del BSC-CNS, April 13 2005, on behalf of BSC-CNS according with the powers conferred by the Ministerio de Educacion y Ciencia, the Generalitat de Catalunay and the Universitat Politècnica de Catalunya in the signed Consortium Agreement, April 1 (B.O.E. nº. 281, November 24),

on the other part

The Parties HAVE AGREED AS FOLLOWS:

ARTICLE 1: OBJECTIVES OF THE MoU

The objective of this MoU is to set up a framework under which the Parties will collaborate on the context of the development of the NCEP/NMMb model and its applications on air quality and weather forecasting.

ARTICLE 2: ABOUT THE PARTIES

NCEP, an arm of the NOAA's National Weather Service (NWS), is comprised of nine distinct Centers, and the Office of the Director, which provide a wide variety of national and international weather guidance products to National Weather Service field offices, government agencies, emergency managers, private sector meteorologists, and meteorological organizations and societies throughout the world. NCEP is a critical national resource in national and global weather prediction. NCEP is the starting point for nearly all weather forecasts in the United States. The EMC develops and improves numerical weather, climate, hydrological and oceanic predictions through programs of applied research in data analysis, modeling and product development in partnership with the broader research community.

BSC-CNS is National Supercomputing Facility in Spain and manages MareNostrum, one of the most powerful supercomputers in Europe. The mission of BSC-CNS is to investigate, develop and manage information technology in order to facilitate scientific progress. With this aim, special dedication is taken to areas such as Computational Sciences, Life Sciences and Earth Sciences. The Earth Sciences Department of the BSC-CNS takes advantage of the computing performance of the MareNostrum supercomputer to develop and implement high resolution emission-meteorology-chemistry modeling systems, to understand and predict the atmospheric life cycle of mineral dust, to run high resolution climate models and to study geophysical flows including the numerical modeling of volcanic ash transport in the atmosphere and the emplacement of lava flows.

ARTICLE 3. BACKGROUND AND MUTUAL INTEREST OF THE PARTIES

The NMMB atmospheric model developed at NOAA/NCEP/EMC is an evolution of the operational WRF-NMME model extending from meso to global scales. Its unified non-hydrostatic dynamical core allows regional and global simulations. The BSC-CNS has developed a new atmospheric mineral dust model (BSC-Dust) coupled on-line to the NMMb, representing the first step towards the implementation on-line of a full chemistry transport model. The new modeling system is intended to be a powerful tool for research and to provide efficient chemical weather forecasts at sub-synoptic and mesoscale resolutions.

A strong collaboration has been established between BSC-CNS and NOAA/NCEP/EMC on the development of the model. Dr. Carlos Perez Garcia-Pando of BSC-CNS was

awarded with the Mobility grant "José Castillejo" of the Spanish Ministry of Science and Innovation for a research visit to NOAA/NCEP/EMC hosted by Dr. Zavisa Janjic during the first half of 2009. The work resulted on the coupling of an updated radiation scheme to the NMMB model, and on the initial steps of collaboration between BSC-CNS and NOAA/NCEP/EMC for diagnosing and improving the efficiency of the model on high performance supercomputers.

Though this MoU the parties are interested on formalizing their collaboration:

(1) to further develop the NCEP/NMMB model and the mineral dust and chemistry modules implemented by BSC-CNS and NOAA/NCEP/EMC.
(2) to diagnose and improve the efficiency of the model on high performance supercomputers.
(3) to share the codes developed at NOAA/NCEP and BSC-CNS in the context of the NMMB developments and applications.

ARTICLE 4. INVOICING AND PAYMENT TERMS.

There are no transfers of funds in this MoU. The MoU is not legally binding.

ARTICLE 5. PERIOD OF AGREEMENT

This agreement will become effective when signed by all parties The MoU will be in effect for five years from the date of signature, but may be amended at any time by mutual written consent of the parties. The parties will review this agreement at least once after the first year to determine whether it should be revised, renewed, or canceled. Any party may terminate this agreement by providing 60 days written notice to the other party.

ARTICLE 6. COORDINATORS

Responsible coordinators of this MoU will be:

From NOAA/NCEP:
Dr. Zavisa Janjic, E-mail: zavisa.janjic@noaa.gov
Dr. Jeff Mcqueen, E-mail: jeff.mcqueen@noaa.gov

From BSC-CNS:
Dr. Jose María Baldasano, E-mail: jose.baldasano@bsc.es
Dr. Carlos Pérez García-Pando, E-mail: carlos.perez@bsc.es
Dr. Oriol Jorba, E-mail: oriol.jorba@bsc.es

As proof of agreement, both Parties will sign and date three copies of this document in the space provided below.

NOAA/NWS/NCEP/EMC
5200 Auth Road, Room 2
Camp Springs, MD 20746

Dr. Stephen Lord
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Date 14 July 2009

Supercomputing Center
Centro Nacional de Superc

Dr. Mateo Valero Cortes
Barcelona Supercomputing Center

Date 16 July, 20