

Memorandum of Understanding
between the
U.S. Department of Energy
and the
National Oceanic and Atmospheric Administration
for
High-Performance Computing

1.0 Background

The National Oceanic and Atmospheric Administration (NOAA) and the Department of Energy (DOE) Office of Science (SC) propose to increase cooperation and coordination centered on High-Performance Computing (HPC) and to develop a framework for complementary and collaborative research in the modeling and prediction of climate change, climate variability, and high-impact weather events. The Office of Science's mission is to deliver the basic research necessary to enhance U.S. energy and national security and improve U.S. competitiveness. NOAA's mission includes gaining better understanding of climate variability and change in order to enhance society's ability to plan and respond, and to serve the nation's needs for weather information to help save lives and reduce damage to critical infrastructure, including that related to energy.

The SC and NOAA science-based missions complement one another in the area of climate modeling and prediction on global and regional scales. NOAA is responsible for producing operational weather and climate products and simulating and predicting climate variability on subseasonal to interannual time scales. DOE relies on NOAA for weather prediction related to protecting the Nation's energy infrastructure from weather events. SC and NOAA have complementary efforts in decade-to-century scale simulations of climate response to natural and human-induced forcing. These latter climate change research efforts are coordinated through the U.S. Climate Change Science Program (CCSP). Both SC and NOAA dedicate significant high-performance computing resources to climate modeling activities, though SC is currently among the world leaders in open-scientific computing. SC has both leadership class and production HPC resources that support broad areas of scientific inquiry related to the SC mission and are poised to enable remarkable advances in climate modeling. This Memorandum of Understanding (MOU) builds on existing cooperation between SC and NOAA to enhance collaboration between the two organizations in climate modeling in ways that are mutually beneficial to their respective missions, support the CCSP, and ensure maximum impact of Federal investment in this area.

2.0 Purpose

This MOU acknowledges SC's and NOAA's effort to leverage each agency's complementary expertise in modeling atmospheric processes and climate change, and it identifies a mechanism to make SC HPC resources available to the NOAA program. SC

and NOAA will work together to improve the quality of and quantify the uncertainty of climate and weather prediction, including improving the prediction of high-impact weather events, to provide the best science-based climate and weather information for management and policy decisions. These improved predictive capabilities will help protect the Nation's energy infrastructure and advance our understanding of the planet's systems, including the climate system.

3.0 Scope

This MOU provides a framework for cooperation and coordination and is not intended to be an exhaustive description of work to be carried out over the term of the MOU. Further details on the extent and specific type of cooperation will be worked out between NOAA and SC consistent with this MOU and will build on existing Innovative and Novel Computational Impact on Theory and Experiment (INCITE) based activities between NOAA and SC. NOAA operational forecasting product activities are not within the scope of this MOU.

One of the objectives of SC's INCITE program is to provide researchers the opportunity to demonstrate how high performance computing resources can advance scientific research and how researchers can effectively manage their use of these resources. INCITE not only helps push the frontiers of scientific computation and simulation, but also enables researchers and their institutions to make informed decisions on their future investments in computing resources.

4.0 Roles and Responsibilities

4.1 DOE Responsibilities

- SC will provide computer allocations for NOAA either through:
 - successful peer-reviewed INCITE proposals submitted by NOAA; or
 - startup grants in the form of computer allocations on SC HPC resources at Argonne National Laboratory (ANL), Oak Ridge National Laboratory (ORNL) or Lawrence Berkeley National Laboratory (LBNL); or
 - up to 25 percent of the Office of Science Director's reserve on the SC HPC resources, based on 2008 reserve levels; or
 - a combination of the above.
- The use of DOE facilities by foreign nationals is governed by DOE P 250.1, Departmental Cyber Security Program and DOE O 205.1A Department of Energy Cyber Security Management and applies to these activities.
- Staff at SC's HPC facilities at the National Energy Research Scientific Computing Center (NERSC) at LBNL and Leadership Computing Facilities at ORNL and ANL will assist NOAA's efforts to port and scale NOAA's climate and weather prediction models to take advantage of these facilities.

4.2 NOAA Responsibilities

- Provide the computer models that NOAA proposes implementing on DOE HPCs and the modeling expertise necessary to implement those models.
- Adhere to the specific HPC site's INCITE user requirements for access and utilization.
- Recommend reviewers for NOAA INCITE proposals.
- Provide priority rankings for NOAA INCITE proposals.
- Request computer allocations for environmental modeling research that is collaborative or complementary with DOE climate modeling research activities.
- Make datasets produced by this activity available to the public.
- Provide open access and documentation to the NOAA codes used for climate modeling following publication of model results.

4.3 Shared Responsibilities

- Acknowledge DOE and NOAA collaboration activities under this MOU in relevant publications.
- Periodically, conduct joint, focused workshops on topics of common interest to DOE and NOAA composed of relevant NOAA and DOE Principal Investigators and interested outside parties working in the field to foster mutually beneficial interactions.
- Invite the participation of federally-funded climate modeling researchers and SC and NOAA federal program managers in each other's climate modeling program and science team meetings to identify and discuss opportunities for joint collaboration.

5.0 Terms of Agreement

5.1 Participating Parties

The DOE-SC point of contact shall be the Associate Director of the Office of Biological and Environmental Research in consultation with the Director of the Climate and Environmental Sciences Division and the Associate Director of the Office of Advanced Scientific Computing Research. The NOAA point of contact shall be the Director of the NOAA Climate Program Office in consultation with the NOAA Chief Information Officer, the NOAA Assistant Administrator for Research, and the NOAA Assistant Administrator for Weather Services.

5.2 Funding

This agreement is neither a fiscal nor a funds obligation document. Nothing in this agreement authorizes or is intended to obligate either agency to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value.

This agreement is strictly for DOE and NOAA internal management purposes. This agreement is not legally enforceable and shall not be construed to create

any legal obligation on the part of either party. This agreement shall not be construed to provide a private right of action for or by any person or entity.

All agreements herein are subject to, and will be carried out in compliance with, all applicable laws, regulations and other legal requirements.

If appropriate, cooperative activities undertaken pursuant to this MOU may be further detailed in project annexes to the MOU.

5.3 Authorities

NOAA is authorized to enter into this agreement by 15 U.S.C. §313, 15 U.S.C. §2901, and 33 U.S.C. § 883d and § 883e.

DOE is authorized to enter into this agreement for cooperation and collaboration on research and development initiatives that support the Department's energy-related missions pursuant to its general authorities under Section 31 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2051), (Section 107 of the Energy Reorganization Act of 1974 (42 U.S.C. 5817), and Section 646 of the Department of Energy Organization Act (42 U.S.C. 7256). Further, DOE is authorized to enter into this agreement involving high-performance computing methods in scientific research and development activities pursuant to Section 976 of the Energy Policy Act of 2005 (42 U.S.C. 16316), which directs the Department to carry out high-performance computing research and development efforts consistent with the Department of Energy High-End Computing Revitalization Act of 2004 (15 U.S.C. 5541 et seq.) and the High-Performance Computing Act of 1991 (15 U.S.C. 5523), as amended.

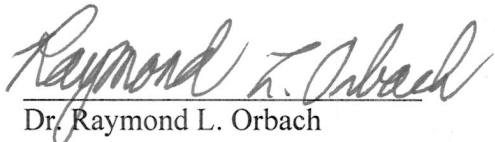
- 5.4 This agreement in no way restricts either of the Parties from participating in any activity with other public or private agencies, organizations, or individuals.

6.0 Effective Date

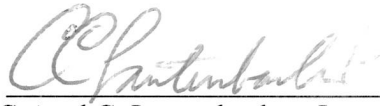
This MOU is effective upon signature by all parties. It shall remain in effect for three years beginning on its effective date. The MOU may be renewed for additional terms of periods to be determined upon mutual agreement of the parties.

7.0 Amendment and Termination

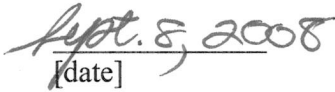
This MOU may be amended by mutual agreement of the parties. The MOU will be reviewed every three years to determine whether it should be renewed and whether changes are needed. The MOU may be terminated at any time by mutual agreement of the parties or unilaterally by either party provided that reasonable written notice is provided to the other party.

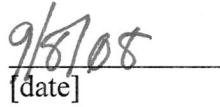


Dr. Raymond L. Orbach
Under Secretary for Science
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Conrad C. Lautenbacher, Jr.
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