April 12, 2013

R&D 100 Awards
100 Enterprise Drive
Suite 600, Box 912
Rockaway, NJ 07866-0912

RE: Letter of Reference for ESGF

Dear R&D 100 Awards Committee:

We are happy to endorse the outstanding research and engineering capabilities of the Earth System Grid Federation (ESGF). The ESGF is internationally recognized as a relatively new and highly significant research and engineering capability, that pioneered developments in federated and distributed data infrastructure, data management, and analysis and visualization tools. ESGF has extensively served the climate community at large for more than a decade. Data disseminated through the ESGF has undoubtedly allowed a more rapid advance of the understanding of climate models and has created a paradigm shift in how the developers of climate models view ownership of the model output.

The Department of Energy (DOE) has supported the Earth System Grid since its inception in the late 1990s. Since then, the Earth System Grid provided the community data dissemination, access, and discovery tools for the exploration of climate research through model intercomparison projects. Fueled by the Coupled Model Intercomparison Project (CMIP)—which in turn supplies data to the Intergovernmental Panel on Climate Change (IPCC) periodic assessment reports—the Earth System Grid expanded to a federated system. This ESGF team devised a revolutionary technology for housing, managing, searching, and disseminating data on a scale that is critical to climate science knowledge management and discovery.

Because the IPCC CMIP simulation archives are high profile community efforts, other projects within the climate and earth system community have become attracted by ESGF software infrastructure. As such, ESGF provides access to dozens of highly visible national and international climate and earth system data products. The ESGF distributed archive now includes model simulation output, observational, and reanalysis data sets from major U.S. agencies (e.g., Department of Energy (DOE), National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and National Science Foundation (NSF)) and major international agencies (InfraStructure for the European Network for the Earth System Modeling (IS-ENES), Australian National Computational Infrastructure (NCI), and the University of Tokyo).

By leveraging current and evolving technologies to manage distributed climate and earth system data in a unified virtual environment, the ESGF project is promoting data sharing between international research centers and diverse users. In transforming these data into a collaborative community resource, ESGF is changing the way global climate research is conducted. Through unifying team efforts, the ESGF infrastructure enables scientists to evaluate models, understand their differences, and explore the impacts of climate change through a common interface, regardless of the location of the data. The total ESGF federated archive currently serves tens of thousands of users, and it contains multiple petabytes of disparate data sets that have enabled publication of more than one thousand scientific journal articles.

Like many others in the field, we believe that ESGF is a major asset in support of the climate change community at large—and deserving of the R&D 100 honor. Therefore, it is with great pleasure and enthusiasm that we write this letter of support for the ESGF technical team.

Sincerely,

Dr. Gerald Geernaert
DOE CESD Division Director

Dr. Wanda Ferrell
DOE CESD Program Manager

Dr. Renu Joseph
DOE CESD Program Manger

Dr. Dorothy Koch
DOE CESD Program Manager