

NOAA Science Advisory Board

High Performance Computing Working Group (HPCWG)

TERMS OF REFERENCE

Draft – June 1, 2017

Background

The current state of the High Performance Computing (HPC) industry presents significant challenges for both agencies and users. Novel architectures such as graphic processing units, “many-core”, and ARM processors represent substantial changes in how systems are configured and how applications are written. Years or decades of experience in operating and coding for high-end systems need to be reexamined and modified in order to take advantage of the potential power of these new architectures.

To ensure that NOAA is adequately prepared to exploit the potential of Exascale computing, NOAA’s High Performance Computing and Communications (HPCC) program is requesting the formation of a standing HPC Working Group (HPCWG) to the Science Advisory Board that would provide advice critical for NOAA’s HPC planning and strategic roadmap.

Purpose and Scope

The purpose of the HPC Working Group is to evaluate available and projected HPC technologies in light of NOAA’s needs and advise the SAB about how best to take advantage those technologies going forward. This committee will consider the NOAA identified challenges and uncertainties then provide the SAB with the information it needs to refine NOAA’s HPC roadmap. This working group will cover the entire spectrum of the HPC related issues from compute to I/O and how they affect NOAA’s traditional and potential growth areas in scientific computing. It is expected that the SAB will review the material provided by the working group, ask questions, distill the information for actionable execution, and transmit their informed recommendation up to NOAA. This advice will inform the Office of the Chief Information Officer’s strategic plan and assist in guiding the future HPC roadmap and planning.

Working Group Description

This working group will be composed of up to 15 individuals from government, academia, National Laboratories, and industry, and any other sources that have experience with hardware components, system software and tools, and development and optimization of applications. These members will be recognized leaders within the HPC, domain science, and scientific computing community.

It is expected that meetings will be held through a virtual medium on a quarterly basis, with an annual in-person meeting. During the first year of operation additional face-to-face meetings may be needed to facilitate the working group's focus and engagement within NOAA's HPC planning. It is also envisioned that this committee will interact with relevant working groups such as but not limited to the Unified Modeling Task Force, SAB working groups, and the University Corporation of Atmospheric Research Community Advisory Committee for NCEP Model Advisory Committee within NOAA to gather internal requirements and feedback regarding prospective computing needs based on developing modeling requirements.

Products and Outcomes

The working group will produce an annual report based on the research conducted during the previous year. The report will summarize the group's findings regarding any developments and trends in HPC technologies, and make recommendations to address the hardware and software needs of NOAA's High Performance Computing enterprise, taking into account the nature of NOAA's applications and its scientific mission objectives.

Sponsoring Organization

The sponsoring office for this working group is the Office of the Chief Information Officer's High Performance Computing Program. This program will assume the cost to support the working group and will provide liaisons to the working group and organizing committee.

Membership

The HPCWG 15 members will be appointed for three-year terms, with the opportunity for one additional term. (Initially, membership will consist of four members with four-year terms, five members with three-year terms, and four members with two-year terms.) When vacancies arise the HPCWG and the HPC program will provide suggestions of new candidates to the NOAA SAB for consideration.