Earth System Research Laboratory
Global Systems Division (GSD)
Putting Compute Power in the Hands of Users
We Make Forecasts Better
High-Performance Supercomputers and Facilities

Where would our science be without the support of super-computing power to process the sophisticated equations and data volume needed in research? NOAA's Earth System Research Laboratory (ESRL) supports some of the world's top scientific research demands with continuous high-performance computing capabilities in a state-of-the-art data center.

What is a supercomputer?

It is a system built to accommodate the storage and computational speed necessary to process complicated numerical calculations. This allows extraordinarily complex forecasts to be performed by breaking the mathematics into hundreds of thousands of smaller, more manageable, and reliable calculations.

Computer Ensemble Capabilities

To improve accuracy and timeliness of predictions, there is an ever increasing volume of complex data and equations that need to be processed. ESRL/GSD is one of NOAA's three locations that host R&D high performance computing systems which are shared by the entire NOAA user community. The super computers located at ESRL/GSD are collectively referred to as *Jet*. The Jet system totals 37,360 cores of 64-bit Intel CPU's, with a total capability of 416 trillion floating point operations per second – FLOPS. Long term storage is facilitated on a 80 petabyte (quadrillion bytes) tape storage system at NOAA's National Environmental Security Computing Center (NESCC), in Fairmont, WV. To accommodate the significant data transfer needs, NOAA's three R&D locations are part of NOAA's NWAVE muti-10Gb network.

Award-Winning Facility

ESRL's 2,060-square foot computing facility is housed at the NOAA campus in Boulder, Colorado and managed by GSD. The room's award-winning design can handle the rigorous environmental and electrical demands of *Jet*. State-of-the-art ambient air cooling and a clean-agent fire protection system, as well as many sophisticated facility environment monitoring and control safeguards, are features that add up to a highly reliable and resilient center. It enhances NOAA's ability to facilitate the efficient and timely delivery of products and services.

Support and Applications

NOAA's R&D supercomputers support a wide variety of applications, serving a number of NOAA research labs, plus university collaborators. These computing systems aid scientists in making short-term weather and longer-term climate forecasts. The calculating power and volume-handling storage allow scientists to produce more accurate ocean, air quality, and environmental models that lead to a better understanding of our complicated Earth system.

GSD's state-of-the-art high-performance supercomputer *wJet*, and award-winning facility, at NOAA's Earth System Research Laboratory in Boulder, CO

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