



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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Earth System Research Laboratory

Putting Tools in the Hands of Users

ESRL's High-Performance Supercomputers and Facility

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

What is a supercomputer?

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

GSD's computer ensemble capabilities

As technology advances, so does the need to raise the volume of complex data and equations that can be processed by our scientists. That is why NOAA's new R&D high-performance computer, wJet, was added to ESRL's existing supercomputing resources, eJet and iJet. A comparison of computing capabilities between iJet and the new wJet illuminates the rapid development in this changing environment. iJet is composed of over 1300 32-bit Intel central processing units (CPUs). Each CPU is capable of 4.4 billion arithmetic operations per second. wJet raises that volume drastically to meet both current demands and those of the future. It consists of 1424 64-bit Intel CPUs. Each CPU is capable of performing over 10 billion arithmetic operations per second for a total capability of 15.2 trillion arithmetic operations per second, ranking this computer in the top 150 in the world.

Award-winning facility

ESRL's new 2,060-square foot computing facility, housed at the NOAA campus in Boulder, Colorado, is managed by the Global Systems Division (GSD). The room's award-winning design can handle the rigorous environmental and electrical demands of wJet. State-of-the-art ambient air cooling and a clean-agent fire protection system, as well as numerous 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

These robust supercomputers support a wide variety of applications. Serving a number of NOAA and other research labs, plus university collaborators, ESRL's computing system aids scientists in making short-term weather and 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.