

Capability

Computer, Computational, and Statistical Sciences Division (CCS)

Los Alamos National Laboratory is seeking academic, government, and commercial partners

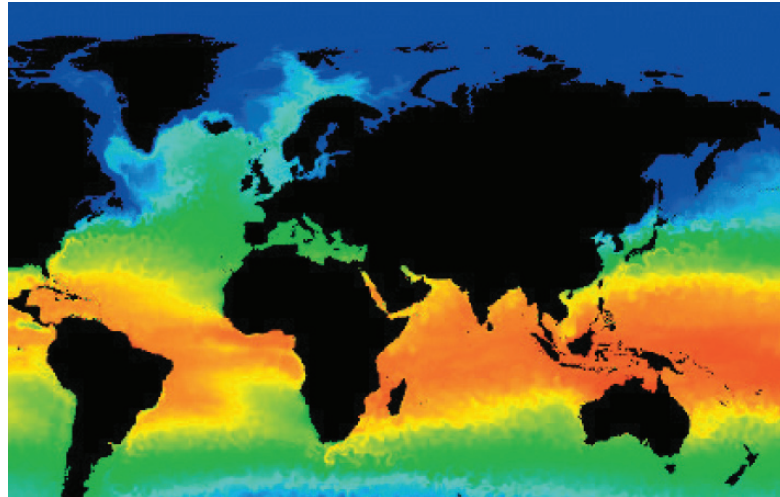
- that need problems solved in these areas, and
- to collaborate with to further develop these capabilities.

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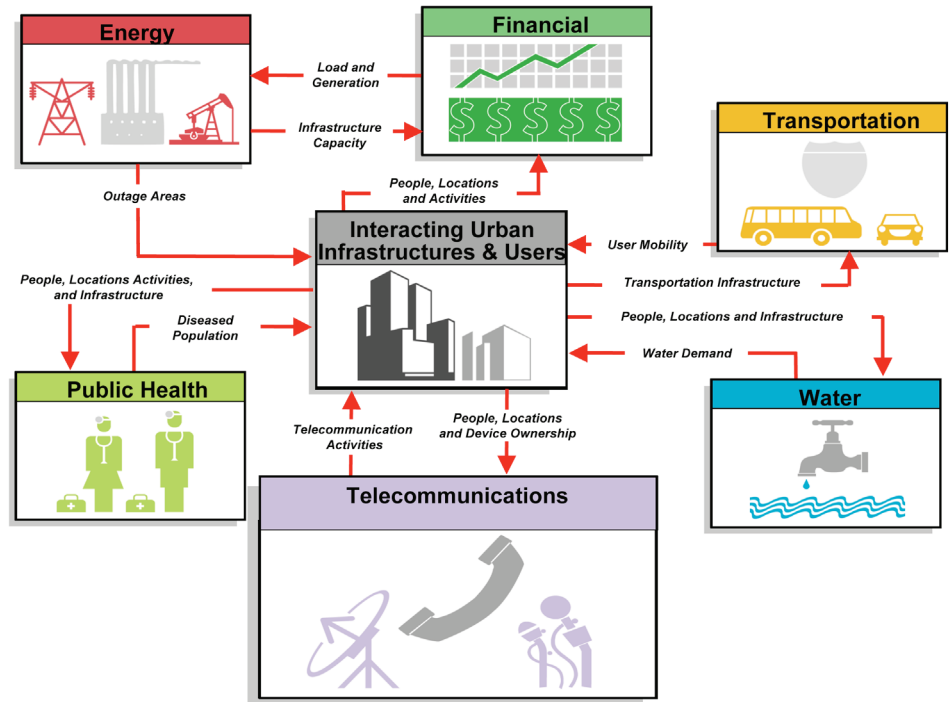
Technology Transfer Division



Simulated ocean temperatures in a Los Alamos ocean model.

Los Alamos National Laboratory's CCS Division forms a bridge between external partners and Laboratory programs bringing new ideas and technologies to bear on today's important issues. CCS scientists represent a unique blend of applied mathematicians, engineers, physicists, and computer scientists who specialize in the following:

- **Advanced Computing and Computer Science**
 - Pushing the envelope of supercomputing systems
 - Exploring and utilizing advanced computing architectures
 - Analyzing and modeling performance of extreme-scale parallel systems
 - Developing and refining tools for High Performance Computing
 - Developing visualization technologies (hardware and software)
 - Benchmarking applications and hardware
- **Computational Physics and Mathematics**
 - Using computational tools to answer physics problems
 - Modeling and simulating multi-scale, coupled transport phenomena
 - Performing climate and ocean modeling
 - Providing a center of expertise on radiation transport
 - Developing simulation tools for manufacturing processes (casting, welding, etc.)
- **Information Science and Technology**
 - Understanding massive data streams through visualization and analysis
 - Applying pattern recognition and machine learning
 - Researching knowledge systems, computational linguistics, computational biology, quantum computing, and sensor networks
- **Statistical Sciences**
 - Applying statistical reasoning to risk/vulnerability/reliability analysis
 - Designing experiments to optimize knowledge generation and capture
 - Performing multidisciplinary scientific investigations
 - Applying and communicating cutting-edge statistical sciences R&D
 - Extracting information from noise (sparse data streams)



Urban Infrastructure Suite (UIS)

Putting it all together

CCS division is a national leader in applied mathematics, computer science, and computational sciences for scientific and engineering foundations of simulation for socio-technical systems. The division has a well-earned worldwide reputation for simulation-based virtual experiments and design and analysis of such systems.

- **Climate, Ocean and Sea Ice Modeling (COSIM)**
 - The Parallel Ocean Program (POP) and sea ice (CICE) models and their applications as components of fully coupled climate models as part of the Earth System Grid project
- **Large-Scale Socio-Technical Infrastructure Modeling and Simulation**
 - Telecommunications
 - Transportation
 - Financial
 - Public Health/Epidemics
 - Energy/Water
- **The Large-Scale Socio-Technical Infrastructure Modeling and Simulation team uses integrated discrete simulation science programs that include**
 - Applied mathematical research
 - Algorithmic and computational complexity research
 - High-performance computing based design and system development
 - New engineering approaches to simulation architectures
 - Efficient data storage
 - Knowledge engineering.

www.lanl.gov/partnerships