NSF and the National Earth Science Prediction Capability

Investments in fundamental science through NSF Atmospheric Science Programs:
- Physical and Dynamical Meteorology
- Climate and Large-Scale Dynamics
- Atmospheric Chemistry
- Sponsored Visitor Programs
  - NCEP
  - Developmental Testbed Center

Investments in community support through NCAR:
- Climate and Earth system modeling
- Weather modeling and prediction
- Computational studies
- Data assimilation
- Visualization
Executive Order: Creating a National Strategic Computing Initiative (NSCI)

Lead agencies: DoD, DoE, NSF
Deployment Agencies: NASA, NOAA, DHS, FBI, NIH

Strategic Objectives:
• Accelerate delivery of capable exascale computing
• Increase technology coherence between modeling and data computing
• Extend beyond limits of current semiconductor technology
• Establish a sustained high-performance computing ecosystem
• Support public–private partnerships
Large-scale, data-driven modeling and simulation

National Strategic Computing Initiative

Data Intensity

Computational Intensity

State of the Science

Initiative Goal
Discipline-specific initiatives for fundamental understanding:

- Earth system modeling
  - Global, regional
  - Climate, seasonal, sub-seasonal, weather
  - Extreme events
- Space weather modeling
  - Theoretical
  - Computational
Cross-discipline advanced data assimilation initiatives for fundamental understanding:

- Advanced numerical techniques
- New observing systems
  - Assessment
  - Design
- Sensitivity to initial conditions using ensemble prediction systems
  - High-resolution models
    - Climate
    - Weather
    - Ocean
- Quantification of uncertainty
NSCI-related initiatives for FY 2017 and beyond:

- Data assimilation
- Brain
- Water and food security
- Advanced manufacturing and engineering
- Advanced optics and photonics