This subtopic focuses on supporting science analysis through innovative approaches to managing and visualizing collections of science data which are extremely large, complicated, and are highly distributed in a networked environment that encompasses large geographic areas. There are specific areas for which proposals are being sought:

**3D Virtual Reality Environments**

- 3D virtual reality environments for scientific data visualization that make use of novel 3D presentation techniques that minimize or eliminate the need for special user devices like goggles or helmets;
- Software tools that will enable users to 'fly' through the data space to locate specific areas of interest.

**Distributed Scientific Collaboration**

- Tools that enable high bandwidth scientific collaboration in a wide area distributed environment;
- Novel tools for data viewing, real-time data browse, and general purpose rendering of multivariate geospatial scientific data sets that use geo-rectification, data overlays, data reduction, and data encoding across widely differing data types and formats.

**Distributed Data Management and Access**

- Metadata catalog environments to locate very large and diverse science data sets that are distributed over large geographic areas;
- Dynamically configurable high speed access to data distributed and shared over wide area high speed network environments;
• Object based storage systems, file systems, and data management systems that promote the long term preservation of data in a distributed online (i.e., disk based) storage environment, and provide for recovery from system and user errors.

Research should be conducted to demonstrate technical feasibility during Phase 1 and show a path toward a Phase 2 hardware/software demonstration, and when possible, deliver a demonstration unit for functional and environmental testing at the completion of the Phase 2 contract.