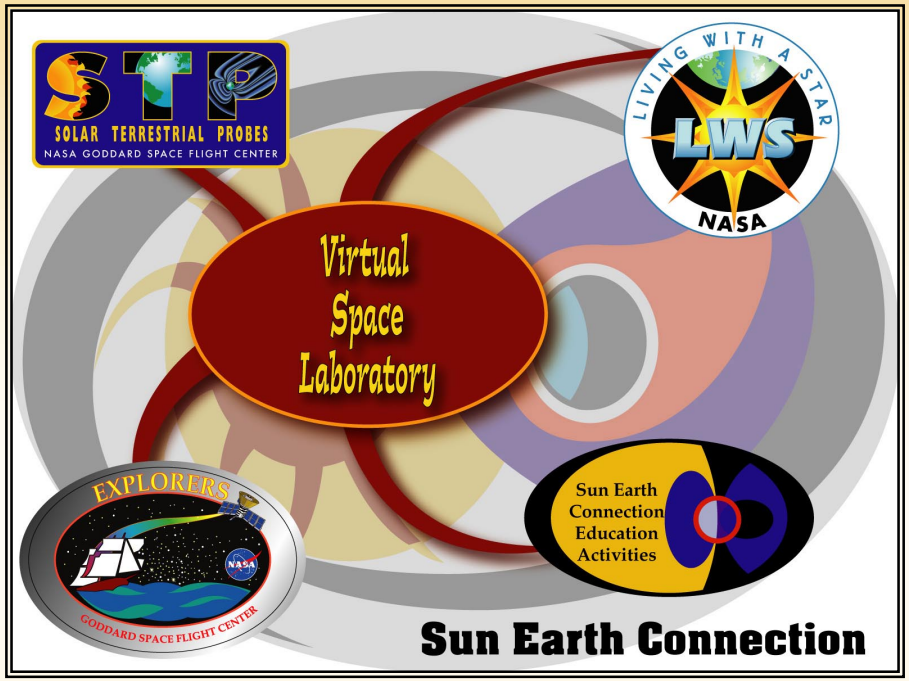
Virtual Space Laboratory (VSL)



NASA's SEC data collected and accessible as if the large-scale SEC system were a laboratory experiment

Technology Requirements

- Advanced system architecture and implementation strategy that facilitates ready infusion of newest viable information technologies

Fundamental Question

- Evolve a real quantitative understanding of the Sun, Earth and Heliosphere as a connected, end-to-end, large-scale physical system

Science Objective

- Create and sustain a multi-program, multi-mission, multi-disciplinary and community-wide data environment that truly enables full and ready access to the data underlying SEC science

Virtual Laboratory Concept

- Make SEC data from a comprehensive span of SEC-relevant missions and instruments available and usable

  as if these data came from a single, combined array of diagnostic instruments in a laboratory

- Transparent, simultaneous and ready access to and combining of data from multiple data sources
- Services and tools for analysis, modeling, visualization

Implementation Strategy

- Open data environment based on the use of standard science data formats
- Distributed and modular architecture with key central multi-mission services and a core of common software
- Evolving capabilities and service components against the science data population over time

Why is this Effort Important

- The foundation of science understanding of the SEC large-scale system is necessarily the ready combination and correlation of data across that system

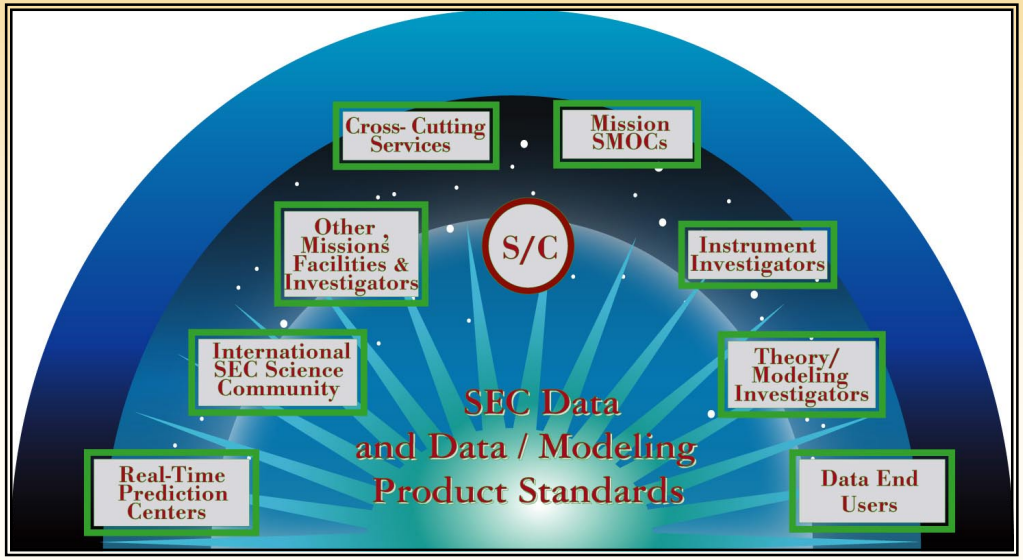
Virtual Space Laboratory (VSL)

Unique Programmatic Value

- VSL is the only logical way for the SEC program to "join" the capabilities of three SEC mission lines (STP, LWS, Explorer) into a coherent whole
  - > An integrated resource to better achieve
    - Science objectives of each
    - Cross-cutting objectives of SEC's program overall
- Key to incorporating relevant data from outside SEC
  - > Other agencies, ground-based observations
- A framework for data assimilation into models
- Program-level ties to SEC Education and Public Outreach

Principles of Design

- VSL will be an enabling Data Environment
  - > Not a single monolithic "system"
- Open and data standards based architecture
  - > Data together form a common pool
  - > Critical tools and services keyed to those standards
  - > Science data from many sources forming a common resource for direct access and creating new services
- Modularity allows many activities to develop and operate in parallel, so the system can evolve



A modular and distributed system based on data standards and evolving over time

A VSL Initiative As a Part of the SEC Roadmap

- SEC's first (virtual) mission truly to span the traditional discipline boundaries of the program
  - > Only possible with today's information technology
  - > A s/c constellation of audacious scale
- Complementary to other OSS programs
  - > Paves the way to draw the OSS-wide elements together