Columbia University
University of Wisconsin
Goddard Inst. (Science Co-Lead)
Texas A&M (Science Co-Lead)
USC/IMSC (Into Systems Lead)

Partners: JPL (Project Leader: Tom Yungk)

GPS: The Global Positioning System

Information Systems

GPS ENVironmental & Earth Science

GENESIS:
Earth Observing System (EOS) Announced

Science Priorities
- Terrestrial & marine ecosystems
- Atmospheric chemistry (e.g., ozone)
- Causes of long-term (10-100 yr) climatic change
- Seasonal/interannual climate prediction (El Nino)
- Understand and prepare for global change
- Study Earth as a complex, interdependent system

Mission to Planet Earth, Inaugurated

Earth System Science AT NASA
Objective of Genesis

- Participation in the WP-E3P Federation
- On-line help and documentation
- Data migration from existing GPS archived data
- Data subscription service
- Interactive web/java-based data search & retrieval
- Data browsing using integrated visualization tools
  - Other ground-based GPS receivers
  - Space-borne Turboprop Space Receivers for GPS science
- Products derived from:
  - Data archiving, searching & distribution for science data
Online Publishing
- Information: tutorials, papers, FAQs, help line
- User-contributed products and tools
- Experimental "data mining" functions
- Downloadable science analysis tools
- Powerful data visualization tools: VIS-AD
- Data subscription: automated notification & delivery
- Versatile search and query across data centers

Other User Services
- Topography and boundary layer heights
- Global pressure contours, gradients, and derived winds
- User-specific time and spatial averages of the above
- Profiles of reflectivity, density, pressure, temp, moisture

Focus on Atmospheric Occultation Products

GENESIS Products & Services
Baseline Technology

- Pattern recognition
- Discriminant analysis
- Feature extraction
- Time series analysis

Future research to provide:
- Object-oriented database technology (USC)
- Data visualization tools (University of Wisconsin-Madison)

Others:
- Data distribution via FTP
- APIs and Web-based interface for search engine
- File-based archive management system
- JPL home grown & currently operational Distributed Object Management (DOM) System
Enforces intelligent demand control
Allows versatile subsetting and user-specified actions
Metadata is human-readable, machine-parsable
Web-based interface emphasizes Java applications
Adapts Hierarchical Data Format (HDF)
  - Paradise (U. Wisconsin)
  - Oracle-8
  - INFORMIX Universal Server

Will draw from latest commercial & research systems:
  - Will evolve into a true object-oriented system in 2 yrs
  - Search system based on high performance DBMS
  - Product system based initially on file management

Other GENESIS Features

Pilot derived from JPL's Distributed Object Manager