Information Technology Infrastructure for the NASA Earth Science Enterprise Solutions Network

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“Developing, Deploying, and Strategically Evolving the NASA Sun-Earth Research Knowledge Database, Enterprise Architecture, and Future Solutions Network”

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Period of performance: January 2006 through June 2007
• Developing, deploying, and evolving the NASA Solutions Networks Earth-Sun System Research Project Knowledge Base (RPKB)
  – Must be compatible with ESAT
  – Assess user requirements; incorporate in RPKB design
Task 2

- Characterizing the current state of NASA’s network partners and components and deploying database technologies for enhanced functional network and functional-network analysis → Partners Network Knowledge Base (PNKB)
  - Survey current MOUs
  - Catalogue current partnerships in Earth-Sun System research
  - Establish contacts in each partner agency/organization's project team
  - Map partner progress and NASA progress in Earth-Sun System projects, noting overlaps and gaps
Task 3

• Developing a strategic plan to evolve the NASA Earth-Sun System Science Solutions Network
  – Client Applications
  – Web Interfaces
  – Data Discovery Agents
  – Web Services for Advanced Data and Results Publishing
  – Integrated Interfaces to NASA EA RPKB
Solutions Networks

- RPKB
- PNKB
- User Needs Assessment
- M2M
- Candidate Solutions
- RPC
- ISS
• RPKB is populated with Research Project Results and searchable by:
  – Science Focus Area
  – National Application Area
  – Principal Investigator
  – Observation System / Sensor
  – New or Existing Decision Support Tools (DST) used
  – New and Existing Models / Data Products Used
  – Solicitation Number
  – Proposal Title
  – Keywords
12 Applications of National Priority

- Agricultural Efficiency
- Air Quality
- Aviation
- Invasive Species
- Carbon Management
- Coastal Management
- Disaster Management
- Homeland Security
- Energy Management
- Public Health
- Ecological Forecasting
- Water Management
RPKB Complements M2MM

- NASA Solicitations
- Solicitation Reports
- Publications
- Data Evaluations
- Model Evaluations
- DST Evaluations
- Principle Investigators

RPKB is developing links into the Systems Components database

Systems Components:
- Satellites
- Sensors
- Data Products
- Models
- Model Products
- Decision Support Tools
- National Applications
- Science Focus Areas
- Science Questions
- GCMD Parameters
- Partners
- Benefits to Society
- Outcomes
- IWGEO Requirements
- NOAA Requirements
- RPC Experiments
Research Projects Knowledgebase (RPKB) Development

RPKB User Needs Assessment

RPKB PROTOTYPING (MS ACCESS)

Design an Integrated Table Structure

EA Database Evaluation Analysis of M2M

Evaluation of Interfaces Analysis of METIS and Client Applications

NASA EA (M2M)
Research Projects Knowledgebase (RPKB) Architecture

- RPKB PROTOTYPING (MS ACCESS)
- DATE ENTRY & REVIEW WEB CLIENT (ASP.Net and VB.Net)
- DATABASE CLIENT (SQL Server)
- NASA EA
Integrating RPKB and EA

1. Users add information to the Database

2. Dif Developer specifies how Database is mapped to NASA's EA Metamodel

3. Metis Metamodel Developer imports database information into NASA's EA Metamodel using specifications from Dif Developer

4. Metis Metamodel Developer produces visualizations of information from Database in context of NASA's EA
The Evolved NASA SN

Database Client Applications

Web Client

Integrated Interfaces

Data Discovery Agents

Enterprise Middleware

NASA EA Database

NASA RPKB & PNKB Databases
Thank you!