Geospatial Interoperability & Earth Sun Gateway

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Geospatial Interoperability

- Challenges and Risks
- National Applications
- Integrated Systems Solutions Architecture
- Geospatial Standards Organizations
- Prototypes
  - Applied Sciences/GIO/Synergy Tasks
  - Earth Sun Gateway
    - Overview
    - Architecture
    - Demonstration
- Conclusion
Challenges and Risks

- Transitioning from research to operations
- Characterizing uncertainty in model forecasts for weather, climate, and natural hazards
- Computing capacity to handle volume and range of data from NASA Earth observatories
- Accessing observations and model outputs throughout the Global Spatial Data Infrastructure
- Establishing an Earth Sun Gateway to provide access to scientists, decision makers, education and citizens

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<table>
<thead>
<tr>
<th>Priority</th>
<th>National Programs</th>
<th>International Programs</th>
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</thead>
<tbody>
<tr>
<td>Vision for Exploration</td>
<td>Understanding the Earth as the foundation for Planetary Exploration and Search for Life</td>
<td>“Pursue opportunities for international participation to support U.S. space exploration goals”</td>
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<tr>
<td>Climate Change</td>
<td>Climate Change Science Program (CCSP, 13 Agencies)</td>
<td>Intergovernmental Panel on Climate Change (IPCC)</td>
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<td>Climate Change Technology Program (CCTP, 12 Agencies)</td>
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<td>Weather</td>
<td>U.S. Weather Research Program (USWRP, 7 Agencies)</td>
<td>World Meteorological Organization (WMO)</td>
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<td>Natural Hazards</td>
<td>NSTC CENR Subcommittee on Natural Disaster Reduction (SNDR, 14 Agencies)</td>
<td>International Strategy for Disaster Reduction</td>
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<tr>
<td>Sustainability</td>
<td>CENR Subcommittee on Ecosystems</td>
<td>World Summit on Sustainable Development (WSSD)</td>
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<td>President's Management Agenda: E-Government</td>
<td>Geospatial One-Stop (GOS, 12 Agencies) and the Federal Geographic Data Committee (FGDC, 19 Agencies)</td>
<td>World Summit on the Information Society</td>
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Applications of National Priority

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

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Geospatial Standards Bodies
NASA / GIO Representation

- Open Geospatial Consortium
  - www.opengeospatial.org
  - Not for profit consortium
- ISO TC211 - Geographic Information
  - www.isotc211.org
  - Technical Committee of ISO
  - US Delegation; INCITS - L1
- Federal Geographic Data Committee
  - US Federal government directive
  - www.fgdc.gov
  - Geospatial Applications & Interoperability WG
Synergy V Interoperability Tasks
OGC Services (DOWS)

Catalog
- OGC Catalog Adaptor (NSDI)
- ECHO Catalog
- Export OGC Availability

Data Pool

Earth Sun Gateway Portal

Client

Find

Map / Coverage

Services
- Web Map Service (IONIC)
- Web Coverage Service (IONIC)
- Data Conversion Tool (HEG)

Published

Bind
Earth Sun Gateway Overview

- Portal to information about the Earth-Sun System
  - Observations of natural phenomena (satellite, in situ, airborne)
  - Predictions from computer models
  - Decision Support Systems from Partner Agencies
  - Image Views and visualizations
  - Resources available through OGC Web Services
  - Science Focus Areas

- Intended Users
  - Scientists, Analysts, Decision Makers
  - Students, Educators, Public
Earth Sun Gateway Concept

Earth Sun Gateway

- Portrayal Services
- Processing Services
- Catalog Services
- Authentication Services

OpenGIS Interfaces

Earth Sun Components
- Knowledge Base
- Digital Libraries
- Models
- ESMF
- Grid Resources
- Mission Data Products
- EOS Catalogs

Application Integration Framework

Extensible, open portal architecture
Welcome to NASA's Earth-Sun Gateway!

Not a Registered User? Please Register here.

Featured Views

National Applications

Science Focus Areas

The Earth-Sun Gateway (ESG) provides access to information about Earth and the Earth-Sun system from NASA and other organizations.

- All visitors can use the ESG Viewer to display images and views from Web Map Servers, overlay multiple views from different servers, and search for other data holdings.
- Registered users can save views for later use or to share with friends and colleagues.
- Publishers can register their Map Servers and data holdings.
- Developers can use open-standard interface specifications to connect their software to services provided by ESG.

NOTE: The ESG is currently in beta-test mode. Publishers are encouraged to register their servers, and all users are encouraged to send comments or problems to comments@esg.gsfc.nasa.gov.
Geospatial Interoperability & ESG

- Geospatial Standards & Interoperability are crosscutting functions needed in the current National & International Initiatives
- ESG is in Beta-Test
  - Building on Existing/Evolving Catalogues and Portals
  - Content Enhancement is Underway
  - URL esg.gsfc.nasa.gov
- GIO capable of assisting to make data/products and model outputs more accessible
  - Open Systems Architecture
  - Open GIS Interfaces
- Geospatial Standards Bodies
  - Ensure your requirements are met
  - Receive outcome specifications

- GIO
  - myra.j.bambacus@gsfc.nasa.gov (301) 286-0024
Selected Data

For LPDAAC:

a. 16-Day Vegetation Indices (250m, 500m, 1km), Terra and Aqua
b. 8-Day Surface Reflectance at 500m, Terra and Aqua
c. Daily Global Land Temperature/Emissivity at 1km

1. MOD13A2 MODIS/Terra Vegetation Indices 16-Day L3 Global 1km ISIN Grid
2. MYD13A2 MODIS/Aqua Vegetation Indices 16-Day L3 Global 1km SIN Grid
3. MOD13Q1 MODIS/Terra Vegetation Indices 16-Day L3 Global 250m ISIN Grid
4. MYD13Q1 MODIS/Aqua Vegetation Indices 16-Day L3 Global 250m ISIN Grid
5. MOD13A1 MODIS/Terra Vegetation Indices 16-Day L3 Global 500m ISIN Grid
6. MYD13A1 MODIS/Aqua Vegetation Indices 16-Day L3 Global 500m ISIN Grid
7. MOD11A1 MODIS/Terra Land Surface Temperature/Emissivity Daily L3 Global 1km ISIN Grid
8. MYD11A1 MODIS/Aqua Land Surface Temperature/Emissivity Daily L3 Global 1km ISIN Grid
9. MOD09A1 MODIS/Terra Surface Reflectance 8-Day L3 Global 500m ISIN Grid
10. MYD09A1 MODIS/Aqua Surface Reflectance 8-Day L3 Global 500m ISIN Grid

For Standalone (GSFC),
1. MOD02HKM MODIS/Terra Calibrated Radiances 5min L1B Swath 500m
2. MO04MW MODIS/Terra Ocean Color and SST Mean Maps 8-Day L3 Global 4km CylEqDst