



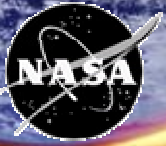
Geospatial Interoperability & Earth Sun Gateway

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Geospatial Interoperability Office
Applied Sciences Program
NASA Science Mission Directorate**



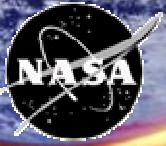
- ACE
- TRACE
- SOHO
- Wind
- Voyager 1 & 2
- RHESSI
- Geotail
- Cluster
- TIMED
- Jason-1
- Aqua
- QuikSCAT
- ERBS
- ACRIMSAT
- Landsat 7
- NMP/EO-1
- Ulysses
- IMAGE
- TOREX/Poseidon
- TRMM
- FAST
- Polar
- SAGE III/METEOR-3M
- SORCE
- UARS
- GRACE
- EP-TOMS
- SeaWiFS
- Aura
- Terra
- ICESat

November 16, 2004



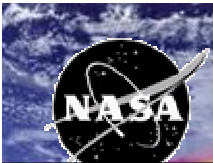
Geospatial Interoperability

- 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



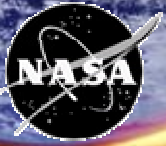
Challenges and Risks

- 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 through-out the Global Spatial Data Infrastructure
- Establishing an Earth Sun Gateway to provide access to scientists, decision makers, education and citizens



National Programs in a Global Context

Priority	National Programs	International Programs
Vision for Exploration	Understanding the Earth as the foundation for Planetary Exploration and Search for Life	<i>"Pursue opportunities for international participation to support U.S. space exploration goals"</i>
Global Earth Observation	NSTC CENR Interagency Working Group on Earth Observations (IWGEO) Integrated Earth Observation System, 17 Agencies)	Group on Earth Observations (GEO) Global Earth Observation System of Systems (GEOSS) 10-Year Implementation Plan
Climate Change	Climate Change Science Program (CCSP) , 13 Agencies) Climate Change Technology Program (CCTP) , 12 Agencies)	Intergovernmental Panel on Climate Change (IPCC)
Weather	U.S. Weather Research Program (USWRP) , 7 Agencies)	World Meteorological Organization (WMO)
Natural Hazards	NSTC CENR Subcommittee on Natural Disaster Reduction (SNDR) , 14 Agencies)	International Strategy for Disaster Reduction
Sustainability	CENR Subcommittee on Ecosystems	World Summit on Sustainable Development (WSSD)
President's Management Agenda: E-Government	Geospatial One-Stop (GOS) , 12 Agencies) and the Federal Geographic Data Committee (FGDC) , 19 Agencies)	World Summit on the Information Society



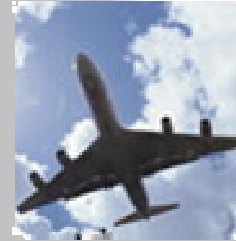
Applications of National Priority



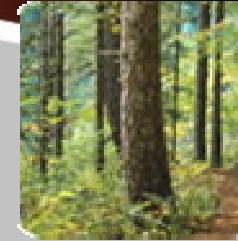
Agricultural Efficiency



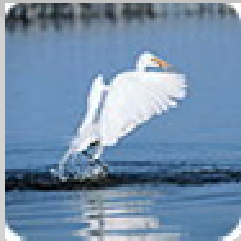
Air Quality



Aviation



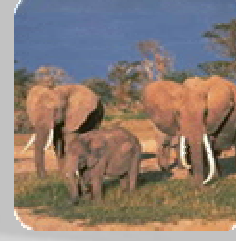
Carbon Management



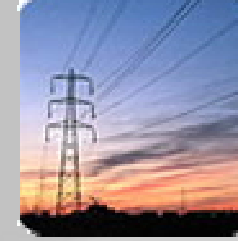
Coastal Management



Disaster Management



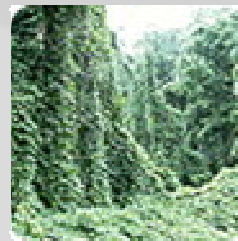
Ecological Forecasting



Energy Management



Homeland Security



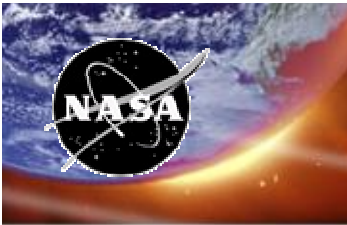
Invasive Species



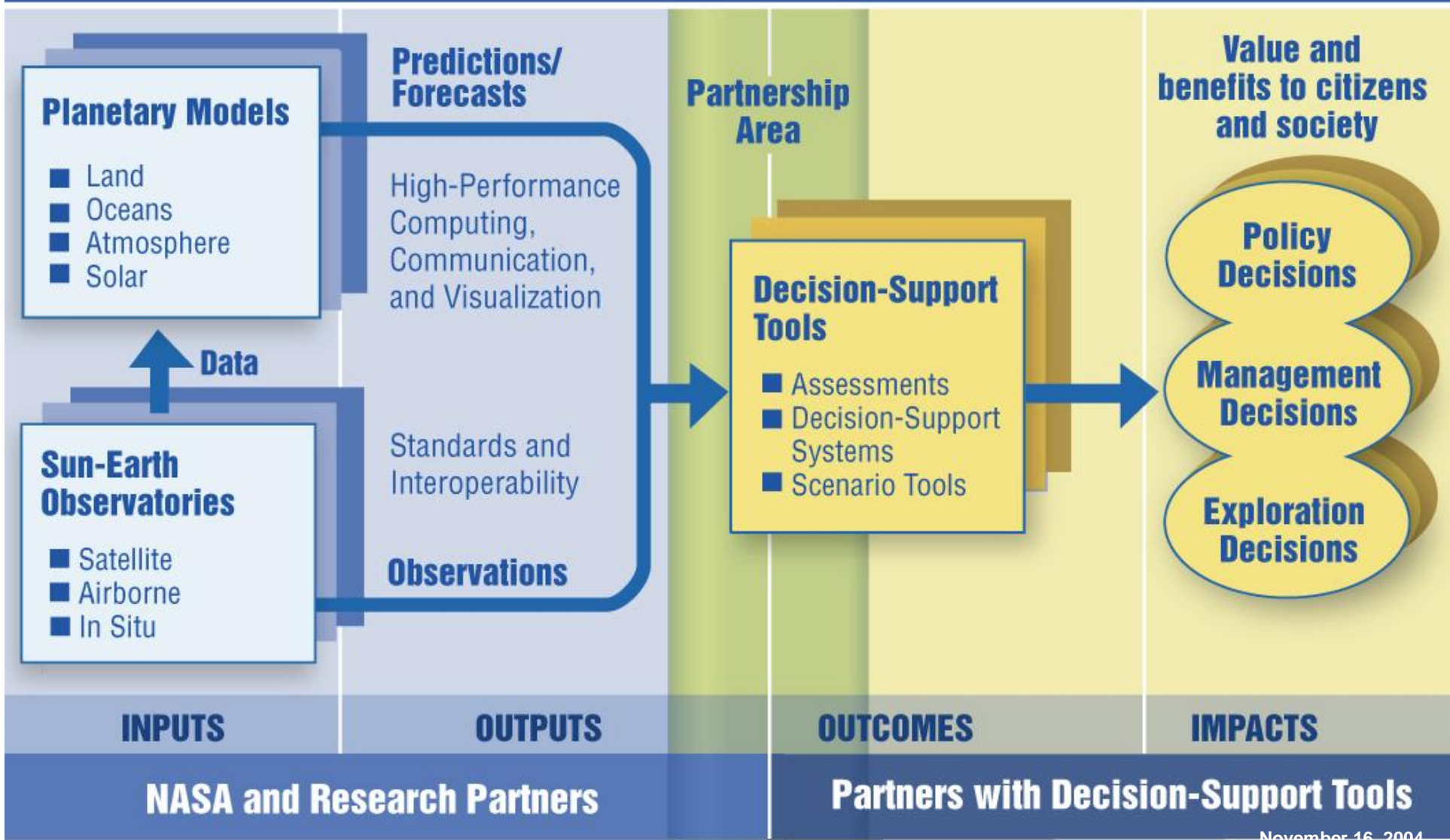
Public Health

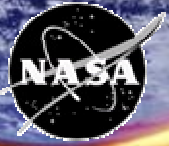


Water Management



Integrating Knowledge, Capacity and Systems into Solutions





Geospatial Standards Bodies

NASA / GIO Representation

■ Open Geospatial Consortium

- www.opengeospatial.org
- Not for profit consortium



■ ISO TC211- Geographic Information

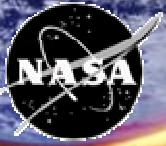
- www.isotc211.org
- Technical Committee of ISO
- US Delegation; INCITS - L1



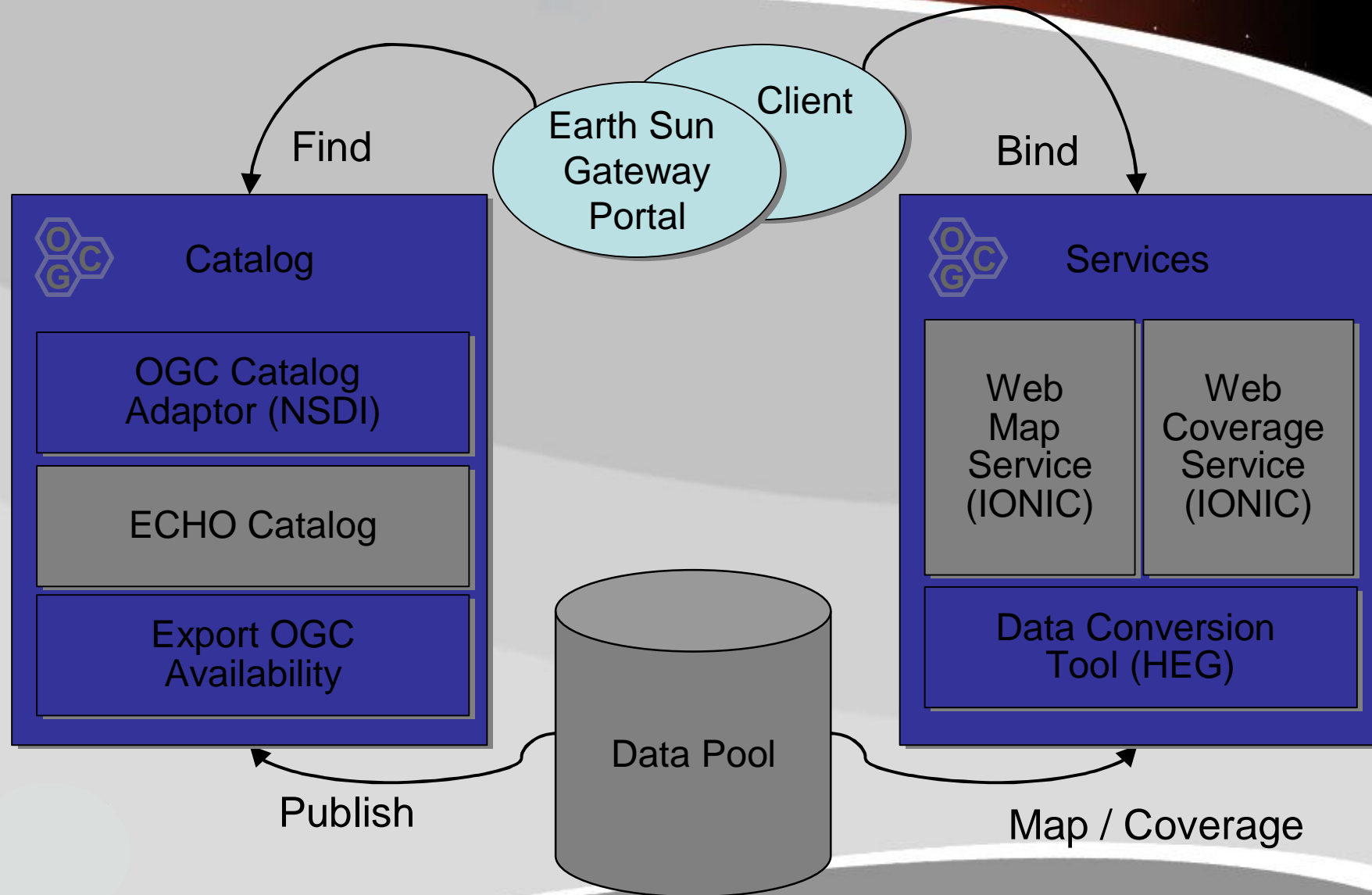
■ Federal Geographic Data Committee

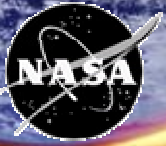
- US Federal government directive
- www.fgdc.gov
- Geospatial Applications & Interoperability WG





Synergy V Interoperability Tasks OGC Services (DOWS)





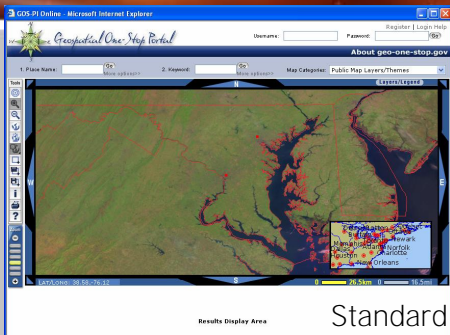
Earth Sun Gateway Overview

- 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



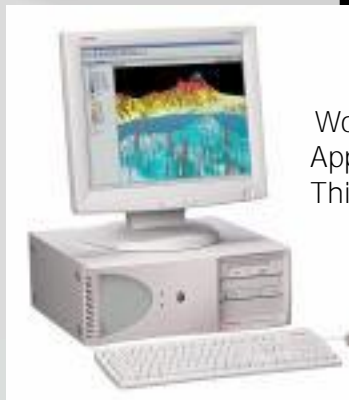
Earth Sun Gateway Concept



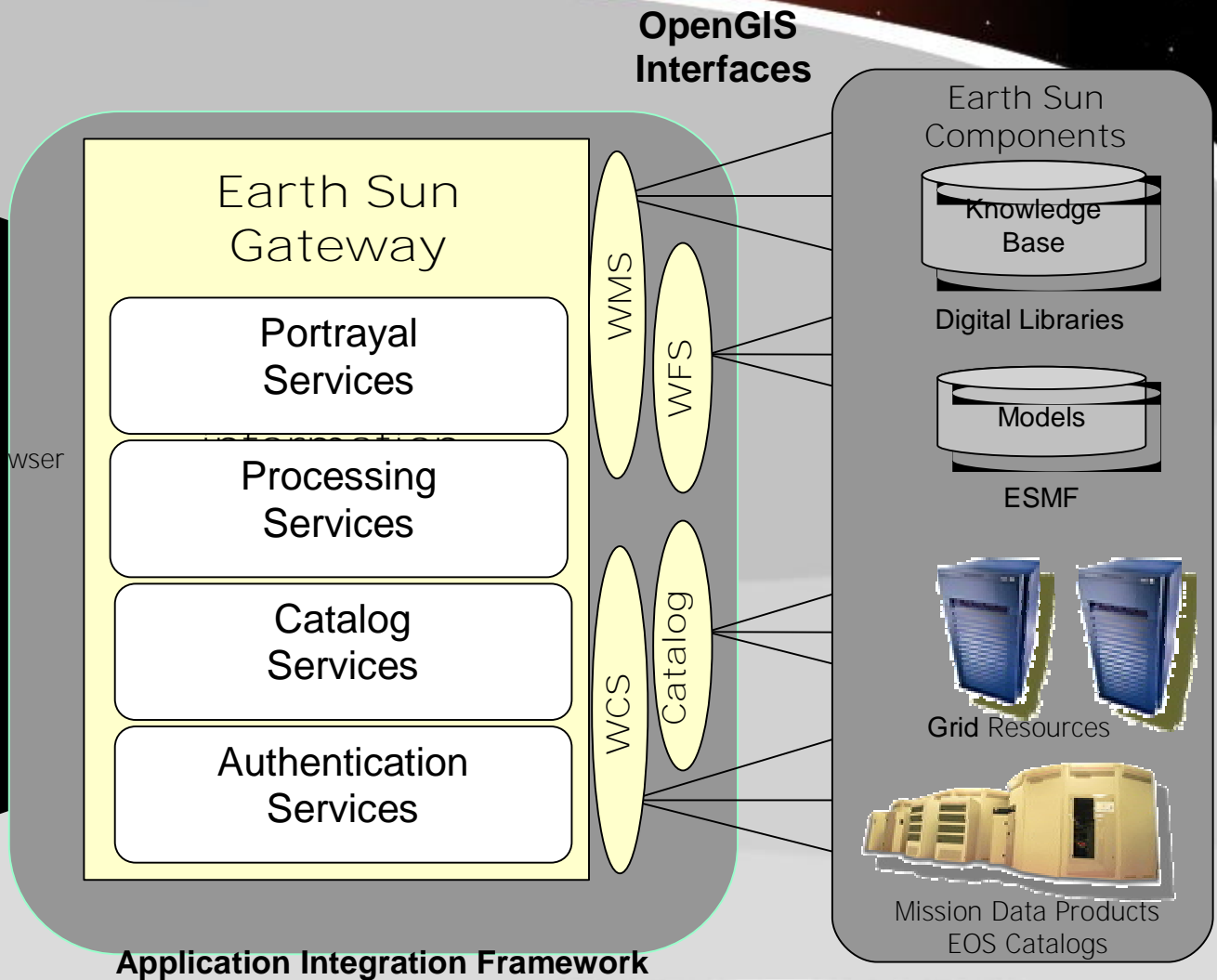
Standard Web



Web App



This



Application Integration Framework

Extensible, open portal architecture

Earth-Sun Gateway (beta-test phase)

National Aeronautics and Space Administration
Science Mission Directorate - Earth-Sun System Division - Applied Sciences Program

ESG Home About Contacts My Gateway

Login (optional)
Username: _____
Password: _____
LOGIN
[Why Register?](#)

Welcome to NASA's Earth-Sun Gateway!

Not a Registered User? Please [Register here](#).

- Getting Started**
- + [Using the Gateway](#)
 - + [Using the Viewer](#)
 - + [Composing Views](#)
 - + [Sharing My Views](#)

- Applied Science**
- + [Program Home Page](#)
 - + [National Applications](#)
 - + [Science Focus Areas](#)

- Searching**
- + [Search](#)
 - + [Viewer](#)
 - + [Featured Views](#)

- Publishers**
- + [How To Publish](#)
 - + [Register to Publish](#)
 - + [Publish Data](#)
 - + [Current Publishers](#)

- Developers**
- + [Introduction](#)
 - + [Using Gateway Services](#)
 - + [Standards In Use](#)
 - + [Technical Architecture](#)



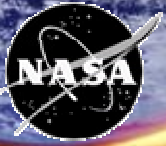
- National Applications**
- Carbon Management
 - Public Health
 - Energy Management
 - Aviation
 - Water Management
 - Homeland Security
 - Coastal Management
 - BioStar Management
 - Agricultural Efficiency
 - Invasive Species
 - Ecological Services
 - Air Quality



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

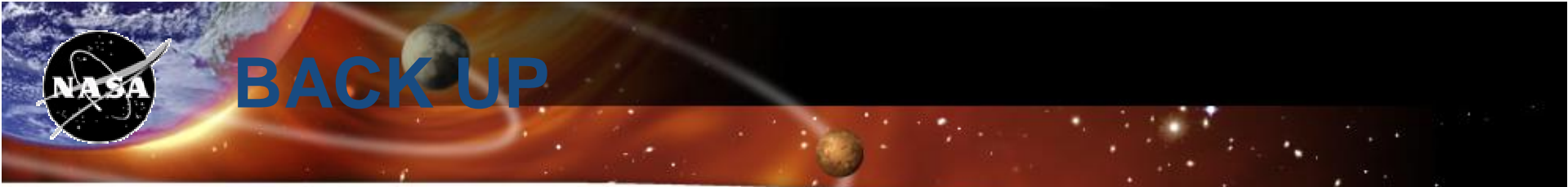
- **All visitors** can use the ESG Viewer to display images and views from Web Map Servers, overlay multiple views from different servers, and search for other data holdings.
- **Registered users** can save views for later use or to share with friends and colleagues.
- **Publishers** can register their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

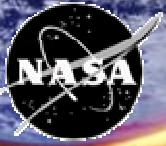
NOTE: The ESG is currently in beta-test mode. Publishers are encouraged to register their servers, and all users are encouraged to send comments or problems to comments@esg.gsfc.nasa.gov.



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