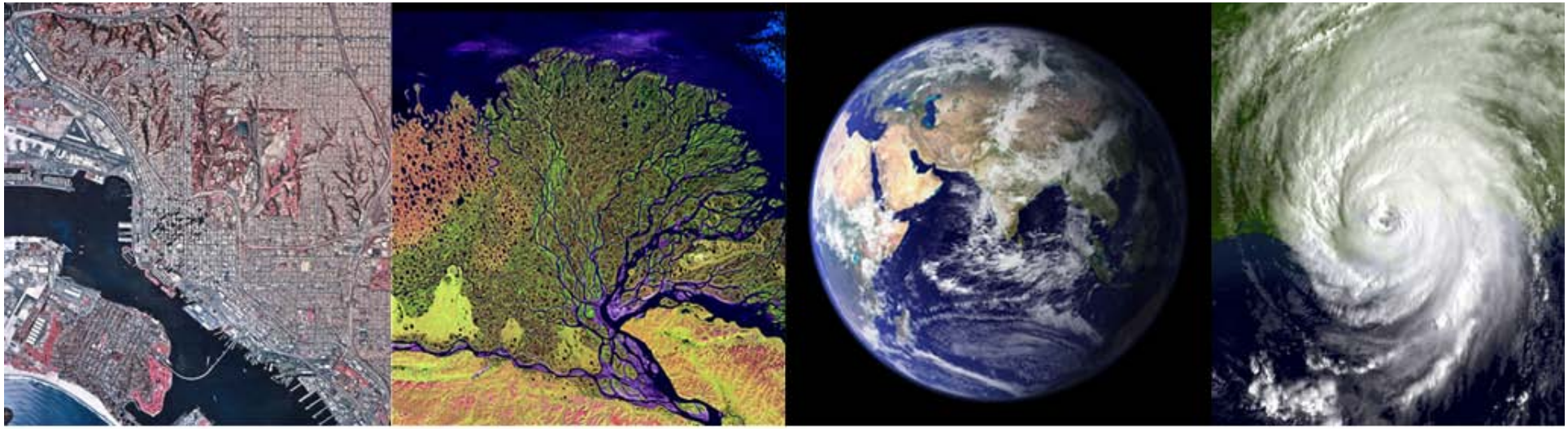
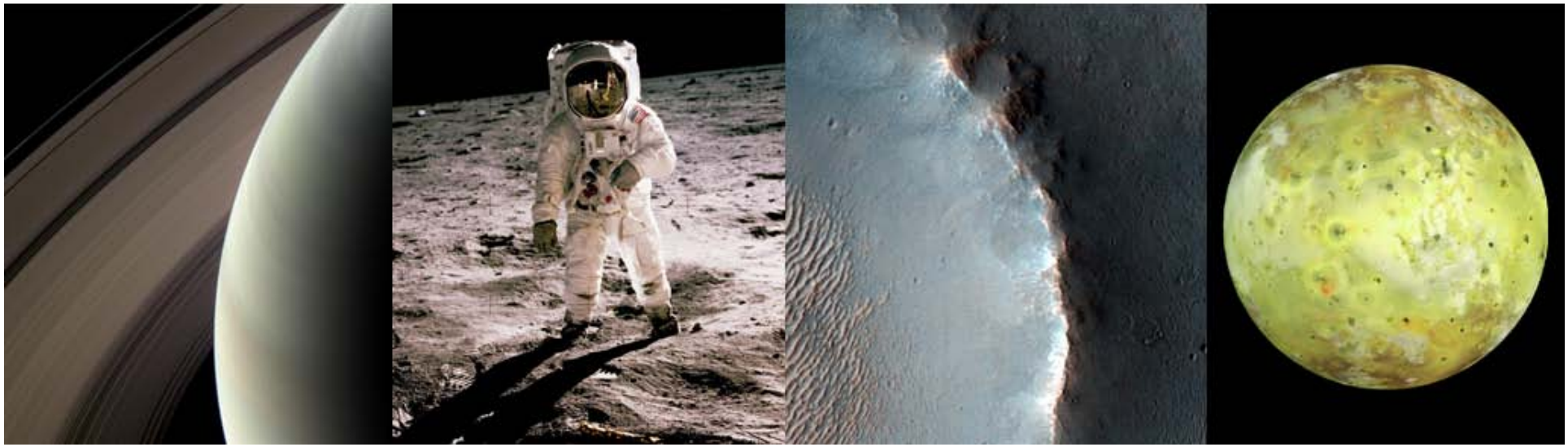


RESOURCES FOR EARTH AND PLANETARY RESEARCH



Introduction

This is a guide to locating resources for Earth and planetary research. Most products are free and available for download. It is your responsibility to check for any usage restrictions. Products include maps, imagery, and data.

Many of the product or database descriptions are taken directly from the source. Every effort has been made to ensure the information in this guide is accurate. Updates and improvements will be made on a continual basis. Any discrepancies or faulty links should be brought to the attention of:

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AERIAL PHOTOGRAPHY FIELD OFFICE

The Aerial Photography Field Office (APFO) is a division of the Farm Service Agency, of the United States Department of Agriculture (USDA). The APFO is the primary source of aerial imagery for the USDA and has one of the largest collections of Historical Aerial Photography in the Nation.

NATIONAL AGRICULTURE IMAGERY PROGRAM (NAIP)
The APFO's National Agriculture Imagery Program acquires imagery during the agricultural growing seasons in the continental U.S. A primary goal of the NAIP program is to enable availability of digital orthophotography (digital images of aerial photographs) within a year of acquisition.

Other APFO Imagery Programs/Collections:

National Aerial Photography Program (NAPP)	Recent, high–quality aerial photos covering the conterminous U.S. on five– to seven–year cycles (1987 – present).
National High Altitude Photography (NHAP)	High–altitude aerial photos for the conterminous U.S. (1980 – 1989).
National Digital Orthophoto Program (NDOP)	Digital images of aerial photos taken of the U.S. and its territories updated every 3 to 10 years.
Other Aerial Photography Collections	Aerial photos secured for the Forest Service, Natural Resource and Conservation Service, and Farm Service Agency.

Online Digital Imagery Viewers
Ordering Information
Prices for Aerial Photographic Reproductions

UNITED STATES GEOLOGICAL SURVEY

The United States Geological Survey (USGS), its many programs and partnerships have made it an excellent source for maps, aerial photography, satellite imagery and data, and planetary products.

Maps

The following is a list of the types of maps sold and distributed by the USGS through its Earth Science Information Centers, State U.S. Geological Surveys, and the USGS Online Store. For more detailed information on each map type, check out the online USGS Maps Booklet

Topographic Maps	Collection of 7.5-minute maps, 15-minute maps, 1:100,000-scale maps, county maps, 1:250,000-scale map, state maps, national park maps, shaded-relief maps, topographic-bathymetric maps and Antarctic maps.
Photoimage Maps	Collection of orthophotomaps, orthophotoquads, border maps, and satellite image maps.
Geologic Maps	Collection of oil and gas investigation maps and charts, geologic quadrangle maps, miscellaneous investigation maps, miscellaneous field study maps, coal investigation maps, state geologic maps, and planetary and moon maps.
Hydrologic Maps	Maps showing a wide range of water-resources information, such as depth to ground water, floods, irrigated acreage, producing aquifers, water availability, and surface-water discharge.
National Atlas Maps	Selected reference maps and thematic maps from the National Atlas of America (1970).

The following are links to additional map collections, online search tools, and even free downloadable maps and data.

National Atlas.gov	Latest version of the National Atlas of America. Available online, users can create and print custom maps and download free data.

National Map	Online, interactive map viewer that allows the user to create and print custom maps and download free data.
Historical Maps	Collection of digitized, historic maps from the Library of Congress. Maps are available as free, downloadable Adobe Acrobat documents (pdfs).
BP&CRADA Maps	Collection of selected USGS Business Partner Program (BP) and Cooperative Research and Development Agreement (CRADA) partner sites where you may view, create and buy your own customized maps online.
Map Locator	Online tool through the USGS store, to help the user find and download free digital topographic maps.
National Geologic Map Database	Provides scanned images of some geologic maps and contains descriptions of all geoscience maps and related products in the database.

Aerial Photography and Satellite Imagery

The most comprehensive information on USGS Aerial Photography and Satellite Imagery can be found at the USGS EROS Data Center (page 4).

Planetary Products

Information on USGS lunar and planetary products can be obtained through the USGS Astrogeology Research Program (page 10).

UNITED STATES GEOLOGICAL SURVEY
EROS DATA CENTER

The Earth Resources Observation and Science Center (EROS) is a data management, systems development, and research field center for the USGS' Geography Discipline.

The following is a list of the aerial, satellite, and manned spacecraft imagery of the Earth, as well as related data products archived and available at EROS.

Aerial Products	
National Aerial Photography Program (NAPP)	Recent, high–quality aerial photos covering the conterminous U.S. on five– to seven–year cycles. (1987 – 2004)
National High Altitude Photography (NHAP)	High–altitude aerial photos for the conterminous U.S. (1980 – 1989)
Single Frame Records	Aerial photos from a variety of sources. (1939 – present)
Digital Orthophoto Quadrangles (DOQs)	Digital images of aerial photos which combine the image characteristics of the photo with the georeferenced qualities of a map. (1987 - present)
High Resolution Orthoimagery	Digital images of orthorectified aerial photographs with a pixel resolution of 1-meter or finer from across the United States. (2000 - present)
Space Acquired Photography	Photos taken from the International Space Station (ISS), Shuttle, Skylab, Gemini, and Apollo missions. (1965 – present)
United States Antarctic Resource Center (USARC)	Large collection of aerial photography over Antartica. (1946 – present)

Aircraft Scanners	Digital imagery acquired from several multispectral scanners on board NASA ER–2, NASA C–130B, and NASA Learjet aircrafts. (1982 – 1995)
Aerial Products Side-Looking Airborne Radar (SLAR)	The Side-Looking Airborne Radar (SLAR) is an image-producing system that derives its name from the fact that the radar beam is transmitted from the side of the aircraft during data acquisition.
Antarctica Single Frame Records	A collection of aerial photographs over the Antarctic that is available for downloading as medium or high resolution digital images. (1946 - 2000)

Digitized Map Products	
Digital Raster Graphics (DRGs)	Scanned digital images of USGS topographic quadrangles.
Digital Line Graphs (DLGs)	Digital vector data derived from USGS maps and related sources.
SRTM Water Body Dataset	SRTM Water Body Data files are a by-product of the data editing performed by the National Geospatial-Intelligence Agency (NGA) to produce the finished SRTM Digital Terrain Elevation Data Level 2 (DTED® 2).

Elevation Products	
National Elevation Dataset (NED)	The National Elevation Dataset (NED) is the primary elevation data product of the USGS. The NED is a seamless dataset with the best available raster elevation data of the conterminous United States, Alaska, Hawaii, and territorial islands.
Digital Elevation Models (DEMs)	Digital raster elevation data based on USGS topographic quads.
Global 30 Arc-Second Elevation Dataset (GTOPO30)	Global 1-km digital raster data derived from a variety of sources.

HYDRO1K	A global hydrologic database derived from 1996 GTOPO30 data.
Shuttle Radar Topography Mission (SRTM) - "Finished"	Shuttle Radar Topography Mission data were used to generate digital elevation data with a resolution of 1 arc-second for the United States and 3 arc-seconds for global coverage. 3 arc second (90 meter) SRTM Research Grade data is also available from NASA/JPL.

Satellite Products	
Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER)	High-resolution (15- to 90-meter) multispectral data from the Terra satellite (2000 to present).
Advanced Very High Resolution Radiometer (AVHRR)	1-km multispectral data from the NOAA satellite series (1979 to present).
Declassified Satellite Imagery - 1	Photographic imagery from the CORONA, ARGON and LANYARD satellites (1960 to 1972).
Declassified Satellite Imagery - 2	Photographic imagery from KH-7 Surveillance and KH-9 Mapping system (1963 to 1980).
Global Land Survey (GLS)	GLS 2005 (Tri-Decadal global Landsat Orthorectified ETM+ update), GLS 2005 Islands, GLS 2000, GLS 1990, GLS 1975
Heat Capacity Mapping Mission (HCMM)	The first of a series of NASA Applications Explorer Missions (AEM-A) that collected visible and thermal band data of the earth from April, 1978 through September, 1980. A HCMM scene has a width of approximately 715 km with a moderate resolution of 500-600 meters.

Hyperion and Advanced Land Imager (ALI)	10- to 30-meter multispectral and hyperspectral data from the Earth Observing-1 (EO-1) Extended Mission (2000 to present).
Landsat Enhanced Thematic Mapper Plus (ETM+)	High-resolution (15- to 60-meter) multispectral data from Landsat 7 (1999 to present).
Landsat Multispectral Scanner (MSS)	80-meter multispectral data from Landsats 1 to 5 (1972 to 1992).
Landsat Thematic Mapper (TM)	30- to 120-meter multispectral data from Landsat 4 and 5 (1982 to present).
Landsat Data Continuity Mission (LDCM)	Multispectral data from the proposed Landsat Data Continuity Mission.
Moderate Resolution Imaging Spectroradiometer (MODIS)	Moderate-resolution (250- to 1000-meter) multispectral data from the Terra Satellite (2000 to present) and Aqua Satellite (2002 to present).
Multi-Resolution Land Characteristics 2001 (MRLC2001)	Selected ETM+ and TM scenes (Landsats 7 and 5) from the National Land Cover Characterization 2001 project.
North American Landscape Characterization (NALC)	Time-series triplicates of selected MSS scenes (Landsats 1-5) for the U.S. and Mexico. Average acquisition dates are 1973, 1986, and 1991.
NASA Landsat Data Collection (NLDC)	Selected MSS and TM scenes (Landsats 1-5) from the NASA Landsat Data Collection (1975 to present).
Spaceborne Imaging Radar C-band (SIR-C)	Imaging radar data (C-band and L-band) from two Space Shuttle missions (1994).

TerraLook	The TerraLook collection consists of georegistered Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) images and Tri-Decadal Global Landsat Orthorectified images from three epochs (circa 1975, 1990, and 2000), selected from satellite images archived at EROS. TerraLook is intended to broaden the satellite data user community by providing both ASTER and Tri-Decadal Global Landsat Orthorectified data (from three different epochs) as simulated natural color JPEG images.
Tri-Decadal Global Landsat Orthorectified Overview	An overview of the Tri-Decadal Global Landsat Orthorectified data collection.
Commercial Data Purchases (UCDP) Imagery	Collection of licensed commercial imagery from various vendors. Available to government agencies only.

Landcover Products	
National Land Cover Database (NLCD)	Contains standardized land cover components useful for a variety of applications.
Land Use and Land Cover Data (LULC)	Historical U.S. land use and land cover data derived from 1970`s and 1980`s aerial photography.
Global Land Cover Characterization (GLCC)	A global land cover database primarily derived from 1992 to 1993 1-km AVHRR data.
AVHRR NDVI Composites	Weekly and biweekly NDVI composites based on 1-km AVHRR data (1989 to present).

Additional Imagery and Data	
Emergency Operations	Explore critical pre- and post disaster images and datasets online for immediate viewing and downloading. The USGS Emergency Operations, in support of the Department of Homeland Security, provides these images for use in disaster preparations, rescue and relief operations, damage assessments, and reconstruction efforts. Satellite and aerial images of disaster areas supplied for before, during and after a disaster.
National Satellite Land Remote Sensing Data Archive (NSLRSDA)	The archive includes more than 28,000 gigabytes of data from the Advanced Very High Resolution Radiometer (AVHRR) carried aboard National Oceanic Atmospheric Administration's polar orbiting weather satellites and more than 880,000 declassified intelligence satellite photographs.
Land Processes Distributed Active Archive Center (LP DAAC)	Processes, archives, and distributes land data and products derived from the EOS sensors, MODIS and ASTER.
Landsat Image Gallery	Collection of Landsat imagery. Includes images sets showing change over time. All images can be downloaded.
EROS Image Gallery	Collections of aerial and satellite imagery. Includes the "Earth As Art" collections. Some imagery can be downloaded.

UNITED STATES GEOLOGICAL SURVEY
ASTROGEOLOGY RESEARCH PROGRAM

The Astrogeology Research Program provides support and produces images, maps, and data in the fields of remote sensing, planetary geodesy, photogrammetry, cartography, nomenclature, and geographic information systems.

The following is a list of planetary products and information available through the Astrogeology Research Program. Many of the maps and images can be downloaded.

Indexes of the Planets and Satellites	Searchable comprehensive listing of published planetary maps, with links to digital versions when available.
Planetary Geomatics Group	Topographic maps and daisy petal globes. (Lunar, Mars, and Venus)
Maps and Globes Gallery	Topographic and image mosaic maps and daisy petal globes. (Lunar, Mars, Venus and the Jovian satellites)
Planetary Geologic Mapping Program	Mapping guidelines, handbooks, and other reference materials.
Planetary GIS Web Server	Lunar, Venus, and Mars online interactive maps and GIS data downloads, plus tools and utilities, tutorials, and general information for the GIS community.
Gazeteer of Planetary Nomenclature	Lunar, Mars, Venus, and Jovian satellite maps labelled with feature names.
Planetary Maps	Download planetary maps and other publications from USGS Geopubs.
Mars Science Laboratory Candidate Landing Sites	THEMIS-derived daytime infrared, nighttime infrared, visible, and thermal inertia mosaics available for download of the MSL candidate landing sites.

Apollo Lunar Exploration Media Gallery	This gallery features interactive panoramas (or *virtual reality* movies), photography, and maps from the various Apollo manned missions to explore the lunar surface.
Map-a-Planet	Online, interactive global mosaics of Venus, the Moon, Mars, and Jovian satellites.
Historical Lunar Data Archive	Download images and data from this collection consisting of products derived from Apollo, Lunar Orbiter, Galileo, Zond 8, and Earth-based observations.
Mars Global Digital Image Mosaic	View and download the latest Mars Digital Image Model, a global image map designed to emphasize local topographic features.
Mars Odyssey THEMIS Mosaics	Ongoing project to prepare for the creation of THEMIS global controlled mosaics. Download images, data, and access information about the project.
Clementine Near-Infrared Global Lunar Mosaics	View and download the near-infrared global mosaic of the Moon from the Clementine mission data.
Jupiter Satellites-Global Image Mosaics	Global image mosaics of the galilean satellites created from Voyager and Galileo mission imagery.
Saturn Satellites-Global Image Mosaics	Global image mosaics of Mimas, Enceladus, Tethys, Dione, and Rhea prepared for the Cassini-Huygens mission to Saturn.
Valles Marineris-The Grand Canyon of Mars	Various image products of Ophis and Candor Chasmata region of Mars' Valles Marineris.
Martian Hemisphere Images	Hemisphere point perspective images of several regions of Mars.

Digital Geologic Maps of the Planets	Download digital planetary geologic maps of Mercury, Venus, Lunar, Mars, and the galilean satellites.
Io's Aurorae	Images and observations about Cassini images of Io's visible aurorae during an eclipse.
Lunar Orbiter Digitization Project	Download recently completed imagery, see the project status, and learn more about the history of this project to scan, enhance, and mosaic Lunar Orbiter photographic film.
Mars Orbiter Camera (MOC) Image Collection	Information about MOC and access to the MOC data archive.
Isis	An image processing software package. The focus of the software is to manipulate imagery collected by current and past NASA planetary missions sent to Mars, Jupiter, Saturn, and other solar system bodies.

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE

The National Environmental Satellite, Data, and Information Service (NESDIS) is part of the National Oceanic & Atmospheric Administration (NOAA). NESDIS acquires and manages the Nation's operational environmental satellites, provides data and information services, and conducts related research.

The following resources are available through NOAA\NESDIS:

NESDIS Satellite Products	Products covering Earth's weather, atmosphere, oceans, land, hazards, and near-space conditions.
NOAA Environmental Visualization Laboratory	Provides enhanced resolution satellite imagery and animations of the Earth and environmental events. Includes hurricanes, severe weather events, and other remotely sensed data concerning the atmosphere and oceans.
Operational Significant Event Imagery	Collection of high-resolution, detailed NOAA satellite imagery of significant environmental events. Use the interactive OSEI Map Viewer to see "where on earth" images are available.

NOAA Data Centers

NOAA's three data centers serve as national repositories and dissemination facilities for global environmental data.

The National Geophysical Data Center (NGDC) provides products and services for geophysical data from the Sun to the Earth and Earth's sea floor and solid earth environment, including Earth observations from space.

The National Climatic Data Center (NCDC) is the world's largest active archive of weather data. NCDC produces numerous climate publications and responds to data requests from all over the world.

The National Oceanographic Data Center (NODC) manages the world's largest collection of publicly available oceanographic data. NODC holdings include *in situ* and remotely sensed physical, chemical, and biological oceanographic data from coastal and deep ocean areas.

NATIONAL SNOW AND ICE DATA CENTER

The National Snow and Ice Data Center (NSIDC) was established by the National Environmental Satellite, Data, and Information Service (NESDIS) and is affiliated with the National Geophysical Data Center (NGDC) through a cooperative agreement. It archives and distributes data, with NGDC, that supports research into our world's frozen realms: the snow, ice glaciers, frozen ground, and climate interactions. Scientific data is collected from the field and from satellites orbiting Earth.

The following are programs, imagery collections, and mapping services made available by NSIDC:

Antarctic Glaciological Data Center (AGDC)	Archives and distributes Antarctic glaciological and cryospheric system data collected by the U.S. Antarctic Program.
NASA Icebridge Data	Data products derived from NASA's Operation IceBridge aircraft missions, and tools and services+ extending the uses of these products.
National Snow and Ice Distributed Active Archive Center (NSIDC)	Provides data and information for snow and ice processes, in support of research in global change detection and model validation.
NOAA@NSIDC	The NOAA team at NSIDC manages, archives, and publishes data sets with an emphasis on in situ data, data sets from operational communities such as the U.S. Navy, and digitizing old and sometimes forgotten but valuable analog data.
Roger G. Barry Resource Office for Cryospheric Studies (ROCS)	Information resource for people studying Earth's frozen regions, the history of science, or past climate related to the Earth's frozen regions.
Glacier Photograph Collection	Online, searchable collection of photographs of glaciers, taken from both the air and the ground. The dates of the photographs range from the mid 1800s to the present day. As of June 2010, more than 13,000 glacier photographs are online.
Images of Antarctic Ice Shelves	Collection of satellite imagery spanning back to the late 1980's. Currently 19 areas around Antarctica are being monitored year round.

Radarsat Images of Antarctica	Collection of images from the RADARSAT Antarctic Mapping Project.
World Glacier Inventory	Searchable inventory of glacier names, number, location, and other information.
Atlas of the Cryosphere	Dynamic mapping site that allows the visitor to explore the Earth's frozen regions.
Antarctic Cryosphere Access Portal (A-CAP)	Geo-visualization tool for NSIDC's Antarctic Glaciological Data Center (AGDC) data and other Antarctic-wide parameters.
GLIMS Glacier Database	Globally comprehensive inventory of land ice, including measurements of glacier area, geometry, surface velocity, and snow line elevation.
MODIS Mosaic of Antarctica (MOA) Image Map	Web-based map server that can create manually-selected JPEG images of the Antarctic continent and surrounding islands.
Virtual Globes	Google Earth™ files that enable you to overlay data-based images of snow and ice on a virtual globe:

Data Collections

Some NSIDC data sets are grouped together as a "data collection". The table below lists some of the most frequently used collections.

Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E)	Data from the AMSR-E sensor on NASA's Aqua satellite. Daily, weekly, and monthly Level-1A, Level-2, and Level-3 data are provided.
Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) Validation	Data characterizing and documenting the accuracy and precision of AMSR-E observations.

Advanced Very High Resolution Radiometer (AVHRR)	Data from the AVHRR sensor on the NOAA satellite series. Provides a global, long-term, consistent time series with high spectral and spatial resolution suitable for albedo and surface temperature measurements.
Cold Land Processes Field Experiment (CLPX)	Data from nested study areas in Colorado and Wyoming, USA. NASA's CLPX is a multi-sensor, multi-scale field program designed to extend the current local-scale understanding of water fluxes, storage, and transformations to regional and global scales
Digital Elevation Models (DEMs)	DEM and other elevation data mostly for Greenland and Antarctic polar ice sheets.
Easy-to-use Data Products	This Web page groups together selected NSIDC data sets that require little or no processing or programming to use. These may be of particular interest to teachers, students, press, the general public, or non-cryospheric researchers.
Environmental Working Group (EWG) Arctic Atlases	Three atlases on CD-ROM containing information from both Russian and Western perspectives on the Arctic climate system, including a host of atmospheric, oceanographic, and cryospheric data, maps, histories, and climate and weather facts.
Equal-Area Scalable Earth Grid (EASE-Grid) Products	Data gridded to the Equal-Area Scalable Earth Grid (EASE-Grid), which consists of a set of three equal-area projections: Northern and Southern hemispheres (Lambert's equal-area, azimuthal), and global (cylindrical, equal-area).
Ice, Cloud, and land Elevation (ICESat)/Geoscience Laser Altimeter System (GLAS)	Data from the GLAS instrument on the ICESat satellite. The main objective of the ICESat mission is to measure ice sheet elevations and changes in elevation through time.
International Polar Year (IPY)	Data and information support IPY, which is cosponsored by the International Council of Science and the World Meteorological Organization.

Making Earth Science Data Records for Use in Research Environments (MEaSUREs)	NSIDC currently archives and distributes several data sets from the MEaSUREs.. The project aims to develop consistent global and continent scale data records related to earth science, or Earth System Data Records (ESDRs).
Moderate Resolution Imaging Spectroradiometer (MODIS)	Data from the MODIS sensor on NASA's Earth Observing System (EOS) Aqua and Terra satellites. MODIS provides data of the polar regions at spatial resolutions of 250 m, 500 m, and 1,000 m.
Moored Upward Looking Sonar (ULS)	Data archived in support of the World Climate Research Programme's Arctic Climate System Study/Climate and Cryosphere (ACSYS/CliC) project. ULS (sometimes called ice profiling sonar, or IPS) data measure sea ice draft.
Program for Arctic Regional Climate Assessment (PARCA)	Investigator-supplied data supporting PARCA's primary goal of measuring and understanding the mass balance of the Greenland ice sheet.
Polar Stereographic Data	Web site listing and describing NSIDC's data holdings in a polar stereographic projection.
Radarsat Antarctic Mapping Project (RAMP)	Data providing high-resolution mapping of the entire continent of Antarctica. RAMP is a joint effort of NASA and the Canadian Space Agency (CSA).
Scatterometer Data	The Scatterometer Climate Record Pathfinder (SCP) data form a NASA-funded comprehensive suite of processed scatterometer imagery to support climate studies over the polar and terrestrial regions.
Sea Ice Products	Web site groups together many of NSIDC's sea ice products (derived from passive microwave sensors and other sources) for comparison, and provides links to tools and related information.
West Antarctic Ice Sheet (WAIS) Cores	Data for deep ice cores from West Antarctica. WAISCORES is part of the National Science Foundation (NSF) Office of Polar Programs' (OPP) initiative, aimed at understanding the influence of the ice sheet on climate and sea level change.

Use the Advanced Data Search tool to search all of the data sets in NSIDC's catalog or try one of the following Search-and-Order Interfaces:

Data Pool	Provides direct FTP access to NSIDC's complete archive of AMSR-E, ICESat/GLAS, MODIS, and NISE products. A simple Web search interface helps you quickly locate data of interest.
MODIS Interactive Subsetting Tool (MIST)	Search for and receive certain Version 5 (V005) MODIS data products over the Greenland Climate Network (GC-Net) and the International Arctic Systems for Observing the Atmosphere (IASOA) stations. MIST also provides limited online analysis capabilities that include generating time series and scatter plots.
Discovery, Access, and Delivery of Data for IPY (DADDI)	Provides facetted data search and access to Arctic data held by a growing number of data centers. All IPY data registered in the IPY Metadata Portal at the Global Change Master Directory are also searchable.
Polaris	Allows for searching and receiving data with a new infrastructure that supports users finding and browsing actual data holdings online. It serves as a navigation point for limited NSIDC data sets adding subsetting, reformatting, and reprojecting capabilities.
SAGE	Adds analysis capabilities and a unique interface for specific Greenland data sets. It is a tool designed to help scientists access, integrate, and analyze data related to the history and status of Greenland's ice sheet in real time using timeseries, scatterplot, histogram, and box and whisker plots.
Warehouse Inventory Search Tool (WIST)	Search for and order data from NSIDC and other Distributed Active Archive Centers (DAACs). Allows FTP and media distribution, as well as subsetting capabilities. Browse images are also available.

NSIDC has also developed a variety of available Data Software & Programming Tools.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The National Aeronautics and Space Administration (NASA) is the best overall source for Earth and planetary imagery and data. The majority of NASA's available imagery can be found using the following image collections and databases.

NASA's Image eXchange (NIX)	Search this database of NASA imagery, or view an index of Web sites that brings together all of NASA's photo collections.
nasaimages.org	The most comprehensive compilation of NASA stills, film and video, created in partnership with Internet Archive.
GReat Images in NASA (GRIN)	A selection of the best and best-known images from a half-century of exploration and discovery.
Visible Earth	A catalog of NASA images and animations of our home planet.

This huge wealth of imagery is made possible by the many manned and unmanned missions sent to study our planet and beyond. Mission specific imagery can be found by investigating individual mission websites. Search through NASA's Mission Index to find imagery from the early Apollo missions to the latest Earth-observing satellites.

NASA's Earth Observatory provides a freely-accessible publication on the Internet where the public can obtain new satellite imagery and scientific information about our home planet.

NASA's Distributed Active Archive Centers (DAAC) process, archive, document, and distribute data from NASA's past and current Earth-observing satellites and field measurement programs. Each center serves a specific Earth system science discipline and provides users with data products, services, and data-handling tools unique to the center's specialty.

The Warehouse Inventory Search Tool (WIST) allows for the searching and ordering of earth science data products from NASA and affiliated centers.

NASA's History Program was first established in 1959 (a year after NASA itself was formed) and has continued to document and preserve the agency's remarkable history through a variety of products, such as the Apollo Lunar Surface Journal, On the Moon with Apollo 16 guidebook, and a collection of Technical Diagrams and Drawings for manned spacecraft.

NASA's Lunar Mapping and Modeling Project is an interactive web-based tool that incorporates observations from past and current lunar missions, allowing anyone with an Internet connection to search through, view, and analyze a vast number of lunar images and other digital products.

The International Polar Year (IPY) focused science and education concerning Earth's remote polar regions. A wealth of related imagery and videos can be found in the web site's multimedia gallery. You'll also find NASA Polar Express, the one-stop shop for the latest NASA images and videos on polar exploration combined with a searchable storehouse of related information.

NASA Science is a web site containing news and features about NASA research, aimed at the general public. Also contains links to data and multimedia.

NASA CENTERS

NASA is composed of centers and facilities located across the U.S. Those involved in Earth and planetary research maintain related data archives and/or image collections. The following pages contain information on the imagery made available by NASA's Goddard Space Flight Center, Jet Propulsion Laboratory, and Johnson Space Center.

The Goddard Space Flight Center (GSFC) is responsible for developing and operating unmanned scientific spacecraft. GSFC manages many of NASA's Earth Observation, Astronomy, and Space Physics missions.

Scientific Visualization Studio (SVS)	Offers more than 2,700 scientific data visualizations and conceptual animations on Earth and Space Science-related topics.
Hubble Resource Reels	Collection of raw footage and animations from the last mission to the Hubble Space Telescope.
NASA Goddard Resource Reels	Best NASA Goddard visualizations compiled in one location.
NASA Goddard High Definition Video Resources	Tape collection highlighting the latest and best of Goddard's raw video products. All tapes are available to order.
NASA Goddard Video Library	Includes hundreds of past video files and resource tapes. Tapes available to order.

NASA Earth Observations (NEO)	The mission of NEO is to help picture climate and environmental changes on Earth. You can search for and retrieve satellite images, download them, export them to GoogleEarth and even perform basic analysis.
Goddard Earth Sciences (GES) Data and Information Services Center (DISC)	Home of the GES Distributed Active Archive Center (DAAC) which offers Earth science data, information, and services. The GES DISC is the home (archive) of Precipitation, Atmospheric Chemistry and Dynamics, and information, as well as data and information from other related disciplines.
Ocean Biology Processing Group	The OceanColor data facility archives and distributes ocean color data from several sensors, including Moderate Resolution Imaging Spectroradiometer (MODIS) Aqua, Sea-Viewing Wide Field-of-View Sensor (SeaWiFS), Ocean Color and Temperature Scanner (OCTS), and Coastal Zone Color Scanner (CZCS), as well as sea surface temperature data from MODIS on Terra and Aqua platforms.
Earth Science Data and Information System (ESDIS) Project	The ESDIS Project is responsible for providing scientific and other users access to data from NASA's Earth science missions.

Also located at GSFC is the National Space Science Data Center (NSSDC). NSSDC serves as the permanent archive for NASA space science mission data.

NSSDC Photo Gallery	Provides access to some of the more popular NASA images available to the public and provides examples of images produced from CD-ROM data.
Catalog of Spacebourne Imaging	A guide to NSSDC's Planetary Image Archives. Has over 500 images.

The Jet Propulsion Laboratory (JPL) is the center responsible for conducting robotic space missions for NASA, exploring our own and neighboring planetary systems, understanding the origin and evolution of the universe and making critical measurements to understand our home planet and help protect it.

Photojournal	Planetary Photojournal is a searchable/browseable online interface to the Planetary Image Archive (PIA). The archive contains thousands of high-resolution images and accompanying products created from data returned by JPL missions. Images can also be found at JPL's Space Gallery and Space Images
Solar System Simulator	Select from the options to have the simulator create a color image of any planet or satellite as seen from any point in the Solar System.
Planetary Data System (PDS)	The PDS archives and distributes scientific data from NASA planetary missions, astronomical observations, and laboratory measurements. Its purpose is to ensure the long-term usability of NASA data and to stimulate advanced research.
Shuttle Radar Topography Mission (SRTM)	SRTM obtained elevation data in February of 2000 on a near-global scale to generate the most complete high-resolution digital topographic database of Earth. Data Products and Multimedia are available.
SIRC-R/X-SAR Image Gallery	Collection of Space Radar Images of the Earth.
Physical Oceanography Distibuted Active Archive Center (PO.DAAC)	The PO.DAAC provides global oceanographic data from spaceborne instruments and produces higher level data products. Holdings include data on ocean winds, ocean surface topography, sea surface temperatures, significant wave height, ionospheric electron content, atmospheric moisture, and heat flux.

The Johnson Space Center (JSC) is home to NASA’s astronaut corp and leads NASA’s efforts in human space exploration.

Human Space Flight Gallery	The searchable galleries of the Human Space Flight Web contain thousands of images and videos relating to NASA's human missions, from the Mercury program to the International Space Station.
Gateway to Astronaut Photography	The Gateway to Astronaut Photography of Earth hosts the best and most complete collection of astronaut photographs of the Earth from 1961 through the present.
Earth From Space	Earth From Space is a catalog of some of the most beautiful and fascinating photos captured by astronauts during their missions.
JSC Digital Image Collection	Collection of more than 9,000 NASA press release photos spanning the American manned space program, from the Mercury program to the STS-79 Shuttle mission.

LUNAR AND PLANETARY INSTITUTE

The Lunar and Planetary Institute (LPI) is a center for lunar and planetary science, conducting research studies on the formation, evolution, and current state of the Moon, planets, comets, asteroids, planetary satellites, cosmic dust, and our solar system as a whole through analysis of data and samples obtained through NASA's long history of missions and exploration.

The following is a list of planetary maps and imagery available through LPI.

Apollo Surface Panoramas	Digital library of photographic panoramas that the Apollo astronauts took while exploring the Moon's surface. The panoramas are stitched together from individual 70mm Hasselblad frames.
LPI Clementine Mapping Project	An online tool for users wanting to generate maps of the lunar surface and its composition using data from the Clementine mission (1994).
Lunar Orbiter Photo Gallery	Extensive collection of over 2,600 high and moderate-resolution photographs produced by all five of the Lunar Orbiter missions (1966-1967).
Digital Lunar Orbiter Photographic Atlas of the Moon	Considered the definitive reference manual to the global photographic coverage of the Moon (NASA SP-206).
Consolidated Lunar Atlas	Collection of the best photographic images of the Moon.
Apollo Image Atlas	Comprehensive collection of Apollo-Saturn mission photography.
Lunar Map Catalog	Collection of digitized topographic, geologic, and shaded relief maps and charts of the Moon in a variety of scales. Includes the USGS Gelogic Atlas of the Moon, Lunar Chart (LAC) Series, Lunar Earthside, Farside and Polar Chart (LMP) Series, Apollo Intermediate Charts (AIC), Lunar Photomaps Traverse Charts, and the more recent Lunar Topographic Orthophotomap (LTO) Series.

Ranger Photographs of the Moon	Digital versions of NASA documents on the 1964-1965 NASA Lunar Ranger Program. It contains selected Ranger 7, 8 and 9 mission images and documentation.
Mars Map Catalog	Digital versions of the USGS I-1083 Geologic Map of Mars and MEC-1 Prototype.
Mercury Map Catalog	Collection of digitized geologic and shaded relief maps of Mercury in a variety of scales. Includes the Reference Mosaic of Mercury.
Venus Crater Database	Database of images and information about the approximately 900 impact craters on the surface of Venus.
Ganymede Crater Database	Database of images and information about the approximately 150 impact craters on Ganymede.
Callisto Crater Database	Database of images and information about the approximately 150 impact craters on Callisto.
LPI Slide Sets	Each online slide set includes a series of images and captions describing the various aspects of a particular topic or theme, such as Terrestrial Impact Craters or the Solar System in 3-D.

A variety of educational products, image collections, maps, and atlases are also available for purchase on CD-ROM through the LPI Online Store.

The LPI website is also home to the NASA Regional Planetary Image Facility. Established in 1977, this international system of planetary image libraries maintains photographic and digital data as well as mission documentation and cartographic data. Each facility's general holding contains images and maps of planets and their satellites taken by solar system exploration spacecraft. These planetary image facilities are open to the public. The facilities are primarily reference centers for browsing, studying, and selecting lunar and planetary photographic and cartographic materials. Experienced staff can assist scientists, educators, students, media, and the public in ordering materials for their own use.

U.S. NAVAL RESEARCH LABORATORY

The U.S. Naval Research Laboratory (NRL) operates as the Navy's full-spectrum corporate laboratory, conducting a broadly based multidisciplinary program of scientific research and advanced technological development directed toward maritime applications of new and improved materials, techniques, equipment, systems and ocean, atmospheric, and space sciences and related technologies.

On January 25, 1994, the Deep Space Program Science Experiment (DSPSE) (better known as Clementine) was launched from Vandenberg Air Force Base, California. In addition to testing various sensors, Clementine was given the complex task of mapping the moon. NRL was assigned responsibility for the Clementine spacecraft design, manufacture, integration, and mission execution.

NRL has made the following Clementine products available:

Albedo Map of the Moon	About 50,000 Clementine images have been processed and mosaicked to produce a global map of the Moon's albedo (normalized brightness or reflectivity) at a wavelength of 750 nm.
Selected Imagery	42 selected images of the Moon and Earth.
Clementine Collection	This collection is an early sampling of the 1.8 million images acquired by the Clementine spacecraft.
Clementine Lunar Map 2.0	A browser based map that uses a mosaic of the Clementine data set to display the Moon at a variety of resolutions. It also allows users to locate any of the named lunar features.

MARS SPACE FLIGHT FACILITY

Located at Arizona State University (ASU), the Mars Space Flight Facility's scientists and researchers are using instruments on spacecraft at Mars to explore the geology and mineralogy of the Red Planet.

These instruments include the Thermal Emission Imaging System (THEMIS) on the Mars Odyssey orbiter and two Miniature Thermal Emission Spectrometers (Mini-TES) on the Mars Exploration Rovers, Spirit and Opportunity. The facility's researchers also operated the Thermal Emission Spectrometer (TES) instrument on the Mars Global Surveyor orbiter.

The following resources are available:

Maps of Mars Mission Images	Maps of Mars with the footprints of all images taken by THEMIS, CTX, HiRISE, MOC, and Viking, with more on the way.
Map of All THEMIS Images	A web map that lets you find THEMIS images of Mars by pointing and clicking.
THEMIS Images of the Day	Daily images from the THEMIS camera.
THEMIS Images by Topic	A selection of THEMIS images organized by geologic theme.
THEMIS Feature Articles	Each week a new feature combines striking images and recent research about Mars.
THEMIS Pre-Launch Image Gallery	A gallery of pre-launch THEMIS hardware images.
Best of THEMIS Images of the Day	A selection of the most striking or significant images from THEMIS.
'Live' Images From Mars	Every week, THEMIS takes several hundred images of the surface of Mars, and you can see them here as they are received by mission scientists.

Mars As Art 2006	NASA's choice of the best and most evocative Mars images ever taken includes numerous ones from THEMIS.
Vistas	Images showing what you would see if you could fly over Mars.
Mars Global Movies	Movies created out of datasets that cover all of Mars.
Global Data Sets	Access for scientific data sets that cover all of Mars.

Software tools are also available for both analyzing and visualizing scientific data.

SPACE EXPLORATION RESOURCES

The Space Exploration Resources (SER) website is maintained by the School of Earth and Space Exploration at Arizona State University (ASU).

The following products are available:

Near Earth Asteroid (NEAR) Rendezvous Images	Collection of imagery, mosaics and movies taken by the NEAR spacecraft of asteroid EROS.
Clementine Lunar Images	Collection of lunar imagery taken by the Clementine spacecraft.
Mariner 10 Image Archive	Digital archive of Mercury images taken by the Mariner 10 spacecraft.
Lunar Orbiter Images	Collection of imagery taken by Lunar Orbiter 2, 3, and 5 spacecrafts.
Mariner 6 and 7 Images	Collection of Mars imagery taken by the Mariner 6 and 7 spacecrafts.
Apollo Image Archive	Digital archive of all the original Apollo mission flight films.
Digital Petrographic Slide Collection	Collections of photographs taken of slides made from lunar samples returned by the Apollo missions.
Lunar Reconnaissance Orbiter Camera	Lunar Reconnaissance Orbiter Camera homepage. Contains mission and camera information, and a gallery of returned imagery.

MALIN SPACE SCIENCE SYSTEMS

Malin Space Science Systems (MSSS) designs, develops, operates, and conducts scientific research with instruments that fly on robotic spacecraft.

This includes the Mars Orbiter Camera (MOC) aboard Mars Global Surveyor (MGS), the Mars Color Imager (MARCI) and Context Camera (CTX) aboard the Mars Reconnaissance Orbiter (MRO), the Mars Descent Imager (MARDI) on the Phoenix Mars Lander, the Mast Camera (Mastcam), Mars Hand Lens Imager (MAHLI), and Mars Descent Imager (MARDI) on the Mars Science Laboratory (MSL)

Captioned Mars Image Archive	Over 1600 captioned image releases from MRO, MGS and other Mars missions.
MOC Image Gallery	Contains the more than 212,000 images acquired through September 2005.
MOC Geodesy Campaign Mosaic	Mosaic assembled from Wide Angle red images (May to June 1999).
MOC Weather Reports	Weekly reports (January to September 2002). There are also Weather Reports at the MER and Beagle2 Landing Sites (December 2003 to July 2004)
MOC Public Target Images	Images acquired through the MGS MOC Public Target request Program (2003 to 2006).
MOC Landing Site Images	Images acquired of the Phoenix Mars Lander, MSL, MER, Mars Surveyor landing sites.
MARCI Weather Reports	Weekly reports (starting in November 2007). Latest Weather Report

MOC Publications describe MGS MOC investigations and results, while MARCI Publications describe MARCI investigations and results

HUBBLESITE

HubbleSite provides the public with all the latest news concerning the Hubble Space Telescope and its imagery.

HubbleSite Gallery	Contains Picture Albums, Wallpaper, Wall Murals, an Astronomy Print Shop, info Behind the Pictures, Spacecraft Images, a Movie Theater and Image Tours
Webb Telescope	Information about The James Webb Space Telescope, the next observatory.
Hubble Discoveries	Highlights the discoveries made possible with Hubble's farseeing capabilities,

CASSINI IMAGING CENTRAL LABORATORY FOR OPERATIONS

The Cassini Imaging Central Laboratory For Operations (CICLOPS) website is the official source of Cassini images of Saturn, its rings and moons.

Imaging Diary	Collections of imagery captured by the Cassini, Voyager, Galileo, and New Horizons spacecraft.
Maps	Collection of the best and most recent maps of the Saturnian moons.
Theatre	Combination of brief movie clips at Jupiter and Saturn and "feature films".
Art Room	Collection of planetary art created by today's space artists.

Publications about the Cassini Imaging Science team, on its findings and on the characteristics of the Imaging Science experiment.

MESSENGER WEBSITE

The Mercury Surface, Space Environment, Geochemistry, and Ranging (MESSENGER) spacecraft is a NASA Discovery mission managed by The John Hopkins University Applied Physics Laboratory.

Gallery	Contains a wide variety of science images, movies, animations, and photos covering all aspects of the mission. Artist impressions and flyby visualization tools are also available.
Science Operations	Contains info on papers, presentations and access to all publicly available data through NASA's Planetary Data System

HiRISE WEBSITE

The High Resolution Imaging Science Experiment (HiRISE) is an instrument aboard the Mars Reconnaissance Orbiter (MRO). It's operated by the Lunar and Planetary Laboratory at the University of Arizona (UA).

HiRISE Image Catalog	A collection of over 11,000 high-resolution images. The images are grouped by Science Theme and New Images are being continually added. To view images at full-resolution, use the online HiRISE Image Viewer or download the IAS Viewer.
HiRISE Stereo Pairs	Images acquired when HiRISE re-imaged locations of special interest.
HiRISE Anaglyphs	Created from stereo pairs, these images show the Martian terrain in 3D relief.
Science in Motion	Presents published HiRISE papers with special features.

Downloadable software is available to aid in the processing and viewing of image data.

EUROPEAN SPACE AGENCY

The European Space Agency (ESA) is Europe's gateway to space. ESA's programs are designed to find out more about Earth, its immediate space environment, our Solar System and the Universe.

The ESA Science & Technology Portal contains solar system mission news, status reports and multimedia archives. Missions include: Venus Express, Rosetta, Mars Express, Cassini-Huygens, Cluster, Double Star, SMART-1, and Giotto.

The following resources are available:

Science Archives at ESAC	The European Space Astronomy Centre (ESAC) hosts most of ESA's astronomy and planetary missions' archives. They provide instant access to ESA scientific mission data
ESA Planetary Science Archive	Contains data returned by ESA's Solar System missions.
Rosetta Science Operations Centre	Repository for information relevant to Rosetta science operations. It acts as an information exchange between team members and as an access point for the Scientific Community.
Mars Express Science Operations	Repository of information relevant to the Mars Express payload science operations, scientific activities and data handling/archiving. It also gives access to other information related to the mission as a whole and Mars science in general.
Cluster Active Archive	Depository of processed and validated high-resolution Cluster data, raw data, processing software, calibration data, documentation and other products.
ESA Multimedia Gallery	The Multimedia Gallery displays the best visual material of the ESA portal.

The Observing the Earth page contains information on Earth observing missions and related multimedia galleries. Missions include: Envisat, ERS, Earth Explorers, Sentinels, MSG, MetOp, and Proba-1.

The following resources are available:

Earth From Space: Image Archive	"Image of the Week" archive, going back to 2004.
Satellite Images	Searchable gallery containing over 1,000 Earth images.
MIRAVI	A website which tracks the Envisat satellite. It generates images from the raw data collected by Envisat's optical instrument, MERIS, and provides them online within two hours.
Earth Observing Principal Investigator Portal	Provides access to ESA Earth observation free datasets and data products generated after specific user requests.
Earthnet	Provides services to the scientific community for access to EO data products via the distributed, multi-mission, ground segment.
eoPortal: Sharing Earth Observation Resources	Functions as a one-stop access point for a wide variety of Earth observation resources. It features a directory to locate projects, services and datasets and provides direct access to satellite data, map servers and cartographic material.

JAPAN AEROSPACE EXPLORATION AGENCY

The Japan Aerospace Exploration Agency (JAXA) performs all activities in the aerospace field, from basic research and development to utilization. In 2003, JAXA was established as an independent administrative institution, integrating the Institute of Space and Astronautical Science (ISAS), the National Space Development Agency of Japan (NASDA) and the National Aerospace Laboratory of Japan (NAL).

JAXA Space Exploration Center	Contains information on JAXA's Lunar and Planetary Exploration Programs.
JAXA Digital Archives	Contains online image and photo collections.
Observation/Research Result Database	Contains various databases including observation data from satellites and probes
Hayabusa Project: Science Data Archive	All scientific data acquired by the HAYABUSA spacecraft.
JAXA Repository	System for public use of materials such as documents, data and theses

JAXA also lends out its image software to meet public demand in order to spread knowledge and educate people about space development.

CHANDRAYAAN-1 WEBSITE

Overseen by the Indian Space Research Organisation (ISRO), the Chandrayaan-1 spacecraft was India's first scientific mission to the Moon.

Results from Chandrayaan-1	Imagery and data collected by the spacecraft's 5 instruments.