



## EOSDIS Glossary

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**ACTIVE DATA BASE SITE.** A general designation for a site where data are being used actively in research and from which those data and resident expertise may be obtained. Source: ESADS.

**ACTIVE LONG TERM ARCHIVE (ALTA).** A facility that provides permanent active archive functions for EOSDIS Archived Holdings (see below) during and beyond the scope of the EOS mission, receiving responsibility for these holdings and providing long-term access to users. An ALTA is funded independently of the EOS budget. ALTAs include the NASA/National Space Science Data Center (NSSDC), the USGS/Earth Resources Observation System (EROS) data center, and the NOAA/National Environmental Satellite, Data, and Information Service (NESDIS) data centers. Source: EPO.

**AEROSOL.** A gaseous suspension of fine particles. Source: EPO.

**AFFILIATED DATA CENTER (ADC).** A facility not funded by NASA that processes, archives, and distributes Earth science data useful for Global Change research, with which a working agreement has been negotiated by the EOS Program. The agreement provides for the establishment of the degree of connectivity and interoperability between EOSDIS and the ADC needed to meet the specific data access requirements involved in a manner consistent and compatible with EOSDIS services. Such data-related services to be provided to EOSDIS by the ADC can vary considerably for each specific case. Source: EPO.

**AFFILIATED USER.** See USER.

**AFFORESTATION.** The act or process of establishing a forest, especially on land not previously forested. Source: EPO.

**ALBEDO.** The fraction of the total solar radiation incident on a body that is reflected by it. Source: EPO.

**\*ALGORITHM.** (1) Software delivered to the SDPS by a science investigator (PI, TL, or II) to be used as the primary tool in the generation of science products. The term includes executable code, source code, job control scripts, as well as documentation. (2) A prescription for the calculation of a quantity; used in Earth system science to derive physical or biological properties from observations and to facilitate calculation of state variables in models. Source: ECS.

**ANCILLARY DATA.** Data other than instrument data required to perform an instrument's data processing. They include orbit data, attitude data, time information, spacecraft engineering data, calibration data, data quality information, and data from other instruments. Source: EPO.

**ARCHIVED HOLDINGS.** All EOS and non-EOS data and data products, as well as supporting information, that are archived by EOSDIS. This includes models, algorithms, documentation, and level 0 data or higher level data products from which level 0 may be recovered. Source: EPO.

**ATMOSPHERE.** The envelope of gases surrounding the Earth and bound to it by the Earth's gravitational attraction. Studies of the chemical and radiative properties, dynamic motions, and physical processes of this system constitute the field of meteorology. Source: EPO.

**ATTITUDE.** The orientation of the sensor along with information about the accuracy and precision with which this orientation is known. This data is required to perform proper calibration of instrument data. The attitude is usually stored in Euler angle or quaternion form and may be 1) calculated by the on-board computer and telemetered to the ground or 2) calculated by ground processing facilities (e.g. GSFC Flight Dynamics Facility) using a variety of attitude sensor data.

**ATTITUDE SENSOR DATA.** Attitude sensor data is that subset of the telemetry data that is used to determine the pointing of the spacecraft axes, calibration and alignment data, Euler angles or quaternions, rates and biases, and associated parameters.

**AUTHORIZED USER.** See USER.

**BIOLOGICAL PRODUCTIVITY.** The amount of organic matter, carbon, or energy content that is accumulated during a given time period. Source: EPO.

**BIOMASS.** The total dry organic matter or stored energy content of living organisms that is present at a specific time in a defined unit (community, ecosystem, crop, etc.) of the Earth's surface. Source: EPO.

**BIOSPHERE.** The portion of Earth and its atmosphere that can support life. The part (reservoir) of the global carbon cycle that includes living organisms (plants and animals) and life-derived organic matter (litter, detritus). The terrestrial biosphere includes the living biota (plants and animals) and the litter and soil organic matter on land; the marine biosphere includes the biota and detritus in the oceans. Source: EPO.

**\*BROWSE.** A representation of a dataset or data granule used to pre-screen data as an aid to selection prior to ordering. A data set, typically of limited size and resolution, created to rapidly provide an understanding of the type and quality of available full resolution data sets. It may also enable the selection of intervals for further processing or analysis of physical events. For example, a browse image might be a reduced resolution version of a single channel from a multi-channel instrument. Note: Full resolution data sets may be browsed. Source: SPSO, ESADS.

**\*BROWSE DATA PRODUCT.** Subsets of a larger data set, other than the directory and guide, generated for the purpose of allowing rapid interrogation (i.e., browse ) of the larger data set by a potential user. For example, the browse product for an image data set with multiple spectral bands and moderate spatial resolution might be an image in two spectral channels, at a degraded spatial resolution. The form of

browse data is generally unique for each type of data set and depends on the nature of the data and the criteria used for data selection within the relevant scientific disciplines. Source: EPO.

**Dynamic Browse.** Refers to the generation of a browse product, including subsetting and/or resampling of data, by command of the user engaged in the browse activity. The browse data set is built in real-time, or near-real-time, as part of the browse activity.

**Static Browse.** Refers to interrogation of browse products which have been generated (through subsetting and/or resampling) before any user browses that particular data set.

**CALIBRATION.** 1) The activities involved in adjusting an instrument to be intrinsically accurate, either before or after launch (i.e., "instrument calibration). 2) The process of collecting instrument characterization information (scale, offset, nonlinearity, operational, and environmental effects), using either laboratory standards, field standards, or modeling, which is used to interpret instrument measurements (i.e., "data calibration"). Not to be confused with related terms: Source: EPO.

**Correction.** Refers to using instrument characterization information to improve the accuracy of instrument data products (e. g., image correction for geometric distortion).

**Compensation.** Refers to adjusting for measurement effects external to the instrument (e.g., surface color compensation for atmospheric propagation). **Interpretation.** Refers to applying the correlation between a sensed physical parameter and a related phenomenon (e.g., ocean color interpretation for phyto-plankton concentration).

In both cases, may apply to temporal, spatial, radiometric, or any other sensed physical parameter. Ground processing algorithms will often support both types of calibration activities, correction, compensation, and interpretation.

**\*CALIBRATION DATA.** The collection of data required to perform calibration of the instrument science and engineering data, and the spacecraft or platform engineering data. It includes pre-flight calibrator measurements, calibration equation coefficients derived from calibration software routines, and ground truth data that are to be used in the data calibration processing routine. Source: ECS.

**CAPTIVE ACCOUNT.** A guest's user account in a computer system for any user to access without special procedures (such as registration). The account puts the user directly into an application, without access to the rest of the system on which the application is hosted. ESDIS IMS Lexicon.

**CARBON CYCLE.** All parts (reservoirs) and fluxes of carbon; usually thought of as a series of the four main reservoirs of carbon interconnected by pathways of exchange. The four reservoirs regions of the Earth in which carbon behaves in a systematic manner are the atmosphere, terrestrial biosphere (usually includes freshwater systems), oceans, and sediments (includes fossil fuels). Each of these global reservoirs may be subdivided into smaller pools ranging in size from individual communities or ecosystems to the total of all living organisms (biota). Carbon exchanges from reservoir to reservoir by various chemical, physical, geological, and biological processes. Source: EPO.

**CATALOG INTEROPERABILITY.** Refers to the capability of the user interface software of one data set directory or catalog to interact with another data set directory or catalog. Three levels of Catalog Interoperability are recognized: (Source: ESDIS IMS Lexicon).

Level 1 Interoperability - simple network interconnection among systems.

Level 2 Interoperability - catalog systems can exchange of limited search/result and user information.

Level 3 Interoperability - catalog systems exchange standard search protocols. This provides "virtual" similarity between different systems. Source: EPO.

**CATALOG SERVICE.** A set of information, consisting of some or all of directory, guide, and inventories, combined with a mechanism to provide responses to queries, possibly including ordering data. Source: ESADS.

**CATALOG SYSTEM.** An implementation of a directory, plus a guide and/or inventories, integrated with user support mechanisms that provide data access and answers to inquires. Capabilities may include browsing, data searches, and placing and taking orders. A specific implementation of a catalog service. Source: ESADS, IWGDMGC, EPO.

**CHLOROFLUOROCARBONS.** A family of inert, nontoxic, and easily liquefied chemicals used in refrigeration, air conditioning, packaging, and insulation, or as solvents or aerosol propellants. Because they are not destroyed in the lower atmosphere, they drift into the upper atmosphere, where, given suitable conditions, their chlorine components destroy ozone. Source: EPO.

**CLIMATE.** The statistical collection and representation of the weather conditions for a specified area during a specified time interval, usually decades, together with a description of the state of the external system or boundary conditions. The properties that characterize the climate are thermal (temperatures of the surface air, water, land, and ice), kinetic (wind and ocean currents, together with associated vertical motions and the motions of air masses, humidity, cloudiness and cloud water content, groundwater, lake winds, and water content of snow on land and sea ice), and static (pressure and density of the atmosphere and ocean, composition of the dry air, salinity of the oceans, and the geometric boundaries and physical constants of the system). These properties are interconnected by various physical processes such as precipitation, evaporation, infrared radiation, convection, advection, and turbulence. Source: EPO.

**CLIMATE CHANGE.** The long-term fluctuations in temperature, precipitation, wind, and all other aspects of the Earth's climate. External processes, such as solar- irradiance variations, variations of the Earth's orbital parameters (eccentricity, precession, and inclination), lithosphere motions, and volcanic activity, are factors in climatic variation. Internal variations of the climate system, e.g., changes in the abundance of greenhouse gases, also may produce fluctuations of sufficient magnitude and variability to explain observed climate change through the feedback processes interrelating the components of the climate system. Source: EPO.

**CLOUD.** A visible mass of condensed water vapor particles or ice suspended above the Earth's surface. Clouds may be classified by their visual appearance, height, or form. Source: EPO.

**CLOUD ALBEDO.** Reflectivity that varies from less than 10 to more than 90 percent of the insolation and depends on drop sizes, liquid water content, water vapor content, thickness of the cloud, and the sun's zenith angle. The smaller the drops and the greater the liquid water content, the greater the cloud albedo, if all other factors are the same. Source: EPO.

**CLOUD FEEDBACK.** The coupling between cloud-iness and surface air temperature in which a change in surface temperature could lead to a change in clouds, which could then amplify or diminish the initial temperature perturbation. For example, an increase in surface air temperature could increase the evaporation; this in turn might increase the extent of cloud cover. Increased cloud cover would reduce the solar radiation reaching the Earth's surface, thereby lowering the surface temperature. This is an example of negative feedback and does not include the effects of longwave radiation or the advection in the oceans and the atmosphere, which must also be considered in the overall relationship of the climate system. Source: EPO.

**CO-INVESTIGATOR.** An individual selected by the Principal Investigator who typically provides support in preparing the proposal and who has specific responsibilities in the development, operations, or analysis phases of the investigation. Source: ESADS.

**COMMANDING.** Process of scheduling and issuing instructions for actions to be carried out by a space-based instrument or spacecraft. Source: EPO.

**COMMERCIAL INSTRUMENT.** An instrument developed and operated by a private organization whose data are sold commercially to the general user community. Source: ESADS.

**COMMERCIAL OFF-THE-SHELF (COTS).** Commercial off-the-shelf means a product, such as an item, material, software, component, subsystem, or system, sold or traded to the general public in the course of normal business operations at prices based on established catalog or market prices (see FAR 15.804-3(c) for explanation of terms). Source: EPO.

**COMMUNITY CONSENSUS ALGORITHM.** The current global algorithm or spatial mosaic of algorithms for a Pathfinder data product, as agreed upon by a Pathfinder Science Working Group. Source: EPO.

**CONTINUOUS OPERATION.** The ability to support continuous data collection by the reliable, repetitive, systematic observation of the Earth features appropriate to the measurement being made. For EOS, continuous operation will allow the entire globe to be monitored not less than once on the day side and once on the night side every 16 days. Source: EPO.

**CONTROL.** The functions performed at a ground control center to operate space-based instruments, in conjunction with commanding. Source: EPO.

**CORE.** The central portion of the Earth, at a depth of approximately 2900 km. The core has a molten metallic composition. Source: EPO.

**CORRELATIVE DATA.** Scientific data from other sources used in the interpretation or validation of instrument data products, e.g. ground

truth data and/or data products of other instruments. These data are not utilized for processing instrument data. Source: ESADS, EPO.

**COVERAGE MAP.** The footprint coverage of a remote sensing sensor projected on a surface (i.e. A graphical representation of the coverage of data or a granule located on the Earth. Source: ESDIS IMS Lexicon.

**DATA.** The representative forms of information, including facts, concepts, rules, or any other kind of knowledge. Source: ESADS.

**DATA ARCHIVE.** A facility providing indefinitely long storage, preservation, disposition, and distribution of data sets and associated metadata. Source: ESADS.

**DATA CENTER.** (1) An institutionally supported facility providing convenient access to, manipulation of, and/or distribution of data sets (including supporting information and expertise) for a wide community of users. It has a long term charter (not tied to the lifetime of a specific project). A data center can create Special Data Products when needed. (2) A facility storing, maintaining, and making available data sets for expected use in ongoing and/or future activities. Data centers provide selection and replication of data and needed documentation and, often, the generation of user tailored data products. Source: ESADS, EPO.

**DATA ARCHIVE AND DISTRIBUTION SYSTEM (DADS).** Included in each DAAC, and responsible for archiving and distribution of EOS data and information. Source: EPO.

**DATABASE.** (1) A collection of data sets with supporting metadata related to a system, project or facility. (2) A collection of integrated data serviced by a Data Base Management System (DBMS); often organized for quick search and retrieval. Source: ESAD.

**DATA DICTIONARY.** A data dictionary is a repository of descriptive information about data. Data dictionary information includes database elements and valid values used to describe datasets. Source: ESDIS IMS Lexicon.

**DATA ITEMS(S).** Value(s) of a measured or derived parameter, implicitly or explicitly accompanied by an identification of the points in independent variable space where the value(s) applies (e.g., x,y,z,t;a,b,c). Source: ESADS.

**DATA PRODUCT.** A collection (1 or more) of parameters packaged with associated ancillary and labeling data. Uniformly processed and formatted. Typically uniform temporal and spatial resolution. (Often the collection of data distributed by a data center or subsetted by a data center for distribution.) Source: SPSO There are two types of data products:

Standard - A data product produced at a DAAC by a community consensus algorithm. Typically produced for a wide community. May be produced routinely or on-demand. If produced routinely, typically produced over most or all of the available independent variable space. If produced on-demand, produced only on request from users for particular research needs typically over a limited range of independent variable space. Source: SPSO.

Special - A data product produced at a Science Computing Facility by a research status algorithm. May migrate to a community consensus algorithm at a latter point. If adequate community interest, may be archived and distributed by a DAAC. Source: ESDIS.

**\*DATA PRODUCT LEVEL.** Data levels 1 through 4 as designated in the Product Type and Processing Level Definitions document. Source: SPSO.

Raw Data - Data in their original packets, as received from the observer, unprocessed by EDOS.

Level 0 - Raw instrument data at original resolution, time ordered, with duplicate packets removed.

Level 1A - Reconstructed unprocessed instrument data at full resolution, time referenced, and annotated with ancillary information, including radiometric and geometric calibration coefficients and georeferencing parameters (i.e., platform ephemeris) computed and appended, but not applied to Level 0 data.

Level 1B - Radiometrically corrected and geolocated Level 1A data that have been processed to sensor units.

Level 2 - Derived geophysical parameters at the same resolution and location as the Level 1 data.

Level 3 - Geophysical parameters that have been spacially and/or temporally re-sampled (i.e., derived from Level 1 or Level 2 data).

Level 4 - Model output and/or results of lower level data that are not directly derived by the instruments.

**DATA RIGHTS.** An agreement between the funding agent, the project, and the investigation team whereby the team is accorded exclusive use of data for a limited period of time. Source: ESADS.

**DATA SET.** A logically meaningful grouping or collection of similar or related data. Data having mostly similar characteristics (source or class of source, processing level and algorithms, etc.) Source: SPSO

**DATA SET CATALOG.** See CATALOG INTEROPERABILITY.

**DATA SET DIRECTORY.** See DIRECTORY.

**DATA SET DOCUMENTATION.** Information describing the characteristics of a data set and its component granules, including format, source instrumentation, calibration, processing, algorithms, etc. Source: EPO.

**DATA USER GUIDE.** A document, either on-line or hardcopy, containing the necessary information for the correct usage of the data.

Source: ESADS.

**DEEP SPACE NETWORK (DSN).** The network of NASA ground stations normally used to communicate with deep space probes or high-altitude satellites. The DSN can provide backup communications with low Earth-orbiting satellites. Source: EPO.

**DEFORESTATION.** The removal of forest stands by cutting and burning to provide land for agricultural purposes, residential or industrial building sites, roads, etc., or by harvesting the trees for building materials or fuel. Oxidation of organic matter releases CO<sub>2</sub> to the atmosphere, and regional and global impacts may result. Source: EPO.

**DIRECTORY.** (1) A collection of uniform descriptions that summarize the contents of a large number of data sets. It provides information suitable for making an initial determination of the existence and contents of each data set. Each directory entry contains brief data set information (e.g., type of data, data set name, time and location bounds). (2) A uniform set of description of a class or classes of entities (e.g., data sets, data sources, Guides) with pointers to more details and to the entities themselves, as appropriate. Source: ESADS, IWGDMGC, EPO.

**DIRECTORY SERVICE.** A directory, possibly supplemented with other kinds of information, combined with a mechanism to provide responses to queries. Source: ESADS.

**DIRECTORY SYSTEM.** A specific implementation of a directory service. Source: ESADS.

**DISCIPLINE.** A field of study (e.g., oceanography, meteorology, geology, land biology). Source: ESADS.

**DISTRIBUTED ACTIVE ARCHIVE CENTER (DAAC).** An EOSDIS facility that generates, archives, and distributes EOS Standard Data Products, and related information, for the duration of the EOS mission. An EOSDIS DAAC is managed by an institution such as a NASA field center or a university, under terms of an agreement with NASA. Each DAAC contains functional elements for processing data [the Product Generation System (PGS)], for archiving and disseminating data (the DADS), and for user services and information management (elements of the IMS). Other (non-NASA) agencies may share management and funding responsibilities for the active archives under terms of agreements negotiated with NASA. Source: EPO.

**DOCUMENTATION.** See DATA SET DOCUMENTATION.

**DYNAMIC VALIDS.** The logical and valid combinations of keywords formed from various categories of valids (e.g. source, sensor, parameter) that can be used to express a valid query. The subset of the valids for a particular keyword which remain applicable given previously entered criteria. For example, once a platform has been entered, only the sensors which were actually on that platform would be valid for entry. Source: ESDIS IMS Lexicon.

**EOS DATA AND INFORMATION SYSTEM (EOSDIS).** A facility that will manage the data resulting from NASA's Earth science



research satellites and field measurement programs, and other data essential for the interpretation of these measurements. It will also provide access to data held in the archives of other government agencies, organizations, and countries. EOSDIS will generate user-defined data products, and will facilitate the combination and manipulation of data from all sources as well as their incorporation into models of the environment. Concomitant to fulfilling its data management functions, EOSDIS will encourage interdisciplinary research and assist in breaking down the intellectual barriers between the traditional disciplines of Earth science by offering an integrated view of environmental data. Source: EPO.

**EOS DATA OPERATIONS AND COMMUNICATIONS SYSTEM.** The ground-based EOS subsystem interface between Earth-orbiting satellites and TDRSS. It provides forward link connectivity between the SN and the DSN and EOSDIS. It provides for command links through TDRSS, data capture and production processing of telemetry, processing raw data to Level 0, and archiving Level 0 data. Source: EPO.

**EOS DATA PRODUCTS.** Three primary categories of EOS mission data products that will be provided by EOSDIS have been defined, as follows: Source: EPO.

Prototype Data Products. Generated as part of a research investigation, of wide research utility, requiring too much data or computer power for generation at the investigator SCF, and accepted as a candidate Standard Data Product by the IWG. Prototype Data Products will be generated at DAACs, but their routine generation is not guaranteed and will not interfere with Standard Data Product generation.

Special Data Products. Generated as part of a research investigation using EOS data and produced for a limited region or time period, or products that are not accepted as standard by the IWG and NASA Headquarters. They will be generated at research users' computer facilities.

Standard Data Products. Generated as part of a research investigation, of wide research utility, accepted by the IWG and the EOS Program Office, routinely produced, and, in general, spatially and/or temporally extensive data products. Standard Level 1 data products will be generated for all EOS instruments; standard Level 2 data products will be generated for most EOS instruments. Some EOS interdisciplinary investigations will also generate standard data products.

**EOS OPERATIONS CENTER (EOC).** The facility responsible for EOS mission operations, including command and control of EOS spacecraft, mission planning and scheduling, and coordination of EOS instrument planning and scheduling. All commands for EOS spacecraft and instruments go through the EOC for integration and validation before transmission to space. Source: EPO.

**EOS PROGRAM.** The activity that provides the long-term observations and the supporting information system necessary to develop a comprehensive understanding of the way the Earth functions as a natural system. The EOS Program Office and the EOS Project are included in the EOS Program. Source: EPO.

**EOS PROGRAM DIRECTOR.** The NASA Headquarters official who is the focal point for all Headquarters activities bearing on the EOS Program. Source: EPO.

**EOS PROGRAM OFFICE.** The EOS Program Director and his staff. The EOS Program Office is located at NASA Headquarters. Source: EPO.

**EOS PROGRAM SCIENTIST.** The NASA Headquarters official assigned to the EOS mission. The roles and responsibilities of this function are defined in NMI 7100.11, Attachment D. One of them is to establish the policies for the analysis, dissemination, and archiving of data for the mission. Source: EPO.

**EOS PROJECT.** The EOS Project Manager, his staff, and all other participants in the EOS Program who are located at GSFC. Source: EPO.

**EOS PROJECT MANAGER.** The GSFC official who has overall responsibility for executing to completion the design, development, test and operation of the EOS Program within a given set of boundary conditions (technical, cost, schedule, and organization approach). The senior individuals in subordinate installations may also be titled Project Managers, but they are responsible to the GSFC Project Manager. Source: EPO.

**EOS PROJECT SCIENTIST.** The NASA field center or U.S. academic institution scientist assigned to the EOS mission to manage its scientific aspects. The roles and responsibilities of this function are given in NMI 7100.11, Attachment E. Source: EPO.

**EPHEMERIS.** A tabular statement of the spatial coordinates of a celestial body or a spacecraft as a function of time. Source: EPO.

**ESSENTIAL DATA PRODUCT.** A data product that has major significance to the EOS Program and its science users. The EOS Program considers successful production of such data products essential and will use such production as a measure of performance. Source: EPO.

**FACILITY INSTRUMENT.** An instrument defined by NASA as having broad significance to the EOS Program that is provided by a designated NASA center or foreign agency. Source: EPO.

**FEEDBACK MECHANISMS.** A sequence of inter-actions in which the final interaction influences the original one. Source: EPO.

Negative Feedback. An interaction that reduces or dampens the response of the system in which it is incorporated.

Positive Feedback. An interaction that increases or amplifies the response of the system in which it is incorporated.

**FLIGHT HARDWARE.** All active mission hardware in orbit about the Earth. For EOS, flight hardware includes all EOS spacecraft and EOS instruments on International Platforms and other spacecraft. Source: EPO.

**FORWARD LINK DATA.** Instrument control and spacecraft control data. Source: EPO.

**FOSSIL FUEL.** Any hydrocarbon deposit that can be burned for heat or power, such as petroleum, coal, and natural gas. Source: EPO.

**GLOBAL.** Modifier which can denote total or nearly total coverage of the Earth, land, ocean or both. Global can also be a qualifier to describe the distribution of a particular phenomenon over the earth although coverage isn't literally global. E.g. Global land would be all land over the earth but land certainly doesn't entirely cover the globe.

**GRANULE.** The smallest aggregation of data which is independently managed (i.e., described, inventoried, retrievable). Granules may be managed as logical granules and/or physical granules. Source: ESADS, EPO.

**GREENHOUSE GASES.** Those gases, such as water vapor, carbon dioxide, tropospheric ozone, nitrous oxide, methane, and CFCs, that are largely transparent to solar radiation but opaque to outgoing longwave radiation. Their action is similar to that of glass in a greenhouse. Some of the longwave (infrared) radiation is absorbed and reemitted by the greenhouse gases. The effect of this is to warm the surface and the lower atmosphere of the earth. Source: EPO.

**GROUND NETWORK.** The network of ground stations that support near-Earth spacecraft primarily in the launch or early mission phase. The Ground Network is the successor to the NASA Satellite Tracking and Data Acquisition Network (STADAN). Source: EPO.

**GROUND TRUTH.** Geophysical parameter data, measured or collected by other means than by the instrument itself, used as correlative or calibration data for that instrument data. It includes data taken on the ground or in the atmosphere. Ground truth data are another measurement of the phenomenon of interest; they are not necessarily more "true" or more accurate than the instrument data. Source: EPO.

**GUIDE.** A detailed description of a number of data sets and related entities, containing information suitable for making a determination of the nature of each data set and its potential usefulness for a specific application. Source: ESADS, IWGDMGC.

**GUIDE SERVICE.** A set of detailed information combined with a mechanism to provide responses to queries. Source: ESDIS IMS Lexicon.

**GUIDE SYSTEM.** A specific implemented mechanism that provides guide information in response to queries. Source: ESDIS IMS Lexicon.

**HARD METRIC.** The use of rational metric units as the basis of measurement rather than mathematically converted inch-pound units. Source: EPO.

**INFORMATION MANAGEMENT SYSTEM (IMS).** The user interface for EOSDIS. It provides information about data, both in EOSDIS and in external archives, on a 24-hour basis; accepts user orders for EOS data; provides information about future data acquisition and processing schedules; accepts and forwards data acquisition and processing requests; and maintains information on system status, management, and coordination. Source: EPO.

**INFRARED RADIATION.** Electromagnetic radiation lying in the wavelength interval from 0.7  $\mu\text{m}$  to 1000  $\mu\text{m}$  (micrometers). Its lower limit is bounded by visible radiation, and its upper limit by microwave radiation. Most of the energy emitted by the Earth and its atmosphere is at infrared wavelengths. Infrared radiation is generated almost entirely by large-scale intramolecular processes. The tri-atomic gases, such as water vapor, carbon dioxide, and ozone, absorb infrared radiation and play important roles in the propagation of infrared radiation in the atmosphere. Source: EPO.

**IN-SITU DATA.** Data associated with reference to measurements made at the actual location of the object or material measured, by contrast with remote sensing (i.e., from space). Source: EPO.

**INSTITUTIONAL FACILITIES OR ELEMENTS.** Facilities established by an institution that take on some responsibility in support of EOSDIS, or elements of the EOSDIS that function as part of an institution, and represent both EOSDIS and the programs, goals and purpose of the institution. Source: EPO.

**INSTRUMENT.** An integrated collection of hardware containing one or more sensors and associated controls designed to produce data on an environment. Source: ESADS.

**INSTRUMENT CONTROL CENTER (ICC).** An EOS facility dedicated to a specific instrument that plans and schedules instrument operations, generates and validates command sequences, provides the capability to forward commands and to store them for later transmission, monitors the health and safety of the instrument, and provides instrument controllers with status information of their instrument. Source: EPO.

**INSTRUMENT CONTROL FACILITY (ICF).** A facility containing one or more EOS ICCs. Source: EPO.

**INSTRUMENT DATA.** Data specifically associated with the instrument, either because they were generated by the instrument or included in data packets identified with that instrument. These data consist of instrument science and engineering data, and possible ancillary data. Source: ESADS, EPO.

**INSTRUMENT ENGINEERING DATA.** Data produced by the engineering sensor(s) of an instrument that is used to determine the physical state of an instrument in order to operate it, monitor its health, or aid in processing its science data. Source: EPO.

**INSTRUMENT SCIENCE DATA.** Data produced by the science sensor(s) containing the primary observables of an instrument, usually constituting the mission of that instrument. Source: ESADS, EPO.

**INTERDISCIPLINARY SCIENTIST.** An individual selected by the project and/or the peer review process who is responsible for conducting investigations requiring analysis, interpretation, and use of data which crosses instrument and discipline boundaries. Source: ESADS.

**INTERNATIONAL PARTNERS.** Signatories of the Space Station MOUs that established the initial funding for the International Polar Platforms program to monitor Global Change, including NASA, ESA, Japan, and Canada. Source: EPO.

**INVENTORY.** A uniform set of descriptions of granules from one or more data sets with information required to select and obtain a subset of those granules. Granule descriptions typically include temporal and spatial coverage, data quality indicators, and physical storage information. An inventory may describe physical granules, logical granules, or both, including a mapping between them if they are not identical. Source: IWGDMGC, ESADS, EPO.

**INVENTORY SERVICE.** An inventory, possibly supplemented with other kinds of information, combined with a mechanism to provide responses to queries, possibly including ordering data. Source: ESDIS IMS Lexicon.

**INVENTORY SYSTEM.** A specific implementation of an inventory service. Source: ESADS.

**IONOSPHERE.** Rarefied, ionized region of the Earth's atmosphere, between approximately 60 and 400 km. Source: EPO.

**LEVEL.** See DATA PRODUCT LEVEL.

**LOGICAL GRANULE.** The smallest aggregation of data which is independently identified (i.e., described, inventoried). Source: ESADS.

**LOGICAL RECORD.** A collection of data whose location and extent are defined in terms of the information it contains and not in terms related to the physical medium on which it is stored. Portions of the same logical record may be located in different physical records, or several logical records may be located in one physical record. Source: ESADS.

**LOGICAL VOLUME.** That portion of a volume which is viewed by a computer operating system as a complete collection of available files. For instance, with today's WORM optical disk drives, each side of a two-sided disk is a logical volume. Source: ESADS.

**MANTLE.** Layer of the Earth's interior between the core and crust, ranging from depths of approximately 2900 km-40 km. Source: EPO.

**MEASUREMENT MODE DUTY CYCLE.** The fraction of available time during which an instrument is actively performing Earth measurements and producing meaningful data, including incidental calibration and overhead (such as scan retrace). High data rate, high power consumption, and steerable instruments may have small duty cycles. Daylight-only instruments may have measurement mode duty cycles averaging 50 percent. Source: EPO.

**MESOSPHERE.** Region of the atmosphere between approximately 50 and 85 km. Source: EPO.

**MESSAGE.** The structured component in the mechanism for communicating information between an IMS client and archive databases. Different types of messages, corresponding to the functional subsystem of the IMS, are exchanged through the client/server architecture.

Message types include, for example, inventory search and inventory result. Source: ESDIS IMS Lexicon.

**METADATA.** (1) Information about a data set which is provided by the data supplier or the generating algorithm and which provides a description of the content, format, and utility of the data set. Metadata provide criteria which may be used to select data for a particular scientific investigation. (2) Information describing a data set, including data user guide, descriptions of the data set in directories, and inventories, and any additional information required to define the relationships among these. Source: ESADS, EPO, IWGDMGC.

**MODELING.** An investigative technique that uses a mathematical or physical representation of a system or theory that accounts for all or some of its known properties. Models are often used to test the effects of changes of system components on the overall performance of the system. Source: EPO.

**NADIR.** Direction toward the center of the Earth. Opposite of zenith. Source: EPO.

**NEAR REAL-TIME DATA.** Data from the source that are available for use within a time that is short in comparison to important time scales in the phenomena being studied. Source: ESADS.

**NEAR-LINE.** Near-line refers to tapes or other archive media that are typically stored for very quick access and loading on the computer system for use (i.e. robotic tape silos or optical disc jukeboxes). Source: EDC/ESDIS.

**NETWORK MANAGER.** A body of software modules that receive, interpret, and transmit, (depending on a particular state), an appropriate message to the archive server and the user interface software subsystems.

**NUTRIENT.** Any substance assimilated by living things that promotes growth. Source: EPO.

**OCEAN MIXING.** Processes that involve rates of advection, upwelling/downwelling, and eddy diffusion and that determine, for example, how rapidly excess atmospheric carbon dioxide can be taken up by the oceans. Source: EPO.

**OFF-LINE.** Access to information by mail, telephone, facsimile, or other non- direct interface. Source: EPO.

**ON-LINE.** Access to information by direct interface to an information data base via electronic networking. Source: EPO.

**OPERATIONAL FACILITY INSTRUMENT.** An instrument developed and operated by a national or international agency (e.g., NOAA, DOD) to support their operational requirements. Data from such an instrument may be made available to the research community. Source: ESADS.

**OPERATIONS.** Within EOSDIS, those activities directly related to the acquisition, archiving, distribution, and processing of mission-related information. Source: EPO.

**ORBIT DATA.** Data that represent spacecraft locations. Orbit (or ephemeris) data include: Geodetic latitude, longitude and height above an adopted reference ellipsoid (or distance from the center of mass of the Earth); a corresponding statement about the accuracy of the position and the corresponding time of the position (including the time system); some accuracy requirements may be hundreds of meters while other may be a few centimeters. Source: EPO.

**OZONE.** A molecule made up of three atoms of oxygen. In the stratosphere, it occurs naturally and provides a protective layer shielding the Earth from ultraviolet radiation and subsequent harmful health effects on humans and the environment. In the troposphere, it is a chemical oxidant and major component of photochemical smog. Ozone is an effective greenhouse gas especially in the middle and upper troposphere and lower stratosphere. Source: EPO.

**PACKAGE.** A set of data granules organized for distribution by a DAAC. Source: ESDIS IMS Lexicon.

**PARAMETER.** A measurable or derived variable represented by the data (e.g. air temperature, snow depth, relative humidity. Source: SPSO.

**PATHFINDER DATA SET.** A long-term, global Earth science data set produced from non-EOS data using community consensus algorithms as part of the EOSDIS Program. Selection of Pathfinder Data Sets is made by the EOS Program Office (in consultation with the IWG and the science community). Source: EPO.

**PAYLOAD.** The complement of instruments that are accommodated on a spacecraft. Source: EPO.

**PHOTOSYNTHESIS.** The manufacture by plants of carbohydrates and oxygen from carbon dioxide and water in the presence of chlorophyll with sunlight as the energy source. Oxygen and water vapor are released in the process. Photosynthesis is dependent on favorable temperature and moisture conditions as well as on the atmospheric carbon dioxide concentration. Increased levels of carbon dioxide can increase net photosynthesis in many plants. Source: EPO.

**PHYSICAL GRANULE.** The smallest aggregation of data which is independently accessible (i.e., located, readable, reproducible) on physical media. Source: ESADS.

**PHYSICAL MEDIUM.** Any physical material capable of holding data (e.g., pages, film, magnetic tape, optical disk, wire, silicon). Source: ESADS.

**PHYSICAL RECORD.** A collection of data whose location and extent are defined in terms related to the physical medium on which it is stored. A physical record may contain one or several logical records or a part of a logical record. Source: ESADS.

**PHYTOPLANKTON.** That portion of the plankton community in a body of water made up of tiny plants (e.g., algae and diatoms). Source: EPO.

**PLANETARY ALBEDO.** The fraction of incident solar radiation that is reflected by a planet and returned to space. The planetary albedo of the Earth-atmosphere system is approximately 30 percent, most of which is due to backscatter from clouds in the atmosphere. Source: EPO.

**PLAYBACK DATA.** Data that are stored on a spacecraft, platform, or other carrier that are transmitted at a later time. Source: ESADS.

**PRIMARY PRODUCTIVITY.** The rate of carbon fixation by marine photosynthetic organisms (phytoplankton). Primary productivity results in the reduction of dissolved inorganic carbon to form organic carbon, with concomitant release of oxygen. Source: EPO.

**PRINCIPAL INVESTIGATOR (PI).** The individual selected by proposal review, who has primary responsibility for preparing the proposal, selecting the investigation team, carrying out the scientific investigation, and reporting the results. Responsibilities often include supplying an instrument. Source: ESADS, EPO.

**PRINCIPAL INVESTIGATOR INSTRUMENT.** An instrument developed and managed by a Principal Investigator (PI) selected through the NASA, or equivalent, Announcement of Opportunity (AO) process. Source: ESADS.

**PROCESSING LEVEL.** IMS interface term. See Data Product Level.

**PRODUCT GENERATION SYSTEM (PGS).** An EOS DAAC element that performs data processing functions, including routine generation of Standard Data Products, routine generation of associated quick-look products, metadata, and browse data sets, reprocessing of data, and retrospective generation of new Standard Data Products. In practice, a PGS should consist of the hardware and application software at a DAAC used for generating data products. The PGS at a DAAC may also provide computational support for research and special product trials. Source: EPO.

**PRODUCT REQUEST.** Within the IMS interface a request is an action initiated by a user to order data from a DAAC.

**PROTOTYPE INSTRUMENT.** An instrument primarily intended as a prototype for developing an operational instrument capability. The instrument may be replaced by an operational model, or declared operational after the functional utility of the instrument is understood. Source: ESADS.

**PROTOTYPE DATA PRODUCTS.** See EOS DATA PRODUCTS.

**QUICK-LOOK DATA.** Data available for examination within a short time of receipt, where completeness of processing is sacrificed to achieve rapid availability. Source: ESADS.

**RAW DATA.** Numerical values representing the direct observations output by a measuring instrument transmitted as a bit stream in the order they were obtained. Also see DATA PRODUCT LEVEL.



**REAL-TIME DATA.** Data that are acquired and transmitted immediately to the ground (as opposed to playback data). Delay is limited to the actual time (propagation delays) required to transmit the data. Source: ESADS, EPO.

**RESEARCH FACILITY INSTRUMENT.** An instrument provided and managed by an institution for use by a group of approved investigators. Data from the instrument may be made available for the operational applications. Source: ESADS.

**RESERVE.** That amount of a resource held by the EOS Program and Project to satisfy unanticipated requirements or objectives. Source: EPO.

**RESULT.** Information generated and communicated from the archive (DAAC) to the IMS client and displayed in the user interface as a result of a user-initiated search.

**RESULTS INTEGRATION.** The mechanism in the IMS client that merges, manages, and presents to the interface result messages received from the archives (DAACs).

**RETURN LINK DATA.** Spacecraft health and status data and instrument data. Source: EPO.

**SCIENCE COMPUTING FACILITY (SCF).** A facility supplied by the EOS Program to an EOS TL, TM, or PI (Instrument or Interdisciplinary) for the following purposes: developing and maintaining the algorithms and software used to generate Standard Data Products; quality control of Standard Data Products; in-flight instrument calibration and data set validation; scientific analysis, modeling, and research; generation of Special Data Products; and use as an interface to the investigator's institutional facility. Source: EPO.

**SEARCH.** Within the IMS interface search is the action of composing a set of criteria for locating information. These criteria are communicated to the DAACs in a search message structure where it is processed, through DAAC mapping layers, into local database queries.

**SENSOR.** A device which transmits an output signal in response to a physical input stimulus (as radiance, sound, etc.). Science and engineering sensors are distinguished according to the stimuli to which they respond. Source: ESADS.

**SIGNAL-TO-NOISE RATIO (S/N).** The ratio of the level of the information-bearing signal power to the level of the noise power. For MODIS, the ratio between (1) typical cloud free scene brightness with solar zenith angle  $Z=70$  deg, and (2) all sensor and processing noise contributions. S/N specifications for various scenes (e.g., land, clouds, oceans, ice) are only applicable in the filter bands associated with those scenes. Source: EPO.

**SOURCE/PLATFORM.** The observational environment, entity or structure which holds the data collection device (usually an instrument). It may be a satellite, aircraft, ground station, buoy, ship, person (in the case of human observations or hand-held instruments), computer (in the case of computer model data), or a questionnaire (in the case of a paper survey (e.g. CIESIN's Census data)).

**SPACECRAFT.** The spacecraft is the EOS space or orbiting component composed of the payload and mission-unique equipment required to support the EOS mission. It includes propulsion, separation springs, and user interface equipment not unique to the launch vehicle. Source: EPO.

**SPACECRAFT ENGINEERING DATA.** Data produced by the engineering sensor(s) of a spacecraft that are used to determine the physical state of the spacecraft, in order to operate it or monitor its health. Source: EPO.

**SPACE NETWORK (SN).** The NASA assets required to communicate with Earth-orbiting spacecraft via the TDRSS. Source: EPO.

**SPECIAL DATA PRODUCTS.** See EOS DATA PRODUCTS.

**STANDARD DATA PRODUCTS.** See EOS DATA PRODUCTS.

**STRATOSPHERE.** Region of the atmosphere between the troposphere and mesosphere, having a lower boundary of approximately 8 km at the poles to 18 km at the equator and an upper boundary of approximately 50 km. Depending upon latitude and season, the temperature in the lower stratosphere can increase, be isothermal, or even decrease with altitude, but the temperature in the upper stratosphere generally increases with height due to absorption of solar radiation by ozone. Source: EPO.

**SUPPORT EQUIPMENT.** Equipment used to interface with the spacecraft for the purpose of simulating the command and telemetry interface which will be present in the EOC, as well as providing additional status information that may be necessary in the integration and verification processes. Source: EPO.

**TEAM LEADER (TL).** The person designated by the EOS Program as ultimately responsible for the delivery and performance of Standard Data Products derived from an EOS Facility Instrument. Source: EPO.

**TEAM MEMBER (TM).** A person designated by the EOS Program to develop algorithms for Standard Data Products derived from an EOS Facility Instrument. Source: EPO.

**TELEMETRY.** A space-to-ground data stream of measured values (including instrument science data, instrument engineering data, and spacecraft engineering data) that does not include command, tracking, computer memory transfer, audio, or video signals. Source: EPO.

**THERMOSPHERE.** Outermost layer of the atmosphere, above the mesosphere. Source: EPO.

**TRACE GAS.** A minor constituent of the atmosphere. The most important trace gases contributing to the greenhouse effect are water vapor, carbon di-oxide, ozone, methane, nitrous oxide, and chloro-fluorocarbons. Other trace gases include ammonia, nitric oxide, ethylene, sulfur dioxide, methyl chloride, carbon monoxide, and carbon tetrachloride. Source: EPO.

**TRACKING AND DATA RELAY SATELLITE SYSTEM (TDRSS).** A constellation of NASA satellites and ground stations that track and relay data to and from low-altitude, Earth-orbiting satellites (including the Space Shuttle). This NASA system includes specialized communications satellites located in geosynchronous orbit both east and west of the continental U.S. (providing coverage of virtually the whole globe) and a TDRSS Ground Terminal at White Sands, New Mexico. Beginning in 1995P96, redundant Ground Terminals are scheduled to be in place at White Sands. Source: EPO.

**TROPOPAUSE.** Boundary between the upper troposphere and the lower stratosphere that varies in altitude between approximately 8 km at the poles to 18 km at the equator. Source: EPO.

**TROPOSPHERE.** Lowest atmospheric layer, between the surface and tropopause. Source: EPO.

**UPWELLING.** The vertical motion of water in the ocean by which subsurface water of lower temperature and greater density moves toward the surface of the ocean. Upwelling occurs most commonly along the western coastlines of continents, but may occur anywhere in the ocean. Upwelling results when winds blowing nearly parallel to a continental coastline transport the light surface water away from the coast. Subsurface water of greater density and lower temperature replaces the surface water, and exerts a considerable influence on the weather of coastal regions. Carbon dioxide is transferred to the atmosphere in regions of upwelling. This is especially important in the Pacific equatorial regions, where 1 to 2 gigatons of carbon per year may be released to the atmosphere. Upwelling also re-sults in increased ocean productivity by transporting nutrient-rich waters to the surface layer of the ocean. Source: EPO.

**USER.** Any person accessing the EOSDIS. **AUTHORIZED USERS** are users who have viable EOSDIS accounts, and who may therefore make EOSDIS data requests. These users may be **Affiliated** or **Unaffiliated**. **AFFILIATED USERS** are those who are sponsored by one of the parties to the Earth Observations ICWG (EO-ICWG) data policy. Each party is responsible for ensuring that all its affiliated users comply with the EO-ICWG data policy. Use of data by **Affiliated Users** is classified in one of three categories, defined in the EO-ICWG data policy: (Source: EPO.)

Research Use. A study or an investigation in which the user affirms (1) the aim is to establish facts or principles; (2) the data will not be sold or reproduced or provided to anyone not covered by this or another valid affirmation; (3) the results of the research will be submitted for publication in the scientific literature; and (4) detailed results of the research will be provided to the sponsoring spacecraft operator as agreed between the researcher and the sponsoring spacecraft operator. In the context of EOSDIS, this means that NASA-affiliated users must make available to the research community their detailed results, including data, algorithms, and models at the time their research is accepted for publication; and that the data may be copied and shared among other researchers provided that either they are covered by a research agreement or the researcher who obtained the data from EOSDIS is willing to take responsibility for their compliance with the agreement.

Data for affiliated users and for research and applications use will be made available at no more than the marginal cost of production and distribution.

Environmental Monitoring and Operational Use. Includes data use by those government agencies affiliated with the parties which conduct environmental monitoring and/or operational observations for the public good, and can include larger agencies to which the parties belong (i.e., the World Meteorological Organization); or national agencies, or their designates, involved in other operational forecasting activities which are conducted for the public good (i.e., weather, sea state, sea ice, agriculture, hydrology, etc.).

Environmental Monitoring and Operational Use of Data constitutes any use of data to carry out a mandate of environmental observation and prediction as part of an agency's responsibilities to provide for the general welfare. Such use may include the routine downlink or direct broadcast of enhanced and unenhanced data in near-real time within the operational community.

Data for Environmental Monitoring and Operational use shall be provided in real or near-real time without fee, and shall be available through international EOS archives for non-real time users for no more than the marginal cost of reproduction and distribution consistent with the access terms for each instrument category.

Other Users. Those persons requesting data for scientific, operational, applications, or commercial use, who are not directly represented by an EO-ICWG member, and who agree to the stipulations on data access and use as set by the EOICWG and the EOS Program.

**VALID.** A value of a particular attribute (or column in a database). Valid (or keywords in the IMS interface) are both the search criteria and the key descriptions of attributes for inventory information. For example, "radiance" is a keyword within the attribute domain Parameter.

**VALIDS.** The set of values (often keywords) identified for specific categories (i.e. parameter, source, etc.) used to form valid search criteria used in the v.0 IMS interface.

**VISUAL AIDS.** Any graphical representation of data used to communicate the contents or meaning (including spatial and temporal location) of the data.

**VOLUME.** A unit of physical media which contains data, usually physically interchangeable with other volumes of a similar type, and requiring a specific device for reading or writing (e.g., a CD-ROM). Source: ESADS.

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