

Basics of Geomatics

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by

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ISBN 978-1-4020-9013-4 e-ISBN 978-1-4020-9014-1
DOI 10.1007/978-1-4020-9014-1
Springer Dordrecht Heidelberg London New York

Library of Congress Control Number: 2009926868

This is a translation revised and enlarged of the original work in Italian “Elementi di Geomatica” published by Associazione Italiana di Telerilevamento, © 2004.

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Cover illustration: Images by Luca Di Ionno

English translation by the Author assisted by Sara de Santis and Andrew Lowe

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

*This project is for my sons Ilaria Camilla (Ila)
and Jacopo Andrea (Jepus)*

Foreword

Geomatics is a neologism, the use of which is becoming increasingly widespread, even if it is not still universally accepted. It includes several disciplines and techniques for the study of the Earth's surface and its environments, and computer science plays a decisive role. A more meaningful and appropriate expression is *Geo-spatial Information* or *GeoInformation*.

Geo-spatial Information embeds topography in its more modern forms (measurements with electronic instrumentation, sophisticated techniques of data analysis and network compensation, global satellite positioning techniques, laser scanning, etc.), analytical and digital photogrammetry, satellite and airborne remote sensing, numerical cartography, geographical information systems, decision support systems, WebGIS, etc.

These specialized fields are intimately interrelated in terms of both the basic science and the results pursued: rigid separation does not allow us to discover several common aspects and the fundamental importance assumed in a search for solutions in the complex survey context.

The objective pursued by Mario A. Gomasasca, one that is only apparently modest, is to publish an integrated text on the surveying theme, containing simple and comprehensible concepts relevant to experts in Geo-spatial Information and/or specifically in one of the disciplines that compose it. At the same time, the book is rigorous and synthetic, describing with precision the main instruments and methods connected to the multiple techniques available today.

The book is addressed not to super-specialists, but to a wider group of technicians and students who may use Geo-spatial Information in their work, or who already use it as part of their daily professional activity or study. More specifically the book targets at land managers, operating in natural or anthropic environments (engineers, geologists, agronomists, architects, urban planners, operating in the field of architectural assets and environment, technicians at land-surveying agencies, etc.), and students at both first and master levels, more and more of whom are facing themes in which the disciplines of the survey play a determining role.

Mario A. Gomasasca is a researcher at the National Research Council of Italy, expert in remote sensing applied to agriculture and environment, and more recently, for many years (1997–2003), he has held the prestigious and engaging position of president of ASITA (Federation of the Scientific Associations for Land and

Environment Information). In this role, which he performs with enthusiasm and great efficiency, he has become a privileged observer of the topics of Geo-spatial Information, since he coordinates the National Conferences, at which some hundreds of scientific papers are presented annually.

The absolute specialist in a single field will not find profound or very specific innovative elements in his/her particular competence, but the same specialist will be able to add elements from adjacent, interrelated disciplines and techniques.

The readers, whether university student, professional, technician or lay student, will find ready access to the fundamental concepts and up-to-date information on the state of the art, giving them a wider field of view of the complex, multidisciplinary problems related to land surveying and the environment, especially in land planning.

This objective, which I must warn the reader is decidedly other than modest, is totally achieved in this book. To both, the book and its author Mario A. Gomasasca, I wish the best and all the good fortune they deserve.

Turin, Italy

Sergio Dequal

Author's Preface

When I decided to revisit my first book 'GIS and Remote Sensing for the Management of the Agricultural and Environment Resources' (published by AIT in 1997) at the end of November 1999, while waiting for a flight to Niamey, Niger, at the Paris Charles De Gaulle airport, with my unforgettable colleague and friend Eugenio Zilioli, I had in mind to only update the text for the second reprint.

While reading and re-reading, with the growing knowledge that in the meantime was integrating itself in ASITA, the Italian Federation of the Scientific Associations for the Land and Environment Information, of which I had been elected and serving as President since 1998, and with the rising interests of the profession, grew the idea to broaden the content and to develop a more ambitious project involving an interactive approach to some of the main topics of Geo-spatial Information.

After years of reading, research, study, complex bibliographical consultation and selection, along with thorough and sometime critical reviews from many experts, the Italian version of the book (2004) introduced a panorama to the neophyte and completed the framework for those who already work in the field, in order to integrate the knowledge of Geo-spatial Information.

Considering the large success of the book in Italy and the worldwide interest and development of geomatics, I decided to undertake the challenge in preparing the English revised and enlarged version of that book.

This book introduces various disciplines and techniques and is offered as a review of the subject to stimulate the reader's interests. Mathematical demonstrations and deeper explanations have been omitted, but an accurate selected bibliography is provided, chapter by chapter, to assist in finding specific references.

Geo-spatial Information is still a relatively new discipline with fuzzy contours, open to many interpretations; adding my own personal point of view, which could generate approval and criticism, opening, I hope, a scientific and professional constructive debate.

The book does not lay claim to answering multiple issues that Geomatics includes, but it proposes an interdisciplinary integration in order to contribute to face the problems provided by this complex world.

The necessity of defining technical terms occurs in many passages of this book; I tried to impose an order on the labyrinth of definitions and acronyms that are often used in a general way. At this stage, with no existing universally recognized ontological dictionary and thesaurus, I have selected a nomenclature with the more

commonly used definitions and which hopefully mediates between sometimes contrasting positions.

The book is aimed at those who await an introduction and a broadening of the disciplines and techniques of Geomatics (Geo-spatial Information), with particular attention to public administration, university students, training courses and professionals.

Several people have helped me in preparing the first Italian version of this book, in particular, the Italian Remote Sensing Association (AIT), the Institute for the Electromagnetic Sensing of the Environment in Milan (CNR-IREA) and Giovanni Lechi, Polytechnic of Milan have played a fundamental role and I thank all with special affection, as well as the Department of Engineering of the Territory, Environment and Geotechnology of the Polytechnic of Turin, my second professional family.

Substantial support was provided by Rainer Reuter, EARSeL (European Association of the Remote Sensing Laboratories) chairman; Sandro Annoni, JRC, European Commission, Ispra; Antonio Di Gregorio, FAO Africover Plan, Nairobi, Kenya; Jimmy Johnston, National Wetlands Research Center, USGS, Lafayette, USA; Richard Escadafal, CESBIO, Toulouse, F; Ramon Norberto Fernandez, UNDP-GRID, Nairobi, Kenya; Guy Weets, formerly DG Information Society, European Commission, Brussels; Daniele Rizzi, Geographical Information System of the Commission (GISCO), Eurostat, European Commission, Brussels; Luciano Surace, Italian Hydrographical Institute of Navy and ASITA president; Giuseppe Scanu, University of Sassari and Italian Cartographic Association (AIC) president; Ruggero Casacchia, National Research Council of Rome and Italian Remote Sensing Association (AIT) president and Mauro Salvemini, University La Sapienza of Rome, AM/FM Geographical Information System and EUROGI (European Umbrella Organization for Geographic Information) president.

Moreover, I thank Claudio Prati and Fabio Rocca, Department of Electronics and Information, Polytechnic of Milan; Italian Space Agency (ASI); European Space Agency (ESA); Remote Sensing Europe of Milan; Compagnia Generale Ripreseaeree of Parma (CGR) Blom ASA Group and Agronomic Institute for Overseas (IAO), Florence, Italy for assistance with documentation and images.

I thank the several reviewers and advisors, fundamentals with their professionalism and competence. A special acknowledgement goes to Chris J. Johannsen, Professor Emeritus of Agronomy, my tutor during my stay (1988–1989) as visiting scientist at the Laboratory for the Application of Remote Sensing (LARS), Purdue University, West Lafayette, Indiana, USA.

Milan, Italy

Mario A. Gomasasca

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Acronyms

Acronym	Definition
A	
A/D	<i>Analog to Digital</i>
AATSR	<i>Advanced Along-Track Scanning Radiometer</i>
ACM	<i>Association for Computing Machinery</i>
ADEO	<i>Advanced Earth Observing Satellite</i>
ADEOS	<i>Advanced Earth Observing System (Japan)</i>
ADG	<i>Africover Database Gateway</i>
ADM	<i>Atmospheric Dynamics Mission</i>
ADRG	<i>ARC-Digitized Raster Graphics</i>
ADS40	<i>Airborne Digital Sensor 40</i>
ADSL	<i>Asymmetric Digital Subscriber Line</i>
AEB	<i>Agência Espacial Brasileira</i>
AERONET	<i>AErosol RObotic NETwork (NASA)</i>
AGI	<i>Advanced Global Imager (NASA)</i>
AI	<i>Artificial Intelligence</i>
AID	<i>Africover Interactive Database</i>
AIMs	<i>Africover Interpretation and Mapping System</i>
AIMS	<i>Airborne Integrated Mapping System</i>
AIRS	<i>Atmospheric Infrared Sounder (NASA EOS)</i>
ALI	<i>Advanced Land Imager (USA)</i>
ALOS	<i>Advanced Land Observing Satellite (Japan)</i>
ALS	<i>Aerial (Airborne) Laser Scanning</i>
ALTM	<i>Airborne Laser Terrain Mapper</i>
ALTMS	<i>Airborne Laser Topographic Mapping System</i>
ALU	<i>Arithmetic–Logic Unit</i>
AM	<i>Automated Mapping</i>
AM/FM	<i>Automated Mapping/Facilities Management</i>
AMI SAR	<i>Active Microwave Imager Synthetic Aperture Radar</i>
AMPS	<i>Automatic Mapping and Planning System</i>
AMSD	<i>Adjusted Mapping Support Data</i>
AMSR	<i>Advanced Microwave Scanning Radiometer (Japan; NASA EOS)</i>
AMSU	<i>Advanced Microwave Sounding Unit (NASA EOS)</i>
ANOVA	<i>Analysis of Variance</i>

Acronym	Definition
AOIPS	<i>Atmospheric and Oceanographic Image Processing System</i>
APCM	<i>Aerial Photography Contract Management System</i>
APFO	<i>Aerial Photography Field Office (USDA)</i>
API	<i>Application Program Interface</i>
APIS	<i>Aerial Photography Information System</i>
APMI	<i>Aerial Photography Micrographic Index System (USGS)</i>
APQF	<i>Aerial Photography Quad File</i>
APR	<i>Airborne Profile Recorder</i>
APSR	<i>Aerial Photography Summary Record</i>
APSRS	<i>Aerial Photography Summary Record System (USGS)</i>
APTS	<i>Aerial Profiling of Terrain System</i>
AQT	<i>Association Québécoise de Télédétection</i>
ARNS	<i>Aeronautical Radio Navigation Service</i>
ARVI	<i>Atmospherically Resistant Vegetation Index</i>
AS	<i>Applicative Software</i>
ASAR	<i>Advanced Synthetic Aperture Radar; Aerial Synthetic Aperture Radar</i>
ASC	<i>Agence Spatiale Canadienne</i>
ASCAT	<i>MetOp's Advanced SCATterometer</i>
ASCIE	<i>American Standard Code for Information Exchange</i>
ASCII	<i>American Standard Code for Information Interchange</i>
ASI	<i>Agenzia Spaziale Italiana Italian Space Agency</i>
ASP	<i>Active Server Pages; Application Service Provider</i>
ASTER	<i>Advanced Spaceborne Thermal Emission and Reflection Radiometer (Japan; NASA EOS)</i>
ATBD	<i>Algorithm Theoretical Basis Document (NASA EOS)</i>
ATM	<i>Airborne Terrain Mapper</i>
ATMOS	<i>Atmospheric and Ocean Observation Series (Japan)</i>
ATR1	<i>Automatic Target Recognition Module (Leica)</i>
ATSR	<i>Along-Track Scanning Radiometer (ESA ERS)</i>
ATV	<i>Automated Transfer Vehicle</i>
AVHRR	<i>Advanced Very High Resolution Radiometer (NOAA)</i>
AVI	<i>Audio Visual Interleave</i>
AVIRIS	<i>Advanced Visible/InfraRed Imaging Spectrometer</i>
AVL	<i>Automatic Vehicle Location</i>
AVNIR	<i>Advanced Visible and Near-Infrared Radiometer (Japan, ADEOS)</i>
AWARE	<i>A tool for monitoring and forecasting Available WATER REsource in mountain environment</i>
AWiFS	<i>Advanced Wide Field Sensor</i>
B	
BE	<i>Best Effort</i>
B/W	<i>Black and White</i>
BWA	<i>Broadband Wireless Access</i>
BARCIS	<i>BARCode Information System</i>
BGS	<i>British Geological Survey</i>
BIH	<i>Bureau International de l'Heure</i>
BIL	<i>Band Interleaved by Line</i>
BIOS	<i>Basic Input/Output System</i>
BIP	<i>Band Interleaved by Pixel</i>
BIPM	<i>Bureau International des Poids et Mesures</i>

Acronym	Definition
BLG	<i>Binary Line Generalization</i>
BMP	<i>Bitmapped Image Format</i>
BNSC	<i>British National Space Centre (UK)</i>
BOREAS	<i>Boreal Ecosystem Atmosphere Study</i>
BPI	<i>Bits per Inch</i>
BPS	<i>Bits per Second</i>
BRDF	<i>Bi-directional Reflection Distribution Function</i>
BS	<i>Base Station</i>
BWC	<i>Bandwidth Compression</i>
BWE	<i>Bandwidth Expansion</i>
C	
C/A	<i>Coarse-Acquisition (code)</i>
CAD	<i>Computer-Aided Drafting; Computer-Assisted Design; Computer-Aided Design</i>
CADD	<i>Computer-Aided Design and Drafting</i>
CADMAP	<i>Computer-Aided Drafting, Mapping, and Photogrammetry</i>
CADRG	<i>Compressed ADRG</i>
CALIPSO	<i>Cloud–Aerosol Lidar and Infrared Pathfinder Satellite Observations</i>
CAM	<i>Computer-Aided Mapping</i>
CAMA	<i>Computer-Aided Mass Appraisal System (Montana)</i>
CAMEO	<i>Computer-Aided Management of Emergency Operations System (USA)</i>
CASI	<i>Compact Airborne Spectrographic Imager (Canada)</i>
CAT	<i>Computer-Assisted Thermography</i>
CBERS	<i>China–Brazil Earth Resources Satellite Program</i>
C-CAP	<i>Coastal Change Analysis Program</i>
CCD	<i>Charge-Coupled Device</i>
CCD/TDI	<i>Charge-Coupled Device/Time Delay Integration</i>
CCNS	<i>Computer Controlled Navigation System (IGI, Germany)</i>
CCPR	<i>Consultative Committee on Photometry and Radiometry</i>
CCRS	<i>Canada Centre for Remote Sensing (Canada)</i>
CD	<i>Change Detection, Compact Disk</i>
CDM	<i>Canonical Data Model</i>
CDR	<i>CorelDraw format</i>
CD-R	<i>Compact Disk-Recordable</i>
CD-ROM	<i>Compact Disk-Read Only Memory</i>
CDS	<i>Component Database System</i>
CDTED	<i>Compressed Digital Terrain Elevation Data</i>
CD-W	<i>Compact Disk re-writable</i>
CENT/TC 287	<i>Committee of Normalization, Technical Committee 287</i>
CEO	<i>European Centre for Earth Observation</i>
CEOS	<i>Committee on Earth Observation Satellites</i>
CERES	<i>Clouds and Earth's Radiant Energy System (NASA EOS)</i>
CESBIO	<i>Centre d' Études Spatiales de la Biosphère (France)</i>
CGA	<i>Colour Graphics Adaptor</i>
CGI	<i>Common Gateway Interface</i>
CGM	<i>Computer Graphics Metafile</i>
CIE	<i>Commission Internationale de l'Éclairage</i>
CIGNET	<i>Cooperative International GPS Network</i>
CILSS	<i>Comité inter-Etats de Lutte contre la Sécheresse au Sahel</i>

Acronym	Definition
CIR	<i>Color InfraRed</i>
CLC	<i>CORINE Land Cover</i>
CMIS	<i>Conical Scanning Microwave Imager/Sounder</i>
CML	<i>Chemical Markup Language</i>
CMYK	<i>Cyan–Magenta–Yellow–Black</i>
CNES	<i>Centre National d'Études Spatiales (France)</i>
CNR	<i>Consiglio Nazionale delle Ricerche (Italy)</i>
CNRS	<i>Centre National de la Recherche Scientifique (France)</i>
COBOL	<i>COmmon Business-Oriented Language</i>
CONAE	<i>Comision National de Actividades Espaciales</i>
CORINE	<i>Coordination of Information on Environment</i>
COSMO/SkyMed	<i>Constellation of Small satellites for the Mediterranean basin Observation</i>
CPU	<i>Central Processing Unit</i>
CRSS	<i>Canadian Remote Sensing Society</i>
CSA	<i>Canadian Space Agency</i>
CSCW	<i>Computer Supported Cooperative Work</i>
CSIRO	<i>Commonwealth Scientific and Industrial Research Organisation (Australia)</i>
CVA	<i>Change Vector Analysis</i>
CZCS	<i>Coastal Zone Color Scanner</i>
D	
D/A	<i>Digital to Analog (converter)</i>
DAAC	<i>Distributed Active Archive Center</i>
DAIS-1	<i>Digital Airborne Imagery System</i>
DAM	<i>Detection and Mapping</i>
DAT	<i>Digital Audio Tape</i>
DATIS	<i>Digital Airborne Topographic Imaging System</i>
DB	<i>DataBase</i>
DBMS	<i>DataBase Management System</i>
DCF	<i>Digital Cartographic File</i>
DDR	<i>Data Descriptive Record</i>
DDS	<i>Digital Data Storage</i>
DDSM	<i>Dense Digital Surface Model</i>
DEI	<i>Department of Electronics and Information</i>
DEM	<i>Digital Elevation Model; Digital Elevation Matrix</i>
DEM-G	<i>Digital Elevation Model – Graphic (coordinates)</i>
DEM-P	<i>Digital Elevation Model – Planar (coordinates)</i>
DGDF	<i>Digital Geospatial Data Files</i>
DGPS	<i>Differential Global Positioning System; Differential Global Positioning Satellite</i>
difSAR	<i>Differential SAR</i>
DIGCAT	<i>Digital Catalogue</i>
DIGEST	<i>Digital Geographic Information Exchange Standard</i>
DLL	<i>Windows Dynamic Link Library</i>
DLR	<i>Deutsches Zentrum für Luft- und Raumfahrt (German Aerospace Agency)</i>
DLT	<i>Digital Linear Tape</i>
DMA	<i>Defense Mapping Agency (USA); Designated Market Areas</i>
DMC	<i>Disaster Monitoring Constellation</i>

Acronym	Definition
DN	<i>Digital Number</i>
DoD	<i>Department of Defense (USA)</i>
DOP	<i>Dilution of Precision</i>
DORIS	<i>Decision-Oriented Resource Information System; Doppler Orbitography and Radiopositioning Integrated by Satellite</i>
DPI	<i>Dots per Inch</i>
DRF	<i>Digital Raster File</i>
DSE	<i>Data Switching Equipment</i>
DSM	<i>Digital Surface Model</i>
DSS	<i>Decision Support System</i>
DTD	<i>Document Type Definition</i>
DTE	<i>Data Terminal Equipment</i>
DTED	<i>Digital Terrain Elevation Data (U.S. government)</i>
DTM	<i>Digital Terrain Model (or Modelling)</i>
DWF	<i>Drawing Web Format</i>
DXF	<i>Drawing Interchange File; Digital Exchange Format</i>
E	
EAE	<i>European Agency for the Environment</i>
EARSel	<i>European Association of Remote Sensing Laboratories</i>
EarthCARE	<i>Earth Clouds Aerosols and Radiation Explorer</i>
EC	<i>European Commission</i>
ECSS	<i>European Cooperation for Space Standardisation</i>
ED50	<i>European Datum 1950</i>
EDC	<i>EROS Data Center (USGS)</i>
EE	<i>Electrical Engineering</i>
EEA	<i>European Environment Agency</i>
EGA	<i>Enhanced Graphics Adaptor</i>
EGNOS	<i>European Geostationary Navigation Overlay Service</i>
EIA	<i>Environmental Impact Assessment</i>
EIONET	<i>European Environment Information and Observation Network</i>
ENVISAT	<i>Environmental Satellite (ESA)</i>
EO	<i>Earth Observation</i>
EO-1	<i>Earth Orbiter-1 (NASA)</i>
EOF	<i>End of File</i>
EORC	<i>Earth Observation Research Center (Japan)</i>
EOS	<i>Earth Observing System, Earth Observation Satellites</i>
EOS AM	<i>NASA EOS Morning Crossing (Descending) Mission</i>
EOS PM	<i>NASA EOS Afternoon Crossing (Ascending) Mission</i>
EOSAT	<i>Earth Observation Satellite (Company)</i>
EOSDIS	<i>EOS Data and Information System (NASA)</i>
EPA	<i>Environmental Protection Agency (USA)</i>
EPS	<i>EUMETSAT Polar System</i>
EPS	<i>Encapsulated PostScript</i>
ERA	<i>European Research Area</i>
ERDAS	<i>Earth Resources Data Analysis System</i>
EROS	<i>Earth Resources Observation Satellite; Earth Resources Observation System</i>
ERS	<i>European Remote-Sensing Satellite (ESA)</i>
ERSAR	<i>Earth Resources Synthetic Aperture Radar</i>

Acronym	Definition
ErTPS	<i>Extended Real-Time Polling Service</i>
ERTS	<i>Earth Resources Technology Satellite</i>
ES	<i>Expert System</i>
ESA	<i>European Space Agency</i>
ESE	<i>Earth Science Enterprise</i>
ESRIN	<i>European Space Research Institute (ESA establishment)</i>
ESSA	<i>Environmental Science Service Administration</i>
ESSP	<i>Earth System Science Pathfinder</i>
ESTB	<i>EGNOS System Test Bed</i>
ESTEC	<i>European Space Research and Space Technology Centre (ESA)</i>
ETC	<i>European Topic Centres</i>
ETM+	<i>Enhanced Thematic Mapper Plus (NASA Landsat)</i>
ETRS89	<i>European Terrestrial Reference System 1989</i>
EU	<i>European Union</i>
EUMETSAT	<i>European Organisation for the Exploitation of Meteorological Satellites</i>
EUREF	<i>European Reference Frame</i>
F	
FAO	<i>Food and Agriculture Organization of the United Nations</i>
FCC	<i>False Colour Composite; Federal Communications Commission (USA)</i>
FGDC	<i>Federal Geographic Data Committee</i>
FM	<i>Facilities Management; Field Manual</i>
FM-1	<i>Flight Model 1 (NASA EOS MODIS)</i>
FMC	<i>Forward Motion Compensation</i>
FMP	<i>Field Pack Mobile Professional</i>
FORTRAN	<i>Formula Translation (computer language)</i>
FOV	<i>Field of View</i>
FSA	<i>Federal Space Agency (Russia)</i>
FTP	<i>File Transfer Protocol</i>
G	
G3OS	<i>Global Terrestrial Observing System</i>
GALILEO	<i>Informal name of GNSS</i>
GATES	<i>Geostationary Advanced Technology Environmental System</i>
GB	<i>Gigabyte; Geologische Bundesanstalt (Austria)</i>
GBF	<i>Geographic Base File</i>
GBI	<i>Green Biomass Index</i>
GCOM	<i>Global Climate Observing System</i>
GCP	<i>Ground Control Point(s)</i>
GCS	<i>Ground Control Station</i>
GCT	<i>Greenwich Civil Time</i>
GDA	<i>Geographic Data Analysis System</i>
GDC	<i>Geographic Data Council</i>
GDF	<i>Geographic Data File</i>
GEMI	<i>Global Environment Monitoring MSAVI</i>
GEO	<i>Geostationary Orbit</i>
GEOS	<i>Geodynamics Experimental Ocean Satellite</i>
GEOSAT	<i>Geodesy Satellite</i>

Acronym	Definition
GeoVIS	<i>Geographic Vector Interpretation System (Africover)</i>
GERIS	<i>Geophysical Environmental Research Imaging Spectrometer</i>
GGRF	<i>Galileo Geodetic Reference Frame</i>
GI	<i>GeoInformation; GeoSpatial Information</i>
GIF	<i>Graphic Interchange Format</i>
GIS	<i>Geographic(al) Information System(s); Geohydrologic Information System; Global Indexing System</i>
GISCO	<i>Geographic Information System of the European Commission</i>
GISIG	<i>Geographical Information Systems International Group</i>
GLAI	<i>Green Leaf Area Index</i>
GLCC	<i>Global Land Cover Characteristic</i>
GLCN	<i>Global Land Cover Network</i>
GLI	<i>Global Imager (Japan, ADEOS)</i>
GLOBE	<i>Global Change Observing Mission</i>
GLONASS	<i>Global'naya Navigatsionnaya Sputnikovaya Sistema, Global Orbiting Navigation Satellite System (Russia)</i>
GLOSS	<i>Global Observation Surveillance System</i>
GLRS	<i>Geoscience Laser Ranging System</i>
GMES	<i>Global Monitoring for Environment and Security</i>
GML	<i>Geography Markup Language</i>
GMS	<i>Global Land One-km Base Elevation</i>
GMT	<i>Greenwich Mean Time</i>
GNS	<i>GEOnet Names Server</i>
GNSS	<i>Global Navigation Satellite System</i>
GOCE	<i>Gravity field and steady-state Ocean Circulation Explorer</i>
GOES	<i>Geostationary Operational Environmental Satellite (NASA)</i>
GOFC	<i>Global Observations of Forest Cover (IGOS)</i>
GOLD	<i>Global Observation of Land Cover Dynamics</i>
GOME	<i>Global Ozone Monitoring Experiment</i>
GOMOS	<i>Global Ozone Monitoring by Occultation of Stars</i>
GOMS	<i>Geostationary Operational Meteorological Satellites</i>
GPL	<i>General Public Licence</i>
GPR	<i>Ground-Penetrating Radar</i>
GPRS	<i>General Packet Radio Service</i>
GPS	<i>Global Positioning System(s)</i>
GPST	<i>Global Positioning System Time</i>
GRASS	<i>Geographic Resource Analysis Support System</i>
GRD	<i>Ground Resolved Distance</i>
GRS 80	<i>Geodetic Reference System of 1980</i>
GSD	<i>Ground Sample Distance</i>
GSDI	<i>Global Spatial Data Infrastructure</i>
GSDM	<i>Global Spatial Data Model</i>
GSDS	<i>Global spatial data system</i>
GSFC	<i>Goddard Space Flight Center (NASA)</i>
GSLV	<i>Geosynchronous Satellite Launch Vehicle</i>
GSM	<i>Global System for Mobile Communication – Graphic Standard Metafile</i>
GSRC	<i>Geological Survey Research Committee</i>
GSS	<i>Geographic Support System</i>
GST	<i>Galileo System Time</i>

Acronym	Definition
GSTB	<i>Galileo System Test Bed</i>
GTOS	<i>Global Terrestrial Observing System (FAO)</i>
GUI	<i>Graphical User Interface</i>
GVI	<i>Green Vegetation Index</i>
H	
HIPERLAN	<i>High-PERformance Radio LAN</i>
HIRDLS	<i>High-Resolution Dynamics Limb Sounder</i>
HIRIS	<i>Hyperspectral InfraRed Imaging Spectrometer</i>
HPGN	<i>High-Precision Geodetic Network</i>
HRC	<i>High-Resolution Camera</i>
HRG	<i>High-Resolution Geometry (SPOT)</i>
HRPC	<i>High-Resolution Panchromatic Camera</i>
HRSC-A	<i>High-Resolution Stereo Camera-Airborne</i>
HRV	<i>Haute Résolution dans le Visible (SPOT)</i>
HRVIR	<i>High Resolution Visible Infrared (scanner)</i>
HSI	<i>Hue, Saturation, Intensity – Hyperspectral Imaging Instrument</i>
HTML	<i>Hypertext (or HyperText) Markup Language</i>
HTTP	<i>HyperText Transfer Protocol</i>
HTV	<i>H-II Transfer Vehicle</i>
HW	<i>Hardware</i>
HYDICE	<i>HYperspectral Digital Imagery Collection Experiment</i>
HYMAP	<i>Airborne Hyperspectral Imaging</i>
I	
I&CLC2000	<i>Image and Corine Land Cover 2000</i>
I/O	<i>Input/Output</i>
IASI	<i>Infrared Atmospheric Sounding Interferometer</i>
ICAO	<i>International Civil Aviation Organisation</i>
ICC	<i>International Colour Consortium</i>
IDC	<i>Internet Data Center</i>
IDE	<i>Imbedded Drive Electronics</i>
IDL	<i>Interactive Data Language; Interface Definition Language</i>
IDS	<i>Interdisciplinary Science</i>
IEC	<i>International Electrotechnical Commission</i>
IERS	<i>International Earth Rotation Service</i>
IFAD	<i>International Fund for Agricultural Development</i>
IFOV	<i>Instantaneous Field of View</i>
IFSARE	<i>Inter-ferometric Synthetic Aperture Radar for Elevation</i>
IGADD	<i>Intergovernmental Authority on Drought and Development</i>
IGBP	<i>International Geosphere–Biosphere Programme</i>
IGBP-DIS	<i>International Geosphere–Biosphere Programme – Data and Information System</i>
IGOS	<i>Integrated Global Observing Strategy</i>
IGS	<i>International GPS Service</i>
IKAR-N	<i>scanning microwave radiometer system</i>
IKAR-P	<i>nadir microwave radiometer</i>
ILAS	<i>Improved Limb Atmospheric Spectrometer (Japan)</i>
IMG	<i>Interferometric Monitor for Greenhouse Gases</i>
IMO	<i>International Maritime Organisation</i>

Acronym	Definition
IMS	<i>Information Management System</i>
IMU	<i>Inertial Measurement Unit</i>
INPE	<i>Instituto Nacional de Pesquisas Espaciais (Brasil)</i>
INRA	<i>Institut National de la Recherche Agronomique (France)</i>
INS	<i>Inertial Navigation System</i>
InSAR	<i>Interferometric Synthetic Aperture Radar</i>
INSAT	<i>Indian National Satellite</i>
INSPIRE	<i>Infrastructure of Spatial Information in the European Community</i>
IP	<i>Internet Protocol – Image Point – Integrated Project (CE)</i>
IPA	<i>Imagery Product Archive (USDMA)</i>
IPS	<i>Image Processing System; Inertial Positioning System</i>
IR	<i>Imaging Radiometer; Infrared; Information Retrieval</i>
IRF	<i>Internal Raster File; Internal Raster Format</i>
IRMSS	<i>Infrared Multispectral Scanner</i>
IRS	<i>Internal Revenue Service (USA); Information Retrieval System; Indian Remote Sensing (Satellite)</i>
ISA	<i>Israeli Space Agency</i>
ISAMS	<i>Improved Stratospheric and Mesospheric Sounder</i>
ISAS	<i>Institute of Space and Astronautical Science</i>
ISO	<i>International Standards Organization</i>
ISPRS	<i>International Society for Photogrammetry and Remote Sensing</i>
ISRO	<i>Indian Space Research Organisation</i>
ISS	<i>International Space Station</i>
ITOS	<i>Improved Tiros Operational Satellite</i>
ITRF	<i>International Terrestrial Reference Frame</i>
ITRS	<i>International Terrestrial Rotation Service</i>
ITU	<i>International Telecommunication System</i>
J	
JAVA	<i>Joint Academic Virtual Application</i>
JAXA	<i>Japan Aerospace Exploration Agency (ex NASDA)</i>
JEM	<i>Japan Experiment Module</i>
JERS	<i>Japanese Earth Resources Satellite</i>
JFIF	<i>JPEG File Interchange Format</i>
JGW	<i>JPEG with World File</i>
JPEG	<i>Joint Photographic Experts Group format</i>
JPL	<i>Jet Propulsion Laboratory (USA)</i>
JRC	<i>Joint Research Centre (Italy)</i>
JSP	<i>Java Server Pages</i>
JVM	<i>Java Virtual Machine</i>
K	
KARI	<i>Korea Aerospace Research Institute</i>
KB	<i>Kilobyte</i>
KBPS	<i>KiloBytes Per Second</i>
KOMPSAT	<i>Korean Multipurpose Satellite</i>
L	
LADAR	<i>Laser Detection and Ranging</i>
LFC	<i>Large Format Camera</i>

Acronym	Definition
LAGEO	<i>Laser Geodynamic Satellite</i>
LAI	<i>Leaf Area Index</i>
LAMP	<i>Low Altitude Mapping Photogrammetry</i>
LAMPS	<i>Laser-scan Automated Map Production System</i>
LAN	<i>Local Area Network</i>
LANDSAT	<i>Land Satellite</i>
LARA	<i>Aerial Laboratory for Environmental Research</i>
LASER	<i>Light Amplification by the Stimulated Emission of Radiation</i>
LBS	<i>Location-Based Services</i>
LCA	<i>Land Cover analysis</i>
LCCP	<i>National Land Cover Characterization Project</i>
LCCS	<i>Land Cover Classification System</i>
LCD	<i>Liquid-Crystal Displays</i>
LCDB	<i>Land Cover Database</i>
LCS	<i>Location Services</i>
LDHF	<i>Landsat-7 Data Handling Facility</i>
LEO	<i>Low Earth Orbit</i>
LGPL	<i>General Public Licence Library</i>
LIDAR	<i>Light Detection and Ranging</i>
LIDQA	<i>Landsat Image Data Quality Assessment (NASA)</i>
LIS	<i>Land Information System</i>
LISS	<i>Linear Imaging Self-scanning Sensor</i>
LORAN	<i>Long Range Navigation (system)</i>
LPI	<i>Lines per inch</i>
LPV	<i>Land Product Validation</i>
LRR	<i>Laser Reflector</i>
LRS	<i>Landsat Recorder System</i>
LSPIM	<i>Land-Surface Processes and Interactions Mission</i>
LSS	<i>Laser Scanning System</i>
LUT	<i>Look Up Table</i>
LWIR	<i>Long-Wave Infrared (spectral region)</i>
LZW	<i>Lempel Ziv Welch</i>
M	
MacOS	<i>Machintosh Operative System</i>
MADE	<i>Multipurpose Africover Database for Environmental resources</i>
MAGSAT	<i>Magnetic Field Satellite (USA)</i>
MAIS	<i>Modular Airborne Imaging Spectrometer</i>
MAP	<i>Map Accuracy Programme (Africover)</i>
MAPSAT	<i>Mapping Satellite (USA)</i>
MAS	<i>MODIS Airborne Simulator (NASA EOS)</i>
MATLAB	<i>Matrix Laboratory</i>
MB	<i>Megabyte</i>
MBLA	<i>Multi-Beam Laser Altimeter</i>
MCDM	<i>Multi-Criteria decision making</i>
MCGA	<i>Monochrome/Colour Graphics Adapter</i>
MCST	<i>MODIS Characterization Support Team (NASA EOS)</i>
MD	<i>Minimum Distance</i>
MEBS	<i>MODIS Emergency Backup System (NASA EOS)</i>
MEIS	<i>Multispectral Electrooptical Imaging Sensor</i>

Acronym	Definition
MEO	<i>Medium Earth Orbit</i>
MERES	<i>Mineral and Energy Resources Exploration Satellite (Japan)</i>
MERIS	<i>Medium Resolution Imaging Spectrometer (ESA Envisat)</i>
MESSR	<i>Multispectral Electronic Self-Scanning Radiometer</i>
METOP	<i>METeorology OPERational</i>
METSAT	<i>Meteorological Satellite</i>
MGRS	<i>Military Grid Reference System</i>
MHS	<i>Microwave Humidity Sounder (NASA EOS)</i>
MHz	<i>MegaHertz</i>
MIAS	<i>Multispectral Image Analysis System</i>
MIDAS	<i>Multispectral Interactive Data Analysis System</i>
MIME	<i>Multipurpose Internet Mail Extension</i>
MIPAS	<i>Michelson Interferometer for Passive Atmospheric Sounding</i>
MIR	<i>Russian orbital station</i>
MIRAS	<i>Microwave Imaging Radiometer with Aperture Synthesis (ESA)</i>
MISR	<i>Multiangle Imaging Spectro-Radiometer (NASA EOS)</i>
MIT	<i>Massachusetts Institute of Technology</i>
MIVIS	<i>Multispectral Infrared and Visible Imaging Spectrometer</i>
MLA	<i>Multi-linear array</i>
MLL	<i>Maximum Likelihood</i>
MLP	<i>Multilayer Perceptron</i>
MLS	<i>Microwave Limb Sounder</i>
MNS	<i>Multi-Navigator System</i>
MODEM	<i>Modulation and De-Modulation</i>
MODIS	<i>Moderate-Resolution Imaging Spectroradiometer (NASA EOS)</i>
MODLAND	<i>MODIS Land Discipline Group (NASA EOS)</i>
MODS	<i>Moderate Resolution Imaging Spectrometer</i>
MODEM	<i>MODulation and DEModulation</i>
MOMS	<i>Modular Optoelectric Multispectral Scanner</i>
MOPITT	<i>Measurements of Pollution in the Troposphere (Canada; NASA EOS)</i>
MP-MP	<i>Multipoint–Multipoint Systems</i>
MPRD	<i>Modified Proportional Radial Displacement</i>
MrSID	<i>Multiresolution Seamless Image Database</i>
MS	<i>MultiSpectral; Microwave Sounder</i>
MSAS	<i>MTSAT Satellite-Based Augmentation System</i>
MSAVI	<i>Modified Soil Adjusted Vegetation Index</i>
MSC	<i>Multispectral Camera</i>
MSG	<i>Meteosat Second Generation (ESA)</i>
MSL	<i>Mean Sea Level</i>
MSMR	<i>Multi-frequency Scanning Microwave Radiometer</i>
MSP	<i>Microsoft Paint format</i>
MSR	<i>Microwave Scanning Radiometer</i>
MSS	<i>Multispectral Scanner (Landsat)</i>
MSU-SK	<i>Multispectral Optical Scanner</i>
MTF	<i>Modulation Transfer Function</i>
MTPE	<i>Mission to Planet Earth (NASA)</i>
MTSAT	<i>Multi-functional Transport Satellite (Japan)</i>
MTU	<i>Magnetic Tape Unit</i>
MWF	<i>Map Window File</i>

Acronym	Definition
N	
NAD	<i>North American Datum</i>
NAL	<i>National Aerospace Laboratory of Japan</i>
NAPA	<i>National Academy of Public Administration</i>
NARSA	<i>National Advanced Remote Sensing Applications Program</i>
NASA	<i>National Aeronautics and Space Administration (USA)</i>
NASDA	<i>National Space Development Agency (Japan)</i>
NATO	<i>North Atlantic Treaty Organization</i>
NAVSTAR	<i>NAVigation Satellite Timing and Ranging Global Positioning System</i>
NAVTECH	<i>Navigation Technologies Corp.</i>
NBSM	<i>National Bureau of Surveying and Mapping (China)</i>
NCC	<i>National Cartographic Centre (Iran)</i>
NDCS	<i>National Digital Cartographic Standards</i>
NDVI	<i>Normalized Difference Vegetation Index</i>
NERC	<i>Natural Environment Research Council (UK)</i>
NESDIS	<i>National Space Development Agency of Japan</i>
NET	<i>National Environmental Satellite, Data, and Information Service</i>
NGDC	<i>National Geophysical Data Center (USA); National Geospatial Data Clearinghouse</i>
NGDF	<i>National Geospatial Data Files</i>
NGMA	<i>National Geoscience Mapping Agency (Australia)</i>
NGMBD	<i>National Geologic Map Database (USGS)</i>
NGWIC	<i>National Ground Water Information Center</i>
NICMOS	<i>Near-Infrared Camera and Multi-Object Spectrometer</i>
NIMA	<i>National Imagery and Mapping Agency (USA)</i>
NIR	<i>Near Infrared (spectral region)</i>
NLAPS	<i>National Landsat Archive Production System (USGS)</i>
NLCD	<i>National Land Cover Dataset (USGS),</i>
NLOS	<i>Not Line Of Sight</i>
NMAS	<i>National Map Accuracy Standard(s)</i>
NMP	<i>New Millenium Program (NASA)</i>
NNSS	<i>Navy Navigational Satellite System</i>
NOAA	<i>National Oceanic and Atmospheric Administration (USA)</i>
NPOESS	<i>National Polar-orbiting Operational Environmental Satellite System (USA)</i>
NRSA	<i>National Remote Sensing Agency (India)</i>
NRSC	<i>National Remote Sensing Centre (UK)</i>
NRSCC	<i>National Remote Sensing Centre of China</i>
NSAU	<i>National Space Agency of Ukraine</i>
NSC	<i>Norwegian Space Centre</i>
NSCAT	<i>NASA Scatterometer</i>
NSRS	<i>National Spatial Reference System (NOAA)</i>
NSP	<i>Korean National Space Development Plan</i>
NTF	<i>National Transfer Format (UK)</i>
NTIS	<i>National Technical Information Service (USA)</i>
NTS	<i>National Topographic Series (Canada); National Topographic System (Canada); Navigation Technology Satellite</i>
NVCS	<i>National Vegetation Classification Standard</i>

Acronym	Definition
O	
OCM	<i>Ocean Colour Monitor</i>
OCR	<i>Optical Character Recognition; Optical Character Reader</i>
OCTS	<i>Ocean Colour and Temperature Scanner (Japan, ADEOS)</i>
ODBC	<i>Operational Database Connectivity</i>
OEC	<i>Optical-Electronic Camera</i>
OGC	<i>Open Geospatial Consortium</i>
OLE	<i>Object Linking Embedding</i>
OMI	<i>Ozone Monitoring Instrument</i>
ORBIMAGE	<i>Orbital Imaging Corp</i>
ORD	<i>Object-Relational DataBase</i>
ORDBMS	<i>Object-Relational DataBase Management System</i>
ORFEO	<i>Optical and Radar Federated Earth Observation</i>
OS	<i>Operative System</i>
OSCAR	<i>Online Satellite Catalogue and Request System (NOAA)</i>
OSMI	<i>Ocean Scanning Multispectral Imager</i>
OSTM	<i>Ocean Surface Topography Mission</i>
P	
PAGES	<i>Program for the Adjustment of GPS Ephemeris</i>
PALSAR	<i>Phased-Array L-band SAR (Japan)</i>
PAN	<i>Panchromatic</i>
PBM	<i>Portable Bitmap (format)</i>
PC	<i>Personal Computer; Principal Components</i>
PCA	<i>Principal Components Analysis</i>
P-Code	<i>Precise Code; Protected Code</i>
PCX	<i>PC Paintbrush Export Format</i>
PDA	<i>Personal Digital Assistant</i>
PE&RS	<i>Photogrammetric Engineering & Remote Sensing (journal)</i>
PFM	<i>Proto-Flight Model (NASA)</i>
PGM	<i>Portable Graymap (format)</i>
PHP	<i>Personal Home Page</i>
PIC	<i>Lotus 1-2-3 Picture Format</i>
Pixel	<i>Picture element</i>
P-MP	<i>Point–MultiPoint systems</i>
PNG	<i>Portable Network Graphics (format)</i>
PNN	<i>Probabilistic Neural Network</i>
POLDER	<i>Polarization and Directionality of the Earth's Reflectances (CNES, ADEOS)</i>
PP	<i>Principal Point</i>
PPM	<i>Portable Pixelmap (format)</i>
PPR	<i>Portland Pattern Repository</i>
PPS	<i>Precise Position Service</i>
PR	<i>Precipitation Radar (Japan)</i>
PRARE	<i>Precise Range and Range Rate Equipment</i>
PRF	<i>Point Response Function</i>
PRIRODA	<i>Nature Instrument Model on Russian MIR Station</i>
PRISM	<i>Panchromatic Remote Sensing Instrument for Stereo Mapping (Japan); Processes Research by an Imaging Space Mission</i>

Acronym	Definition
PRS	<i>Public Regulated Service</i>
PSLV	<i>Polar Satellite Launch Vehicle</i>
PVI	<i>Perpendicular Vegetation Index</i>
Q	
QA	<i>Quality Assurance</i>
QUASAR	<i>Q</i> uality Assurance and <i>St</i> ability Reference
R	
RA	<i>Radar Altimeter</i>
RADAR	<i>Radio Detecting and Ranging</i>
RAM	<i>Random Access Memory</i>
RAR	<i>Real Aperture Radar</i>
RASA	<i>Russia Aviation-Space Agency</i>
RBV	<i>Return Beam Vidicon</i>
RCSSMRS	<i>Regional Center for Services in Surveying, Mapping and Remote Sensing</i>
RDBMS	<i>Relational Database Management System</i>
RFM	<i>Rational Functional Model</i>
RGB	<i>Red–Green–Blue</i>
RIN	<i>Realty Information Network</i>
RINEX	<i>Receiver Independent Exchange (GPS data format)</i>
RIP	<i>Raster Image Processing; Raster Image Processor</i>
RIS	<i>Retroreflector in Space</i>
RMSE	<i>Root-Mean-Square Error</i>
RNSS	<i>Radio Navigation Satellite Service</i>
ROA	<i>Remotely Operated Aircraft</i>
ROM	<i>Read-Only Memory</i>
ROSA	<i>Radio Occultation for Sounding the Atmosphere</i>
ROSHYDROMET	<i>Russian Federal Service for Hydrometeorology and Environmental Monitoring</i>
ROSIS	<i>Reflective Optics System Imaging Spectrometer</i>
RPC	<i>Rational Polynomial Coefficients</i>
RPF	<i>Raster Product Format</i>
RPV	<i>Remotely Piloted Vehicle</i>
RSA	<i>Russian Space Agency Rosaviakosmos</i>
RSG	<i>Remote Sensing Group (UAZ)</i>
RSI	<i>RADARSAT International</i>
RSS	<i>Remote Sensing Society (UK)</i>
RTCM	<i>Radio Technical Commission for Maritime (format)</i>
RTF	<i>Rich Text Format</i>
RT-GPS	<i>Real-Time Differential GPS</i>
rtPS	<i>Real-Time Polling Service</i>
RTK	<i>Real-Time Kinematics; Right-to-Know Network</i>
RTP	<i>Real-Time Positioning</i>
S	
S/N	<i>Signal-to-Noise Ratio</i>
SA	<i>Selected Availability; Selective Availability</i>
SADCC	<i>Southern African Development Community</i>

Acronym	Definition
SAN	<i>Storage Area Network</i>
SAR	<i>Synthetic Aperture Radar; Search and Rescue Service</i>
SAVI	<i>Soil-Adjusted Vegetation Index</i>
ScaLARS	<i>Scanning Laser Altitude and Reflectance Sensor (Germany)</i>
SCARAB	<i>Scanner for the Radiation Budget</i>
SCIAMACHY	<i>Scanning Imaging Absorption Spectrometer for Atmospheric Cartography</i>
SDBMS	<i>Spatial DataBase Management System</i>
SDES	<i>Spatial Data Exchange Standard</i>
SDI	<i>Spatial Data Infrastructure</i>
SE	<i>Search Engine</i>
SEASAT	<i>Sea Satellite (USA)</i>
SeaWiFS	<i>Sea-Viewing Wide Field-of-View Sensor</i>
SEVIRI	<i>Spinning Enhanced Visible and Infrared Imager (ESA)</i>
SFSI	<i>Shortwave-Infrared Full Spectrum Imager (Canada)</i>
SI	<i>Spatial Information</i>
SIASGE	<i>Sistema Italo-Argentino de Satélites protects Gestión de Emergencias</i>
SIR	<i>Shuttle Imaging Radar; Space Imaging Radar (NASA)</i>
SIRS	<i>Satellite Infrared Spectrometer</i>
SIS	<i>Spatial Information System</i>
SLAR	<i>Side-Looking Airborne Radar</i>
SMIL	<i>Synchronized Multimedia Integration Language</i>
SMOS	<i>Soil Moisture and Ocean Salinity</i>
SMTP	<i>Simple Mail Transfer Protocol</i>
SNM	<i>Square Nautical Miles</i>
SNN	<i>Structured Neural Network</i>
SNSB	<i>Swedish National Space Board</i>
SoL	<i>Safety of Life Service</i>
SOLSPEC	<i>Solar Spectrum (Space Shuttle instrument from Europe)</i>
SOM	<i>Space Oblique Mercator (projection); Spatial Object Manager</i>
SONAR	<i>Sound Navigation and Ranging</i>
SPIE	<i>Society of Photo-optical Instrumentation Engineers</i>
SPIN-2	<i>Space Information-2 Meter Data (Russian Space Agency)</i>
SPOT	<i>Système Probatoire d'Observation de la Terre; Système Pour l'Observation de la Terre</i>
SPS	<i>Standard Position Service</i>
SQL	<i>Standard Query Language; Structured Query Language</i>
SRMCS	<i>Soil Resources Management and Conservation Service</i>
SROM	<i>Spectro-radiometer for Ocean Monitoring</i>
SRTM	<i>Shuttle Radar Topography Mission</i>
SS	<i>Subscriber Station</i>
STDN	<i>Spacecraft Tracking and Data Network</i>
STS	<i>Space Transportation System</i>
SVG	<i>Scalable Vector Graphics</i>
S-VGA	<i>Super Video Graphics Array</i>
SW	<i>Software</i>
SWIR	<i>Short-Wave InfraRed (TM5 and TM7 spectral region)</i>
T	
TCP/IP	<i>Transmission Control Protocol/Internet Protocol</i>
TCT	<i>Tasseled Cap Transformation, Kauth–Thomas 1976</i>

Acronym	Definition
TDRSS	<i>Tracking and Data Relay Satellite System (NASA)</i>
TES	<i>Tropospheric Emission Spectrometer</i>
3S	<i>Small Satellite System, Suite de Systeme SPOT, SPOT Successor System</i>
TIFF	<i>Tag Image File Format</i>
TIMS	<i>Thermos Infrared Multispectral Scanner</i>
TIN	<i>Triangulated Irregular Network</i>
TIR	<i>Thermal InfraRed</i>
TIROS	<i>Television Infrared Observing Satellite</i>
TIRS	<i>Thermal Infrared Scanner</i>
TIS	<i>Topographic Information Systems</i>
TLS	<i>Terrestrial Laser Scanning</i>
TM	<i>Thematic Mapper (Landsat) – Telemetry</i>
TMI	<i>TRMM Microwave Instrument (Japan)</i>
TNC	<i>The Nature Conservancy</i>
TOMS	<i>Total Ozone Mapping Spectrometer</i>
TOPEX	<i>Ocean Topography Experiment</i>
TP	<i>Tie Point</i>
TPS	<i>Thin-Plate Splines</i>
TRMM	<i>Tropical Rainfall Measuring Mission (Japan)</i>
TSAVI	<i>Transformed Soil Adjusted Vegetation Index</i>
TT&C	<i>Tracking, Telemetry and Command</i>
U	
U-2	<i>A high altitude remote sensing aircraft</i>
UARS	<i>Upper Atmosphere Research Satellite</i>
UAV	<i>Unmanned Aerial Vehicles</i>
UGS	<i>Unsolicited Grant Service</i>
UI	<i>Urban Index</i>
UID	<i>Univariate Image Differencing</i>
UMTS	<i>Universal Mobile Telecommunications System</i>
UNEP	<i>United Nations Environment Program</i>
UNOOSA	<i>United Nations Office of Outer Space Affairs</i>
UN-WFP	<i>United Nations-World Food Programme</i>
URI	<i>Uniform Resource Identifier</i>
URL	<i>Uniform Resource Locator</i>
USDA	<i>United States Department of Agriculture</i>
USGS	<i>United States Geological Survey (USA)</i>
USNVC	<i>United States National Vegetation Classification</i>
UTC	<i>Universal Time Coordinated</i>
UTM	<i>Universal Transverse Mercator</i>
UTP	<i>Unshielded Twisted-Pair</i>
UV	<i>Ultraviolet</i>
UVS	<i>Unmanned Vehicle System</i>
V	
VCL	<i>Vegetation Canopy Lidar</i>
VGA	<i>Video Graphics Array; Video Graphics Adaptor</i>
VGIS	<i>Virtual Geographical Information System</i>
VGI	<i>SPOT-4 VEGETATION instrument (France)</i>
VHF	<i>Very High Frequency</i>

Acronym	Definition
VHRPC	<i>Very High Resolution Panchromatic Camera</i>
VHRR	<i>Very High Resolution Radiometer</i>
VI	<i>Vegetation Index</i>
VID	<i>Vegetation Index Differencing</i>
VIIRS	<i>Visible and Infrared Imaging Radiometer Suite</i>
VIRS	<i>Visible Infrared Scanner (Japan)</i>
VIS	<i>Visible (spectral region)</i>
VLDS	<i>Very Large Data Store</i>
VML	<i>Vector Markup Language</i>
VNIR	<i>Visible and Near-Infrared (spectral region)</i>
VoIP	<i>Voice over Internet Protocol</i>
VPN	<i>Virtual Private Networks</i>
VTIR	<i>Visible and Thermal Infrared Radiometer</i>
W	
W3C	<i>World Wide Web Consortium</i>
WAAS	<i>Wide Area Augmentation System</i>
WAN	<i>Wide Area Network</i>
WAP	<i>Wireless Application Protocol</i>
WCRP	<i>World Climate Research Program</i>
WDVI	<i>Weighted Difference Vegetation Index</i>
WFI	<i>Wide Field Imager</i>
WGCV	<i>Working Group on Calibration and Validation (CEOS)</i>
WGS 84	<i>World Geodetic System of 1984</i>
Wi-Fi	<i>Wireless Fidelity</i>
WiFS	<i>Wide Field-of-view Sensor</i>
WiMAX	<i>Worldwide Interoperability for Microwave Access</i>
WirelessMAN	<i>Wireless Metropolitan Area Network</i>
WIS	<i>West Indian Space</i>
WLAN	<i>Wireless Local Area Network</i>
WMO	<i>World Meteorological Organization</i>
WWW	<i>World Wide Web</i>
X	
xDLS	<i>eXtensible Distance Learning System</i>
XML	<i>eXtensible Mark-up Language</i>
XSL	<i>eXtensible Stylesheet Language</i>
XSLT	<i>eXtensible Stylesheet Language Transformation</i>