



## REMOTE SENSING TERMINOLOGY

### A

**Active Sensor:** A sensor that provides its own illumination or energy and measures what is reflected back (e.g., RADAR).

**Amplitude:** The “height” of a wave or its maximum displacement from equilibrium.

**Anthropogenic:** Resulting from human activity.

**AOD:** Aerosol Optical Depth

**AOT:** Aerosol Optical Thickness

**ARSET:** Applied Remote Sensing Training

**Azimuth:** The direction parallel to the flight path of an aircraft or orbit of a satellite.

### B

**Backscatter:** In remote sensing refers to the energy reflected directly back at an active sensor after hitting a target.

**Band:** A band represents a segment of the electromagnetic spectrum.

**Bathymetry:** Measurement of the depth of water bodies.

### C

**CBP:** Capacity Building Program

**Classification:** The process of using certain data characteristics to assign classes to certain areas or objects.

**Composite Image:** A single image made up of the most usable parts of multiple images of the same area or region.

**Conic:** A type of projection that projects Earth’s features onto a conical plane.

**Coordinate Reference System:** A coordinate-based local, regional, or global system used to locate geographical entities.

**Cylindrical:** A type of projection that projects Earth’s features onto a cylindrical plane.

### D

**DAAC:** Distributive Active Archive Center

**Datum:** A known point that can be used as a reference point for all other locations.

**DEM:** Digital Elevation Model

### E

**Earth Observations:** The gathering of information about Earth’s physical, chemical, and biological systems (e.g., satellite imagery).

**Electromagnetic Radiation:** The energy the Earth receives from the Sun.

**Electromagnetic Spectrum:** A term used to describe the entire range of light that exists.

**EOSDIS:** Earth Observing System Data and Information System

**ESDIS:** Earth Science Data and Information System

**Evapotranspiration:** The process by which water is transferred from the land to the atmosphere by evaporation from the soil and transpiration from plants.

### F

**Flux:** The rate of transfer of fluid, particles, or energy across a given surface.

**Frequency:** The number of cycles of a wave passing a fixed point per unit of time.

## G

**Geodetic:** Relating to geodesy.

**Geodesy:** The science of accurately measuring and understanding three fundamental properties of the Earth: its geometric shape, its orientation in space, and its gravity field.

**Geoid:** The hypothetical shape of the Earth, coinciding with mean sea level and its imagined extension under (or over) land areas.

**Georeference:** To link spatial data to its correct location.

**Geostationary:** Remaining fixed over a specific location on Earth's surface.

**GIS:** Geographic Information System

**Greenhouse Effect:** A process that occurs when energy from a planet's sun goes through its atmosphere and warms the planet's surface, but the atmosphere prevents the heat from returning directly to space, resulting in a warmer planet.

**Greenhouse Gas:** A gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect. The primary greenhouse gases in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.

**Gridded:** Spatial data displayed over a uniform grid, often tied to specific locations.

## H

**Hyperspectral Imaging:** Measuring across the electromagnetic spectrum using hundreds or thousands of narrow bands.

## I

**Impervious Surface:** Mainly artificial structures—such as pavements that are covered by water-resistant materials such as asphalt, concrete, brick, stone—and rooftops. Soils compacted by urban development are also highly impervious.

**Incident Angle:** The angle between a ray (e.g., a RADAR wave) incident on a surface and the line perpendicular to the surface at the point of incidence.

**In Situ:** Meaning in the original place. In remote sensing commonly referring to data collected on the ground to validate data collected from airborne or spaceborne sensors.

**Intensity:** The average power transfer over one period of the wave.

## L

**LiDAR:** Light Detection And Ranging

## M

**Masking:** A method of removing certain sections of an image (e.g., removing clouds from an image to leave only the usable portion).

**Microwave:** A comparatively short electromagnetic wave.

**Mosaic:** A single, larger image made up of multiple smaller images.

**Multispectral:** Measuring across the electromagnetic spectrum using typically 3 to 10 bands.

## N

**Nadir:** The point on the Earth's surface directly below the observing satellite.

**NAIP:** National Agriculture Imagery Program

**NBR:** Normalized Burn Ratio

**NDBI:** Normalized Difference Built-Up Index

**NDVI:** Normalized Difference Vegetation Index

**NDWI:** Normalized Difference Water Index

**Near-Real Time (NRT):** Data that is available for use less than 3 hours after the time of observation.

**NOAA:** National Oceanic and Atmospheric Administration

## O

**Optical:** Sensors that gather light from the visible and infrared parts of the spectrum.

**Orthorectification:** The process of correcting optical distortions from the sensor system in an image, thereby setting the precise location of pixels in their true geospatial location.

## P

**Passive Sensor:** A sensor that does not provide its own illumination or energy and only measures reflected or emitted energy.

**Phase:** The position of a point in time on a waveform cycle.

**Phenology:** The study of the cyclic patterns of plant and animal life.

**Planar:** A type of projection that projects Earth's features onto a flat plane.

**Platform:** What carries a sensor. Typically a satellite or an airplane.

**Polar:** A type of orbit that crosses the poles.

**Polarization:** The orientation of an electromagnetic wave.

**Projection:** The means by which you display the coordinate system and your data on a flat surface.

## R

**Radar:** An active sensor that uses radio waves to measure the distance to an object.

**Radiance:** A measure of the light or heat emitted from a target object.

**Radiometric Resolution:** Describes a sensor's ability to discriminate differences in energy (or radiance).

**Range:** The direction perpendicular to an orbit or flight path.

**Real Time:** Data that is available immediately after observation.

**Reflectance:** A measure of the light or heat reflected off a target object.

**Resampling:** The process of adjusting the spatial resolution of one image to match the spatial resolution of another.

**Retrieval:** The process of retrieving raw data from a satellite.

## S

**SIF:** Solar Induced Fluorescence

**Spatial Resolution:** The ground surface area that forms one pixel in the image.

**Spatial Extent:** The overall surface area covered by a given dataset.

**Spectral Resolution:** The number and width of spectral bands of the sensor. The higher the spectral resolution, the narrower the wavelength range for a given channel or band.

**Spectrometer:** An instrument used to measure the properties of light over a specific portion of the electromagnetic spectrum.

**Spectroradiometer:** A light measuring device that can measure both the wavelength and amplitude of emitted light.

**Sun-Synchronous:** The satellite always visits the same spot at the same local time.

**Swath:** The area imaged on Earth's surface by one pass of an aircraft or satellite.

**Synthetic Aperture Radar (SAR):** A form of radar that uses the motion of the radar antenna to create finer spatial resolution than a traditional stationary radar.

## T

**Temporal Resolution:** The time it takes for a satellite to complete one orbit cycle—also called “revisit time.”

**Time Series:** A series of images over a single target area collected at different points in time.

**TOA:** Top Of Atmosphere

**Topography:** The arrangement of the natural and artificial physical features of an area.

## U

**UAV:** Unmanned Aerial Vehicle

**USGS:** United States Geological Survey

**USDA:** United States Department of Agriculture

**Urban Heat Island:** A phenomenon characterized by increased temperature in urban areas in relation to the surrounding areas caused by an increase in impervious surfaces (e.g., pavement) that retain heat.

## W

**Wavelength:** The length of one wave cycle.

## Z

**Zenith:** An imaginary point directly above a particular location.