or blue can be used.

> Geographic context:

Objects have proximity and distance relationship between neighbors.

> Nearest Neighbor Classification:

It is similar to supervised classification.

After multi resolution segmentation, the user identifies sample sites for each land cover class.

Next statistics are defined to classify image objects.

Finally the nearest neighbor classifies objects to the training sites based on their resemblance and the defined statistics.

Photographic and Digital Products:

Photographic and digital products play crucial role in remote sensing, offering diverse data outputs.

Traditional aerial photography provides high resolution images for detailed analysis.

Digital products such as multispectral and hyper spectral imagery, enhance the ability to capture and analyze specific wavelengths, aiding applications like vegetation health assessment and mineral identification.

Additionally, LIDAR technology generates precise elevation data, contributing to 3D modeling and terrain analysis in remote sensing applications.

⇒ Photographic Products

* Orthophotos : Aerial images corrected for distortions, providing accurate representations of the earth's surface.
  It is very important for accurate mapping and spatial analysis.

* Stereoscopic Imagery : A pair of overlapping images captured from different perspectives, allowing analysts to perceive the terrain in 3D.
  It is used for feature identification and measurement.

* Photogrammetric Products: Derived from photogrammetry and it includes point clouds which represent 3D co-ordinates of surface points and digital elevation models (DEMs) for topographic mapping.

* Mosaics : Stitched together from multiple images.
  It provide a seamless and comprehensive view of large areas.
  They are useful for regional planning and land cover assessment.

⇒ * Digital Products

* Digital Orthophotos: These are directly captured by digital sensors, offer high spatial resolution and accurate georeferencing
  They are essential for GIS applications.

* Satellite Imagery: Digital sensors aboard satellites capture data for various purposes, including monitoring land cover changes, assessing environmental conditions and supporting disaster management.

* Hyperspectral Imagery: These sensors capture a wide range of spectral bands enabling detailed analysis of surface materials.

This is valuable for tasks like mineral identification and environmental monitoring.

* LiDAR Data: Light Detection and Ranging technology uses laser pulses to measure distances creating highly accurate elevation models.

LiDAR is crucial for terrain modeling and assessing canopy structure.

* RADAR Imagery: Synthetic Aperture Radar (SAR) on satellites provides all weather, day and night imaging.

It is used for applications like detecting land cover changes, monitoring agriculture and assessing deforestation.

* Digital Terrain Models: Similar to DEM, DTM represents the bare Earth's surface without any vegetation or human-made structures, providing valuable information for various applications.

The integration of these products into Geographic Information systems (GIS) enhances their usability, allowing for advanced spatial analysis, decision making and monitoring of Earth's surface over time.

The transition to digital technologies has significantly improved the efficiency and accuracy of remote sensing processes.

Types, Levels and Open Source Satellite Data Products

Satellite data products encompass a diverse range of information captured by Earth Observation satellites.

⇒ Types of Satellite Data:

* Optical Imagery: Captures visible and infrared light, providing high-resolution images for applications like land cover mapping and change detection

* Radar Imagery (SAR): Utilizes radar signals to create images, offering all-weather and day and night capabilities.

SAR is valuable for terrain mapping, monitoring vegetation and disaster response.

* Hyperspectral Imagery : captures a wide range of spectral bands, enabling detailed analysis of material composition.

Useful for agriculture, environmental monitoring and mineral exploration.

* Thermal Infrared Imagery: Measures thermal radiation, allowing the assessment of surface temperatures

Applied in agriculture, urban heat island studies and environmental monitoring

* Multispectral Imagery: Captures data in multiple bands, often including visible and near infrared spectra. Beneficial for vegetation health assessment and land cover classification.

⇒ Levels of Satellite Data:

* Level 0 (Raw data): Unprocessed data as received directly from the satellite.
* Level 1 (Radiometrically corrected): Calibration for radiometric distortions, providing pixel values in physical units.
* Level 2 (Geometrically corrected): Radiometrically corrected data with additional geometric corrections for accurate spatial representation.
* Level 3 (Geophysical Parameters): Derived products such as vegetation indices, land surface temperature or atmospheric parameters.

⇒ Open Source Satellite Data Products:

* Sentinel Data (ESA): Part of the copernicus program, sentinel-1 (SAR) and sentinel-2 (optical) data are freely accessible.
* LANDSAT Data (USGS/NASA): Landsat satellites provide multispectral and thermal data. Landsat imagery is widely used for land cover monitoring

* MODIS (NASA): Moderate Resolution Imaging spectroradiometer provides global coverage and is used for climate studies, land cover mapping and monitoring.

* Copernicus Open Access Hub: Offers access to various copernicus sentinel satellite Data including optical and SAR data.

* USGS Earth Explorer: Provides access to a variety of satellite data, including Landsat, Sentinel and others.

* NOAA CLASS: The comprehensive Large Array-data stewardship System (CLASS) offers access to NOAA satellite data.

* Google Earth Engine: While not a source itself, it provides a platform for accessing and analyzing various satellite datasets.

Open source satellite data facilitates research, monitoring and analysis, supporting a wide range of applications from environmental studies to disaster response.

Selection and Procurement of Data:

Selection and procuring data in remote sensing involves a systematic process to ensure that the acquired information aligns with the objectives of a particular project.

The step by step is given below,

* Define Project Objectives:

Clearly articulate the goals and objectives of remote sensing project.

Specify the type of information needed, the spatial and temporal resolution required and any specific variables of interest.

* Identify Area of Interest (AOI):

Clearly define the geographic area you intend to study or monitor.

* Research Available Sensors and Satellites:

Identify satellites or sensors that offer data relevant to your AOI and objectives.

Consider factors like spatial resolution, spectra bands, revisit frequency and sensor characteristics.

* Consider Temporal Requirements:

Determine the required temporal frequency for data acquisition.

Some applications may need frequent revisits while others may focus on seasonal or annual data.

* Assess Data Sources:

Explore open access repositories (Eg: NASA Earthdata, USGS Earth Explorer), commericial satellite providers, or data sharing initiatives (eg: Copernicus).

Understand the types of data each source provides and their data distribution policies.

* Evaluate Data Quality:

Check the data and quality assessments provided by data providers.

* Assess factors such as cloud cover, atmospheric conditions and the accuracy of the sensor

* Consider Spatial Resolution:

Choose data with an appropriate spatial resolution based on the scale of study.

High resolution data is suitable for detailed analysis, while coarser resolution may suffice for ~~boro~~ broader regional assessments.

* Review Historical Data:

Investigate the availability of historical data to analyze temporal bands or changes over time.

* Budget and Cost Analysis:

Evaluate the costs associated with data acquisition, including any subscription fees, licensing costs or processing charges.

Consider budget constraints and explore free or lower cost data options if available.

* Check Data Format and Compatibity:

Ensure that the selected data format is compatible with your analysis tools or software.

Consider preprocessing requirements and the availability of data in the desired format. (Eg: GeoTIFF, Net CDF).

* Legal and Ethical Considerations:

Understand the licensing agreements, terms of use and any legal restrictions associated with the data.

Ensure compliance with regulations and ethical considerations related to data use

* Engage with Data Providers :

Communicate with data providers to address specific inquires , clarify any uncertainties and establish a reliable channel for onging support :

* Data Access and Delivery :

Verify the accessibility of the selected data and the distribution of mechanism

consider the ease of download, availability of APIs. or cloud based access options.

By systematically going through these steps ~~you can match make~~ informed decisions during the selection and procurement of remote sensing data is made.

It also ensure that the data acquired is suitable for the project objectives and requirements.