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MAPPING OF NATURAL RESOURCES THROUGH GPS AND REMOTE SENSING TECHNIQUES

Abstract

Abstract Maps and natural resource management are critical for sustainable land management, environmental protection, and effective decision-making. Remote sensing, GPS, and GIS are key geospatial tools for analyzing and mapping natural diversity. This abstract focuses on applying this technique to map specific natural features such as forests, lakes, ground water, rivers, mountains, soil types (both acidic and saline), residences, and agriculture area. Remote Sensing requires the use of satellite or aircraft sensors to collect surface data. Satellite-based sensors such as Landsat, Sentinel, GNSS, and SRTM give multispectral and ultra-spectral data, allowing for the identification of changes in plant cover, land use, and environmental changes. The combination of remotely sensed pictures and ground truth data improves monitoring accuracy. The Global Positioning System (GPS) squares signals from several satellites to offer precise position data. It is commonly used to map items like land boundaries, highways, and infrastructure. The Geographic Information System (GIS) offers geographical data processing, visualization, and modeling. It Permits the integration of a variety of data types, including satellite images, GPS coordinates, and attribute information. GIS-based maps give useful information on natural resource distribution and spatial connections.

I. Forests: Remote sensing monitors forest cover, deforestation, and biodiversity. Satellite data, such as those collected by the Global Forest Monitoring Platform1, is suitable for use to monitor tree cover.

II. Water bodies include groundwater, lakes, and rivers. Satellite photography depicts the extent of flow, water quality, and variations over time. GPS and Landsat give reliable mapping of lake and riverbanks, as well as monitoring changes in their extent over time.

III. Elevation data from satellites aids in charting mountain terrain. GIS allows for evaluating slopes, sections, and terrain.

IV. Soil types: acidic and saline. Remote sensing can identify landscapes with specific soil properties, especially acidity and salinity. Multispectral data can be used to determine the level of water in the soil.

V. GPS coordinates are useful for mapping residential regions, urban sprawl, and building density. Individual systems are easier to recognize when using high-resolution satellite photography.

VI. Agriculture: Remote sensing is used to monitor crop health, classify land usage, and forecast crops. Precision GPS-guided agriculture makes better use of resources.

The combination of GPS and satellite remote sensing technologies will change the course of natural resource mapping. Using these methods, we can better comprehend Earth's ecosystems, control change, and promote sustainable resource usage.

Keywords: satellite, GPS, GIS, Remote sensing, Agriculture