

## GEOSPATIAL DATA PROCESSING CHARACTERISTICS FOR ENVIRONMENTAL MONITORING TASKS

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### Abstract

This paper explores the specifics of working with geospatial data when making decisions about the current environmental status of objects based on Earth space monitoring data. The expediency of sharing statistical data, Earth remote sensing data, and contact measurements is displayed. An analysis of the specifics of this approach to solving the problems of complex processing of multi-temporal a priori data obtained by various shooting equipment was carried out. The existing methods for combining such data are analyzed and possible options for reducing temporary resources and reducing requirements for information resources when working with large volumes of information are considered. It is appropriate to use the method of hierarchical partitioning of multi-temporal image data or images of the analyzed areas obtained at the same time, but from different satellites taking into account the specifics of the shooting equipment and subject to their correspondence to the given a priori geospatial information. One of the criteria for hierarchical partitioning is the identification of areas of greatest correspondence with a priori data with their geographical reference in satellite imagery to reduce the localization time of the corresponding zones throughout the analyzed image array. The economic application effect of this method is substantiated by reducing the computational complexity of costly pattern matching processes, as well as performance improvement of change determination algorithms in topological and geometric characteristics of these objects. An algorithm is shown for detecting changes in heterogeneity in images based on the result of overlay operations with time-differentiated satellite imagery. To confirm the adequacy of the proposed method, the results of its practical implementation are shown on the Ukraine-Poland border area. A comparative analysis of the obtained results with real data is carried out.

**Keywords:** Criterion trees; Geoinformation systems; Photogrammetric processing; Remote sensing; Space monitoring; Hierarchical segmentation.