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Fundamental Concepts For Geospatial Analysis

Certain fundamental concepts and techniques are useful for analyzing spatial and temporal environmental data for project optimization. Almost all samples collected as part of environmental investigations qualify as spatial data. These data, also called georeferenced or geospatial data, have been labeled to show the location where they were collected (for example, labeling latitude, longitude and, in some cases, depth). Samples collected as part of environmental investigations also have been labeled with the collection date.

An overview of basic concepts that apply to geospatial data is presented here, followed by an overview of geospatial interpolation and model prediction. The concept of uncertainty in geospatial analysis is also addressed. Finally, characteristics of interpolation methods are introduced.

Basic statistical concepts aid in understanding the various geospatial methods and in interpreting the results (for example, statistical significance, mean prediction error, root mean square error, z-scores in inverse distance weighting). Common EDA methods are listed in this document and links are provided to GSMC-1 sections.