

SPATIAL CDF ESTIMATION AND VISUALIZATION WITH
APPLICATIONS TO FOREST HEALTH MONITORING

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ABSTRACT

This paper discusses the estimation and visualization of spatial cumulative distribution functions (CDFs) with extensions to bivariate and higher dimensional CDFs. The use of CDFs is an important part of the USEPA Environmental Monitoring and Assessment Program's (EMAP) work in assessing and monitoring the state of the nation's environmental resources. The resources in a given region can be classified broadly into nominal, marginal, or sub-nominal states. These can be obtained from the spatial CDF which, in its entirety, offers the greatest flexibility for investigation of spatial and temporal trends. The emphasis in this paper is on the computational and graphical techniques implemented in an interactive environment. The environment supports computation and visualization of CDFs over several spatial regions and features interaction between and linking of elements in the CDF plot and the map view. The work involves communication of data between a geographic information system (GIS), ArcView 2.0TM, and a program for dynamic graphics, XGobi (Swayne et al., 1991).