

Comparison of Spatial Distributions of Pollen and Vegetation in North America Using Geographic Information Systems

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The pollen that falls to the surface at any given point is called the pollen rain. For most regions of the world the pollen rain provides a fairly reliable record of the plants that produce and disperse airborne pollen within a radius of about 30 km from the sampled location. To some extent the local pollen rain can also reflect limited information about the insect-pollinated plants living in a region. For some regions of North America existing studies of the pollen rain and the regional vegetation associated with those data demonstrate a reliable relationship between these two vegetational aspects. For other regions of North America pollen rain studies exist but they have not been linked or correlated with the regional vegetation. In many others areas of North America there are no existing pollen rain studies. One objective of this project is to develop a method using geographic information systems to correlate existing pollen rain data with remote sensing based on classified vegetational patterns, especially in the forested biomes of North America. In addition, spatial interpolation methods will be used in GIS to predict the pollen rain in other regions where remote sensing data is available but no pollen rain data currently exist. Once completed, these correlations can be used to produce actual and projected pollen rain distributions for many regions of North America. Understanding the relationships between pollen rain data and the vegetational biomes they represent will then enable researchers and practitioners to use existing fossil pollen records to map past environmental changes in forested regions of North America and to predict future global changes of the biosphere. A secondary benefit of this research is that it will provide actual and projected pollen rain maps for North America. Those maps will permit law enforcement agencies to use pollen as a geographical marker and powerful forensic tool in their effort to solve crimes and catch potential terrorists before they can commit violent acts of destruction.

Keywords: Pollen rain, biome, spatial analysis

**5th Southern Forestry and Natural Resources GIS Conference
June 12-14, 2006
Asheville, NC**