



# GeoSTAC—Powerful Spatial Analysis Tools for Environmental Risk Assessment

Stone Environmental developed a powerful, user-friendly set of tools to conduct more efficient and consistent spatial analysis of environmental datasets.

## Tools Applicable Beyond the Agchem Community

The tools are packaged in an ArcGIS extension called GeoSTAC (Geo-Spatial Tools and ACcess). Built using VB.NET, they integrate with a number of frequently used databases from different government organizations. These include: USGS's National Hydrography Dataset (NHD) and National Land Cover Data (NLCD); USDA's Natural Resources Inventory (NRI), State Soils Database (STATGSO), and Census of Agriculture; Oregon State University's raster precipitation database; PRISM; and the National Atlas's Administrative Boundaries datasets.

Developed for Crop Life America, the tool set is part of a larger product, the use of which is standardizing the analytical methods and the data used in agrochemical risk assessment for the agricultural and regulatory community. Although designed for this community, the tools can readily be used in other environmental fields that require similar analyses.

The GeoSTAC extension's five tools are:

- **Table Join Tool:** creates and stores joins between tables and spatial layers for multiple data types.
- **Feature and Attribute Extraction Tool:** provides the capability to extract spatial features that meet criteria based on one or more environmental and agronomic databases, then returns a set of attributes describing those features.
- **Data Summary and Aggregation Tool:** provides advanced options for aggregation and

summarization of vector or raster data over a set of independent spatial features.

- **Doane's Aggregation/Disaggregation Tool:** designed to incorporate crop and land use distribution datasets to refine county-level Doane's Survey data, resulting in better estimates of agro-chemical use.
- **Linear Feature Summary Tool:** designed to summarize linear features within polygons of a user-defined polygon feature layer.

An example of how the tool set can simplify a complex analysis is the identification—based on proximity of crops to the drainage network and impact of rainfall runoff based on that area's soil types—of areas of risk where there is intensive chemical usage.

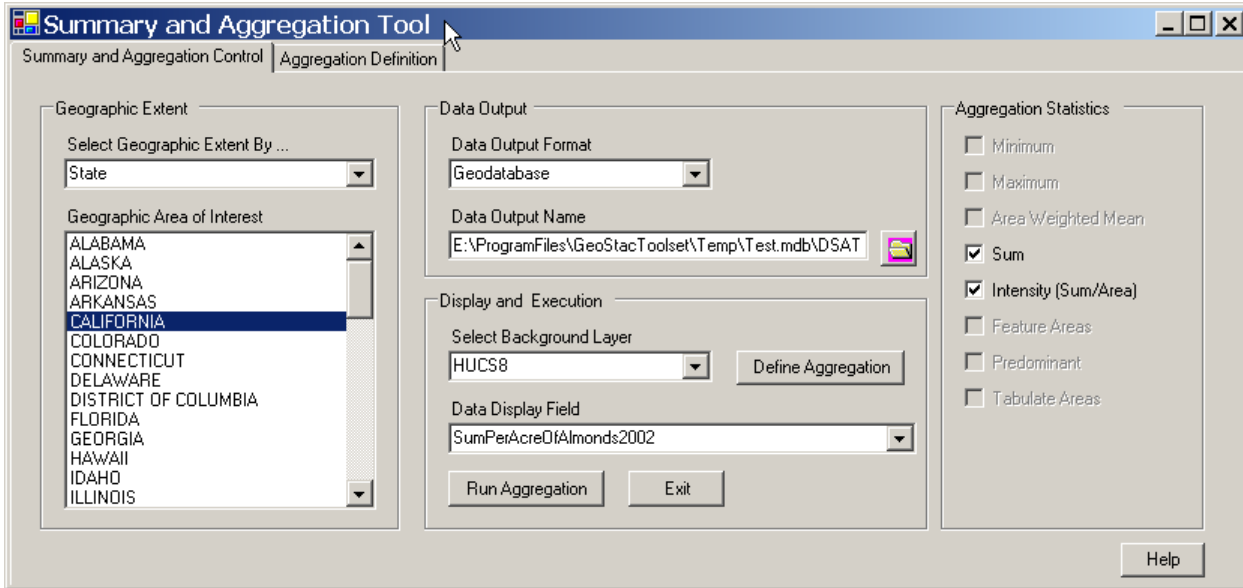
With these tools such an analysis can be completed easily. In addition, each tool produces an XML metadata file for all processing inputs for submission documentation or a summary of the analysis. The GeoSTAC extension and data are available as a free download at [www.geostac.org](http://www.geostac.org).

The development team is currently focused on extending these tools to incorporate other risk assessment analysis tools.

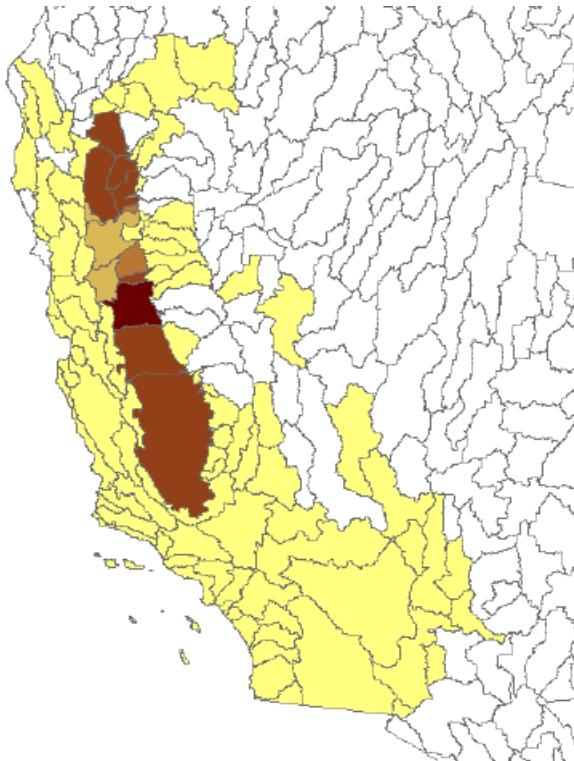
Based in Montpelier, Vermont, Stone Environmental Inc. is a leading provider of GIS-based environmental solutions to private organizations, non-profits, and government agencies.

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Dialog box for summary and aggregation tool, showing the advanced options for aggregation and summarization of vector or raster data over a set of independent spatial features.



Results generated by the GeoSTAC extension's summary and aggregation tool.



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