

Threat Mapper:
Measures of Certainty for Threat Activity Forecasts
Generated through Spatial Similarity Analysis

Cadet Randall Markham
United States Military Academy
West Point, New York

ABSTRACT:

In the fight to combat terrorist activity, the use of predictive tools has a strong allure. The *Threat Mapper* tool for ArcGIS was created in order to aid in “forecasting future threat activity.” Based on a given event and a user determined number of structural man-made features and bounds, the program uses a mathematically validated algorithm to predict future activities based upon the spatial characteristics and associations of a given event to its surroundings. The resulting “threat map” consists of a visual map showing levels of activity threat. It also produces a text file with the numerical results of the map creation. Presently, there is no mathematical model to investigate and interpret the significance of threat activity. There is some strength of association between the threat events and neighborhoods in close proximity. The purpose of this research is to investigate methods to measure the efficacy of the mapping in order to assist military planners in prevention and interdiction of future events. The work will focus on deriving appropriate measures of accuracy and goodness of fit of the map or the strength of the user defined features. This work will assist the program developers in defining a meaningful response for future study and interpretation.

KEYWORDS: Joint distributions, likelihoods, distance measure, statistical significance

CONTACT:

Greg Mader, Environmental Research Laboratory, Redlands, CA, Tel: (909) 793-2853
ext. 2502, E-mail: gmader@esri.com

CDT Randall Markham, United States Military Academy, West Point, NY, Tel: (845)
515-2824, E-mail: Randall.markham@usma.edu