

BLOCK LEVEL OF PREDICTION OF BLUE TONGUE IN KARNATAKA

Geographical Information System (GIS) can be used as tool for any discipline which handles with data that can be connected with geographical locations, such as countries, regions, communities or co-ordinates. These systems have been developing rapidly past and today, there are number of different software which are more user friendly than in the past and GIS is about to become tools for everyone.

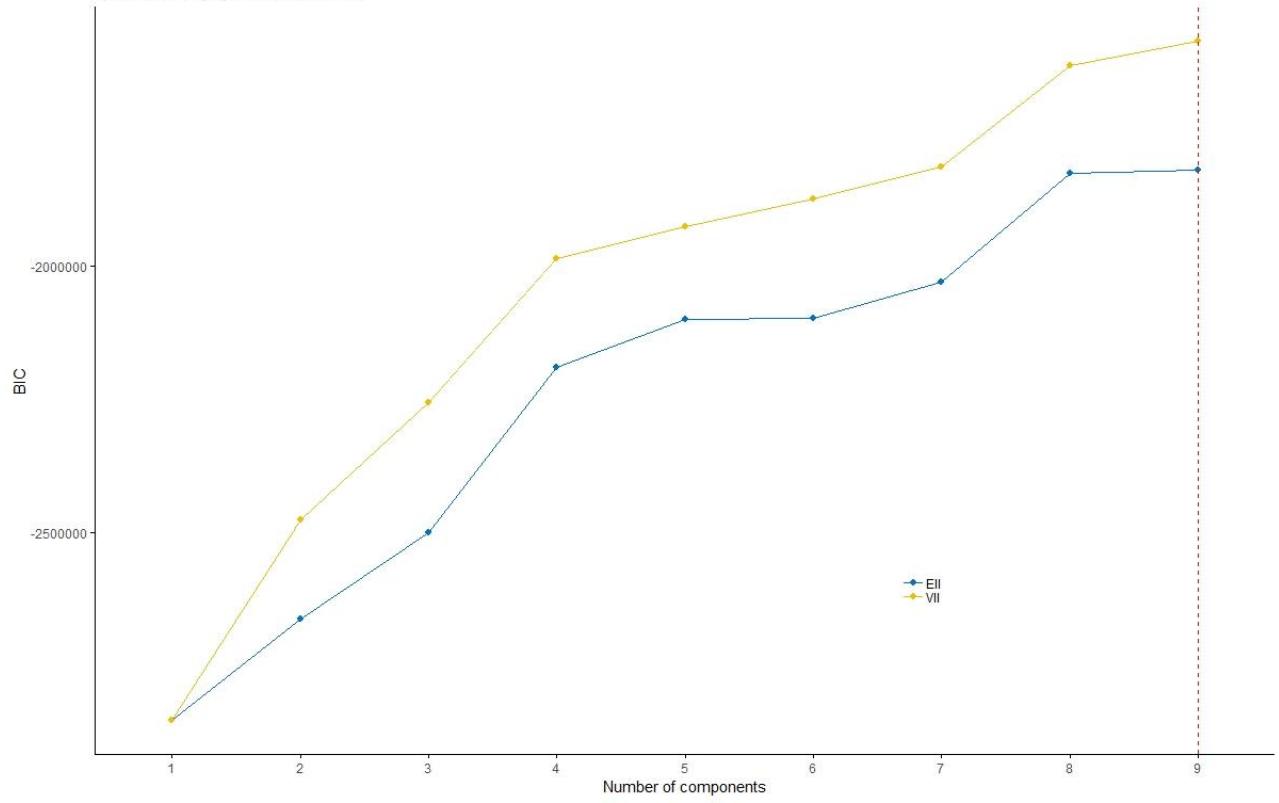
GIS is a computer-based system for analyzing and displaying digital geo-referential data sets. The data can be stored in two formats: Vector-based and Grid based. The maps of vector based format display models of the real world using points, lines and polygons. The grid-based format of data is captured as information of each quadratic cell in a screen and could be looked at as photo of the area.

Spatial statistics are considered as statistical methods in which location data used in the analysis. The framework of spatial epidemiology using statistics include visualization, spatial analysis and modelling. Statistical methods are used to interpret the differences in disease occurrence between areas. Their main ability to filter the signal from the noise. Spatial analysis and statistical methods are combined to identify the pattern in distribution disease incidence and discriminate between systematic and random fluctuations. Auto-correlation indices such as Moran's I or Saman's D have been used to detect the presence of structured variability on aggregate disease data.

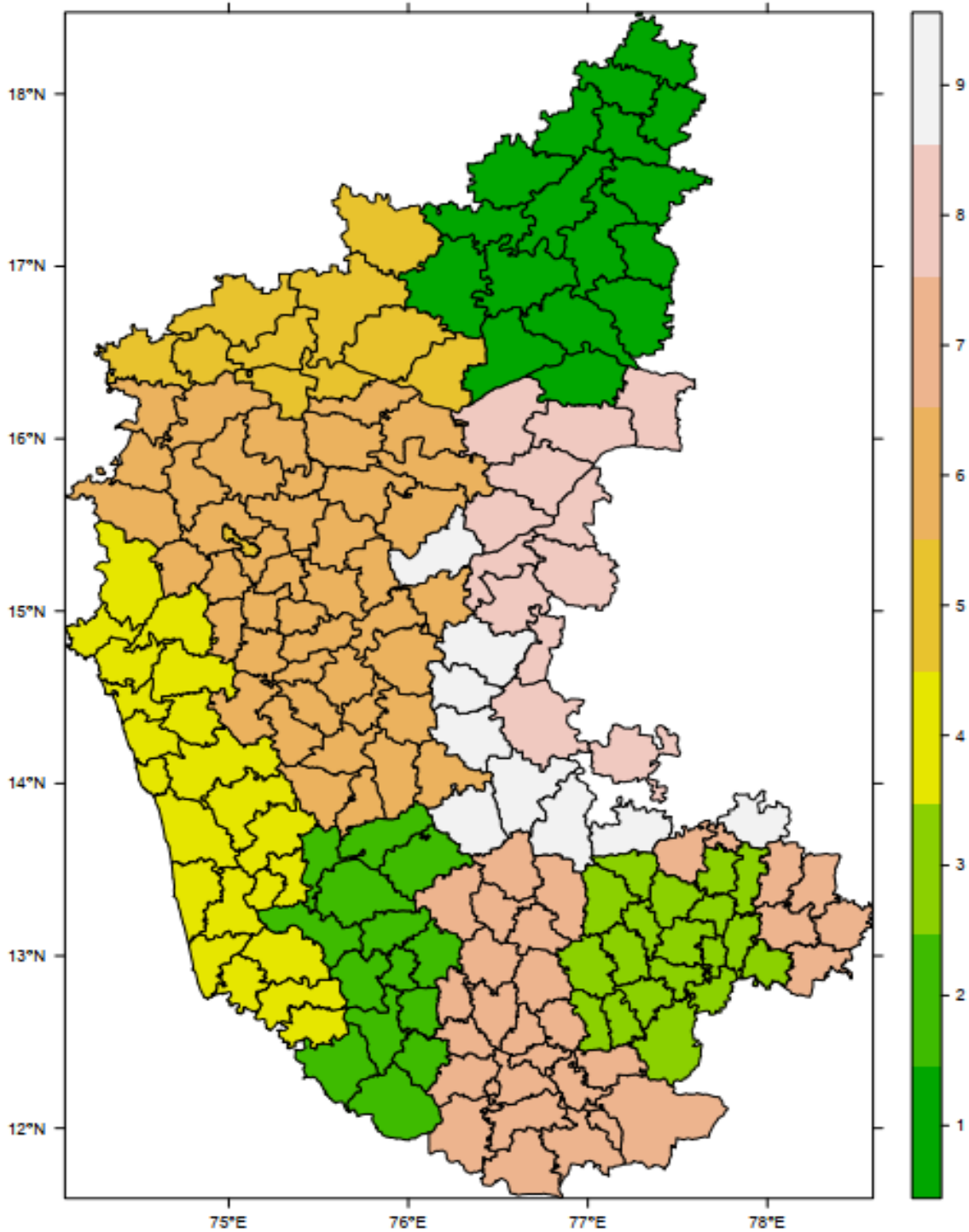
In the prediction of bluetongue , variability factor of rainfall, minimum temperature, maximum temperature and humidity were considered. The data has been extracted from <https://www.esrl.noaa.gov/psd/data/gridded/>, cleansed, curated, labelled and standardization has been performed using R software. Further annotation of curated data with disease outbreak data, Machine learning models was employed for training data set and testing has been done and deployed at reasonable accuracy of prediction. The four variability factors were used to create the classification of blocks using k-means clustering , nine clusters were obtained and outbreak of bluetongue were mapped on newly formed clusters. Four clusters were identified for association with disease outbreaks.

Model selection

Best model: VII | Optimal clusters: n = 9



Clusters



Bluetongue prediction in Karnataka October 2019

