

SPATSIM

SPATSIM (SPATial and Time Series Information Modeling) software package has been developed by the Institute for Water Research (IWR) of Rhodes University in South Africa over a period of 1999-2002.

It is a relatively new software product which is quickly gaining recognition in South Africa and other countries. The package has been developed using ESRI Map Objects as a tool for managing and modeling the data that are typically associated with water resource assessment studies. It contains an integrated database management system that uses GIS Shape files as the main form of data access. It also has a number of built-in data analysis and processing tools (such as for generating catchment average rainfall data from gauged station data or generating monthly and annual frequency tables from time series data), as well as a wide range of external models that can be setup and integrated seamlessly with the database (i.e. the models access their data requirements from the SPATSIM database and store their results in the database without any intermediate data transformation). The models include Design Flood, Spatial Interpolation of Observed Flow Records, Monthly Rainfall-Runoff Simulation Model, Desktop Model for Environmental Flow Assessment, etc. Detailed SPATSIM description and Help options are available with the installation package, which in turn is available from [IWR](#).

IWR and IWMI jointly developed and tested the set of routines designed to quantify, display and analyze the variety of drought indices, which are extensively used for drought assessment and monitoring. The software has the following main features:

- Import/export of original rainfall data files in different formats
- A comprehensive drought index estimation routine that makes use of all available rainfall time series. The *drought indices* which can currently be calculated include: SPI, EDI, Decile, Departure from Mean and Departure from Median. The results are saved to a SPATSIM time series attribute for further analysis and display. The user has the flexibility of choosing different durations, starting months and data integration types (running means, for example). This is important in southwest Asia context, if the analysis is to be made for cropping seasons, for example *Kharif* and *Rabi* in India, which have different durations and starting months.
- A facility to summarize a drought index time series as a table of selected drought index values, or as the statistics of a run (or spell) analysis of a drought index time series.
- Facilities for spatial interpolation of rainfall records based on either administrative or river basin boundaries.
- Display of the time series of drought indices.
- Plotting of spatial distribution of drought index values over the selected area.
- 'Help' items that explain the use of the above facilities as well as the origin of the 5 drought index types (SPI, EDI and Deciles, departures from the mean and median).
- A 'Drought Index Road Map' (part of 'Help' system) to provide step-by-step guidelines to the use of the new facilities.

Availability

The software is available from the Institute for Water Research at a cost of R1200, which covers the application distribution costs charged by ESRI for software developed using Map Objects. However, experience suggests that new users will benefit from attending a 2 to 3 day introductory training course. The Institute is available to offer such courses, either at Rhodes University in Grahamstown, or at other centres. Course costs will vary according to location and numbers of participants and Denis Hughes should be contacted about the availability of such courses. There are no charges for routine maintenance and periodic upgrades of the software are available from this website.

More information can be found at: <http://www.ru.ac.za/institutes/iwr/software/spatsim.html>