The MapCalc Legacy

…a historical look at the software system's roots

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The MapCalc software is the result of integrating **SoilRx** precision agriculture software with **pMAP** map analysis software. SoilRx provides the Windows environment for management and display of raster maps, as well as spatial interpolation and statistical analysis capabilities. pMAP (Professional Map Analysis Package) provides spatial analysis and GIS modeling capabilities. The combination is a powerful, yet inexpensive and easy-to-use package for grid-based map analysis.

1970s— The origin of pMAP software dates to a dissertation project at Yale University from **1977-82**. Doctoral student C. Dana Tomlin extended the grid analysis module to Harvard University's **SYMAP** program with professors Joseph K. Berry (doctoral advisor) and Kenneth L. Reed serving as collaborators on Tomlin's work. Additional analytic operations and an interactive user interface were added to the SYMAP module and made generally available by Yale University in the public domain as the Map Analysis Package (**MAP**). MAP was coded in unstructured FORTRAN IV for the IBM 360 mainframe environment and distributed on 9-track tape. Numerous universities, public agencies and private companies (both domestic and foreign) obtained the code and modified it for use in their computer environments.

1980s— In **1982** the MAP source code was obtained by HDR, a Santa Barbara, California consulting firm for use in the wildlife component of the environmental impact analysis for the MX Missile project under contract to the U.S. Air Force. At first it was envisioned that the code simply would be translated from FORTRAN to the Pascal language needed in the project, but the unstructured code required complete recoding. Reed acting as the HDR project leader and assisted by Berry were actively involved in the code development. In this capacity, they introduced several new algorithms and modified many others. The result was a radically different software system customized to the PRIME mini-computer environment for the U.S. government.

In **1986**, Drs. Reed and Berry formed Spatial Information Systems (SIS), Inc., and utilized the basic framework of the Pascal version of the software to develop a commercial version for DOS-based PC environments (copyright 1986). In 1989 this version was completely rewritten and enhanced in the Modula II language (copyright 1989). This version underwent several important modifications from 1990 through 1996 and was distributed under the name **pMAP** Version 3.1. Special educational licenses for classroom use (Academic Map Analysis Package, aMAP) and for self-instruction (Tutorial Map Analysis Package, tMAP) were acquired by over 200 universities and thousands of individuals.

1990s— In **1998** HyperParallel, Inc. (HPI), consultants and software developers in data mining technology, agreed to jointly develop a version of pMAP for parallel-processing environments. Under this agreement, HPI and SIS converted the Modula code to the Visual C++ and began optimizing the programs for HyperParallel's parallel environment. In late 1998 HPI was acquired by Yahoo and the software sales/consulting division was disbanded. As a result the parallel-processing project was terminated. SIS extended the code conversion to Visual C++ and wrapped the individual components as ActiveX controls.

In fall **1997**, Red Hen Systems (RHS) began development on **SoilRx** and released it in late **1998**. The software accepts yield and sample data then spatially interpolates these values into continuous maps of crop productivity and soil nutrient, properties, conductivity and other distributions for a field. The advanced 2D and 3-D graphics, charting functions and grid math capabilities enable farmers to visualize and interact with the spatial relationships within and among precision agriculture data. The software is primarily used to assist in identifying management zones of similar data characteristics and in the development of prescription maps that use variable rate technology to vary the amount of chemicals applied throughout a field. Traditional farming practices ignore the spatial variation in a field

and apply the same treatment everywhere. SoilRx and other RHS products are widely distributed throughout the precision agriculture industry.

2000s— In the spring of **1998**, Red Hen Systems began purchasing deployments of the pMAP ActiveX controls to enhance the spatial analysis capabilities of SoilRx. In April of **2000** Red Hen Systems acquired SIS and all rights to the pMAP code. **MapCalc Learner** and **Academic** packages are the educational versions of the software based on the integration of the two technologies. **MapCalc Professional** is the commercial version.

In **2004** Red Hen Farming Systems was spun off from Red Hen Systems to provide a focus on precision agriculture applications. Red Hen Farming continued to enhance and streamline MapCalc for incorporation into several commercial systems providing yield mapping and analysis capabilities. In **2007** the MapCalc Learner version was included with the book Map Analysis (Berry, GeoTec Media) providing extensive hands-on experience with the concepts and procedures involved in spatial analysis and statistics.

In **2008** the software rights were returned to Berry and Reed to pursue new academic and commercial applications. The MapCalc Learner version and numerous instructor materials for infusing grid-based map analysis into college courses are available for free download from BASIS.

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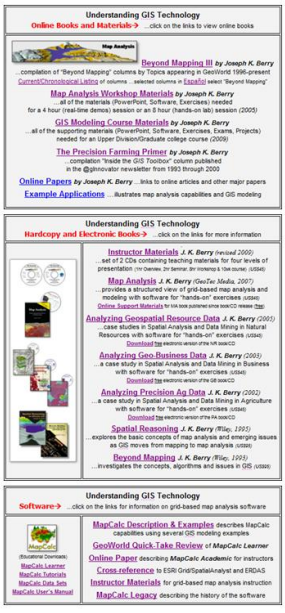

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