

GIS – TOOLS FOR GEOLOGY

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Abstract Geographic Information System (GIS) is rapidly becoming a tool geologists can rely on to adequately depict geologic and hydro geologic data and data interpretations linked to location. GIS is the merging of cartography and database technology. Historical data, including detailed geologic maps or drill hole/well locations, can now be incorporated into a GIS application and utilized to its full potential. Software tools that automatically extract features from maps, aerial photographs, satellite, and other images are now replacing older, time-consuming, methods. The data gathered is identified in a series of attribute tables, and spatial analyses are run on the data to generate maps and other graphical outputs.

Storing maps and other data as layers of information in a GIS application makes it possible to perform complex analyses. GIS has the ability to display these analyses, through graphical productions, both on screen or on paper to convey the results. Geology can now be visualized in ways that suits the need of the audience and/or decision makers. Federal, State, tribal, and local governments, private companies, academia, and nonprofit organizations, are now generating computer databases that can be directly entered into a GIS. With the sources for GIS-ready geologic data expanding, there is no limit to its use.

Various GIS applications allows users to create interactive queries, analyze spatial information, edit data, maps, and present the results of all these operations in two and three dimensional formats, as well as simulations of potential events. ArcGIS/ArcInfo is a powerful GIS system being utilized by the USDA Natural Resources Conservation Service (NRCS). This, along with many GIS supported software programs, and coupled with GPS (Global Positioning Satellite), allows NRCS geologists to develop, manipulate, and archive geologic data for use in support of NRCS Programs. Data generated by geologists can now be easily integrated into planning documents and designs. Knowing what tools to use and how to best utilize them is important.