

A new approach to mapping

The Geological Survey has trialled a new approach to digital map compilation for two 1:100 000 series geological mapsheets, both of which cover areas of moderate geological complexity in the northern Capricorn Orogen.

The aim of the initial study was to trial the production of a 1:100 000 Geological Series map using a partly digital method for map compilation. Under this approach, much of the linework for the mapsheet was compiled in the traditional manner using aerial photography and compilation sheet overlays. A map reference was also created at this stage and all field notebook data was entered into the WAROX database. The linework was scanned and labelled, and then converted into GIS shapefiles which were stored in a central database (ArcSDE). Using ArcView 3.2 software the geologist was able to view and edit copies of the linework (geological boundaries and linear structures) and labels (geological map codes) against a background of the available remotely sensed and geophysical imagery. ArcView was also used to help validate field data and mineral occurrence data held in the WAROX and WAMIN databases. When all the required changes to geological linework and labels were complete, the updated shapefiles were polygonized and used as the basis for digitally creating the interpreted bedrock geology and cross section diagrams. The hardcopy map was then produced following a series of stages which involved the addition of the topographic and cultural data layers, a phase of digital editing, a conversion of Arc shapefiles to Microstation format, WAROX and WAMIN data extraction, and a final phase of hardcopy editing. During this process any required linework changes were fed back into ArcSDE.

Following on from the first study, a second trial was undertaken to produce a 1:100 000 Geological Series map, using an almost entirely digital method of map compilation. Under this approach, field geological and cultural information was captured using orthorectified aerial photography and all field notebook data was entered into WAROX. The linework was then captured by registering the hardcopy photograph against a digital version of the same image displayed in ArcView 3.2, and digitizing the linework using a WACOM mapping tablet. By this method it was possible to digitally check the linework against the geologists fieldnotes and also compare the aerial photography linework with information from a wide range of remotely sensed imagery before it was entered into ArcSDE. The remainder of the the compilation and map production process was essentially the same as that adopted in the first study except that no digital editing was carried out prior to Microstation conversion.

For both of the studies, compilation was carried out using a checklist to monitor the main stages in the process. Although the two projects employed different methods for capturing the initial linework, the compilation principles were largely the same.

