

## **New Mapping of Mancos Shale in Western Colorado**

**David C. Noe**

*Colorado Geological Survey, Denver, CO.*

Geologic maps historically portrayed the Mancos Shale in western Colorado as an undifferentiated unit. However, the oil and gas industry has long recognized that the Mancos Shale contains certain stratigraphic intervals of interest. Examples include the Niobrara Member of the Piceance Basin and the Prairie Canyon Member in the Piceance Basin.

The Colorado Geological Survey (CGS) conducts detailed mapping of the Mancos Shale in western Colorado as part of the STATEMAP national cooperative geologic mapping program. The program uses federal and state matching funds to produce 1:24,000-scale geologic maps. The STATEMAP program has contributed eighty-nine new quadrangles in Colorado since 1993.

The western Colorado mapping focuses on population-growth areas in the Uncompahgre and Gunnison River valleys, from Montrose to Delta to Hotchkiss. Collaborating with the USGS, we delineated several members of the Mancos Shale based on physical characteristics and biostratigraphy, as identified by field observations and invertebrate fossil collections.

The following members are delineated as primary mapping units, from the basal contact upward: Graneros, Bridge Creek, Blue Hill, Juana Lopez, Montezuma Valley, Smoky Hill, Prairie Canyon, Sharon Springs, Lujane Point (informal upwardcoarsening, offshore equivalent of the Castlegate Sandstone); and the Buck Tongue. We correlate these units with reference sections in the Mesa Verde, Book Cliffs, and Front Range (Pueblo) areas.

Although creating detailed stratigraphic sections is beyond the scope of STATEMAP, the creation of a mappable framework of Mancos Shale subunits is of potential use for oil and gas exploration, selenium abatement studies, and geologic-hazard investigations. In addition, the mapping has identified features of potential interest for future geologic studies. An example is the Prairie Canyon Member section north of Delta, which contains spectacular exposures of sand- and organic-shale-filled submarine channels. In another example, our field observations reveal that selenium is concentrated within coarser-grained units such as the Juana Lopez Member. Selenium dissolution from dark shale units and its associated transport to and precipitation within coarser reservoir facies may merit further study by environmental geologists and geochemists.

The maps are available as CD-ROM publications from CGS. Each CD contains a geologic map for a particular quadrangle, correlation of map units, oblique view of the map, cross section(s), and illustrated authors' notes.