

Geologic mapping of the Sheep Rock Unit at the John Day Fossil Beds National Monument,
Oregon (GSA Abstract)

John Day Fossil Beds National Monument

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The John Day Basin of eastern Oregon contains a sequence of primarily volcanic and volcanoclastic sedimentary rock spanning nearly 50 million years of time, from mid Eocene to late Miocene. These rocks contain one of the most complete and diverse records of Cenozoic fossils on the continent, which paired with well-dated volcanic ash layers, provide a rich history of animal and plant evolution.

Through the GeoCorps America program, a partnership between the Geological Society of America and the National Park Service, we created an updated geologic map for the Sheep Rock Unit of the John Day Fossil Beds National Monument at 1:24,000 scale. This unit of the park covers an area of about 22 square miles and has mainly been the subject of reconnaissance mapping. We re-mapped the entire Sheep Rock Unit along with adjacent areas that are of paleontological significance. Five major formations have been mapped at member level for this project ranging in age from Cretaceous to Miocene. Relations between the John Day Formation and underlying units have been clarified and detailed on the new map. The John Day region has most recently been affected by extension, and several normal and vertical faults have been recognized and included in the updated map.

Understanding the complex geology of the park is crucial to preservation and study of its paleontological resources. The Sheep Rock Unit is prospected regularly by the park's paleontology staff, and yields large numbers of scientifically significant specimens, including multiple new species. Accurate and up-to-date geologic maps serve as a valuable tool for understanding the park's geological and paleontological resources and also aid in educating visitors. The GeoCorps America participants assisted park interpreters in the creation of geology-related park handouts and brochures, including a composite stratigraphic section and geologic cross section based on the results of new geologic mapping.