

Beach Front Property in Central Montana: The Upper Jurassic Morrison Formation in the Northern Portion of the Foreland Basin

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ABSTRACT

The Upper Jurassic Morrison Formation covers much of the Western Interior of the United States. During the Oxfordian, the Sundance Sea retreated northward across Montana. The result was deposition of terrestrial Morrison sediments in the Jurassic-aged foreland basin. The formation as a whole has been studied extensively by paleontologists and geologists since the late 19th century. However, the formation in central Montana, with accompanying fauna and flora, remained unstudied. This is the area of interest for this project. Preliminary research shows that this northernmost region has characteristic distinctive from the southern regions of the formation. The J5 unconformity is not present in this area, indicating that deposition from marine to terrestrial was continuous. In recent years, two undescribed sauropod dinosaurs and the first known herd of stegosaurs have been excavated. The excavations are located in a very geologically complex region on the northeastern flank of the Big Snowy Mountains, at the convergence of the Rocky Mountains and the Great Plains. To date, this is the northernmost occurrence of Jurassic dinosaurian remains in North America. This project is a multifaceted approach to recreate the Morrison paleoenvironment. Geological investigation includes structure, stratigraphy, well log analysis, sedimentology, petrology, and geochemistry. Paleontological research consists of the osteological description of the dinosaurs, vertebrate taphonomy, and bone histology. Identification of various invertebrates (bivalves, gastropods, and ostracods) and their depositional environment is included in the study. The intent of the paleobotany study is to identify macroflora (petrified wood), and microflora (seeds and charophytes) and interpret the paleoclimate as evidenced by physical characteristics and growth patterns. Faunal and floral microfossils establish the biostratigraphic framework. The intent of this compilation is to understand the paleoenvironment, paleoecology, and paleoclimate of the previously unstudied Upper Jurassic Formation in central Montana. The Upper Jurassic Morrison Formation covers much of the Western Interior of the United States. During the Oxfordian, the Sundance Sea retreated northward across Montana. The result was deposition of terrestrial Morrison sediments in the Jurassic-aged foreland basin. The formation as a whole has been studied extensively by paleontologists and geologists since the late 19th century. However, the formation in central Montana, with accompanying fauna and flora, remained unstudied. This is the area of interest for this project. Preliminary research shows that this northernmost region has characteristic distinctive from the southern regions of the formation. The J5 unconformity is not present in this area, indicating that deposition from marine to terrestrial was continuous. In recent years, two undescribed sauropod dinosaurs and the first known herd of stegosaurs have been excavated. The excavations are located in a very geologically complex region on the northeastern flank of the Big Snowy Mountains, at the convergence of the Rocky Mountains and the Great Plains. To date, this is the northernmost occurrence of Jurassic dinosaurian remains in North America. This project is a multifaceted approach to recreate the Morrison paleoenvironment. Geological investigation includes structure, stratigraphy, well log analysis, sedimentology, petrology, and geochemistry. Paleontological research consists of the osteological description of the dinosaurs, vertebrate taphonomy, and bone histology. Identification of various invertebrates (bivalves, gastropods, and ostracods) and their depositional environment is included in the study. The

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