



The Geological record of environmental change

Utah: Book Cliffs

Voice over

Eighty million years ago North America looked very different from today. During the Cretaceous the crust of the Proto Pacific Ocean was subducted beneath the westerly migrating North American Plate, creating a mountain belt and associated foreland basin. This basin flooded to form the Western Interior Seaway which stretched from Alaska to Mexico and covered a third of the continental US. The sub-tropical latitude of warm, humid climates of the time led to rapid erosion of the newly uplifted mountains. The Book Cliffs exposures sit on the western margin of the seaway in the present-day state of Utah. During Campanian times Eastern Utah was occupied by a series of shallow marine depositional systems. Post-Cretaceous uplift, erosion and climate change produced today's spectacular cliff faces. To the early Settlers, these parallel layers of sandstone and shale resembled the pages of a book fallen on its side. The Book Cliffs Escarpment stretches from the town of Helper in the north to the town of Green River in the south-east. Today the Book Cliffs are a superb case study in sequence stratigraphy and for geologists Steve Flint and John Howe they provide an ideal opportunity to study the linkages between coastal plain, shallow marine and offshore sediments. Landward with the long, linear shorelines, dinosaurs roamed the heavily vegetated coastal plain.

Under certain conditions, the swamps and forests they grazed upon were preserved as extensive coal seams, their footprints commonly preserved in the upper sections of the coal and were frequently uncovered in the roofs of the local mines. Coal has formed the basis of the region's economy for the last 130 years. Building of the Trans-Continental Railway allowed Book Cliffs coal to be exported nationwide.

Our investigation starts in the northern Book Cliffs near the town of Helper.