

TAPHONOMY AND PALEOECOLOGY OF THE SLATON LOCAL FAUNA

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Slaton Quarry is located north of Slaton at the eastern escarpment of the Llano Estacado in Lubbock County, Texas. Sediments in the quarry consist of mid-Pliocene, possibly Illinoian, stratified sands and interbedded gravel channels overlain by several feet of gray clay which were deposited in a deep depression in the late Pliocene caprock and underlying Pliocene Bridwell Formation. Calcareous casts of plants, mollusks, and mega- and micro-vertebrate fossils are particularly abundant in the clay and large vertebrate fossils are common in the sands. Although subject to two previous studies, recent exploration for gravel has exposed additional parts of the quarry over a wide area and to a greater depth than has previously been studied. Sedimentological, taphonomic and taxonomic studies, particularly of the abundant microfauna, which comprises over 60 percent of the identified vertebrate taxa, in the various sedimentary environments in the quarry are yielding new information on the faunal composition and paleoecology of a time interval rarely preserved in the geologic history of this area.

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THE TEXAS COASTAL MANAGEMENT PROGRAM -- SYNTHESIZING DATA ON RESOURCE CAPABILITY FOR PUBLIC POLICY DECISIONS

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The Federal Coastal Zone Management Act of 1972 encourages coastal states 1) to design comprehensive programs for developing, protecting, enhancing, restoring, and regulating the use of coastal resources, and 2) to implement those programs by the establishment of continuing mechanisms for cogent resource management. Salient issues in establishing such a program raise questions for applied natural sciences, law, and administration.

A resource capability evaluation for coastal management should include 1) delimitation of boundaries of the Coastal Zone, 2) identification of critical environmental-socio-economic conflicts or issues, 3) inventory of extant data, and 4) synthesis of issues and site-specific information in order to designate "areas of particular concern". Because of time constraints, resource capability evaluations depend almost entirely on extant data obtained from various agencies or institutions. These data include physical properties of substrate, location of hazardous processes, occurrence of mineral deposits, distribution of biologic habitats, agronomic soil characteristics, water budget, and local scenic, cultural or historical attributes. These compiled data are analyzed in a site-specific (map) context in terms of socio-economic pressures for various uses of natural resources and resulting environmental impact. Ultimately, only the areas that significantly affect or are affected by human uses fall within the purview of the Coastal Management Program in Texas.

ELECTRIC POWER BEYOND THE NEXT DECADE

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The sources and technologies that are candidates for supplying electric power beyond the next decade will be described, compared, and their prospects of success discussed. Nuclear sources both fission and fusion as well as geothermal and the several manifestations of solar energy will be included. The conclusion is drawn that fusion has the most promise for long-term, large-scale supply, but solar and geothermal will make small but important contributions.

MIOCENE GEOLOGY AND PALEONTOLOGY, NORTHERN SIOUX COUNTY, NEBRASKA

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Continental rocks of early to medial Miocene age in Sioux County have produced abundant fossil vertebrates for over 75 years. This region is of particular importance to the vertebrate paleontologist because it is an assemblage of fossil mammals from these rocks that the Arikareean (early Miocene) and Hemingfordian (medial Miocene) land mammal ages are based. Our work suggests a more complex geology for these rocks than initially described in the earlier work of Darton, Hatcher, and Peterson. Sediments of the Hemingford Group appear to represent a variety of continental depositional environments, with intricate facies relationships, pronounced cut-and-fill sequences, and relatively abundant fossil vertebrates, whereas rocks of the Arikaree Group are sparsely fossiliferous, exhibit greater lateral continuity, and conform in general to the regional concept developed by earlier geologists. The region is influenced by a fabric of SW-NE trending normal faults not reported by earlier workers.

THE APPLICATION OF TYPE AREAS IN URBAN PLANNING -- A CASE HISTORY: WOODWAY, TEXAS

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Increasing urban development in Woodway, Texas prompted a revision of the comprehensive city plan. Data regarding physical environmental factors was presented in an atlas of type areas. In the past, land suitability classifications and overlay mapping systems have proven impractical for urban planning. There appears to be less aversion to the use of technical data when it encourages the user to make the correct decision. Also, there appears to be more demand for technical data presented in an easily understood form.

A study of the geology, soils, physiography and geomorphology was used to establish type areas that possess internally homogeneous characteristics significant to urban development. Information on these areas was combined in a chart and map with simple instructions to permit interpretation by non-geologists. This approach avoids the impractical aspect of ideal land use or the objectionable aspect of an overlay map system, but provides the interpretive information necessary to improve planning.

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