Among the most important (and interrelated) factors that seem to control bedload development are the following size and density of object, presence of associated (stock), size and intensity of associated (stock), presence of associated (stock), presence and composition of atmosphere, configuration of object, rotational period, tilt of rotational axis, stage of evolution of planetery system and associated (stock), presence of plate tectonics, composition of object, and presence and abundance of life.

Water as a Public Trust Resource. Diane O’Connell, Department of Geography, Schoolcraft College, Livonia, MI 48152.

The public trust doctrine, which has been described since the time of the Roman Empire, states that certain resources, such as water and air, are so important that they cannot be owned by individuals. Using this doctrine, the government would argue that these resources can be used by all of the citizens. Application of this doctrine would imply that the nation’s navigable water resources should be held by the government for the people, and these resources could not be legislated or sold for the benefit of individuals. However, water resources are often limited in supply, and legal doctrines defining users have evolved in the stress. In the humid east, riparian rights are assigned to users bordering watercourses. Most western states define water rights using prior appropriation, which has some properties of private ownership. Both of these water rights systems potentially limit the public’s right to use water resources, and conflict often occurs over individual versus public rights. Courts frequently decide if the use of the resource should be viewed as a property right, or if it is subject to the public trust. This paper reviews the public trust doctrine, and examines case studies that define water resources as private property or public commodity.

Geological Sciences

Deformation in the Spine of the Aka Bible Church Mastodon. Peggy Bebej and Ralph Stoway, Calvin College, Departments of Biology and Geology & Geography, U. of Rapids, MI 49346

The Aka Bible Church Mastodon was examined by a Calvin College crew in 1999. During the excavation of this late Pleistocene mastodon skeleton, bone deformation was noticed in the lower thoracic and lumbar vertebrae. Left anterior and posterior zygopophyses are increased in size and have migrated medially, right anterior and posterior zygopophyses are reduced in size and often not articulating with their counterparts processes. This has been accomplished by a shift in the base of the pinnate processes. Compensating, the dermal portion of the pinnate processes, when viewed dorsoventrally is increased in size. Muscular tissue on the lumbar facets surrounding the pinnate processes in this region include the internal and external obliques and the latissimus dorsi. These muscles wrap around the body cavity and support the weight of the internal organs. Morphological changes in the vertebrae result in long-term bone remodeling in response to permanent stress, which we believe was induced by the natural architecture of the mastodon animal.