Seawater Inundation of Texas at the Beginning of the Holocene

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INTRODUCTION

In previous papers (see www.axialshift.com) I postulated that sea level at the beginning of the Holocene (10000 BP) had inundated the Mississippi River valley as far as Keokuk, Iowa, on the main river channel; Boonville, Missouri, on the Missouri River; and Clinton, Indiana, on the Wabash River. This scenario differs from those for the East Coast in the research literature, which typically describes minimal fluctuations from the modern level, or, conversely, water levels were lower and rose to where they are now. The fluctuations are credited to eustatic changes caused by the melting and freezing of water associated with glacial ice. The distinction between the end of the Pleistocene Epoch and the start of the Holocene Epoch is also attributed to the ultimate melting of the continental ice sheet at that time, which produced today's ocean. Minor fluctuations in sea level since that time supposedly relate to cyclic changes in the polar climate for whatever reason (e.g., Little Ice Age).

AN ALTERNATIVE SCENARIO

Perusal of a large number of papers in the fields of geomorphology, glacial geology, climatology, archaeology and ecology over three decades led me to believe that little was being added to the knowledge base that would tell us where the earth and its constituents had been and were going. Anomalies, both stated and unstated, are an integral aspect of these papers. The literature, when taken together, appears bogged down. Intrinsic elements never seem to connect together in a manner that would answer the questions that mankind has asked for thousands of years. The literature goes in circles, takes wrong routes, hits walls and no questions related to our occupancy of this planet really get answered.

One such wall, possibly due to taking a wrong turn, is the muddle surrounding the initiation of the Holocene. The anomalies, contradictions and inconsistencies surrounding the 10000 BP date are multitudinous. It was either hot or cold, wet or dry; cultures either sprang up or disappeared or there were unaccountable chronological gaps; animals either went extinct or started down the road to extinction; and the list goes on and on. Is it possible that the wall that hinders solving the many questions relating to the start of the Holocene pertains directly to the premise we use to characterize it, namely the termination of continental glaciers and the rise of sea level to roughly where it is today? The earth's physical features appear to fit the continental glacier premise, yet this premise has led to more questions than answers. Has accepting a wrong premise or concept led to data being forced or manipulated to fit what is believed to be scientific fact with the result that anomalies continue to build and to be ignored? For example, a carbon-date, that doesn't fit the literature's accepted scenario, is thrown out as erroneous. The origins of sediments overlying buried artifacts are ignored in the rush to describe the artifacts. What was the event or events that instigated the deposition of the sediments and the subsequent burial of the artifacts? Why are there erosional discontinuities between sediment layers long after glacial ice disappeared? What do buried organic layers tell us? What caused sequences of buried clay layers to be different colours? I believe the way out of this quagmire is in the anomalies, which tell me that the basic concept is wrong and requires review. A good starting point for such a review would be a return to the controversial debate surrounding the Parallel Roads of Glen Roy that involved Louis Agassiz, Charles Lyell and Charles Darwin.

Having said all this, what I see on maps and aerial photographs does not fit the premise. I see much higher water levels and, if correct, their existence questions the concept of continental glaciation, at least as presently understood. This takes me back to Keokuk, Iowa. A colleague recently asked if I had traced my postulated Holocene sea level to anywhere else other than the Mississippi River valley. I replied that I had traced it around North America, at least where it

exists above today's sea level, or where it hadn't been truncated by later events. Describing its location orally was, at best, an esoteric exercise (we were bouncing around on back roads in a truck studying landform examples to use in an aerial photo interpretation course). As a further example of the level that terminated at Keokuk, I have chosen what I believe is its path through Texas. From Mexico the shoreline can be traced north from roughly the rapids where the San Rosendo River joins the Rio Grande River (Figure 1). In this area the water level is at about the 1467 foot (447m) elevation. From here it descends about one foot per mile as it makes its way through the middle of Texas. It may be coincidence but this gradient figure closely correlates with the number of miles between one degree of latitude (i.e., roughly 70 ft per 70 miles). The depicted shoreline and gradient is the same as that of my California paper (Noble, 2004). Those interested can extrapolate the respective isolines between the ones provided and follow the postulated shoreline on a web site that provides contour maps and associated aerial photographs (e.g., Terraserver,com; Topozone.com).

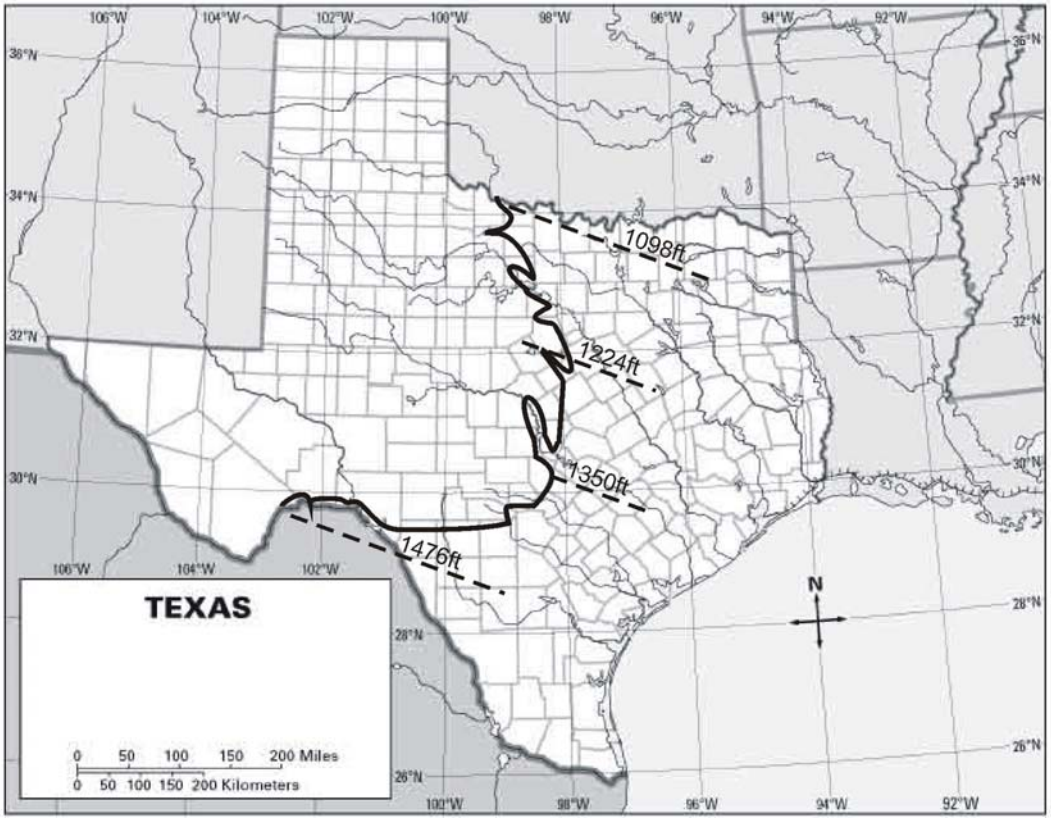

Figure 1. Location of postulated 10000 BP shoreline tilting down to the north through the centre of Texas (offshore islands not shown) with a selection of elevation isolines. That part of Texas east of the shoreline was submerged (background map-NYSTROM Herff Jones Education Division).

Figure 2 below is a more accurate delineation of the shoreline's route through the central part of northern Texas.

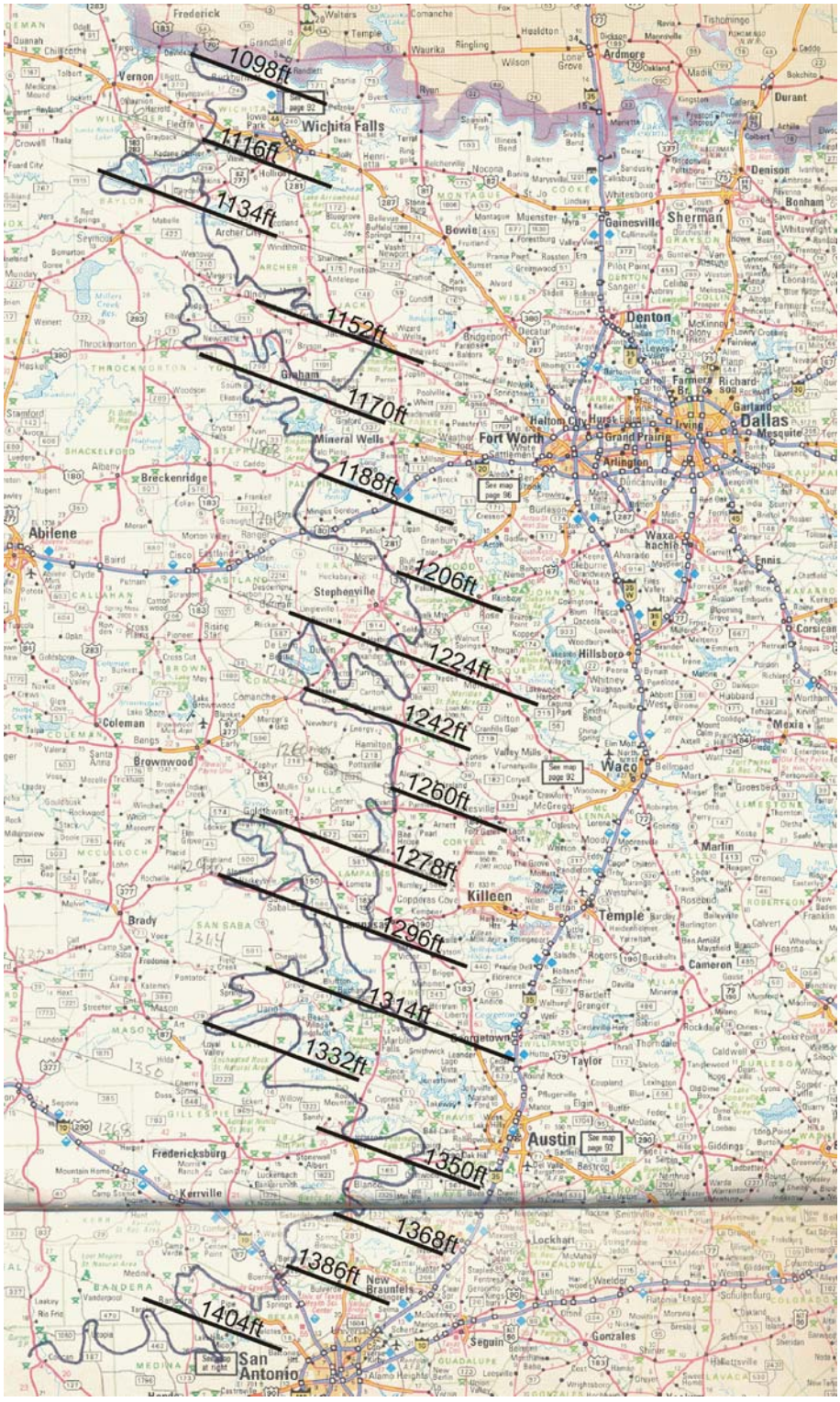

Figure 2. Route of postulated shoreline through central portion of northern Texas depicted on a Rand McNally road map. Also shown are some appropriate elevation isolines.

Figure 3 below is a crude rendition of the shoreline's route through Texas on a topographic image.

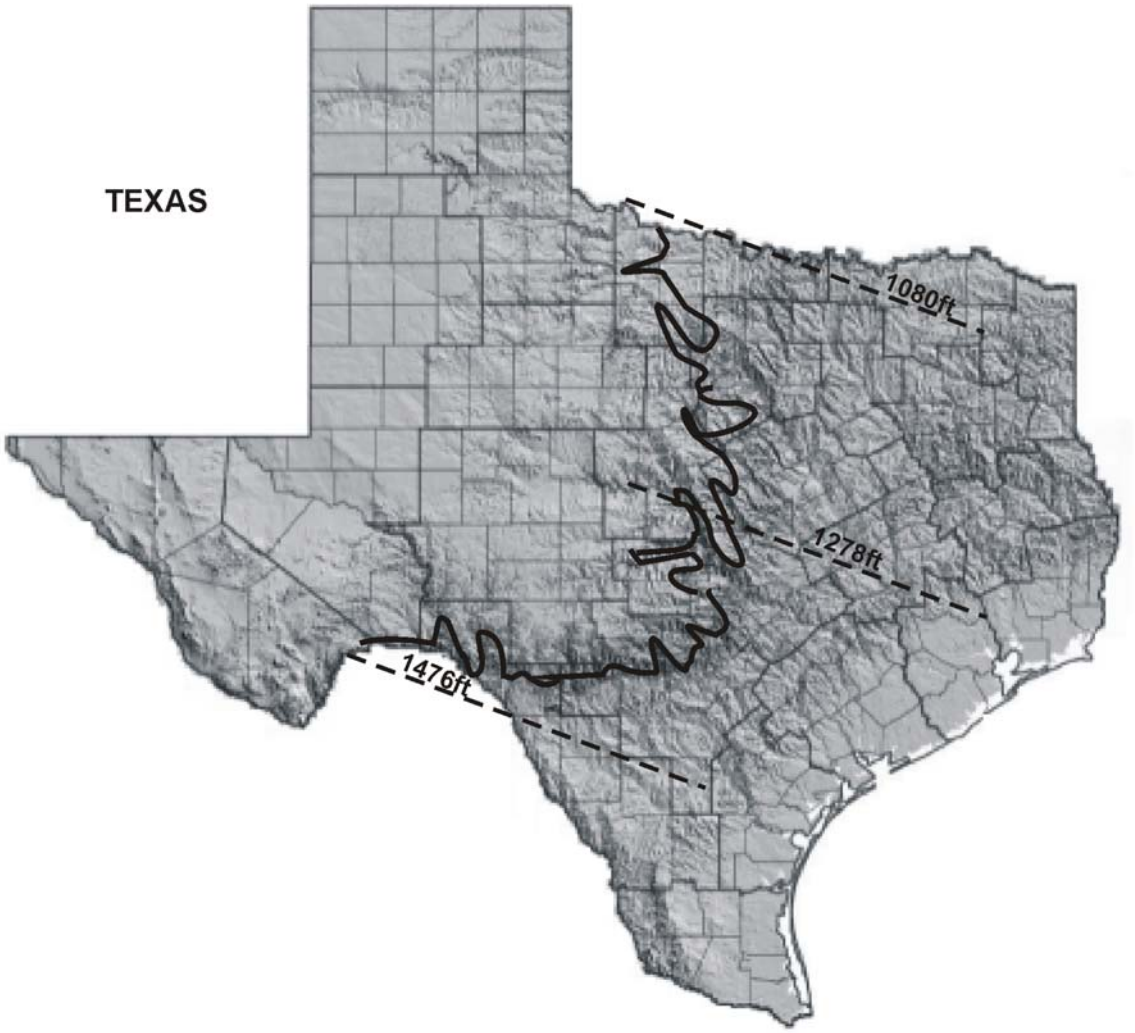

Figure 3. Rough depiction of route of this paper's postulated 10000 BP shoreline through Texas on a Bureau of Transportation topographic map.

Figure 4 shows the shoreline profile and selected isoline elevations in relation to nearby communities. The shoreline either passes through or is close to the indicated locations. The shoreline exits Texas and enters Oklahoma west of Burkburnett on the Red River at roughly the 1098-1100 foot (335m) elevation. Here, and in the State's other major river valleys, it is defined by incipient but identifiable deltas that mark its interaction with previously formed river channels and their respective gradients. Everywhere east of this line was covered with seawater. At increasingly lower elevations downstream from this perched shoreline are similar terrace scarps and other incipient deltas that mark later transgressive cycles that occurred repeatedly through the early, middle and late Holocene period down to the present shoreline.

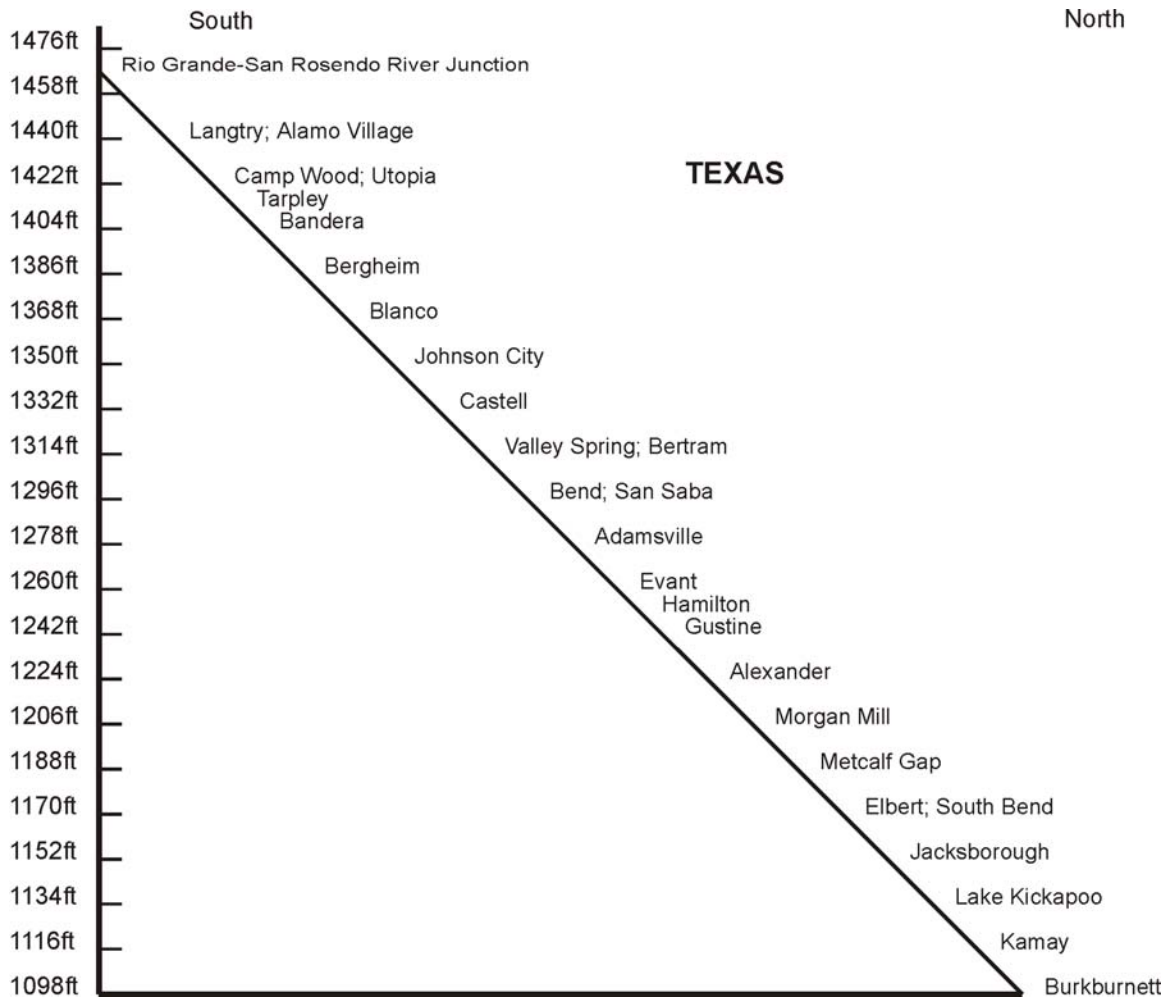

Figure 4. Profile of shoreline tilting down from south to north (ratio 1:1) with a selection of elevation isolines and associated locations.

Figure 5 is a rough depiction of the shoreline in relation to a broadly defined vegetation map of Texas. One can see that there is a close correlation with these broad units in that there is a distinct separation between the units above the defined shoreline and those below. One might argue that the corelation relates more to physiographic features aligned with bedrock formations, however, I maintain that seawater in conjunction with the proposed shifts impacted the bedrock units to form the specific elements making up this terrain (e.g., terrace scarps). One might also argue that the correlation is stronger in the south than the north but this isn't necessarily the case. The seemingly north-south disparity relates to the configuration of the offshore physiography between the two areas and the later incursions mentioned above. This specific incursion and the later ones had a direct impact on the subsequent distribution of plant and animal species in Texas and played a major role in the disappearance of species. These later levels are also closely aligned with the map's defined vegetation units further down-slope on the coastal plain.

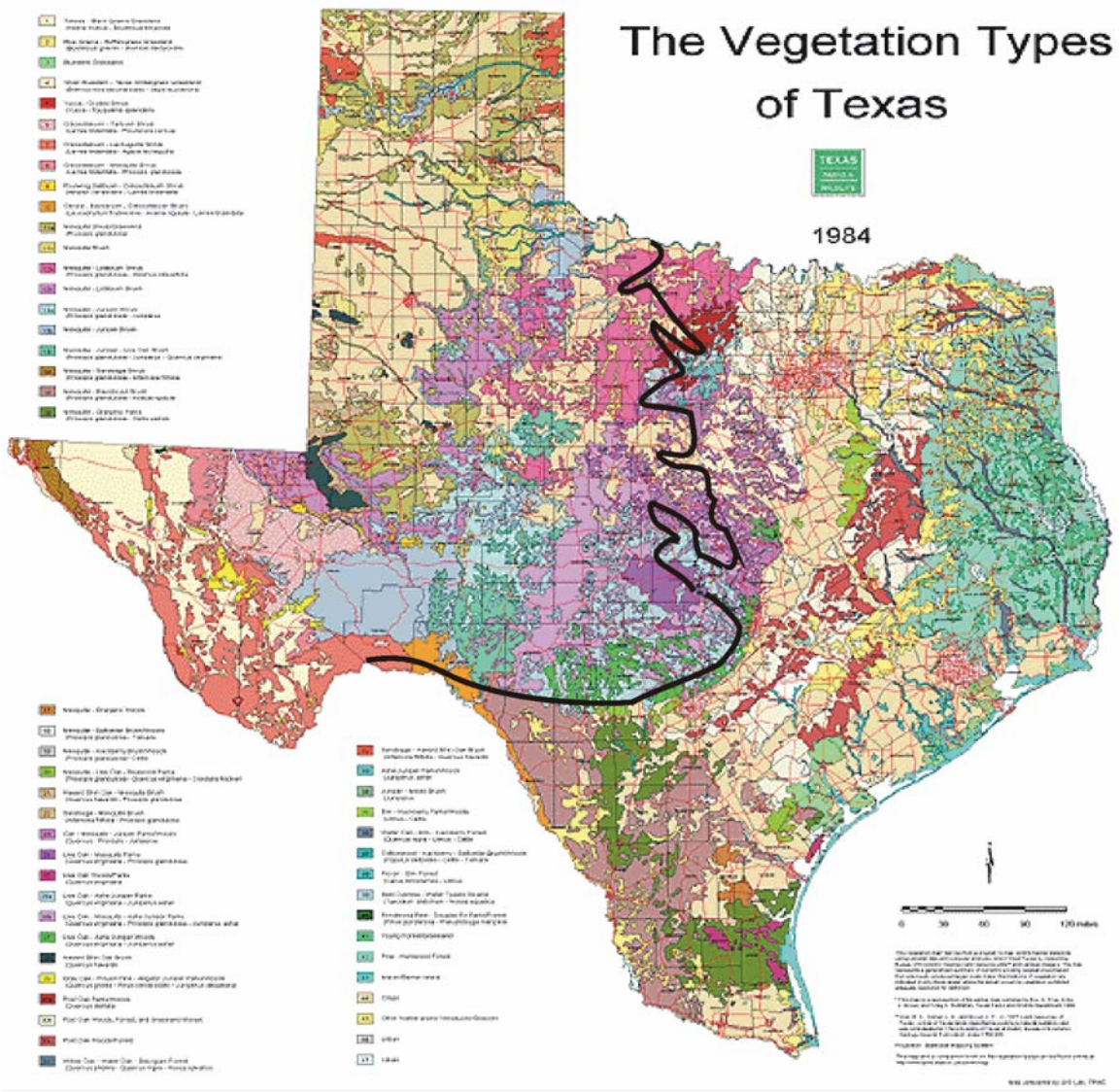

Figure 5. The postulated 10000 BP shoreline roughly superimposed on a broadly-defined Texas Parks and Wildlife Vegetation Types map.

DISCUSSION

I have observed the sequence of shorelines described above in the hinterlands backing the east and west coasts of North America, at least where they have not been covered and/or removed by later events. As described here for Texas, they involve an initial catastrophic submergence about 10000 BP or shortly thereafter (i.e., possibly as late as 9750 BP). This event completely submerged the adjacent State of Louisiana. It also separated the North and South American continents at the Isthmus of Panama. This situation would have been similar to today's Bering Strait separating Asia from North America. In fact, a distinct relationship existed between Panama and the Bering Strait 10000 years ago in that while the Panama corridor was submerged the Bering Strait was emergent making the North American and Asian continents a contiguous entity. Today's United States was then much smaller and Canada much larger.

The submergence of half of Texas was followed by a period of emergence. This submergence-emergence cycle was repeated numerous times after but at successively lower levels and of lesser amplitude. The postulated scenario is based on analysis of anomalies in the literature and physical features depicted on aerial photographs (e.g., perched shoreline features; incised valleys derived from inundation (submergence) rather than fluvial down-cutting, etc.). A defining feature of these shifts is the revision of stream orders and the initiation of another tier of streams (e.g., this Holocene shoreline defines the upstream ends of many river systems).

The tilting-down to the north of these shoreline profiles contrasts with other shorelines found elsewhere on the continent that tilt down to the south. This leads me to believe that isostatic rebound is not involved but rather a shift in the Earth's equatorial axis relative to its orbital axis. Opposing tilts imply a physical disconnect between the Earth and its ocean water (i.e., they don't move in tandem) when such a shift occurs with the possibility of some involvement related to the Earth's spheroid shape (i.e., flatter poles – bulging equator).

The catastrophic nature of the submergence event played havoc with the distribution and demise of many of the Earth's species and accounts for its many extinctions, particularly the large number purported to have occurred around 10000 BP. The axial shifts are the basis for the many "floods" that make up the oral and written chronologies of historic cultures around the world. Seawater submergence resulted in drowning, burial, lost habitat and abrupt changes in climate. The shift/submersion cycles, severely impacted large mammals, particularly those on large valley plains at lower elevations. The impact on humans in the area was enormous. For example, the Holocene shift accounts for the disappearance of the Paleo-Indian Culture in North America.

Animals are perceived to be more susceptible to catastrophic events. Plant species, however, are viewed as having an ecological elasticity or amplitude that enables them to rebound. I am not convinced this was the case in that plants probably exhibited many regional extinctions and the nearby Mississippi River valley is a case in point. In the shifts the land base would not only pass through a number of climatic zones but a self-induced climate change would also occur (i.e., marine conditions where there previously were none). For example, this valley would have provided niches for Boreal and possibly Near-Arctic species that enabled their survival up to the 10000 BP event. It is possible, through isolation and subsequent hybridization, that specific species survived older events to become valley endemics. Although there are scenarios for endemic and disjunct species surviving by not having been impacted by this event (e.g. offshore islands) the situation in the Mississippi River valley would have seen many species wiped out if they were not capable of surviving as submerged seed banks that germinated on emergence. Interesting relationships present themselves when aspects of plant evolution (e.g., hybridizations) and distributions in the Gulf States, the Mississippi River valley, the Appalachians and Mexican uplands are studied in relation to cyclical axial shifts and corresponding sea level changes.

The ramifications of the 10000 BP event described here are relatively self-evident. Given that the described shoreline, and others both before and since, are postulated to have resulted from axial shifts one can conclude that the events used to characterize the Pleistocene are wrong or at least muddled. Having said this, I believe there was an event so distinctive that it warranted the identification of an epoch change, namely, the Holocene designation. That event is the axial shift described here and it marks the furthest south that the North American continent, or more accurately the present North American side of the Northern Hemisphere, has been in 10000 years.

References

Noble, T.W., 2004. Holocene Seawater Incursion of California's Valleys: www.axialshift.com.