



BOOK REVIEWS

Changing Tides: Twilight and Down in the Spanish Sea, 1763–1803, by Robert S. Weddle, 1995. College Station: Texas A&M University Press, 352p., ISBN 0-89096-661-3.

Changing Tides deserves the attention of those studying the littoral sciences because it documents an early period of coastal studies and demonstrates the potential for using primary historical documents to study historical coastal changes. The European conflicts of the Seven Years War spilled over into the Americas, resulting in changes in political hegemony through the Gulf of Mexico in the last half of the eighteenth century. Coastal explorations and surveys by Spain and Britain were initiated so they could increase their knowledge of their newly acquired territory in Louisiana and Florida. *Changing Tides*, the history of these explorations and surveys of the Gulf of Mexico, is divided into four roughly chronological parts, concentrating largely on the Texas, Louisiana, and Florida coastlines.

Spain desperately needed surveys of the coast between the Mississippi River and Galveston after taking possession of Louisiana. Mariners and pilots were brought together in New Orleans in 1769 to write instructions for merchants approaching the mouth of the river. Approaching La Balise, the old French fort at the entrance to North Pass, mariners would evaluate bottom conditions at a depth of fifty fathoms to determine their position. When they brought up fine black and white sand, sand with little or no mud, coarse sand mixed with shell, fine gravel, or hard mud the mariners knew if they were on course or how far and in what direction they had fallen off to enter North Pass. These sailing instructions suggest they had a practical, if unsophisticated, knowledge of the geology around the delta. In 1766, Captain Blas de la Garza Falcón and Diego Ortiz Parilla produced the first map during an early reconnaissance of Padre Island in 1766, while they wrestled to understand the concept of barrier islands, a new phenomenon.

English "publishing travelers," many of whose reports remain available in reprints, added greatly to the knowledge of the coast. Between 1763 and 1770, Lt. Philip Pittman, an army engineer, studied changes in the Mississippi Delta since the arrival of Europeans and explained the rivers distributary system. Pittman used the post at La Balise, established in 1734, as a benchmark for measuring the delta's growth. Spanish installations erected in 1767 across the channel from La Balise were on an island that had not existed twenty years earlier. George Gauld, between 1764 and 1777, surveyed much of the Gulf between Florida and Texas, producing the most detailed surveys up to that time.

The French, with the idea of regaining Louisiana, sent Georges-Henri-Victor Collot to survey the Mississippi Valley in 1796. Collot observed the Mississippi's different channels

and studied the delta's geology. He hypothesized that sediment carrying is minimized when the river's current meets the breaking waves of the sea, forming bars. Slow currents through the distributaries created bars that grow more rapidly, eventually becoming banks that created lakes separated from the gulf. Lakes Borgne, Maurepas, and Ponchartrain, Collot theorized, resulted from the slow current of the Amite River fed by Mississippi floodwaters. These lakes would become shallower as more sediment deposited on the bottoms, eventually to become swamps. Lake Barataria was just such an example, already having lost half its depth and one third of its diameter at that time. These conclusions may seem obvious now, but in the late 1700s they were brilliant new ideas. During this last part of the century cartographers and surveyors began using the chronometer, rather than celestial observations of the sun, Jupiter's moons, and other heavenly bodies, to determine longitude as they surveyed the coast, creating the most accurate maps up to that time.

This is only a brief sketch of the many surveys of the Gulf documented in *Changing Tides*. Weddle's accounts of the hardships of these early coastal surveyors arouses excitement, though some may find the political background a bit dry. The book includes only one map of the entire Gulf, and many larger-scale maps would have allowed the reader to follow the surveys in detail. Reproductions of seventeenth-century maps add to the book, and suggest the value these would have in studying historical changes to the coast. The bibliographic references, from both seventeenth-century and later sources, will prove valuable to any researcher studying historical coastal change in the Gulf of Mexico. Many of the surveys have been published, although many are found only in archives in Europe and North America. For coastal researchers in general, the coastal changes documented by these surveys demonstrate the potential for using primary sources in ascertaining long-term historical changes to the coastal areas.

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The Corps and the Shore, by Orrin H. Pilkey and Katharine L. Dixon, 1996. Washington, DC: Island Press, 282p., \$22.95, ISBN: 1-55963-438-3.

Orrin Pilkey and Katharine Dixon have written an insightful assessment of how the U.S. Army Corps of Engineers goes about its business of "guarding" our nation's shoreline. Their book is well written and provides keen criticism of Corps beach protection efforts, and the authors set forth several in-

interesting recommendations for reforming how the Corps handles such projects. Unfortunately, the authors as scientists fail to grasp the truth that keeps the Corps preeminent in shoreline decision-making: the Corps is foremost a political entity rather than a scientific body and cannot ever be a neutral party in the debate over America's beaches. The Corps is the shore; *e.g.* the shore exists to promote the Corps.

The Pilkey-Dixon book is divided into ten chapters with the initial ones providing background on the Corps and its evolving involvement with the shore. The most intriguing chapter is a devastating (to me) critique of the basic model used by the Corps to scientifically predict and politically justify shoreline projects, the GENESIS model (Generalized Model for Simulating Shoreline Change). The authors using logic, experience, assertion and quotations from other scientists show that GENESIS fails to predict shoreline change accurately nor, indeed, is it even capable of doing so. Its assumptions of beach similarity, no offshore currents and no storms, coupled with a failure to consider interactions of beach processes, render the model a mere exercise.

The issue for society is that a model based on unrealistic assumptions and incomplete site data is used to justify funding to interfere with the very beach it fails to describe. The lame excuse that "Congress cannot deal with uncertainty in cost estimates" fails to recognize that Congress indeed grapples with uncertainty in costs for all programs it considers. In fact, Congressional debate and the political process is the democratic vehicle for handling uncertainty. Providing a range of uncertainty for model predictions would assist the debate rather than hinder it; however, the Corps wants concrete (pardon the pun) funding for proposed projects and not more debate. The Corps, as a political entity, knows politics drives science and cannot be the reverse as Pilkey and Dixon wish it to be.

The Corps, as one of America's oldest public agencies, has learned well the art of political persistence and preeminence. Fundamental to its success is the District Office which works to tune itself to local interests concerned about a shoreline project. This office provides the rationale, the engineering studies, and assists those interests in the political support for their common cause. To disarm critics (and scientists), the office keeps the project focus so narrow that only it has the requisite information for project success. In turn, local interests and their congressional representatives keep funding the office for its studies and eventual implementation. As the authors point out, this narrow project focus is insufficient to maintain a quality shoreline over time. But the vicious circle of win-win for the District Office (the Corps) and local interests is based on a funded project. Because the funded project means they win they are biased against participating in a more complex group process to widen the perspective beyond a funded project which has a concrete (the pun again) identity for garnishing votes. Because no participation is done, their critics become harsher without information and the District feels justified in continuing its winning strategy.

Most of the authors' chapters deal with the failure of beach

replenishment as a long-term strategy for protecting America's beaches. Separate chapters detail selected case studies to include Folly Beach, South Carolina; Sargent Beach, Texas; Presque Isle, Pennsylvania; Camp Ellis, Maine; and Oregon Inlet, North Carolina. All of these cases have been controversial and each case shows the Corps' failure to predict the longevity of the new sand and the amount of the cost for the initial project and its maintenance. After reading these cases, one would not be too far afield to say that standard Corps practice is to estimate the total project cost involved and simply take 40% of it for use in getting Congressional approval, on the basis that a project once begun would be funded to completion!

The final chapter sets forth the authors' prescription for reforming the Corps. They correctly identify the problem as the Corps' project approach based on obtaining funding for its projects. They go on to criticize the "science" practiced by the Corps as client-serving (building owners and District Offices), dogmatic (ignore the natural system), and political (ignore science). The authors conclude that greater external scientific monitoring and oversight of Corps project proposals would go far to stop projects that would harm beaches. Alas, such a proposal, while rational, would not be implemented, or even if implemented, would not last long without co-optation of the standing panel. Scientists are not integrated into their communities so that they would be seen as obstructionists and become isolated from the political base unless they worked more closely with District Offices. Such scientific co-optation has occurred in other natural resource arenas to include forest districts, grazing districts and water development districts. The only way to reform the Corps is to remove the Corps entirely from shoreline protection. Incremental changes of Corps practice will not change their orientation as all federal agencies rely on program and project funding for their existence.

P. T. Barnum, the American circus entrepreneur, once noted that a lamb can co-exist with a lion, provided one has a large reserve of lambs. The Corps lion continues to co-exist with the shoreline lambs because so many shoreline lamb projects exist to feed it. A dynamic beachfront cannot co-exist with the static boundary of private property lines; therefore, the Corps, which serves these private interests, can indefinitely thrive on the proposed projects put to it. Can the Corps lion be tamed? Can the reserve of lambs be reduced by educating local interests to live with a changing shoreline? I professionally doubt it, but I personally would be delighted to see it!

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