Information Concerning the Historic Shoreline Database

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The Historic Shoreline Database on the Web contains many directories of related types of information about beach changes in Florida over the past 150 or so years. The historic shoreline map images (see the Historic Shoreline Maps directory) show precision-digitized approximate mean high water (mhw) shorelines, from the US government coastal topographic maps listed in the associated map bibliography files (see the Historic Map Source Bibliography directory). These generally show data extending from the mid to late 1800's to the mid to late 1970's. The mhw positions have been extracted and tabulated (see the MWH files directory) relative to fixed reference "R" points along the beach, spaced approximately 1000 feet (300 meters) apart. Reference points not actually corresponding to actual "in the ground" survey markers are virtual "V" points. Mean high water positions have been and continue to be extracted from FDEP beach profile surveys from the 1970's through the present and added to the tables. The beach profile data files from which mhw data have been extracted and added into the mhw tables can be found in the ProfileData directory and visually (for many areas) in the ClickOnProfiles directory. The beach profile files include elevation information along the entire length of the profiles. This profile data set has undergone up to fifteen additional quality control checks to ensure accuracy, reliability, and consistency with the historic database coordinate and bearing set. Note that any data deeper than wading depth have not yet undergone any extra quality control checks. Note also that there are *.cod text files of notes associated with the review of the profile data files.

The digital historic shoreline map image files are given in a DWG AutoCAD-based format, which should be usable on most versions, as well as many GIS systems. The Florida State Plane 1927/79- adjusted and 1983/90 horizontal coordinate systems are used. These are not metric systems, but with the proper software can be converted to whatever systems you may need. Each map image DWG file contains many layers, documented in an ASCII layer list archived with the DWG file.

The database has been maintained and greatly expanded by E. Foster since approximately 1987 and by N. Nguyen since 1995. The initial map digitizing effort was done for FDEP at Florida State University, primarily by S. Demirpolat. Final processing and editing of the original map files to make them user- friendly was performed by N. Nguyen and E. Foster in 1995-7. Extensive quality control and update work has been performed by E. Foster since 1987, and by N. Nguyen since 1995. Field profile surveys have been performed by the FDEP Coastal Data Acquisition section since the early 1970's, and by a number of commercial surveyors in recent years.

The formats of the mhw tables and profile files are explained in text files included in the respective directories.

Note that the digitized map image files were originally created in the UTM coordinate system on Intergraph equipment. The translation from UTM to the State Plane coordinate systems has resulted in some minor textual and other visual shifts in the northwest Florida area map image files.

The dates in the map legends in the map images are generally composite dates. It is necessary to use the mhw data tables and map bibliographies for accurate dates for any specific location. The date ranges in the data tables relate to specific information given in the map bibliography files.

Generally, it may be assumed that the historic shorelines have been digitized as carefully as possible from the source maps. If a historic shoreline does not contain a systematic position error and is feasible in a physical sense, the accuracy of the mhw position is estimated at plus or minus 15 to 50 feet (5 to 15 m), depending on the source and scale. This is as a position in time, NOT as an average mhw position. Data added from field surveys are estimated at plus or minus 10 feet (3 m) or better.

It is to be noted that from the 1920's onward, aerial photographs have usually been the basis of the US government's coastal topographic maps. Prior to that, the method was plane table surveying. Along higher wave energy coasts, especially the Florida east coast, if there was significant wave activity in the source photography, it is very possible that the mhw was mapped in a more landward location than was probably correct. Alternatively, the use of photography sets with excessive sun glare may have caused the mhw to be mapped in a more seaward location than was probably correct. These effects have been frequently observed in comparisons of close- in-time FDEP controlled aerial photography with FDEP profile surveys. The use of some photography sets containing high wave uprush or sun glare is probable within the historic data. For example, on the east coast the 1940's series maps tend to show the mhw more seaward than expected, possibly due to sun glare, and the 1960's series tend to show the mhw more landward than expected. In the latter case, the effect may be due to the 1960's being a decade of frequent storms. It is recommended that the analyst be aware that some of these effects may exist in the historic data. A questionable historic shoreline is NOT necessarily one to be discarded, just considered with allowance for its' potential limitations. Using this database, it can readily be observed that the historic trends in shoreline evolution are very consistent with behavior expected from the longshore transport equation, well known to coastal engineers. This is a non- linear equation. Shoreline change can be expected to be linear or constant only in certain situations. It is NOT recommended that any analyst arbitrarily assume constant or linear shoreline change rates over long periods of time, which is often done but not supported by the evidence. The three primary factors controlling shoreline change are sand supply, wave climate, and local geographic features. In some parts of Florida, major storms since 1995 have also become important factors.