
Methodology for Flow and Salinity Estimates in the Sacramento-San Joaquin Delta and Suisun Marsh

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Chapter 10: Geometry

Authors: Ralph Finch, Chris Enright, and Mohammad Rayej

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[Editor's Note: The original electronic copy of this report is unavailable. Only the last section of this chapter is presented here.]

Delta Channel Geometry

This task, to assemble geometry data already collected into a single generic database, and then develop model-specific databases from that, was started in 1992 and is described in the 1993 Annual Report. The task was not fully completed at that time because of software limitations; we did not have a good way of checking the data for errors or completeness (missing data), nor did we know what form the new models required the geometry data to be in. This section provides an update on the latest work of getting new data and checking and processing data in a form DSM2 can use.

In the Summer of 1994, it became apparent that DSM2 would be ready within a year and it would be desirable to calibrate that model with a realistic channel geometry. Therefore an effort was made to locate software that could display the data, check for errors, and generate channel cross-sections. The FastTabs package was considered, but rejected because it was designed for 2-dimensional finite-element modeling and had too many unneeded features, and could not display the original, raw data points. Instead, we purchased software from John Crapuchettes, a private software developer. This package, which runs on MS-Windows on IBM PC machines, will allow the display of the original geometry data in both a plan (aerial) view and cross sectional view. In the plan view the user can draw straight lines with the mouse to select cross-section locations. In the cross-section view, the geometry points are displayed and the user can draw the proposed channel cross-section through the individual points as a series of connected line segments. The cross-sections and related information may be written to a file and used in DSM2.

A geometry viewer was available on a SGI Unix computer we had in the Section. In the Fall of 1994 Chris Enright of the Section used the viewer to identify areas of missing data. Paul Sandhu of the Section contacted NOAA, and they sent new datasets. Paul then processed the data using methods developed by Andy Chu previously (1993 Annual Report), and prepared a new file with all geometry data points. We now have nearly 400,000 data points describing the Delta channel geometry from several different sources.

Ideally, data describing the channel bathymetry and surface topology would be sufficient to generate cross-sections or other forms to fully describe the channels. However, in practice the channel data may be insufficient. For instance, sections of the Sacramento River have only data for the ship channel in the middle and data is lacking in other portions of the river bed. To estimate the channel extent Chris located a channel outline data set, developed by the US Geological Survey. Unfortunately the channel outline data does not always agree with the bathymetry data, and they must be reconciled. Since the channel outline data is more accurate

with respect to horizontal placement, the channel bathymetry data must be moved to agree with the channel outlines. This task will be performed by the Teale Data Center. When finished, we will have a channel bathymetry data set and a channel outline description to be used in the viewer to construct channel cross-sections for use in DSM2.