

Comparing HF radar and ADCP profiling data with a nowcast numerical model in San Francisco Bay, California

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A marine nowcast system has been installed in San Francisco Bay since April 1997. An important element of the marine nowcast system is a nowcast numerical hydrodynamic model that provides near real-time tidal current distribution in the bay to users via WWW at <http://sfports.wr.usgs.gov/sfports>. The control points of the nowcast hydrodynamic model are the observations of tides and tidal currents at a few locations in the bay. In recent years, HF radar has been used successfully for mapping currents on the coast of open oceans. Applications of HF radar in bays and estuaries are rare or non-existent. In the summer of 1999, two SeaSonde HF radars were installed at Tiburon and Treasure Island in Central San Francisco Bay in a field experiment to collect surface mapped tidal current distribution. Between late June and early August 1999, the USGS deployed two upward pointing acoustic Doppler current profilers (ADCP) in the region covered by SeaSonde HF radars. On August 2, a boat-mounted ADCP was used to obtain ADCP profiling data with the boat crisscrossing within the region monitored by the SeaSonde HF radars for about 8 hours. The combined ADCP profiling data, in-situ ADCP time-series and SeaSonde surface current map time-series provide a unique data set of tidal current that spans both temporal and spatial spaces. This data set will be used in the inter-comparison between HF radar measured tidal currents and fixed and profiling ADCP data sets. Both the HF radar mapped tidal current distribution and the ADCP transect data are used in the validation of the nowcast numerical model of tides and tidal currents in San Francisco Bay.