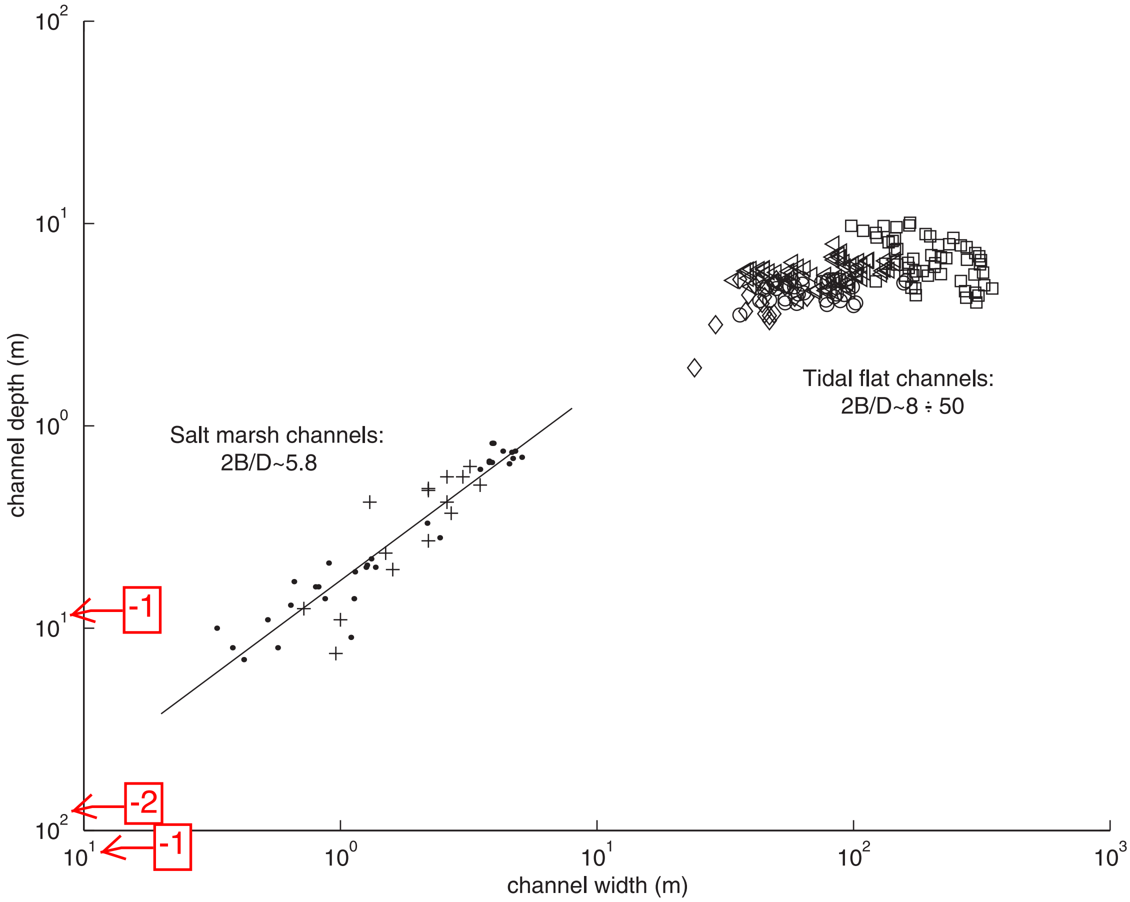

Figure 11. Width versus depth for a number of directly surveyed tidal channel sections in the lagoon of Venice. Crosses and dots indicate two different salt marsh channels measured along their winding path. Diamonds, squares, and triangles indicate tidal flat channels. As an excercise, we have fitted only salt marsh data with a straight line (whose intercept is forced to zero), which is estimated to yield a slope $\beta \sim 6$ and $R^2 = 0.98$.

[39] A comparative study of fluvial and tidal forms can be based on the above features. Specifically, we applied the techniques of analysis introduced here to mesoscale landforms observed within the river Livenza in northern Italy. We analyzed three different reaches of lengths 4700, 6700 and 19900 m respectively, characterized by mean discharge values of 16, 50 and 90 $m^3 s^{-1}$, and mean widths of 20, 25 and 50 m. Negligible spatial gradients of contributing area suggest constant landforming flow rates within each of the reaches considered. We found that, differently from the tidal cases, meander wavelengths are approximately constant as well as the ratio of wavelength to width. Further, computation of the parameter χ in equation (14) indicates consistent up-stream skewing of the meanders ($\chi < 1$). The comparison of the fluvial and tidal forms therefore indicates that in the latter cross-sectional dimensions are strongly varying in space in response to strong discharge gradients. It is remarkable, however, that the proportionality of wavelength and width applies in both cases. On this basis alone we might suggest that a condition of local equilibrium should hold even in tidal environments, in which the average width of each meander and its cartesian length adjust to the value of the dominant discharge with no appreciable (and durable) transient feature moving from one meander lobe to the next ones.

[40] Finally, the above geomorphic characterization of tidal meanders cannot, of course, be considered complete because properties other than planar are to be considered. Topography is first considered. It has been inferred [*Rinaldo et al.*, 1999a] that topographic gradients are less significant in tidal environments than in hillslope and fluvial geomorphology, owing to the different dynamic implications. In fact, while slopes (and thus gravity) command basin-scale transport, tidal flows are driven mostly by free surface gradients that are weakly dependent on topography. Nevertheless, topographic curvatures can be suitably used to single out the channelized portion of the tidal environments [*Fagherazzi et al.*, 1999a]. Moreover, the bottom profile of tidal channels is usually characterized by an upward concavity which increases with channel convergence [*Lanzoni and Seminara*, 2002]. As a consequence, bottom slope, which may attain relatively high values in the landward reaches, tends to decrease progressively as one moves seaward, thus implying that the flow depth is likely to increase at a rate smaller than the width.

[41] Here we show the results of our survey of width-to-depth ratios $\beta = 2B/D$ in meandering tidal channels and creeks [e.g., *Leopold et al.*, 1993]. Figure 11 shows, for a large sample of channels within the Lagoon of Venice, plots of channel depth D versus width $2B$. The data are derived