

Section PR125 was first monumented and surveyed in 1975. It was resurveyed annually during the 4 consecutive years 1977-1980, resurveyed in 1982, resurveyed annually during the 18 consecutive years 1984-2001, and, after a 9-year hiatus, resurveyed in 2011, 2012, and 2013.

Cross section PR125 is located about 1.5 km down Powder River valley from the point where the channel of Flood Creek enters the left side of the valley. The section is located near the crossover point of a large bend in Powder River. The left bank of the channel is formed by the floodplain surface developed after the 1978 flood (Moody et al., 1999), which steps upward onto a piece of the Moorcroft terrace. The right bank is a Lightning/Moorcroft terrace (Moody and Meade, 2008).

The flood of 1978 produced one massive change in section PR125: a shift in the lateral arrangement of the channel from cutbank-on-the-left-side-and-pointbar-on-the-right to cutbank-on-the-right-and-pointbar-on-the-left. The thalweg of the river channel here shifted, during two weeks of flood flows in May 1978, some 70 meters toward the right bank. This lateral shift appears to have been produced by the downriver transport of a large gravel bar (some 40 meters wide and about a meter in thickness, Meade and Moody, 2013, see *their* Figures 14 and 15), toward the left bank. Bank erosion during the 1978 flood amounted only to 3 meters of cutback of the right bank. The combination of large (70-m) thalweg shift and small (3-m) cutbank erosion probably was due to section PR125's being located near the inflection point (or, more likely, in the inflection *zone*) between the downriver limb of one meander bend and the upriver limb of the next meander bend downstream.

During the decades following the 1978 flood, the left-side gravel bar at section PR125 has become a new vegetated inset flood plain by the incremental addition of new sand (Moody and others, 1999; Pizzuto and others, 2008). A total thickness of 1-2 meters of new sand has accumulated between station 20 and station 50, mostly during years 1982, 1987, 1993, 1995, and, probably, 2008. The right-side cutbank meanwhile has eroded some 8 meters laterally, mostly during the same 5 years.

Measurements of Reynolds stress were made in 1996 at the edge of the new vegetated inset flood plain. An acoustic Doppler velocimeter (ADV) was mounted on a carriage, which could move the velocimeter horizontally out over the channel and vertically in the water (Moody and Smith, 2002). Measurements were made on 28 May 1996 at six verticals between station 26.5 and 30.0 in water depths ranging from 0.1 m to 0.6 m at a quasi-steady discharge of  $71 \text{ m}^3 \text{ s}^{-1}$ .

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PR125. **Top.** 22 July 1977. View upriver. E. Meade (~1.6 m tall) in red circle is standing on the section. **Bottom.** May 1996. View from the Kaycee Terrace above the left bank. Flow is from right to left in the channel in the foreground. Red line indicates the line of section.



PR125. **Top.** 28 May 1996. Discharge was  $\sim 71 \text{ m}^3 \text{ s}^{-1}$ . View is downriver showing the acoustic Doppler velocimeter (yellow object) mounted on a carriage, which moved on an I-beam deployed out over the edge of the left bank of the new inset flood plain built since 1978. **Bottom.** 30 May 1996. Discharge was  $\sim 62 \text{ m}^3 \text{ s}^{-1}$ . View is downriver showing the tripod, I-beam, and D. Martin ( $\sim 1.5 \text{ m}$  tall) who is down river from the I-beam. The exposed sediment along the right bank was deposited between 28 May and 30 May 1996.



PR125. **Top.** 29 September 2013. View upriver. Tripod and D. Martin (at right edge of photo and behind the trees) are about 7m downriver of station 4. Rodman (J. Moody) is on section at station 38, and is standing on vegetated top of floodplain sediment deposited since 1978, when the main channel of Powder River shifted from the left bank to the right bank (see also Meade and Moody, 2013, *their* figures 14 & 15). **Bottom.** 29 September 2013. J. Moody is standing at station 38.



PR125. **Top.** 29 September 2013. View upriver. J. Moody (~1.9 m tall) is on section at left edge of water at station 50.6.