

Table 3. Summary of interpolation procedures used to estimate median flow information for stream segments on the Kansas Surface Water Register (KSWR)

[Q, median flow; DA, drainage area; B, bias equals measured gaging station Q minus regression equation Q; Subscripts: r, regression-equation estimate of median flow; s, segment (ungaged); b, with bias added; u, upstream gaging station; d, downstream gaging station; g, at streamflow gage]

Case number	Case	Controlled segment interpolation procedure	Uncontrolled segment interpolation procedure
1	No gage on stream	Never occurs.	Use regression estimate (no adjustment).
2	Gage on that segment near ¹ downstream end of segment	Use gaged value.	Use gaged value.
3	Gage on that segment not near ¹ downstream end of segment	Estimate flow from gage data using ratio of gage drainage area to downstream end of KSWR segment drainage area. Ignore regression equations. $Q_s = \frac{Q_u}{DA_u} DA_s$	Use regression estimate adjusted by weighting the bias between the gaged value and the estimated value at the gaged site by the ratio of the gaged drainage area to the downstream end of the KSWR segment drainage area. $B_s = \frac{B_d}{DA_d} * DA_s$ $Q_{sb} = Q_{sr} + B_s$
4	Gage on stream only upstream or downstream of that segment	Estimate flow from gage data using ratio of gage drainage area to downstream end of KSWR segment drainage area. Ignore regression equations. $Q_s = \frac{Q_u}{DA_u} * DA_s$ or $Q_s = \frac{Q_d}{DA_d} * DA_s$	Use regression estimate adjusted by weighting the bias between the gaged value and the estimated value at the gaged site by the ratio of the gaged drainage area to the downstream end of the KSWR segment drainage area. $B_s = \frac{B_u}{DA_u} * DA_s$ $Q_{sb} = Q_{sr} + B_s$
5	Gage on stream both upstream and downstream of that segment	Estimate the flow from upstream and downstream gage data using weighted average ratios of gage drainage areas to downstream end of KSWR segment drainage area. Ignore regression equations. $Q_s = \frac{Q_u(DA_d - DA_s) + Q_d(DA_s - DA_u)}{DA_d - DA_u}$	Use regression estimate adjusted by a weighted average bias between the two gages. $B_s = \frac{B_u(DA_d - DA_s) + B_d(DA_s - DA_u)}{DA_d - DA_u}$ $Q_{sb} = Q_{sr} + B_s$

¹Near is defined as location on the stream segment that is downstream from any natural hydrologic break, such as a tributary stream.