

Exercise 7—Multiple Offsets

Develop two segments of a single rating using two offsets such that each segment passes within reasonable limits of all measurements associated with that segment. Measurement information is shown in the attached table.

Suggested procedure:

1. Use [BARC](#) to input all measurements and plot them using a common scale offset, such as 1.0 ft. In BARC, use input for Rating A to develop this rating.
2. Develop one rating for the lower five measurements and another for the upper four measurements. Use input for Ratings B and C, respectively to develop these rating segments
3. Determine the best offset for the lower rating segment. You should be able to come up with a rating that falls within 5% of the lower 5 measurements.
4. Determine the best scale offset for the upper segment of the rating. Once again, you should be able to develop a rating that falls within 5% of the upper four measurements.
5. Finally, use BARC's Rating D to develop a rating that uses two offsets and passes within acceptable limits of ALL measurements.
6. In the next exercise you will see how these two rating segments can be combined into a single rating.

Measurement data for Exercise 7

Mill Brook near Dunraven, N.Y.		
Measurement number	Gage Height	Discharge
839	7.19	1000
840	9.74	2500
841	6.2	621
842	5.9	506
843	3.82	32.5
844	3.57	18.1
845	3.78	29.9
846	3.56	18.1
847	4.58	126

Shows BARC output for Ratings B and C. Note percent differences are good for highest four measurements using Rating B and good for the lower five measurements using Rating C.

A new rating for Station: 12345678
 Exercise 7

Copy to Rating C

Single Offset Breakpoint Ratings
 Show Show Show

Regression	Rating A	Rating B	Rating C	
Enter the Rating Offset	#DIV/0!	1.00	1.40	3.00
Enter the Low Endpoint Gage Height	3.56	3.56	3.56	5.90
Enter the Low Endpoint Discharge	#VALUE!	18.1	18.1	506
Enter a Breakpoint Gage Height (Optional)				
Enter a Breakpoint Discharge (Optional)				
Enter the High Endpoint Gage Height	9.74	9.74	3.82	9.74
Enter the High Endpoint Discharge	#VALUE!	2500	32.5	2500
Sum of the Percent Differences	385.91	-239.55	-121.10	
Percent Difference Furthest From Zero	106.47	-86.85	-29.71	

Measurement Data

Use	Number	Gage Height	Discharge	Rated	Rating A % Diff.	Rating B % Diff.	Rating C % Diff.
<input checked="" type="checkbox"/>	839	7.19	1000		59.72	-65.56	-1.57
<input checked="" type="checkbox"/>	840	9.74	2500		0.00	-86.85	0.00
<input checked="" type="checkbox"/>	841	6.2	621		99.63	-43.83	1.85
<input checked="" type="checkbox"/>	842	5.9	506		106.47	-36.19	0.00
<input checked="" type="checkbox"/>	843	3.82	32.5		21.79	0.00	-29.71
<input checked="" type="checkbox"/>	844	3.57	18.1		-1.55	-2.35	-22.04
<input checked="" type="checkbox"/>	845	3.78	29.9		18.66	0.25	-28.91
<input checked="" type="checkbox"/>	846	3.56	18.1		0.00	0.00	-19.38
<input checked="" type="checkbox"/>	847	4.58	126		81.20	-5.02	-21.33

Shows how all measurements are now within 5% when two offsets (1.4 and 3.0) are used. Note that only one offset can be used for plot.

Multiple Offset Breakpoint		
	<input type="radio"/> Show	<input type="radio"/> Show
	Rating D	Rating E
Offset to be Used on the Log Rating Curve	3.00	
Offset at the Bottom of the Rating	1.40	
GH at Which 2nd Offset Starts (Optional)	5.40	
2nd Offset (Optional)	3.00	
GH at Which 3rd Offset Starts (Optional)		
3rd Offset (Optional)		
Enter the Low Endpoint Gage Height	3.56	
Enter the Low Endpoint Discharge	18.1	
Enter the 1st Breakpoint Gage Height	5.00	
Enter the 1st Breakpoint Discharge	250	
Enter the 2nd Breakpoint Gage Height		
Enter the 2nd Breakpoint Discharge		
Enter the 3rd Breakpoint Gage Height		
Enter the 3rd Breakpoint Discharge		
Enter the High Endpoint Gage Height	9.74	
Enter the High Endpoint Discharge	2500	
Sum of the Percent Differences	-6.05	
Percent Difference Furthest From Zero	-4.65	