

## \$SMOOTH-Record - Smoothing Command

There are no tests for slope stability across the cross section in HEC-6. Consequently, the bed can become very irregular during a simulation containing periods of low flows. The \$SMOOTH Command record instructs HEC-6T to test the slope across the movable bed versus the angle of repose for sand. An angle of repose is calculated between each set of coordinates using the initial cross section stations and elevations. When the calculated values are less than 0.3, the program assumes the material to be sand and assigns 0.3. Values larger than 0.3 become the angle of repose for that panel.

Smoothing is turned OFF by default. If smoothing is desired, place a \$SMOOTH-Record at the beginning of the HYDROLOGIC Data set. The following example illustrates a request for smoothing each time step. The command can be placed anywhere a COMMAND-Record is permitted. Smoothing can be turned on or off when the user desires. Different smoothing intervals can be prescribed.

A second feature of the smoothing command is the option to prevent erosion below model bottom. This option may artificially reduce the tons of sediment being transported. Therefore, it should be used in conjunction with the original option for bed sediment available when interpreting the overall model results.

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Example:           FIELDS
1234567 1234567 1234567 1234567 1234567 1234567 1234567 1234567 1234567 1234567
$HYD
$SMOOTH      ON      1      0
$RATING      1
RC           6      200      100      1.37      1.84      2.01      2.16      2.28
RC           2.39
*   AB      RUN 1
Q   1000
T    55
W    1
.
.
.
$$END
```

# \$SMOOTH

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## HEC-6 Input Description - Special Commands and Program Options

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Field(1)	Variable	Value	Description
1	CMD	\$SMOOTH	Record identification
2	ISMOPT	[ON, OFF]	Code the option in Field 2 of the \$SMOOTH-Record  Default is OFF. No smoothing calculations are made.
3	LSMO	[0, b]	The smoothing interval.  Program will default to a smoothing interval of 100 time steps. (Note: X-Records allow more than one time step per event.)
		+	Prescribe the smoothing interval. It is the number of time steps between smoothing calculations.
4	IDBSR_TEMPLATE	b,0	Template option that controls the shape the Bed Sediment Reservoir as sediment is eroded from it.  This is the Historic HEC-6/6T rules. The program will test for the availability of sediment in the Bed Sediment Reservoir (BSR) using the mass of sediment. It does not consider the channel invert elevation. The entire mass can be eroded even if it means distorting the shape of the cross section. Continuity of mass is preserved, but the cross section can become distorted to the point the invert is lower than the Elevation of Model Bottom.  This continues to be the default option for HEC-6T.

## HEC-6 Input Description - Special Commands and Program Options

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- 1 This option is new beginning with Version 5.13.18. The elevation of the channel invert will not erode below the Elevation of Model Bottom. The mass of sediment in the Bed Sediment Reservoir (BSR) is converted into a depth, and the depth is compared to the depth of the BSR at the beginning of each event.

$$YSINV = TWP - EMB$$

where

TWP = Thalweg (Channel Invert) Elevation

EMB = Elevation of Model Bottom

YSINV = Depth of BSR in option 1

The volume of the BSR is

$$VBSR = YSINV * SABK$$

where

SABK = Surface area

VBSR = Volume of BSR

The values of YSINV and SABK have changed at the beginning of each time step. The specific weights used to convert from mass to volume includes consolidation if cohesive sediments are involved.

- 2 ~~A template of cross section coordinates, (stations, elevations), for the bottom of the Bed Sediment Reservoir is calculated from the initial shape of the cross section.~~ (NOTE: THIS OPTION IS NOT YET AVAILABLE.)

Notes:

1. This record is actually read using free field rules; therefore, the values do not have to fit

**\$SMOOTH**

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perfectly within each field. Each must be separated by either white space or a comma.