

Worksheet 22A. Various field methods of estimating Near-Bank Stress risk ratings for the calculation of erosion rate.

Estimating Near-Bank Stress (NBS)								
Stream:	Location:			Date:	Crew:			
Methods for Estimating Near-Bank Stress								
(1) Transverse bar or split channel/central bar creating NBS/high velocity gradient: Level I - Reconnaissance.								
(2) Channel pattern (Rc/W): Level II - General Prediction.								
(3) Ratio of pool slope to average water surface slope (S_p/S): Level II - General Prediction.								
(4) Ratio of pool slope to riffle slope (S_p/S_{rif}): Level II - General Prediction.								
(5) Ratio of near-bank maximum depth to bankfull mean depth (d_{nb}/d): Level III - Detailed Prediction.								
(6) Ratio of near-bank shear stress to bankfull shear stress (τ_{nb}/τ): Level III - Detailed Prediction.								
(7) Velocity profiles/Isovels/Velocity gradient: Level IV - Validation.								
Level I	(1) Transverse and/or central bars - short and/or discontinuous. NBS = High/Very High							
	(1) Extensive deposition (continuous, cross channel). NBS = Extreme							
	Chute cutoffs, down-valley meander migration, converging flow (Figure X). NBS = Extreme							
Level II	(2)	Radius of Curvature	Bankfull Width	Ratio	Near-Bank Stress			
		Rc (feet)	W_{bkt} (feet)	Rc/W				
	(3)	Pool Slope	Average Slope	Ratio	Near-Bank Stress	Dominant Near-Bank Stress		
		S_p	S	S_p/S				
(4)	Pool Slope	Riffle Slope	Ratio	Near-Bank Stress				
	S_p	S_{rif}	S_p/S_{rif}					
Level III	(5)	Near-Bank Max Depth	Mean Depth	Ratio	Near-Bank Stress			
		d_{nb} (feet)	d (feet)	d_{nb}/d				
	(6)	Near-Bank Max Depth	Near-Bank Slope	Near-Bank Shear Stress	Mean Depth	Average Slope	Shear Stress	Ratio
d_{nb} (feet)		S_{nb}	τ_{nb} (lb/ft ²)	d (feet)	S	τ (lb/ft ²)	τ_{nb}/τ	
Level IV	(7)	Velocity Gradient (ft/s/ft)		Near-Bank Stress				
Converting Values to a Near-Bank Stress Rating								
Near-Bank Stress Rating		Method Number						
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Very Low	N/A	>3.0	< 0.20	< 0.4	<1.0	<0.8	<1.0	
Low		2.21 - 3.0	0.20 - 0.40	0.41 - 0.60	1.0 - 1.5	0.8 - 1.05	1.0 - 1.2	
Moderate	See (1) Above	2.01 - 2.2	0.41 - 0.60	0.61 - 0.80	1.51 - 1.8	1.06 - 1.14	1.21 - 1.6	
High		1.81 - 2.0	0.61 - 0.80	0.81 - 1.0	1.81 - 2.5	1.15 - 1.19	1.61 - 2.0	
Very High		1.5 - 1.8	0.81 - 1.0	1.01 - 1.2	2.51 - 3.0	1.20 - 1.60	2.01 - 2.3	
Extreme		< 1.5	> 1.0	> 1.2	> 3.0	> 1.6	> 2.3	
								Overall Near-Bank Stress Rating