

# CIVE 716 EROSION AND SEDIMENTATION

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## Assignment #4 Chapters 8 and 9 due November 11, 2009

### Problem # 1 (100%) Bedforms and Bedload (SI Units)

Consider the data from the Rio Grande at Bernalillo from HW #3 and determine the following in SI units:

1. Bedform type from Liu and Albertson, plot field measurements on Figure 8.6.
  2. Bedform type from Chabert and Chauvin, plot on Fig. 8.7.
  3. Bedform type from Simons and Richardson, plot on Fig. 8.8.
  4. Bedform type from Bogardi, plot on Fig. 8.9.
  5. Calculate the mean flow velocity from the velocity profile
  6. Calculate Manning n and Chézy C.
  7. Calculate  $d^*$ .
  8. Calculate  $u^*$ .
  9. Calculate the laminar sublayer thickness \*
  10. Calculate  $Re^*$ .
  11. Calculate the critical Shields parameter  $J_c^*$
  12. Calculate the critical shear stress  $J_c$ .
  13. Estimate T,
  14. Bedform type from van Rijn.
  15. Estimate the bedform height )
  16. Estimate the bedform length 7.
  17. Estimate  $J_*$ ,  $J_*'$  and  $J_*''$ .
  18. Estimate  $f$ ,  $f'$  and  $f''$ .
  19. Estimate  $k_s$  from the velocity profile measurements and compare with the grain diameter and the dune height
  20. Plot the  $k_s$  measurement assuming ) and 7 on Figure 8.13.
  21. Estimate the bedload sediment transport using the Duboys method in kg/m-s.
  22. Estimate the bedload sediment transport using the MPM method.
  23. Estimate the bedload sediment transport using the Einstein Brown method.
  24. Produce a Table with the bedload transport rates the three methods in lb/ft-s and in metric tons/m-day.
  25. Define the bedload discharge in English tons per day and in metric tons per day.
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