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BANK PROCESSES ON THE RED RIVER BETWEEN INDEX, ARKANSAS AND SHREVEPORT, LOUISIANA

By

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First Periodic Report

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This is the first report in the Study of Bank Processes on the Red River between Index, Arkansas and Shreveport, Louisiana, which includes work on data assimilation has begun and a model of bank stability developed by Osman and Thorne is being applied to quantify bank processes.

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1. SCIENTIFIC WORK DONE

1.1 Logistics

I arrived in Vicksburg on June 11 in good time to begin the project on June 15. Most of the data pertaining to the Red River are held at the Vicksburg District, Corps of Engineers (LMK) offices in downtown Vicksburg. Therefore, after consultation with Dr Brown (the Contracting Officer at WES), it was decided to base my study mostly at LMK rather than at the Waterways Experiment Station, where my previous study was based. It took a few days for me to set up a desk, computer, and work space at LMK.

On June 15, Lisa Cheadle arrived in Vicksburg and immediately began work as my research assistant on this project.

1.2 Data Collection

During the first 3 weeks of the project I have established contact with the individuals in LMK who will supply the data necessary to undertake this project. This has involved visits to the Hydraulics, Potomology, and Foundations and Materials Branches. So far, the bulk of the information on hydrographic surveys, channel evolution, sediment characteristics and transport rates, and the distribution of the various geologic units in the flood plain has been made available. I am still awaiting data on the geotechnical properties of the various units which has been requested from the Foundations and Materials section.

With assistance from Tim Hubbard (LMK), Lisa Cheadle has extracted information on the distribution of bank angles and bank heights in the study reach from the most recent hydrographic survey. These data are now being stratified according to bank location (in bendways or straight reaches) and bank material type (meander belt alluvium, clay plug, back swamp, or pliestocene deposits). This will aid in the interpretation of the role of bank material properties in affecting bank retreat rates and sediment yields from bank erosion.

John Watkins (LMK) has assimilated data on bend pool scour depths. The distribution of scour depth in relation to bend geometry and outer bank materials (natural and manmade) is being studied using geometric, revetment and soils data supplied by Glenda Hill and Clara Pinkston (LMK).

2. RESEARCH PLANS

As soon as the existing data relevant to this study have been assembled and evaluated, a field trip to the study reach will be undertaken to fill in any gaps and resolve questions raised by the data. Subject to there being sufficient flow in

the river to allow passage by small boat, we will visit the field later this month.

The analysis of bank stability developed in the DEC Study (Thorne, 1988) will be applied to the Red River using the combined archive and field data, to identify the prevalent erosion processes and mechanisms of failure that are responsible for significant bank retreat. The data on scour pool depths will be used to asses the potential for bed scour in bendways that might be experted to result from bank stabilization by the Corps of Engineers.

When Freddy Pinkard (LMK) returns from a two week trip to the HEC Center at Davis, California, it is planned to begin assimilating and assessing data from the Philip Bayou cut-off for possible use in testing and further developing the Osman-Thorne channel evolution model (Thorne and Osman, 1988).

3. ADMINISTRATIVE ACTIONS

There have been no significant administrative actions during this period of the project.

4. REFERENCES

Thorne, C.R. (1988) "Analysis of bank stability in the DEC watersheds, Mississippi", Final report to the US Army European Research Office, London, England, under contract No. DA45-87-C-0021, 40 p.

Thorne, C.R. and Osman, M.A. (1988) "Riverbank stability analysis: Part II Applications", Journal of Hydraulic Engineering, ASCE, Vol 114, No.1, pp 151-172.