

Kerr 216 Sedimentation/Channel Morphology Task Group

13 November 2003 Meeting Summary

In attendance were:

Richard Lewis- USACE
Hasan Pourtaheri- USACE
Cliff Hupp- USGS-Reston, VA
Phil Townsend- Uni. Of Maryland
Adugna Kebede- NCDWQ
Sam Pearsall- NCTNC
Jean Richter- USFWS
Jerad Bales- USGS- Raleigh, NC

Introductions were made

Richard Lewis distributed three handouts:

1. Powerpoint presentation explaining the section 216 study.
2. Project Delivery Team flow chart.
3. Flow chart showing the three phases of the Section 216 study.

The J.H. Kerr Section 216 study of the J.H. Kerr flood control project is designed to answer the question- Can Kerr dam be operated in a way that is better for the river and the environment downstream?

It is important to note that we are currently in Phase I of the study. At this phase the Sedimentation/Channel Morphology Task Group is responsible for:

- Determining data needs
- Determining data gaps
- Identifying what studies are needed to fill gaps
- Identify cost of studies and surveys
- Assign tasks to appropriate elements

Although the group has until May 2004 to address the above bullets, we need to have the above information by the end of January and should have a face-to-face meeting in February to keep things moving and to ensure we will have a complete product for the May deadline.

At today's meeting the Task Group proceeded to address the first three bullets in a brainstorming type session keeping the following question in mind- How are the operations of Kerr dam affecting bank stability and the transport of sediments?

Statements that came out of the brainstorming session on how the operations of Kerr dam are thought to be impacting the environment downstream were:

- The dam enhances the redistribution of post-colonial sediments, which will affect forest communities and floodplain morphology. This has long term biodiversity and ecosystem integrity implications.

- The dams accelerate the rate of erosion of the banks causing them to erode in such a way that they are no longer able to support plants and some animal life.

The following is the start of a list of data needs or gaps identified by Task Group members at the meeting to help address the impacts listed above:

- Bank erosion rates in upper and middle reaches of the river. This information needs to be linked to river reach and morphology feature.
- Deposition rates in the middle and lower reaches.
- Bank height and width/depth ratios.
- Bed dynamics and sediment size analysis.
- Suspended sediment monitoring relative to dam releases.
- GIS- categorization of river reaches
- GIS- prediction of river reach
- Historic information on bed sediment analysis before dam construction.
- Correlation between variance to flow and bank erosion (this will require regular monitoring i.e. stream load resampling and erosion pins at regular intervals.
- Sediment fingerprinting
- Sedimentation and its long term deposition on the floodplain- How does this impact the diversity of forest communities?
- How long water stands on floodplain to how much deposition there is.
- What is the impact of the lack of flushing of sediments on the floodplain?

The timeline for Phase I

- On 16 December, there will be another Task Group Leader meeting to present status updates of progress on Phase I activities to date. Each respective Task Group should have met (which we have) and begun exploring project impacts, data gaps, etc. in a way that illustrates to the executive committee that the issues for each Task Group are real and need to be examined further.

Following is a list of the issues (as I understand them) that our Task Group should be dealing with. Please review and add to the list **AND** provide any history, documentation, and/or data that support these issues as being a problem for consideration. Note that these issues are what we will base the foundation of our efforts for this Task Group and where we will be focusing our Phase I scope and cost estimates.

- ✓ Bank caving - “whether or not the bank caving, which is active along the river, is due to the Reservoir Operation.” How far downstream of the dam bank caving is happening. If it is too far may be it is a natural occurrence of the down valley movement of the meander pattern. However, if bank caving resulted from farming practices – i.e. plowing their fields right up to the river bank, they should see more bank scars and downed trees along the plowed fields than along the naturally vegetated reaches of the river.
- ✓ Systematic changes in channel geometry.
- ✓ The change in sediment concentrations over time

- ✓ Also water intakes and bridge foundations may be affected.
 - ✓ Gullies in the channel banks – Head cuts on the small tributaries due to lower water level in the main river downstream of the dam.
 - ✓ Long-term forecasts are often needed for decisions about project operations. Computational model may be the best approach for making those long-term forecasts, 50-year predictions of conditions along the mainstream and perhaps the major tributaries.
 - ✓ The type of in-stream data, which is needed to analyze such problems, as these are the same as, needed to calibrate a sedimentation model. The data set must be synoptic in time and spread over the entire study area. Aerial photography, at intervals over time, is of great benefit in studying changes in channel plan-form, land use and vegetation.
 - ✓ The Corps of Engineers Engineering and Design Manual “Sedimentation Investigations of Rivers and Reservoirs,” EM 1110-2-4000 dated 15 December 1989, contains several paragraphs describing the impact of dams on River Morphology. <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-2-4000/toc.htm>. EM 1110-2-1418, “Channel Stability Assessment for flood Control Projects” also has good information on river morphology, which can be applied directly to the above issues. <http://www.usace.army.mil/inet/usace-docs/eng-manuals/em1110-2-1418/entire.pdf>
 - ✓ Please provide any available information by the end of this week (Friday 5 December-03) to include in our presentation for executive committee to support the issue.
- May 2004- each Task Group should have completed a package that outlines the following:
 - The impacts the J.H. Kerr project is having on the downstream ecosystem,
 - what data exists,
 - what data is still needed to better understand the impacts,
 - what studies will be necessary to verify the impacts and their extent,
 - what will be the cost of the studies,
 - who is going to do the studies.

The Task Group met for only 1^{1/2} hours and was not able to make a comprehensive list of project impacts, data needs, gaps etc. The group agreed to complete this via email. The next step will be to identify what studies need to be done, the cost and who’s going to do the studies. Another face-to-face meeting will most likely be necessary sometime next year winter or early spring.