US Army Corps of Engineers®

Flood&Coastal Storm Damage Reduction R&D Program

Channel Debris Assessment and Management and Bank Restoration Methodologies

Description

Flooding, either in riverine environments or in coastal surge settings, frequently results in the deposition of debris in drainage channels. These floods also damage stream channels, which are generally repaired later -- either by the Corps or by another organization. Much of the material in flood-related debris such as trees, wood, and building materials, represent physical barriers and hazards, but have little potential for long-term environmental damage if not rapidly removed. However, other materials, such as damaged machinery and refrigerators, are capable of exuding hazardous constituents resulting in long-term damage to the environment or presenting health hazards to local populations or emergency response personnel. Being able to quickly identify potential hazardous materials and to prioritize cleanup needs can allow for limited resources to be used in areas with the most harmful debris sources. Additionally, debris from surges which is pushed up drainage channels may act as temporary dams. These dams can create secondary flooding, which may cause further damages to impacted areas or hinder recovery efforts. Application of remote sensing technologies (such as LIDAR and hyperspectral imagery) coupled with existing spatial modeling capabilities can be used to quickly prioritize debris clearance activities to minimize impacts of secondary flooding and to identify potential hazardous waste sources present in such debris. Finally, many lessons have been learned regarding the best methods for the actual cleanup of debris material and subsequent stream restoration which would both reduce cost and maximize long-term bank stability. Combining removal and restoration would reduce risk as the restored stream would be better prepared for additional storms.

Issue

- Specify potential debris identification, removal, and disposal methodologies which take into account the entire life-cycle of a debris-related event – from initial deposition, through cleanup, and subsequent bank and channel restoration.
- To capture and document lessons learned in previous Corps debris response efforts and identify potential technologies and approaches which merit additional research in the future.
- To identify technologies, such as stream channel and bank restoration techniques, which are sufficiently mature to support demonstration projects and to assist in facilitating planning possible demonstration projects to be funded by other means.

Potential Users

Corps Districts, Federal Emergency Management Agency (FEMA), local police, fire and other disaster response agencies

Products

Initial project funding will be used to develop a white-paper on debris removal which documents the best approaches for debris identification, prioritization, removal, and channel restoration which capture lessons learned from previous flood and surge events. It will also identify technologies and methods showing particular promise for follow-on research. A plan will be outlined to direct further research in this area.

Benefits

Development of efficient and effective methodologies for assessing debris fields and prioritizing their removal will aid decision-makers in more effective use of limited response resources. Furthermore, improvements in the handling, removing, and disposal of flood-related debris material will result in significant savings to the Corps of Engineers. Additionally, these methods should ensure long-term viability and stability of steam channels, which should reduce additional expenditures in the future.

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