

for future emergencies. Field personnel were also asked what major obstacles faced them while trying to do their jobs. Supervisors (39 responses) were asked whether they had the resources to continue their ongoing projects while their employees were detailed to flood duty.

2. Recommendations

Recommendations are based upon the responses that were received from both the field personnel and the supervisors. They are summarized below in four categories.

- a. Flood Emergency Preparedness/Training
 - Conduct training exercises at least annually.
 - Have maps, plans and specifications readily available for field personnel.
 - Flood manuals should be up-to-date.
 - Provide video instructions to levee districts on the proper methods of flood fighting.
- b. Emergency Operation/Management
 - Set clear goals, define responsibilities and authorities and provide briefings for flood area engineers and assistant flood area engineers.
 - Standardize administrative activities of EOC operations.
 - Activate and mobilize the EOC early.
 - Assign public relations personnel to work in the field during emergencies.
- c. Communication
 - Transmit critical information to the field as quickly as possible.
 - Overlap shifts to facilitate exchange of information between shift personnel.
 - Utilize cellular telephones, fax, etc. to relay information between field personnel and EOCs.
- d. Equipment
 - Provide adequate and appropriate equipment and supplies such as telephones, radios, flood gear, computers and cameras and give personnel proper training on the use of equipment.
 - Provide reliable and appropriate transportation for field personnel. Have contingency arrangements made with GSA and commercial rental agencies in advance.

XIV. Flood Damage Description

A. Discussion of Damages Experienced

Damage surveys have not been completed, but the best estimate at this time is that flood damages in the Rock Island District will exceed \$1 billion dollars. More than two dozen levees in the Rock Island District eventually succumbed to the flood waters, flooding more than 190,000 acres of farm land and several small towns.

Due to funding and time constraints, detailed field data collection will be limited. The majority of the data will be collected from agencies such as Civil Defense Offices, U.S. Department of Agriculture, Federal Emergency Management Agency, State and local transportation offices, the Red Cross, etc. Damage categories will include: residential, commercial, industrial, public facilities, transportation, utilities and agricultural. The 1993 Flood damage data will be summarized in the Flood Plain Management Assessment of the Upper Mississippi and Lower Missouri Rivers and Tributaries Study Report, to be published in June 1995.

B. Discussion of Damages Prevented by Corps Projects

The building, raising and strengthening of federal flood control projects and levees and the operation of the three reservoirs prevented an estimated \$1.1 billion dollars in damage. Damages prevented in this flood exceeded the total cost of all flood control projects in the Rock Island District.

1. Reservoir Regulation

The three reservoirs were operated to the extent possible to reduce damages on the Iowa and Des Moines rivers. The total damages prevented by the three reservoirs during 1993 flooding was \$672 million dollars. Table 33 shows the damages prevented by the three reservoirs.

Table 33
1993 Damages Prevented by Corps Reservoirs
Rivers with Reservoirs Millions of Dollars

Iowa River	3
Des Moines River	172
Mississippi River	497
Total Reservoirs	672

2. Local Protection Facilities

Table 34 shows a breakdown of damages prevented by Corps projects during 1993 flooding. It is a preliminary estimate based on existing damage curves from previous reports and is subject to revision based on completed damage surveys and other information.

Table 34
1993 Damages Prevented by Corps Projects

Mississippi River	\$ Million Damages Prevented
Urban Levees	178
Levee Districts	204
Total	382
Other Levees	
Iowa River	11
Cedar River	11
Illinois River	58
Other	10
Total	90

3. Emergency Measures

Damages prevented by emergency works are included in the totals shown above.